

LUMINOSITY FUNCTIONS FOR OLD STELLAR SYSTEMS

by

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ABSTRACT

The potential for luminosity functions (LFs) of post-turnoff stars to constrain basic cluster parameters such as age, metallicity, and helium abundance is examined in this dissertation. A review of the published LFs for the globular cluster (GC) M92 suggests that the morphology of the transition from the main sequence to the red giant branch (RGB) is sensitive to these parameters. In particular, a small bump in this region may provide an important age discriminant for GCs. A significant deficiency in the number of stars over a 2 mag interval, just below the turnoff, remains unexplained.

A method of interpolating isochrones and LFs accurately from evolutionary sequences, from the lower main sequence to the RGB tip, is discussed. The interpolation scheme is based on primary interpolation points which are identified by the behaviour of the derivative $d(\log T_{\text{eff}})/d(\log t)$ along an evolutionary sequence.

New BV CCD observations, calibrated with Landolt and Graham standard stars, for the old open cluster NGC 2243 and for the bright stars in the GCs NGC 288 and NGC 7099 are presented. The colour magnitude diagram (CMD) of NGC 2243 contains a strong binary star component. Comparisons with the fiducial sequences of the GC 47 Tuc (Hesser *et al.* 1987) indicate that the two clusters have similar abundances, while comparisons with the new oxygen-enhanced isochrones (Bergbusch & Vandenberg 1992) suggest that NGC 2243 has an age of 4–5 Gyr, and a metallicity $[\text{Fe}/\text{H}] \gtrsim -0.65$. The morphology of both the CMD and the LF through the turnoff region cannot be attributed to the merging of the binary and single star sequences, but convective overshooting works in the correct sense to account for the differences between the isochrones and the CMD.

For NGC 288 and NGC 7099, excellent overall consistency among the Zero Age Horizontal Branch, isochrone, and LF fits is obtained for cluster ages of 14–16 Gyr. The manifestation of the transition bump in NGC 288's LF provides a particularly

strong constraint on the age, since this feature becomes more prominent as the metallicity increases. *R*-method helium abundance estimates give $Y \approx 0.23$ for NGC 288 and $Y \approx 0.31$ for NGC 7099. The 2nd parameter problem is discussed in light of these results. The RGB bump, present in canonical LF's, is only weakly identified in the cumulative LF (CLF) of NGC 288, and may not be present at all in NGC 7099's CLF. However, the brightest RGB stars in both clusters are found within ≈ 0.2 mag of the RGB tip predicted by the oxygen-enhanced models.

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Chapter 1

Introduction

1.1 The Relevance of Luminosity Functions

Observed luminosity functions (LFs) have not yet had the expected impact on stellar astrophysics, in spite of a number of theoretical studies (e.g., Simoda & Iben 1970; Ratcliff 1987) and impressive observational efforts (e.g., Sandage 1957; Hartwick 1970; Da Costa 1982). As emphasized by Renzini & Fusi Pecci (1988), the LF is a much more critical test of stellar evolution theory than the fitting of isochrones to observed color-magnitude diagrams (CMDs), because the numbers of stars in different evolutionary phases is a direct reflection of the relative lifetimes in these phases. Moreover, it has the advantage (see Paczyński 1984) that it is completely independent of predicted and observed colors and is sensitive to model temperatures only through the bolometric correction scale.

The information that can be derived from an observed LF depends on which portion of the CMD has been observed. The standard power-law form of the initial mass function (IMF) is $\phi(\mathcal{M})d\mathcal{M} \propto \mathcal{M}^{-(1+x)}d\mathcal{M}$, where $\phi(\mathcal{M})d\mathcal{M}$ is the number of stars in the mass range $\mathcal{M}, \mathcal{M} + d\mathcal{M}$. If it is assumed that the stars in a cluster are coeval and that mass-loss is not significant for the evolutionary phases considered, then the number of stars per unit V-magnitude interval is simply $\Phi(V) = \phi(\mathcal{M})\frac{d\mathcal{M}}{dV}$. The exponent x is derived from the lower main sequence, where a statistically significant number of stars, spread over a reasonable range in mass, can be obtained. This has been the main thrust of recent CCD-based LF studies (e.g., Richer *et al.*, 1991).

From the turnoff point to the tip of the giant branch, the LF is insensitive to the IMF and to the effects of mass segregation because the range in mass is very small ($< 0.03M_{\odot}$ from model calculations for reasonable cluster ages). However, as illustrated in Figure 1-1, the morphology of the LF, in the transition from the turnoff to the giant branch, is sensitive to age, helium abundance, and metallicity. The location of this transition, together with the bump evident near the base of the giant branch, shifts to fainter magnitudes as the age is increased. Moreover, the size of the bump decreases with increasing age. The effect of increasing the helium abundance is to depress the height of the transition, while increasing the metal abundance serves to steepen the slope and to accentuate the size of the bump. (See Simoda & Iben 1970, and Ratcliff, 1987 for a more detailed discussion regarding the transition from the turnoff to the giant branch.) However, the slope of the LF between the base of the giant branch and the location of the evolutionary pause, where the H-burning shell contacts the composition discontinuity produced when the convective envelope attains its deepest penetration into the interior, is insensitive to *any* of the input model parameters, and so serves as a good region over which to normalize different model predictions for comparison to observation.

The bump in the LF near the base of the giant branch is mainly a reflection of the morphology of the subgiant branch: the flatter the transition from the turnoff to the RGB, the larger the number of stars in the magnitude interval centered on it. Post-turnoff stars evolve rapidly in temperature, while their luminosity evolution may actually slow down (Fig. 2-2(a) illustrates this for a $1.25M_{\odot}$ star with $[\text{Fe}/\text{H}] = -0.65$). Such temperature evolution occurs more rapidly as the stellar

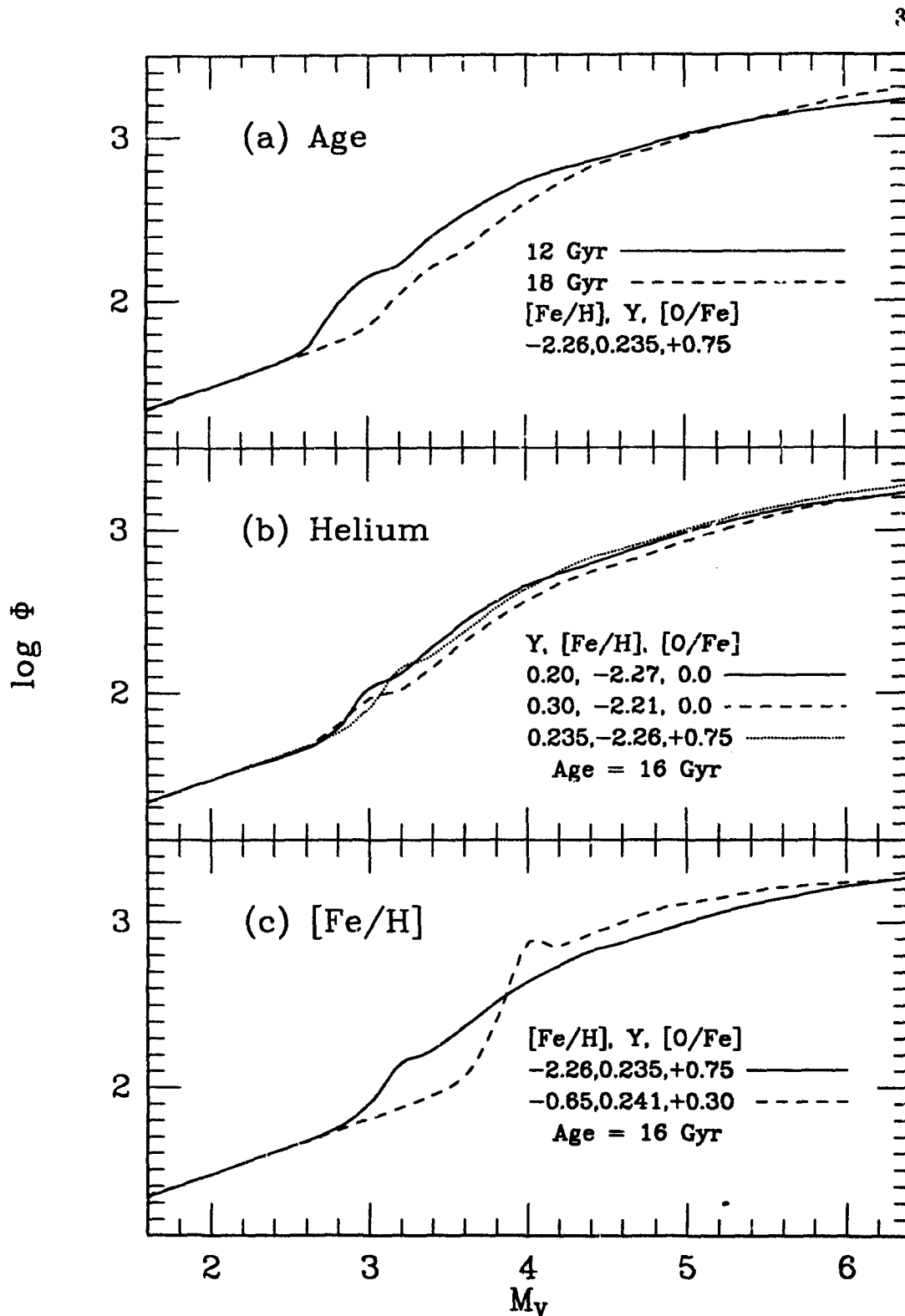


FIGURE 1-1 The effects of (a) age, (b) helium abundance, and (c) metallicity on model LFs through the turnoff region, normalized at $M_V = +2.0$, for the parameters indicated.

mass increases, which accounts, in part, for the increasing size of the bump at younger ages. The effect is further enhanced in the V -magnitude LF by the increasing effect of metallicity on stellar temperatures, which, through the bolometric corrections, results in large effects on M_V . Consequently, when the LF is partitioned into magnitude bins, those bins which sample the subgiant portion may contain stars in significantly different evolutionary stages, whereas the rest of the bins contain stars which are in essentially the same stage of evolution.

Stellar evolution theory (Sweigart & Gross 1978) predicts that two features of the red-giant branch (RGB) LF are affected by metallicity, helium abundance, and age; they are the location of the evolutionary pause, which also manifests itself as a bump in the LF, and the magnitude of the RGB tip. As illustrated in Figure 1-2, differences in the tip magnitude and in the location of the bump are most obvious for changes in metallicity. Again, the effect at the tip is due to the large bolometric corrections at cooler temperatures (see, for example, Vandenberg 1992), associated with the line blanketing and increasing metallicity. The shift in position of the bump to fainter magnitudes as the metallicity increases results from the combined effects of a real reduction in luminosity and the bolometric corrections. However, the location of the bump is also sensitive to the treatment of convection, particularly to the amount of overshoot at the bottom of the convective envelope (e.g., see Alongi *et al.* 1991). For this reason, the identification of the RGB bump in observed LFs may prove to be a more useful constraint on the treatment of convection than on the basic cluster parameters.

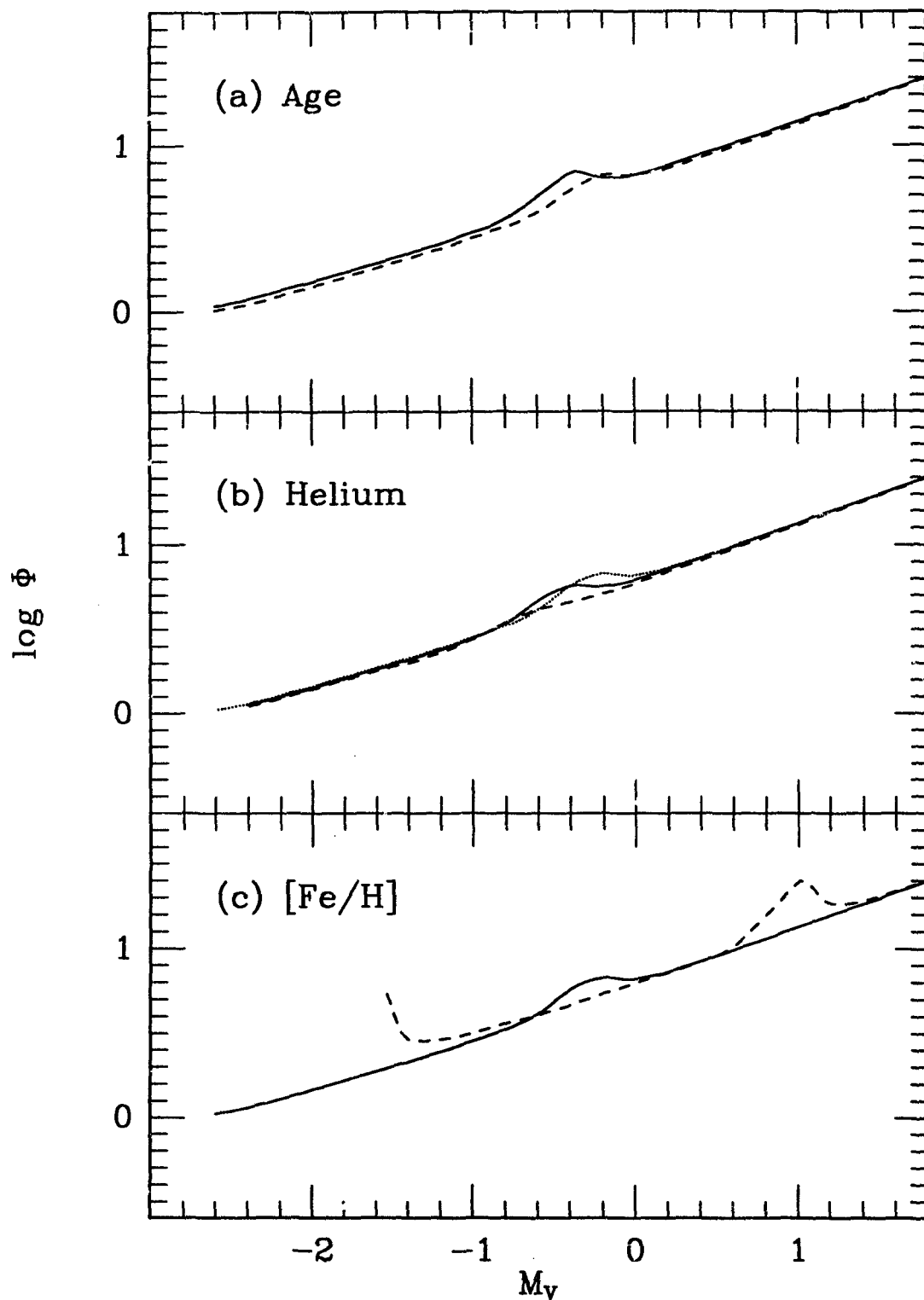


FIGURE 1-2 The effects of (a) age, (b) helium abundance, and (c) metallicity on model LFs along the giant branch. The parameters for each line type are the same as in Figure 1-1.

Because of the difficulty in obtaining large samples of bright RGB stars, Rood & Crocker (1985) have argued that the best way to locate the RGB bump is through the logarithm of the cumulative luminosity function (CLF). Figure 1-3 illustrates that the bump manifests itself in the CLF as a small break in the slope, approximately 2-2.5 mag below the RGB tip. Even though the break in the slope is a subtle feature, it is due entirely to the contribution of the bump stars to the CLF. Moreover, the effect on the slope of the CLF below the bump persists over several magnitudes, which provides an additional constraint when comparisons are made between model and observed CLFs. (Of course, the *shape* of the CLF at the bright end is not affected by the presence of the bump at all.) Recently, Fusi Pecci *et al.* (1990) have identified the bump in 11 clusters by locating the break in the slope of observed CLFs, and have demonstrated the potential of the bump as a standard candle.

In addition to the indications given by model calculations, observational evidence (e.g., Frogel *et al.* 1981; Frogel *et al.* 1983; Vandenberg & Durrell 1990) suggests that the RGB tip magnitude has potential as a standard candle because of its relative insensitivity to age. In Figure 1-4, the data compiled by Frogel *et al.* (1983) are plotted together with the RGB tip loci for the ages 12 and 18 Gyr derived from the oxygen-enhanced isochrones of Bergbusch & Vandenberg (1992). The two relevant points to be made from this diagram are: 1) at a given metallicity, the models predict a difference of no more than 0.03 mag over the 6 Gyr age difference, and 2) the model loci seem to form an approximate upper envelope to the data. The main observational difficulties appear to be: 1) obtaining a sufficiently large sample of bright stars near the RGB tip, to ensure that the brightest RGB star is observed; and 2) discriminating

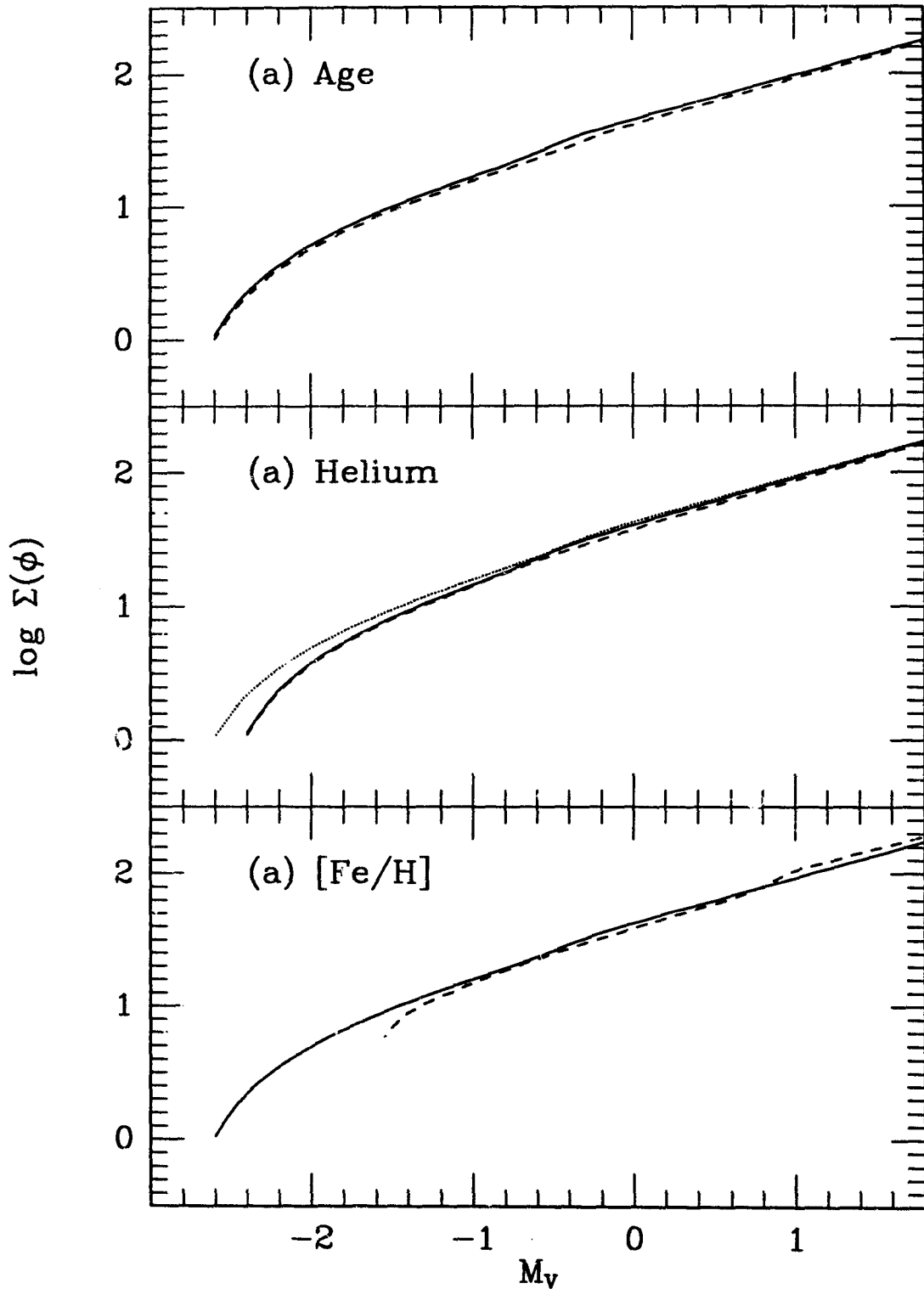


FIGURE 1-3 The effects of (a) age, (b) helium abundance, and (c) metallicity on cumulative LFs along the giant branch. The parameters for each line type are the same as in Figure 1-1.

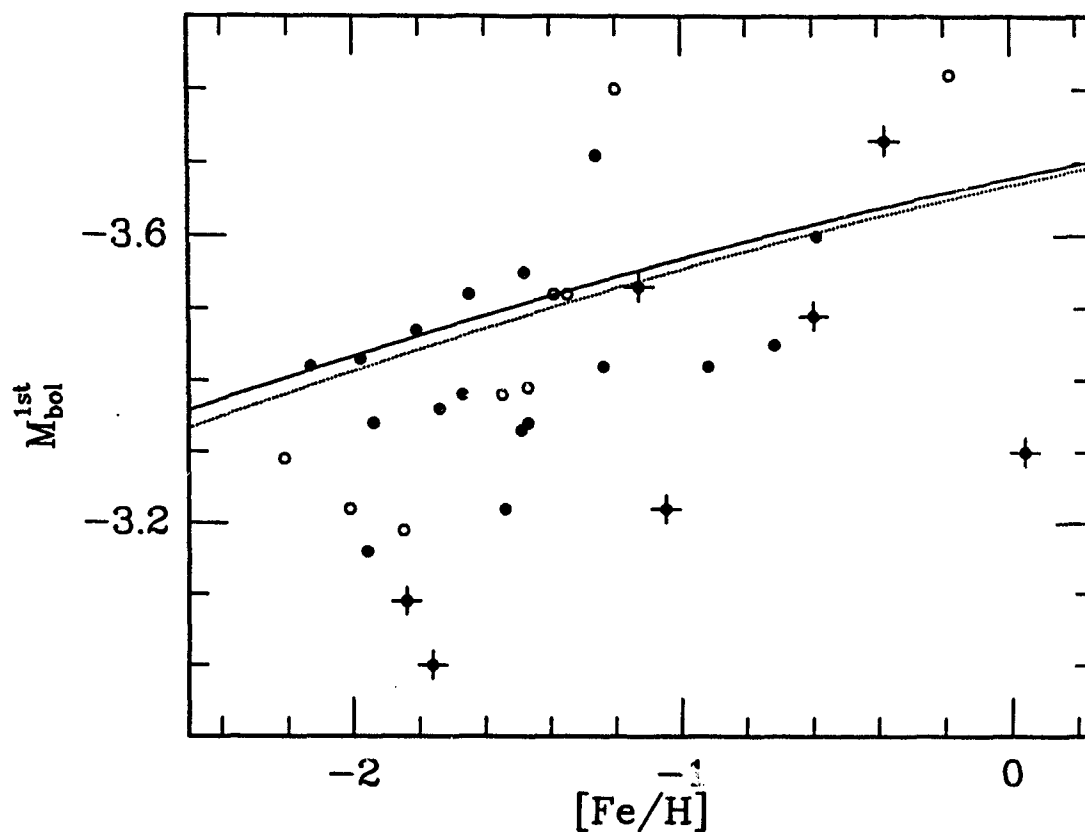


FIGURE 1-4 The brightest GB star data for 33 globular clusters compiled by Frogel *et al.* (1983) together with the model RGB tip luminosities derived from the Bergbusch & Vandenberg (1992) isochrones for 12 Gyr (solid line) and 18 Gyr (dotted line). Cluster metallicities based on the infrared measures of Frogel *et al.* have been adopted, and the symbols plotted match those of their Figure 6; open circles indicate that the brightest cluster star may not have been observed; crosses indicate clusters for which the effects of crowding were severe.

between stars on the RGB and those on the asymptotic giant branch (AGB). Through intercomparisons with model CLFs, the shape of observed CLFs may provide a way to estimate the RGB tip luminosity to somewhat better precision.

1.2 The Helium Abundance

It is difficult to establish helium abundances in cluster stars because the spectral lines due to helium only become (relatively) strong in stars with spectral types earlier than A0. In globular clusters, this observational constraint restricts the stellar sample to hot, blue horizontal branch (HB) stars. Even so, it is not certain that helium abundances derived from such observations reflect the helium content when the stars were formed. For one thing, model calculations show that the dredge-up phase on the RGB may serve to *enhance* the surface abundance of helium, depending on the significance of diffusion (*cf.* Proffitt & Vandenberg 1992) through main sequence and giant branch evolution. On the other hand, the observational evidence (e.g., Heber *et al.* 1986, and Glaspey *et al.* 1989) indicates that blue HB stars are *helium poor* as the result of diffusion.

The *R*-method, first elucidated by Iben (1968a), combines the results of stellar evolution theory with observed luminosity functions to deduce *Y*. The ratio *R* is defined by $R = t_{HB}/t_{RGB} = N_{HB}/N_{RGB}$, where t_{HB} and t_{RGB} are the predicted lifetimes of stars on the horizontal branch and on the region of the RGB above the HB, which may be deduced from theory; N_{HB} and N_{RGB} are the observed numbers of stars in the corresponding regions of the CMD.

The sensitivity of these ratios to the helium abundance can be understood by comparing stellar models at the RGB tip with those along the HB. First of all, the helium flash, which signals the end of the first ascent of the giant branch, is initiated in a highly degenerate helium core, where the temperature and density are of the order 10^6 g/cm^3 and $8 \times 10^7 \text{ K}$ respectively (Renzini 1977). According to Iben's red giant models, the mass of this inert helium core ($\mathcal{M}_c$) is most strongly a function of the helium abundance ($d\mathcal{M}_c/dY \approx -0.4\mathcal{M}_\odot$), but it is only a weak function of the metallicity ($d\mathcal{M}_c/d(\log Z) \approx 0.01\mathcal{M}_\odot$) and of the total stellar mass ($d\mathcal{M}_c/d\mathcal{M} \approx -0.06$).

The dependence of $\mathcal{M}_c$ on the total stellar mass occurs because the temperature and density conditions, mentioned above, are obtained sooner in more massive stars, due to the constraint imposed by hydrostatic equilibrium. Consequently, helium ignition occurs sooner. In the case of stars with $\mathcal{M} > 2.2\mathcal{M}_\odot$ ¹, helium burning may be initiated without the flash, because the interior temperatures become high enough before degeneracy sets in. The direct effect of increasing the helium abundance in a star of a given mass, is to increase its mean molecular weight. Through the equation of state, this results in higher temperatures (at equivalent evolutionary stages) throughout its interior, thereby producing an earlier onset of the flash conditions. Thus, an increased helium abundance serves to reduce both the time spent on the RGB and the luminosity at the RGB tip.

¹ This is the limit in the canonical models for RGB evolution. If convective overshoot is important (*cf.* Maeder & Meynet 1989), then the transition mass can be significantly lower.

Another consideration is that the luminosity of the horizontal branch is effectively set by $\mathcal{M}_c$, because He-burning in the core is the dominant source of luminosity in this evolutionary phase. Furthermore, $\mathcal{M}_c$ is essentially a constant for stars arriving on the HB (see, for example, Vandenberg 1992), despite the fact that total stellar mass increases from blue to red. (The size of the outer envelope increases towards the red end of the HB. The difference in mass is thought to arise from variable amounts of mass loss which could occur along the RGB and/or during the transition from the RGB tip to the zero-age horizontal branch.) Since the HB consists of all stars in the helium core burning phase, and since all HB stars have nearly the same luminosity, they all evolve at approximately the same rate. Consequently, the number of stars on the HB is proportional to the lifetime of an HB star, and therefore on Y . Moreover, since both the HB and the RGB tip luminosity are controlled by $\mathcal{M}_c$, the number of stars seen on the RGB between the HB and the tip is also predominantly a function of Y .

The chief limitation of the R-method is that it is model dependent through the theoretically determined ratio of the lifetimes. The original calibration by Iben (1968a) lead to the conclusion (Iben 1968b) that the initial helium abundance was $Y \approx 0.33$, which at that time agreed reasonably well with the results of hot big-bang calculations. However, improvements in the treatment of convection, including convective overshooting and semiconvection (Robertson & Faulkner 1972; Sweigart & Gross 1974, 1976) have produced substantial increases in estimated HB lifetimes. Recalibrations of the method by Buzzoni *et al.* (1983) and Caputo *et al.* (1987) gave mean values of $Y = 0.23 \pm 0.02$ and $Y = 0.24 \pm 0.01$ respectively, again in remarkable

agreement with the more current predictions (e.g., Yang *et al.* 1984; see also Denegri *et al.* 1990) of the big-bang calculations. Dorman *et al.* (1989) obtained similar results for the globular cluster 47 Tuc, independent of the R -method estimates, by comparing model horizontal branch sequences to the observations of Hesser *et al.* (1987) in the CMD.²

Another problem with the R -method is that it is difficult to separate red HB stars and AGB stars from the RGB stars since the colour differences between them can be quite small. To account for the AGB contribution, Buzzoni *et al.* derived another ratio, $R' = N_{HB}/(N_{RGB} + N_{AGB})$, and arrived at the same helium content as they inferred from the R -method estimates. However, it is preferable to use only RGB and HB stars, since evolution theory is better understood for these stars than for those on the AGB.

Neither Buzzoni *et al.* nor Caputo *et al.* were able to rule out the possibility of a variation in Y from cluster to cluster, possibly correlated with metallicity. This may be attributed to the scatter in the data and the large uncertainty in each datum due to poor statistics. However, a significant variation in Y could also be obtained if M_c varies among the clusters for some other reason. (For example, calculations by Mengel & Gross (1975) suggest that rotation in giant branch stars can induce

² A further increase in theoretical horizontal branch lifetimes may be required (Castellani *et al.*, 1985) by the occurrence of core-breathing pulses (convective instabilities), which bring fresh helium into the core, thus extending the helium core burning phase. This would necessitate a further reduction in the estimates of Y via the R -method.

variations in $\mathcal{M}_c$, in the sense that a higher rotation rate results in a greater core mass.) In the absence of compelling evidence for such a random variation, a sizeable sample of clusters with good statistics and accurate photometry, covering a wide range in metallicity should make it possible to discern any significant cluster-to-cluster variation in Y , and whether it is systematic or not.

1.3 M92: An Illustration

Among the globular clusters in the Galaxy, M92 is the only one for which repeated observations of the LF in the turnoff region have been made. The first luminosity function of M92 was derived by Tayler (1954), who managed to obtain star counts down to about one magnitude below the turnoff. Hartwick (1970) produced a luminosity function that reached ≈ 1 mag deeper than this, and separated horizontal branch stars from giant branch stars on the basis of their $B - V$ colours. Additional LFs covering different portions of the CMD from the subgiant region to the lower main sequence have been obtained by van den Bergh (1975), Fukuoka & Simoda (1976), and Sandage & Katem (1983). All of these LFs were obtained from star counts on photographic plates and therefore suffer from incompleteness at some magnitude level, due to crowding of stellar images and to the inability to detect faint images.

Most recently, Stetson & Harris (1988) have produced a CCD study of the cluster which reaches from the base of the giant branch to the lower main sequence ($M_V \approx 8$). They derived an apparent distance modulus $(m - M)_{app} \approx 14.6$ by comparing their fiducial main sequence with the local Population II subdwarf standards, and obtained a good match to the observations with an isochrone for $Y = 0.24$, $[\text{Fe}/\text{H}] = -2.03$,

$[O/Fe] = +0.7$, and an age of 16–17 Gy. For the lower main sequence, a power law exponent $x \approx 0.5$ fit the LF well, although at the bright end, the inferred mass spectrum appeared to have a higher slope.³

In what follows, a composite luminosity function for the turnoff region of M92 is derived by combining the published LFs mentioned above. This composite LF is compared with a variety of model LFs derived from evolutionary tracks (VandenBerg & Bell 1985; Bergbusch & VandenBerg 1992) to see if the luminosity function can constrain any of the model input parameters, the age and/or the distance modulus, and to shed some light on the direction future observations should take.

1.3.1 The Age-Luminosity Relations

The age-luminosity relations for the main sequence turnoff shown in Figure 1-5 were derived from evolutionary tracks, where the adopted turnoff point for each track was taken as the location where the temperature derivative with respect to time, $d(\log T_{eff})/d(\log t)$ changed sign. The motivation for using tracks rather than isochrones is that the main sequence turnoff point can be obtained more readily from an evolutionary sequence, and as can be seen from the figure, the technique does

³ In a sample of nine globular clusters, ranging in metallicity from $[Fe/H] = -2.1$ to -0.7 , McClure *et al.* (1986) found that the exponent for the IMF varies with the metallicity of the cluster, with the most metal poor clusters requiring $x \approx 2.5$, while the most metal rich clusters require $x \approx -0.5$. However, Ortolani *et al.* (1989) have noted that the mass functions of M30 and NGC 6397 (both metal-poor clusters) have much lower slopes than would be expected from the McClure *et al.* results. M92 is similar to these two clusters in this respect.

produce a very smooth set of relations. It should be noted, however, that had the age-luminosity relations been derived from isochrones, slightly different results would necessarily have been obtained. On an isochrone, the turnoff point is identified as the location of the bluest stars near at the top of the main sequence. Such stars may already be in the thick hydrogen-burning shell stage of evolution, whereas the location of the turnoff point on an evolutionary track, defined by the temperature derivative, corresponds very closely to the point of core hydrogen exhaustion. In what follows, such differences may be neglected, since the derived relations will be used only in the differential sense.

Table 1-1. Apparent Distance Moduli for Various Ages and Compositions

Age	M_V^{TO}	$(m - M)$	[Fe/H]	[O/Fe]	Y
14.0 Gyr	3.95	14.86	-2.21	0.0	0.30
	3.80	15.01	-2.27	0.0	0.20
	4.00	14.81	-1.77	0.0	0.20
	4.01	14.80	-2.26	+0.75	0.235
	4.08	14.73	-2.03	+0.70	0.235
16.0 Gyr	4.09	14.72	-2.21	0.0	0.30
	3.95	14.87	-2.27	0.0	0.20
	4.13	14.68	-1.77	0.0	0.20
	4.14	14.67	-2.26	+0.75	0.235
	4.21	14.6	-2.03	+0.70	0.235
18.0 Gyr	4.21	14.60	-2.21	0.0	0.30
	4.07	14.74	-2.27	0.0	0.20
	4.24	14.57	-1.77	0.0	0.20
	4.25	14.46	-2.26	+0.75	0.235
	4.32	14.49	-2.03	+0.70	0.235

The age-luminosity relation for the composition $Y = 0.24$, $[\text{Fe}/\text{H}] = -2.03$, $[\text{O}/\text{Fe}] = +0.7$, together with the Stetson & Harris estimates of age (16 Gyr) and distance modulus (14.6), fix the transformation of the model LFs to the observer's plane. The distance moduli given in Table 1-1 then follow from the age-luminosity

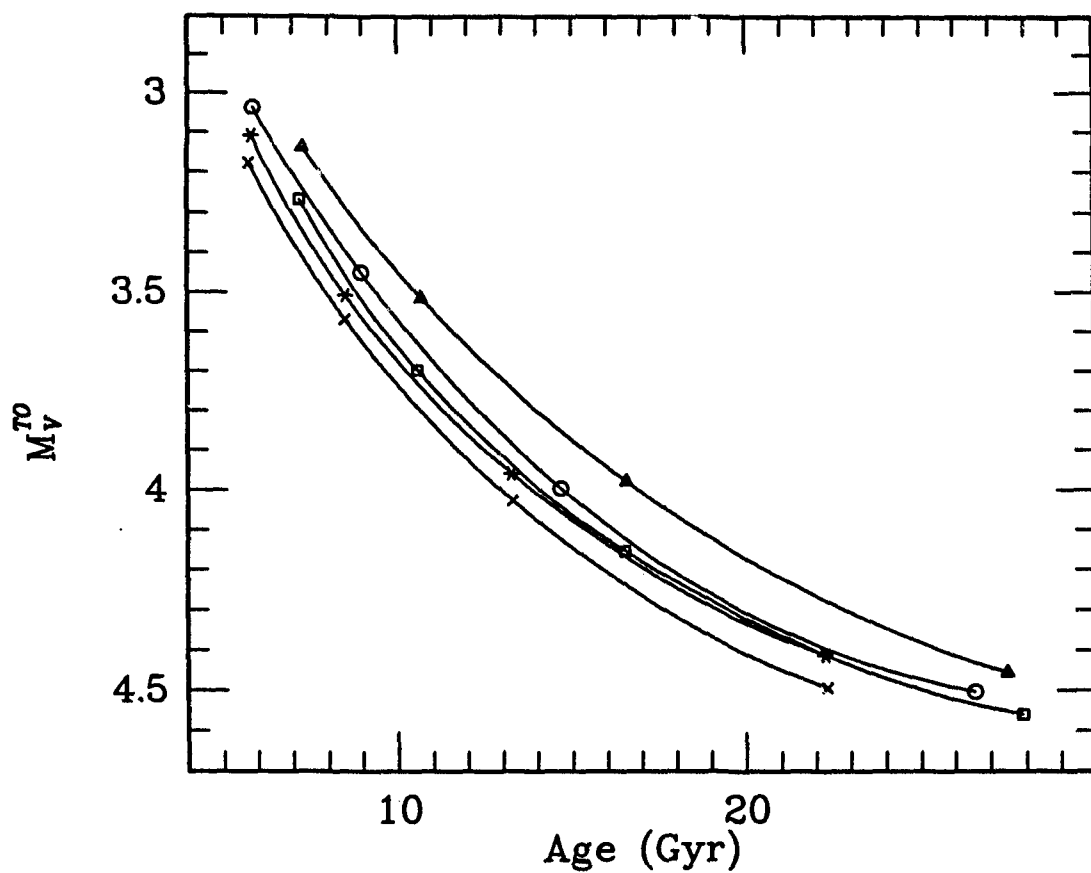


FIGURE 1-5 Age-Luminosity relations at the main sequence turnoff point derived from the evolutionary sequences of Vandenberg & Bell (1983) and Vandenberg (1992). The composition parameters corresponding to the plotted curves are: $\blacktriangle$ $[\text{Fe}/\text{H}] = -2.27, Y = 0.20, [\text{O}/\text{Fe}] = 0.0$; $\square$ $[\text{Fe}/\text{H}] = -1.77, Y = 0.20, [\text{O}/\text{Fe}] = 0.0$; $\circ$ $[\text{Fe}/\text{H}] = -2.21, Y = 0.30, [\text{O}/\text{Fe}] = 0.0$; $*$ $[\text{Fe}/\text{H}] = -2.26, Y = 0.24, [\text{O}/\text{Fe}] = +0.75$; $\times$ $[\text{Fe}/\text{H}] = -2.03, Y = 0.24, [\text{O}/\text{Fe}] = +0.70$.

relations of Fig. 1-3, for the compositions and ages listed. The distance modulus $(m - M)_{app} = 14.74$ for an age of 18 Gyr with $Y = 0.20$, $[Fe/H] = -2.27$, and $[O/Fe] = 0.0$ is in good agreement with $(m - M)_{app} = 14.72$, obtained by Heasley & Christian (1986) for the same model parameters.

1.3.2 The Luminosity Function Near the Turnoff

The various observed LFs were normalized to Hartwick's (1970) LF so as to have the same number of stars in the magnitude range over which they overlapped and over which they were thought to be complete. Hartwick's LF was the only one used to define the giant branch LF because M92's horizontal branch reaches down to $V \approx 17$, and none of the other LFs discriminate between horizontal branch stars and giants. The composite LF is shown in Figure 1-6. At $V = 17$, the Poisson error, $\sigma(\Phi)$, in the Hartwick LF amounts to ≈ 0.1 dex in $\log \Phi$. The apparent discrepancy of van den Bergh's LF at this magnitude is probably due to the fact that his bins have very few stars in them, giving $\sigma(\log \Phi) \approx 0.3$ dex. At the faint end, the Poisson errors are typically < 0.1 dex. Apart from the large amount of scatter in the data, there is a pronounced dip in the LF between $19 < V < 20$, and at $V = 18$, there appears to be a small plateau adjacent to a step of about 0.2–0.3 dex in $\log \Phi$ at $V = 18.2$.

The morphology of the plateau and step in the LF near $V = 18$ is subtle, and given the uncertainty in the data, requires some justification. However, the individual LFs spanning $17.9 \leq V \leq 18.3$ with bin widths narrow enough to resolve small features (i.e., those by Hartwick, van den Bergh, and Fukuoka & Simoda), regardless of how well they agree on the slope of the LF through this region, show a step of ≈ 0.3 dex

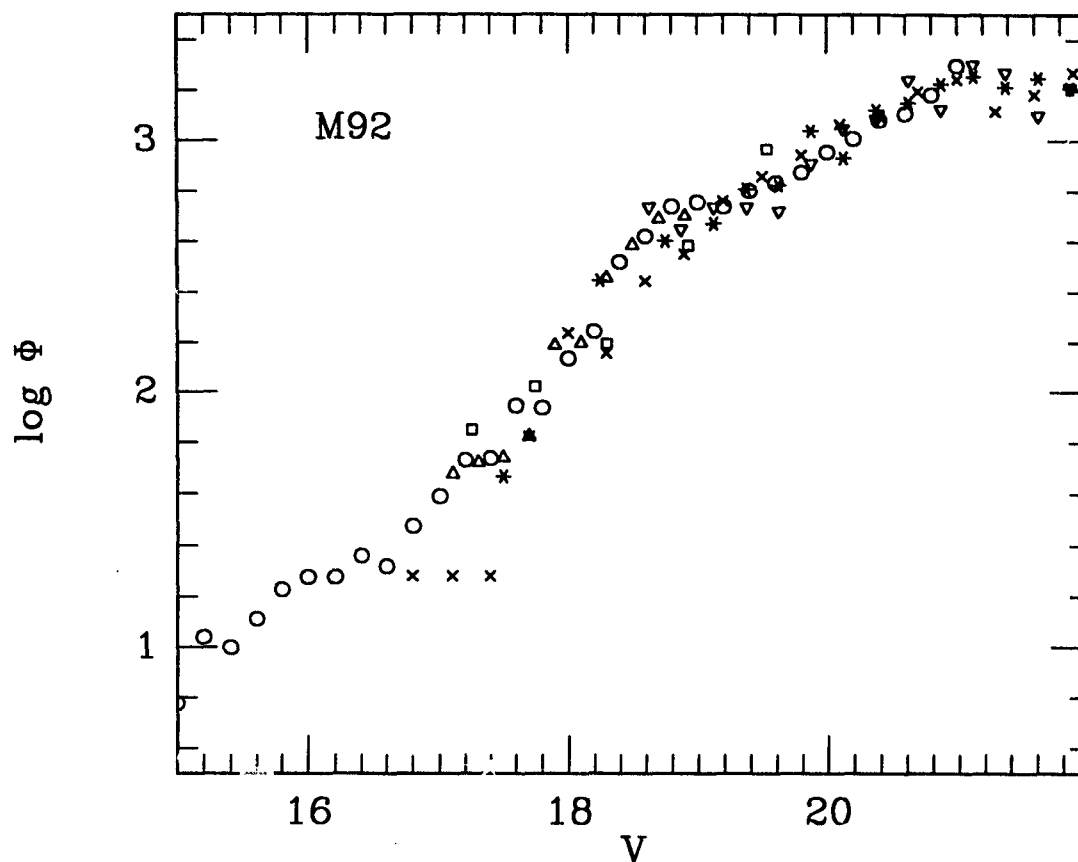


FIGURE 1-6 The composite luminosity function for M92. The data are from $\square$ Tayler (1954), $\circ$ Hartwick (1970), $\times$ van den Bergh (1975), $\triangle$ Fukuoka & Simoda (1976), ∇ Sandage & Katem (1983), and $*$ Stetson & Harris (1988). The Poisson errors at $V = 17$ in the Hartwick data amount to ≈ 0.1 dex in $\log \Phi$. Near $V = 18$, the LFs of Fukuoka & Simoda and of van den Bergh show a small plateau, and at $V = 18.2$ they have a step amounting to ≈ 0.3 dex which is also repeated in Hartwick's LF.

near $V = 13.2$. Moreover, these three LFs show a hesitation immediately adjacent to this step over the next two brighter bins. The evidence for the existence of the bump in the LF is certainly not conclusive, but it is suggestive. Furthermore, model LFs using the current best estimates of the helium abundance and reasonable estimates of cluster metallicity do have a bump at this location for a wide range of possible cluster ages.

Model LFs, binned in 0.2 magnitude intervals, were constructed using the techniques described in Chapter 2 and in Bergbusch & Vandenberg (1992). For the model loci shown in Figure 1-7, the exponent adopted for the IMF was $x = 1.0$. This is roughly the mean of the Stetson & Harris results — but, as noted earlier, the choice of x makes little difference for this region of the LF. The 16 Gyr LF for $Y = 0.24$, $[\text{Fe}/\text{H}] = -2.03$, and $[\text{O}/\text{Fe}] = +0.70$ was normalized to the Hartwick LF between $+0.4 \leq M_V \leq +2.6$, with $(m - M) = 14.6$, to give a good fit to the giant branch LF. The appropriate distance modulus obtained from the age-luminosity relation was then applied to each of the other model LFs, which were then normalized to match along the giant branch. Apart from the gross morphology of the break in the LF above the turnoff point, the only other feature apparent in the model LFs is a small bump near $V = 18$ which develops more strongly with *decreasing* age. Neither the location nor the size of this bump is very composition sensitive for the small range in metallicities shown, but the $Y = 0.30$ LF (indicated by the long-dashed curve) is distinct from the other cases.

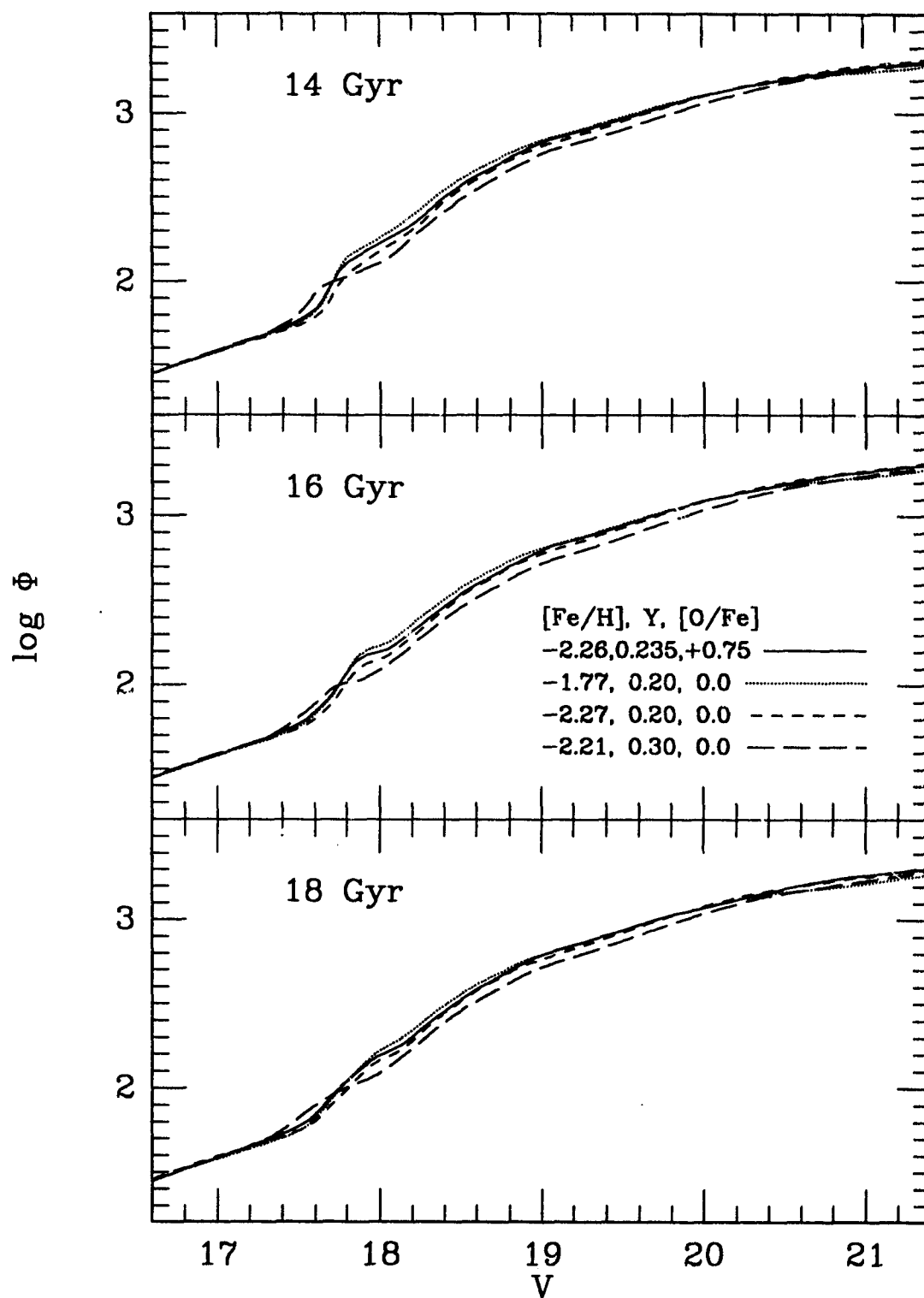


FIGURE 1-7 Theoretical luminosity functions normalized to match along the lower giant branch. The distance moduli given in Table 1-1 have been applied.

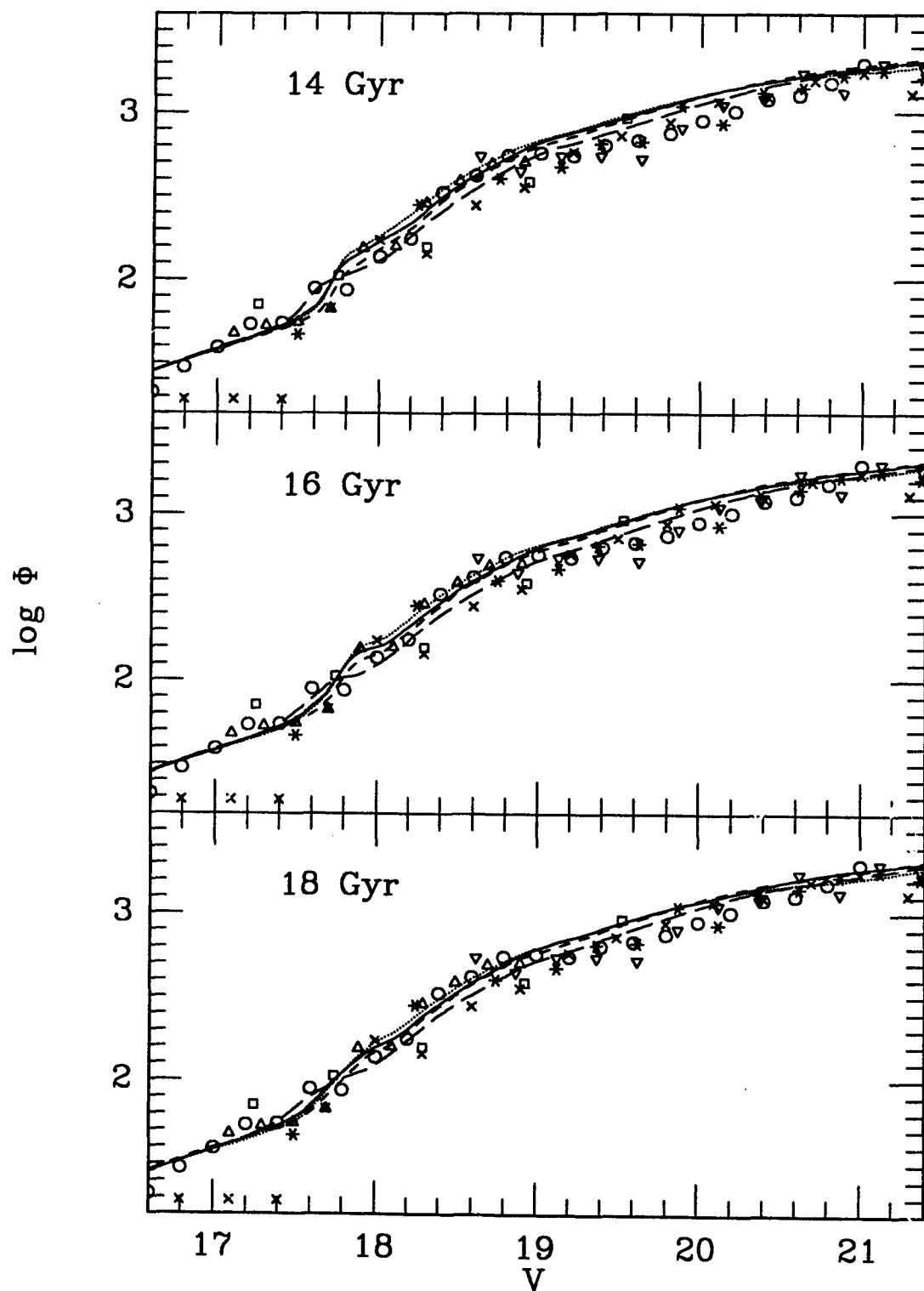


FIGURE 1-8 Comparisons between theoretical LFs and the composite LF for M92. The model curves are identified as in Fig. 1-7; the observed points are identified as in Fig. 1-6.

The comparisons between theory and observation are shown in Figure 1-8. None of the model LFs can be singled out as fitting the data substantially better in this magnitude range than any of the others. The dip feature already alluded to ($19 \leq V \leq 20$) is best matched by the LFs with $Y = 0.3$, but between $18 < V < 19$, the observed LF is located about 0.2 mag brighter. This portion of the LF can be matched with the $Y = 0.3$ models, only if a distance modulus inconsistent with the Stetson & Harris age estimate and distance modulus is used. It is possible that a feature corresponding to the bump in the model LFs is present in the composite LF at $V = 18$, but the error bars in the data are sufficiently large to make this identification uncertain. Moreover, the observed LFs were binned over different magnitude intervals (ie. roughly 0.5 mag bins for Tayler's LF, and 0.2 mag bins for Hartwick's LF), so the resolution and exact location of this feature varies between them. However, if the bump is real, the $Y = 0.3$ model LF is ruled out for all ages and for the others (i.e., $Y = 0.20, 0.24$), the 16–18 Gyr model LFs appear to match it best.

1.3.3 The Giant Branch Luminosity Function

Hartwick's giant branch luminosity function is shown in Figure 1-9, together with the model LFs for the input parameters described in the previous section. There is a distinct transition in the smoothness of the observed LF near $V = 14.6$, which corresponds within ≈ 0.2 mag of the predicted location of the RGB bump. The CLF shown in Figure 1-10 does show a discontinuity at the position of the transition, but rather than steepening, as predicted by the models, the slope of the CLF flattens after the discontinuity. (To reiterate, the break in the slope of the model CLFs is due

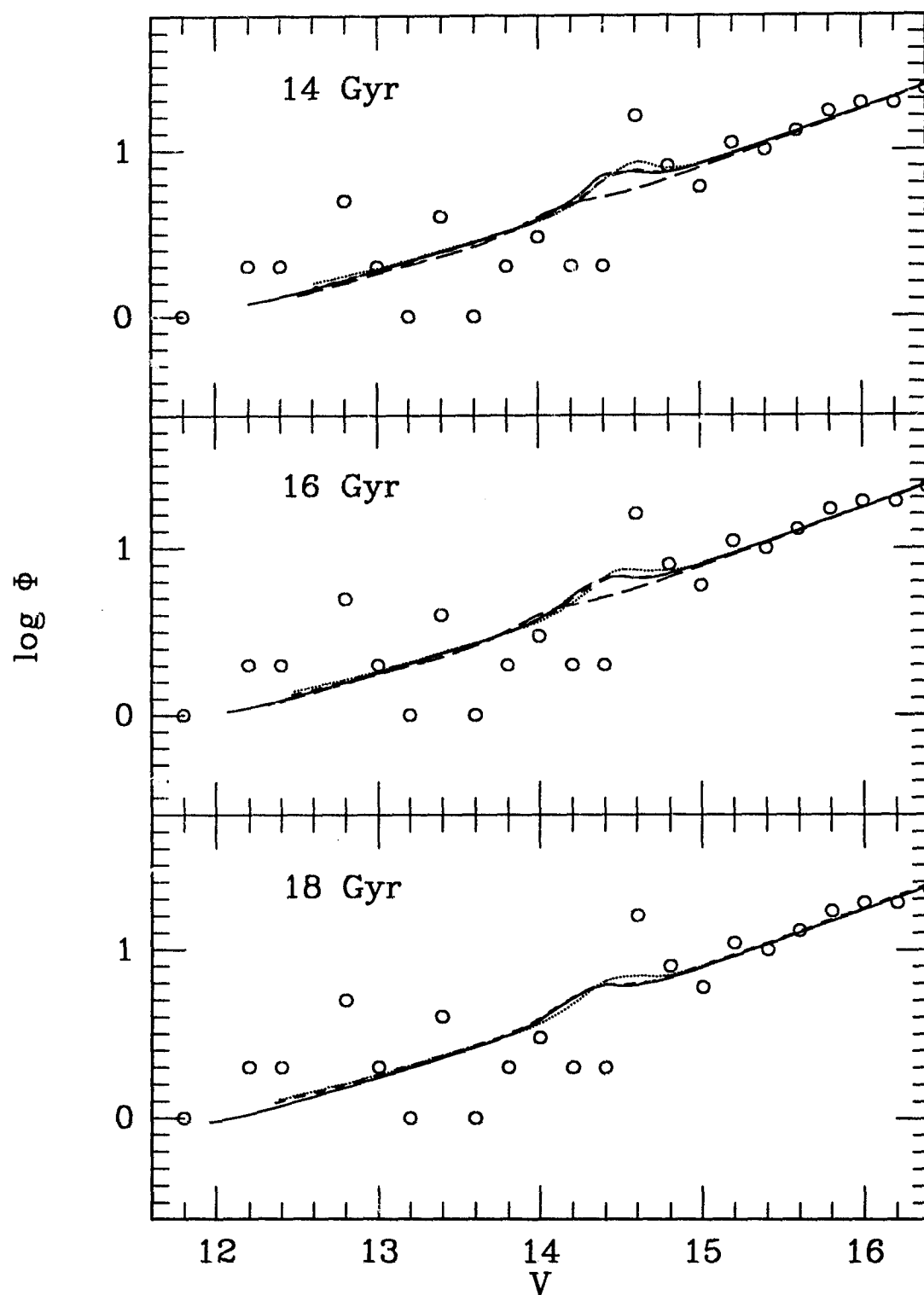


FIGURE 1-9 Comparisons between theoretical LFs and the Hartwick's RGB LF for M92. The identifications of the model curves are as given for Figure 1-7.

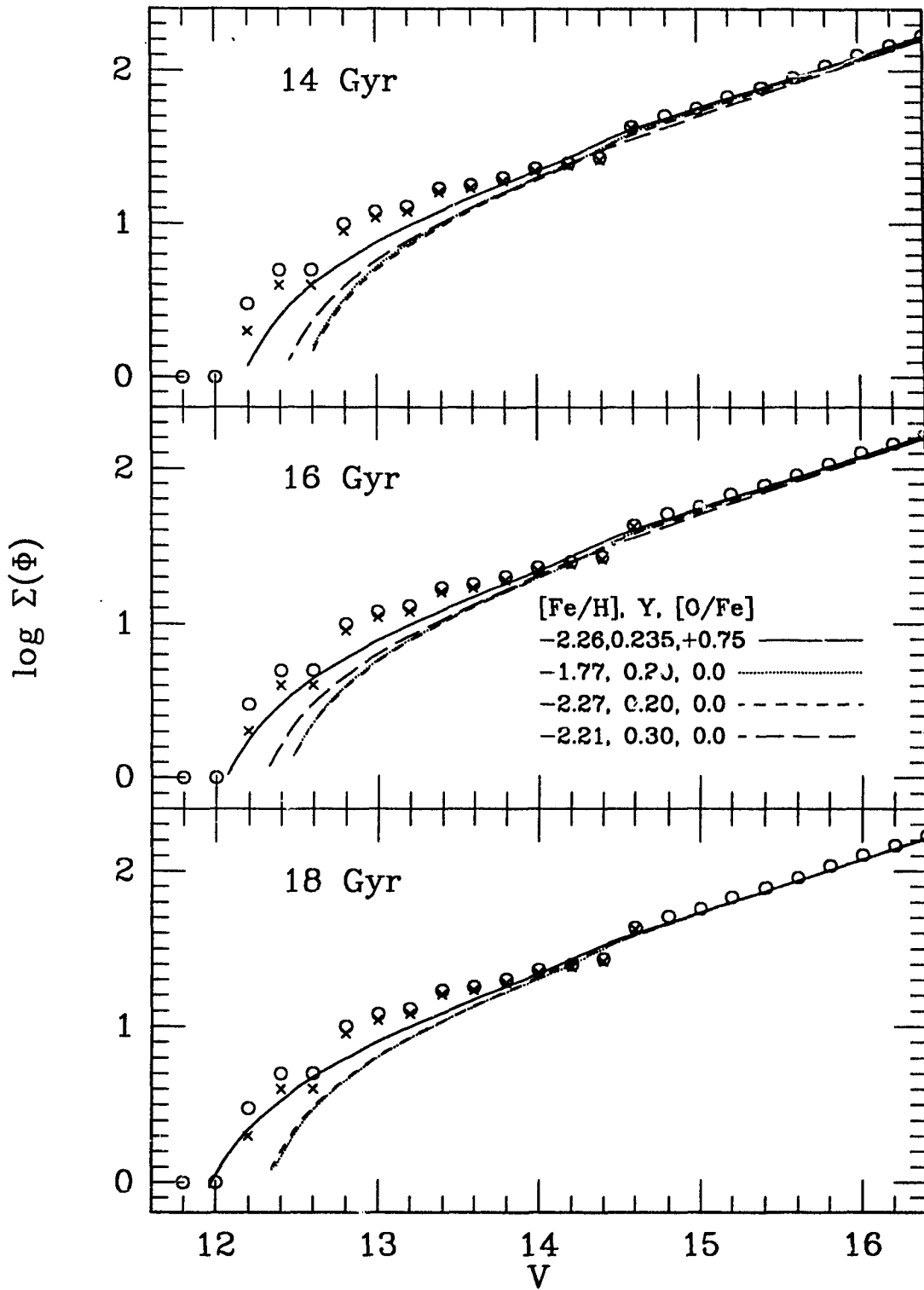


FIGURE 1-10 Comparisons between theoretical CLFs and the observed CLF for M92, based on Hartwick's (o) LF. Crosses (x) represent the CLF when the brightest star is removed.

entirely to the presence of the giant branch bump.) This discrepancy could be due to the accidental inclusion of one or two AGB stars at the bright end. As illustrated in Fig. 1-10, the location of the RGB tip would match the model CLFs very well if the brightest star were removed from the sample.

1.3.4 Discussion

M92's LF in the region of the main-sequence turnoff point appears to offer at least one tantalizing feature, namely the bump at $V = 18$. The theoretical LFs indicate, over the small range in metallicity explored here, that the location of the bump is sensitive both to the helium content and to the oxygen abundance ratio, while the size of the bump is sensitive to age. Increasing the helium abundance delays the appearance of the bump to later evolutionary phases, while increasing the oxygen abundance ratio causes the bump to appear earlier. The current view is that $[O/Fe] > 0$ for metal-poor stars (e.g., Vandenberg 1992), so that $[O/Fe] = 0.75$ at $[Fe/H] = -2.26$ places an upper limit $Y \leq 0.24$ on the helium abundance. Although not shown, comparisons have been made for 10 and 12 Gyr model LFs. Based on the size of the bump, an age of 10 Gyr can be ruled out — but 12 Gyr remains a possibility, particularly for the $Y = 0.20, [Fe/H] = -2.27$ and $Y = 0.24, [Fe/H] = -2.26$ models, because the 0.2 mag bins smear the feature enough to depress the height of the bump.

The situation for the giant branch LF is rather more discouraging. While the character of the observed LF does change near the expected location of the RGB bump, it is hard to claim that the bump itself can be recognized. However, if the identification of the RGB bump with the location of the break in the slope of the

observed CLF is correct, then the $Y = 0.30$ case again appears to be ruled out. When both the location of the bump and the RGB tip are considered, the best overall fits are obtained with the $[\text{Fe}/\text{H}] = -2.26$, $Y = 0.235$, $[\text{O}/\text{Fe}] = +0.75$ models for 16–18 Gyr. A more populous sample of bright RGB stars, clearly free of contamination by AGB stars, would certainly provide a more rigorous test of the models.

Although the observations currently available do not yield the model parameters unambiguously, they do show that the LF can be used to constrain both the age and the helium abundance even when the metallicity is uncertain by a few tenths of a dex. The major difficulty from an observational point of view lies in obtaining a sufficiently large sample of stars with good photometric accuracy to give both the statistical contrast and the binning resolution required to determine the location and the size of both the turnoff and RGB bumps more precisely.

An estimate of the number of stars above the main sequence turnoff point can be made if the total mass of a cluster and the slope of its mass function are known. For example, from the mass-to-light ratios given by Illingworth & King (1977), the estimated mass of M15 is $\approx 10^6 \mathcal{M}_{\odot}$. The slope of the mass function according to Fahlman *et al.* (1985) could be as large as $x = 2.0$, and if all of the mass in the cluster is contained in stars of $0.1\text{--}0.8 \mathcal{M}_{\odot}$, then $\approx 5,000$ of them lie above the turnoff. Approximately 80% of these stars will be found in the one magnitude interval above the turnoff point, so the potential to improve the observed LFs in the turnoff region certainly exists.

On the basis of Monte Carlo simulations, Rood & Crocker (1985) have claimed that more than 1000 stars are required in the upper 3.5 mag of the RGB to provide a

statistically significant detection of the bump. Using the parameters for M15 quoted above, no more than ≈ 250 such stars can be expected in the entire cluster. Apparently, the CLF is likely to be of more use than the differential LF in constraining cluster parameters — particularly the distance modulus — through its potential to define both the location of the RGB bump and the tip luminosity.

The dip feature between $19 < V < 20$ remains a problem for interpretation because virtually all of the observed LFs agree on its existence, while none of our standard models of stellar evolution predict it. The comparison between the model LFs and the observations in Figure 1-8, suggests that it may reach as faint as $V = 21$. In this magnitude range the observed LFs do not suffer from incompleteness. As can be seen from Figure 1-6, the observed LFs are in good agreement as faint as $V = 21$, where the Stetson & Harris LF is known to be complete. Regardless of its extent, a significant fraction of the stars predicted by standard evolutionary calculations is missing from this part of the LF.

Rotation and diffusion are among the physical processes commonly believed to play a role in stellar evolution, but are not included in standard models. Rotation has the effect of increasing main sequence lifetimes slightly, but evolutionary rates (which would affect LF morphology) remain virtually unchanged through the main sequence and turnoff regions. (See Deliyannis *et al.* (1989), who argue from quite a sophisticated study of rotation, that it cannot be of much significance for globular cluster stars.) A dispersion in rotational velocities among the cluster stars would effect the the intrinsic width of the cluster CMD along the main sequence and turnoff regions. So far, the observed widths of CMDs in many globular cluster studies have been at-

tributed to photometric errors (see Renzini & Fusi Pecci (1988) for further discussion of these points). The main effect of helium diffusion on stellar evolution, according to the theoretical calculations of Stringfellow *et al.* (1983), is to speed up evolution along the main sequence and to slow it down during the H-shell thinning phase. However, it is hard to understand how diffusion could produce the dip seen in the LF, for which the mass range is $\approx 0.05\text{--}0.1M_{\odot}$, or why it would be so sharply focussed on such a small part of an isochrone. Moreover, LFs computed from stellar models that include diffusion (Proffitt & Vandenberg 1991) are almost indistinguishable from LFs derived from canonical models.

A possible answer to this dilemma is that the IMF cannot be represented by a simple power law, as Stetson & Harris (1988) have already suggested for their main sequence LF. Such an explanation would severely reduce the usefulness of the LF through the turnoff region in constraining any of the cluster parameters. From the perspective of stellar astrophysics, it would be more palatable to incorporate some, as yet unaccounted for, physical process(es) into the models to reconcile the observations. For example, the occurrence of a small isothermal core in main sequence stars (Vandenberg & Stetson 1991) can account for much of the morphology in M92's LF through the turnoff region.

1.3.5 Conclusions

A small plateau near $V = 18$ in the observed LF for M92 has been identified tentatively with the bump in the subgiant region predicted by standard models of stellar evolution. The size of the plateau suggests an age 16–18 Gyr for the cluster.

A pronounced dip in the observed LF between $19 < V < 20$ has been identified, but this feature has no counterpart in the theoretical LFs. Although the dip has been attributed to variations in the commonly accepted power law behaviour of the IMF, it may instead be an indication that canonical models are missing something. The available observed LFs for the turnoff region of M92 are not good enough to constrain any of the astrophysical parameters used in the construction of model LFs as accurately as one would like, except possibly the helium content, for which $0.20 \leq Y \leq 0.24$ is preferred when $0.0 \leq [\text{O}/\text{Fe}] \leq 0.75$ are the corresponding oxygen abundance ratios.

A similar situation holds for the giant branch luminosity function. The LF is too sparse to clearly define the RGB bump predicted by the standard models. Both the differential and cumulative luminosity functions suggest that the bump occurs near $V = 14.6$, which again seems to exclude the $Y = 0.30$ models with scaled solar abundances. The oxygen-enhanced models provide the best over-all fit.

CCD observations have the potential to make great improvements over the old photographic work because profile-fitting photometry can be done with relative accuracy in crowded fields, and quantitative estimates of the completeness of the sample, as well as of the photometric accuracy, can be derived. Although most of the available CCDs cover only small areas of a globular cluster at a time, the newer, large format detectors do provide the opportunity to cover significant fractions of the cluster on a single frame. Nevertheless, as will be shown in Chapter 5, the reduction process is computer intensive and time consuming.

1.4 Scope of the Work

In this chapter, the luminosity function has been presented as a potentially powerful diagnostic tool for confronting the current models of stellar structure and evolution. The basic problem, both from the theoretical and observational points of view, is to generate precise and accurate LFs. To this end, in Chapter 2 a new, accurate method of generating model LFs from evolutionary sequences is described. Chapter 3 presents some of the problems and the methods employed in the acquisition and reduction of CCD data, and together with a formulation for the analysis of artificial star tests based on Bayes' Theorem for conditional probabilities. In Chapter 4, photometry reaching ≈ 4 mag below the turnoff of the old open cluster NGC 2243 is presented and analysed. In such clusters, both the CMD and the LF through the turnoff region can potentially constrain the degree of convective overshooting in stellar models. Furthermore, the analysis presented in Chapter 4 also provides the first confrontation between the isochrones and LFs derived with the techniques described in Chapter 2 and CCD observations. In Chapters 5 & 6, photometry of the evolved stars in the core regions of the globular clusters NGC 288 and NGC 7099 (M30) is presented. Comparisons between the observed LFs, rectified according to the methods outlined in Chapter 3, and the oxygen-enhanced isochrones and LFs of Bergbusch & Vandenberg (1992) are made. Finally, in Chapter 7, the results of the preceding chapters are summarized, and some proposals for further studies are suggested.

Chapter 2

The Construction of Model LFs and Isochrones

2.1 Introduction

The most important consideration in generating model luminosity functions and isochrones from evolutionary sequences, is that the interpolated quantities should produce the morphology evident in those sequences as accurately as possible. The Revised Yale Isochrones and Luminosity Functions (Green *et al.* 1987), often show features (bumps and wiggles) which have not been attributed to evolutionary processes — presumably, they are manifestations of numerical noise in the original evolutionary sequences, or they have been produced by the interpolation scheme. In some cases, the magnitude of these apparently spurious features rivals that of real features such as the RGB bump.

As has been illustrated in Chapter 1, the detailed morphology of the luminosity function in the region near the main sequence turnoff shows subtle differences as the basic input parameters are varied. If it is to be used successfully to constrain the input parameters, then particular care will have to be taken to produce the best possible models, and to obtain observations with high statistical significance. In this chapter, a method of accurately interpolating isochrones and model LFs from evolutionary sequences will be described.

2.2 The Mathematical Formalism

Deep CCD studies have revealed that the CMDs of the Galactic globular clusters tend to be exceedingly tight through the turnoff region, with a photometric scatter that is fully consistent with (small) observational uncertainties. This result provides very strong support for the basic assumptions that are made about the stars in most globular clusters; namely, that (1) they are coeval, and (2) the material out of which they were formed was essentially chemically homogeneous. These assumptions, together with the Vogt-Russell Theorem, imply that at any given epoch, the number of stars, $\phi(L)dL$, in the luminosity interval $(L, L + dL)$ is equal to the number of stars, $N(\mathcal{M})d\mathcal{M}$, in the corresponding mass interval $(\mathcal{M}, \mathcal{M} + d\mathcal{M})$. The quantity $\phi(L)$ is called the *luminosity function* (LF), and the quantity $N(\mathcal{M})$ is called the *initial mass function* (IMF)¹. Formally, the equality is expressed as

$$\phi(L)dL = N(\mathcal{M})d\mathcal{M}, \quad (2-1)$$

where $L = L(\mathcal{M}, t)$, and $N(\mathcal{M}) \propto \mathcal{M}^{-(1+\alpha)}$ is the form usually adopted for the IMF.

The LF may then be expressed as

$$\phi(L) = N(\mathcal{M}) \frac{d\mathcal{M}}{dL}, \quad (2-2)$$

and it remains to find a suitable expression for the derivative $d\mathcal{M}/dL$ which can be evaluated from the theoretical evolutionary tracks and isochrones.

¹ Observations will sample the *present mass function* (PMF). How well it matches the IMF depends on the dynamical evolution of the cluster.

For a set of evolutionary sequences that have been computed with a certain helium abundance and metallicity, the luminosity can be treated as a function of two variables — mass, $\mathcal{M}$, and age, t . The functional relation $L = L(\mathcal{M}, t)$ then defines a surface in the L - $\mathcal{M}$ - t coordinate frame. As illustrated in Figure 2-1, the difference in luminosity, dL , between the points P_1 and P_2 along the direction θ in the $\mathcal{M}$ - t plane is given by

$$\frac{dL}{ds} = \left. \frac{\partial L(\mathcal{M}_1, t_1)}{\partial \mathcal{M}} \right|_t \sin \theta + \left. \frac{\partial L(\mathcal{M}_1, t_1)}{\partial t} \right|_{\mathcal{M}} \cos \theta, \quad (2-3)$$

where $ds = (d\mathcal{M}^2 + dt^2)^{1/2}$. (The direction θ will be identified with the direction of interpolation *between* equivalent evolutionary phases (see §2.3) in tracks of different mass.) Rearranging equation (2-3), we get

$$\begin{aligned} \left. \frac{\partial L(\mathcal{M}_1, t_1)}{\partial \mathcal{M}} \right|_t &= \frac{dL}{ds} \csc \theta - \left. \frac{\partial L(\mathcal{M}_1, t_1)}{\partial t} \right|_{\mathcal{M}} \cot \theta \\ &= \frac{dL}{ds} \frac{\partial s}{\partial \mathcal{M}} \Big|_{\theta} - \left. \frac{\partial L(\mathcal{M}_1, t_1)}{\partial t} \right|_{\mathcal{M}} \frac{\partial t}{\partial \mathcal{M}} \Big|_{\theta} \\ &= \left. \frac{\partial L(\mathcal{M}_1, t_1)}{\partial \mathcal{M}} \right|_{\theta} - \left. \frac{\partial L(\mathcal{M}_1, t_1)}{\partial t} \right|_{\mathcal{M}} \frac{\partial t}{\partial \mathcal{M}} \Big|_{\theta}. \end{aligned} \quad (2-4)$$

Taking this result back to equation (2-2), the LF may now be expressed as

$$\phi(L) = N(\mathcal{M}) \left(\left. \frac{\partial L}{\partial \mathcal{M}} \right|_t \right)^{-1}, \quad (2-5)$$

where $\left. \frac{\partial L}{\partial \mathcal{M}} \right|_t$ may be evaluated at points *along an isochrone* via equation (2-4). The quantities $\left. \frac{\partial L}{\partial \mathcal{M}} \right|_{\theta}$ and $\left. \frac{\partial t}{\partial \mathcal{M}} \right|_{\theta}$ are evaluated along the direction of interpolation, while $\left. \frac{\partial L}{\partial t} \right|_{\mathcal{M}}$ is interpolated to the isochrone point from its values obtained numerically along the evolutionary tracks.

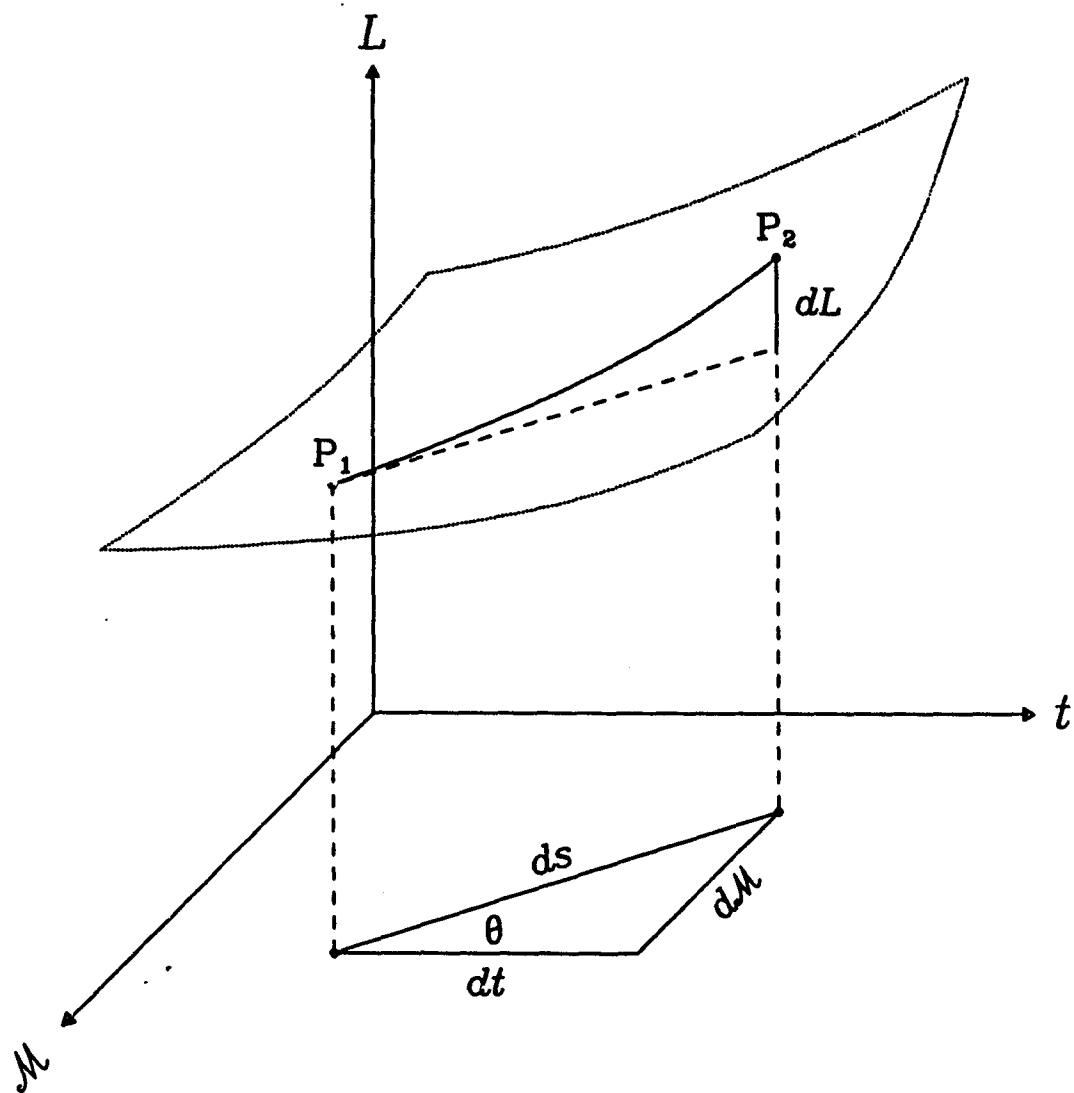


FIGURE 2-1 The L - M - t coordinate frame showing the relation between dL , dM , dt , and the direction of differentiation θ .

In practice, logarithmic quantities (i.e., $\log L/L_\odot$, $\log T_{\text{eff}}$, $\log t$) are used to describe stellar models and evolutionary sequences, but each sequence is identified by its mass. Thus, on the theoretical plane, equation (2-5) becomes

$$\phi(\log(L/L_\odot)) = N(\mathcal{M}) \left(\frac{\partial \log L/L_\odot}{\partial \mathcal{M}} \Big|_t \right)^{-1}, \quad (2-6)$$

where the use of $\log \mathcal{M}$ has deliberately been avoided. One reason for doing this is that no interpolation advantage is gained by the use of $\log \mathcal{M}$ because the stellar masses considered range between $0.15\text{--}1.5\mathcal{M}_\odot$; another justification is that the equations are simplified — using $\log \mathcal{M}$ would have introduced $\mathcal{M}$ into the equations anyway.

The advantage of this approach to calculating model LFs, over direct integration of the mass-luminosity relation, is that the range in mass from the base to the tip of the giant branch is $< 0.01\mathcal{M}_\odot$ for the metallicities and ages we are concerned with, which can lead to considerable numerical noise in the interpolated masses along the isochrone. However, by a suitable choice of equivalent evolutionary phases (see below), the interpolations *between* the tracks to the desired isochrones can be made very nearly linear, resulting in well determined values for $\frac{\partial \log L}{\partial \mathcal{M}}|_\theta$ and $\frac{\partial \log t}{\partial \mathcal{M}}|_\theta$ in equation (2-4). Moreover, $\frac{\partial \log L}{\partial \log t}|_{\mathcal{M}}$ is a smoothly varying and well determined function *along the evolutionary tracks*, and thus may easily be interpolated to the location of the isochrone.

Transformations of the model LFs from the theoretical plane ($\log \phi(M_{\text{bol}})$ versus M_{bol}) to the observer's plane ($\log \phi(V)$ versus V), where V is the V -magnitude, are accomplished via the bolometric correction, BC , defined by

$$M_{\text{bol}} = V + BC. \quad (2-7)$$

Differentiating equation (2-7) with respect to $\mathcal{M}$ along an isochrone gives

$$\left. \frac{\partial \log L}{\partial \mathcal{M}} \right|_t = -\frac{1}{2.5} \left(\left. \frac{\partial V}{\partial \mathcal{M}} \right|_t + \left. \frac{\partial BC}{\partial \mathcal{M}} \right|_t \right), \quad (2-8)$$

so that the model LF, transformed to the observer's plane, can then be written

$$\phi(V) = N(\mathcal{M}) \left(-2.5 \cdot \left. \frac{\partial \log L}{\partial \mathcal{M}} \right|_t - \left. \frac{\partial BC}{\partial \mathcal{M}} \right|_t \right)^{-1}. \quad (2-9)$$

Rather than attempt the calculation of the derivative $\left. \frac{\partial BC}{\partial \mathcal{M}} \right|_t$, it is easier to define the bin limits of the differential luminosity function for the V -magnitude, and then interpolate to the corresponding M_{bol} values.

2.3 Equivalent Evolutionary Phases (EEPs)

We wish to set up an interpolation scheme that will produce isochrones accurately from a set of evolutionary sequences for stars of different masses but with a common chemical composition. Equivalent evolutionary phases are locations on these sequences that share a common property, such as the same central hydrogen content — i.e., at the zero-age main-sequence (ZAMS) or core hydrogen exhaustion (CHE) points — or helium core mass (Prather, 1976). Such definitions of equivalence are somewhat arbitrary, but they do produce an essentially linear interpolation scheme, which has obvious advantages with respect to interpolation accuracy.

The equivalent evolutionary phases defined here are based on the behaviour of the derivative $\left. \frac{\partial(\log T_{eff})}{\partial(\log t)} \right|_{\mathcal{M}}$ along the evolutionary sequences², and these equivalent

² Other derivatives, such as $\left. \frac{\partial(\log L)}{\partial(\log t)} \right|_{\mathcal{M}}$ (see Fig. 2-2(a)), or even $\left. \frac{\partial D}{\partial(\log t)} \right|_{\mathcal{M}}$, where $D = \sqrt{c_1(d \log L)^2 + c_2(d \log T_{eff})^2}$ could be used to define the interpolation scheme. Ultimately, it may be better to define the primary interpolation points independently for each of the variables.

points reflect the nature of the EEPs as defined by Prather (i.e., *similar* hydrogen content) as well as the structural changes in the star (essentially the response of the stellar atmosphere to the evolving core). Furthermore, because this approach uses the *mathematical* properties of the curves defined by the evolutionary sequences in the $\log L$ - $\log T$ plane, it has the advantage that only these quantities are needed to define the interpolation scheme. As will be shown in the following discussion, interpolation between corresponding primary EEPs on tracks of different masses is also very nearly linear, so by dividing the corresponding regions between the primary EEPs into equal numbers of secondary interpolation points, the essential linearity of the interpolations is preserved.

2.3.1 The Zero-Age Main-Sequence (ZAMS)

The evolutionary sequences used to produce the isochrones and luminosity functions were contracted to their ZAMS points from fully convective, chemically homogeneous models high on the Hayashi track. But, because of the vastly different rates at which stars of different mass evolve, the definition of a ZAMS point is somewhat arbitrary. For the upper-main sequence grids, Vandenberg and Laskarides (1987) have shown that a very smooth age-luminosity relation can be obtained if the ZAMS locus is defined by the points on the tracks which share a common central hydrogen content (X_c) and for which at least 99% of the luminosity is generated by nuclear reactions instead of by gravitational contraction. However, when this criterion is applied to the low mass ($\lesssim 0.5M_\odot$) evolutionary sequences, the first model retained already has an age of several Gyr (depending on the value of X_c selected), with monotonically

higher ages for lower masses (> 10 Gyr for masses $\leq 0.35\mathcal{M}_\odot$). For our purposes, it is sufficient to consider only the models following the point of minimum luminosity on these low mass tracks. At this point, the ages range from ≈ 4 Gyr for the $0.15\mathcal{M}_\odot$ sequences, depending on the metal abundance, to ≈ 1.5 Gyr for the $0.45\mathcal{M}_\odot$ (These are, of course, still much longer than the actual pre-main-sequence lifetimes of such stars.) The chief advantage of this approach is that we avoid the complicated morphology of the evolutionary sequences that occurs before the luminosity minimum.

It should be noted that these definitions for the ZAMS points are not based entirely on the morphology of the evolutionary loci in the $\log L$ - $\log T_{\text{eff}}$ plane. Moreover, because the ZAMS can be divided into regions where fundamental changes in the structure and consequent evolution of a star occur (i.e., near $0.35\mathcal{M}_\odot$ and just above $1.1\mathcal{M}_\odot$), these definitions do not produce linear interpolations over the entire mass range. Evolutionary sequences with masses $\lesssim 0.65\mathcal{M}_\odot$ do not achieve core hydrogen exhaustion within times comparable to the estimated age of the universe, so the isochrone and LF points for the lower main sequence were obtained from them by interpolating to the desired age along the tracks. The tabulated isochrone and LF points were then obtained from cubic splines that were constructed for each isochrone from these points.

2.3.2 Core Hydrogen Exhaustion (CHE)

In the evolutionary sequences that have the convective hook-back feature following central hydrogen exhaustion, the CHE point corresponds to a local T_{eff} minimum, while the sequences without it have the CHE point at a local T_{eff} maximum. There

is an intermediate mass range over which a temperature maximum occurs *before* the CHE point (see Figure 2-2(b)). We have opted to assign the CHE point to the location where $\frac{\partial(\log T_{\text{eff}})}{\partial(\log t)}|_{\mathcal{M}} = 0$ for the *first* time *after* the ZAMS point, unless a local temperature minimum is located before the end of the track, in which case the CHE point is identified with the second occurrence of the zero.³ As will be shown below, the interpolation relations for the CHE point are remarkably linear up to the models in which the blue hook appears.

³ When the temperature maximum that sometimes occurs before the CHE point is ignored, morphological differences of the sequences in the CMD are glossed over. The main reason for doing so is to enforce the requirement that age be a monotonic function of mass in the interpolation scheme. However, the model calculations of Maeder & Meynet (1989) imply that there is a near discontinuity in the age-luminosity relations at the turnoff for $1.2M_{\odot} \gtrsim \mathcal{M} \gtrsim 1.1M_{\odot}$, in the sense that the age barely changes over this mass range (at least in *canonical* as opposed to *overshooting* stellar models). This seems to be a real physical effect brought on by the development of the convective core. A preliminary investigation of the detailed development of the hook-back feature (Bergbusch & Vandenberg, 1992), over the narrow mass range where it first appears, shows that stars of $\approx 1.15M_{\odot}$ can have *marginally* greater ages at the CHE point than those of slightly higher or lower mass. However, this phenomenon will have no more than a small effect on the $\lesssim 5$ Gyr isochrones of Bergbusch & Vandenberg, and it certainly has no effect whatsoever on their calculations for older ages.

2.3.3 The Blue-Hook (BH)

The blue-hook first appears in the evolutionary sequences for masses $\gtrsim 1.1\mathcal{M}_{\odot}$, and more noticeably in the more metal-rich sequences. Temperature evolution first accelerates from the CHE point to a location near the middle of the hook, and then decelerates to the end. Thus at the middle of the hook, $\frac{\partial(\log T_{\text{eff}})}{\partial(\log t)}|_{\mathcal{M}}$ has a maximum, while it is zero at the beginning (CHE point) and at the end. Because the hook does not occupy a large region of the CMD, only the end-point of the hook was adopted as a primary EEP: this does not seem to have affected the accuracy of the interpolations to any significant extent.

The blue-hook feature does not occur in the evolutionary tracks with masses typically $\lesssim 1.1\mathcal{M}_{\odot}$, so that near $1.1\mathcal{M}_{\odot}$ the CHE becomes a branch point in the interpolation scheme — one branch connects all the CHE points in the grid, the other connects the lower mass CHE points to the BH points on the higher mass tracks. The tendency for the hook to develop becomes apparent as a ‘dimple’ in the turn-off region of the tracks for masses $\lesssim 0.2\mathcal{M}_{\odot}$ preceding its obvious appearance. To avoid having the BH points branch too sharply from the CHE points, thus introducing a severe nonlinearity into the interpolations, a primary EEP point is added at the end of the ‘dimple’, which seems to correspond with the end of the hook in the higher mass tracks. The location of this EEP was sometimes adjusted slightly in the lower mass track adjacent to the first one with a BH in order to preserve a monotonic relationship between age and mass (see footnote 3).

2.3.4 Post-Main-Sequence EEPs

The remaining EEPs, except for the one at the tip of the giant branch, are defined by the locations where $\frac{\partial(\log T_{\text{eff}})}{\partial(\log t)}|_{\mathcal{M}}$ has a local maximum or minimum. These local extrema occur at the middle of the Hertzsprung gap region (a minimum), at the base of the giant branch (a maximum), the beginning of the evolutionary pause on the giant branch (a minimum), the end of the pause (a maximum), and just below the tip of the giant branch (a minimum). Not all of these extrema are necessary for the construction of a good interpolation scheme, particularly where they are closely spaced (e.g., the evolutionary pause on the giant branch, or as mentioned in §2.3.3, the blue-hook feature), because the interpolated quantities do not undergo large variations in these regions. (On the other hand, were it necessary to follow very closely the evolution through the blue-hook, for example, then the CHE point as well as both local extrema along the hook could be used.) Similarly, at the tip of the giant branch, only a few points on each evolutionary sequence follow the point at the temperature minimum, which signals the imminent development of the helium flash. To ensure that the interpolation scheme reaches to the extreme giant branch tip, the last point in each evolutionary sequence has been adopted as the final EEP.

In Figure 2-2(a), the EEPs defined in this way are identified on the $\frac{\partial(\log T_{\text{eff}})}{\partial(\log t)}|_{\mathcal{M}}$ derivative, with their corresponding locations indicated on the $\frac{\partial(\log L)}{\partial(\log t)}|_{\mathcal{M}}$ derivative. In Figure 2-2(b), their locations are indicated on a grid of evolutionary tracks. A schematic representation of the interpolation method, which also illustrates its essential linearity, is shown in Figure 2-3. In the uppermost panel, an isochrone is a horizontal line. The intersection of that line with an EEP-curve in the upper panel

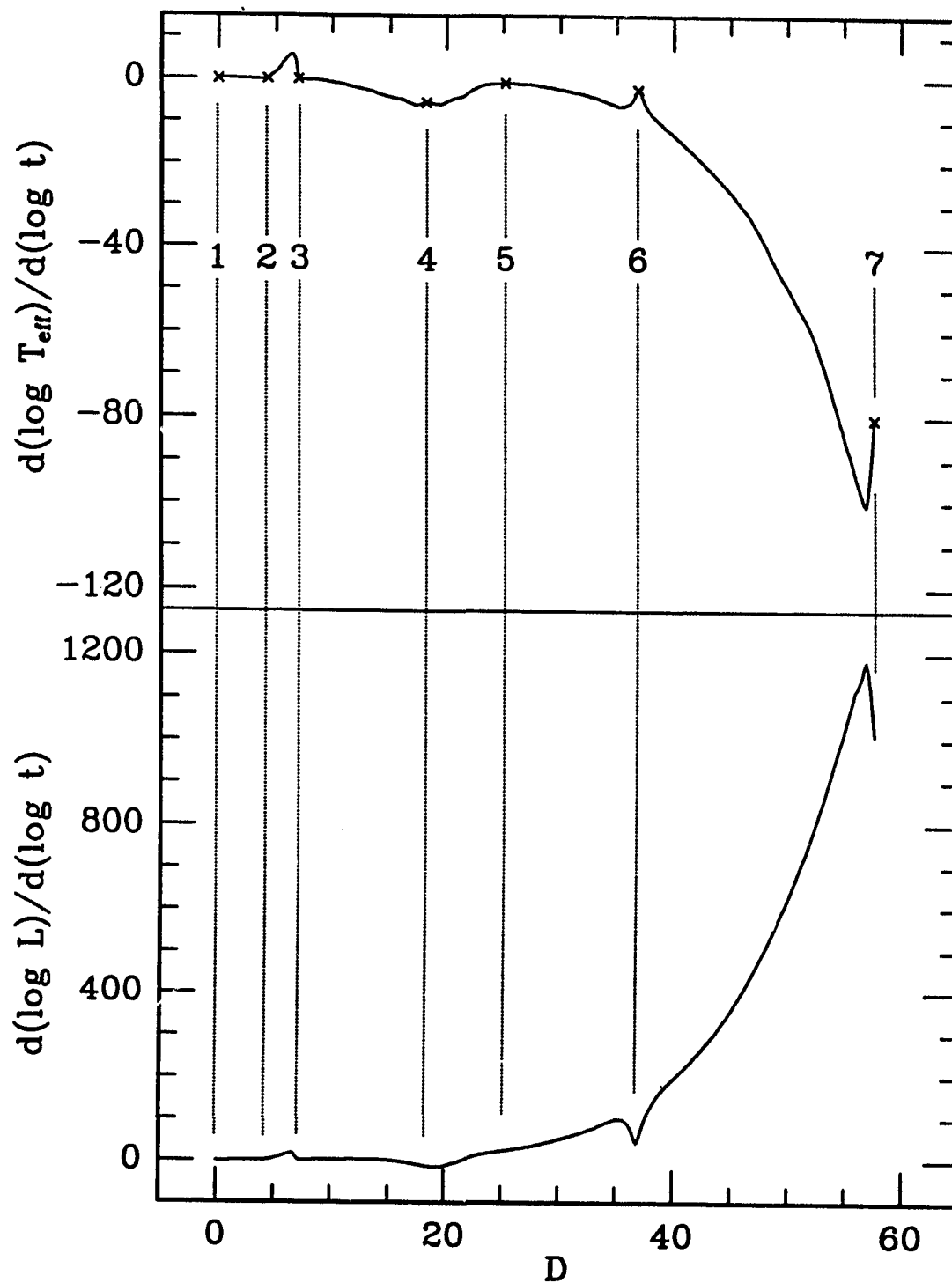


FIGURE 2-2(a) The primary EEPs — (1)ZAMS, (2)CHE, (3)BH, (4)Hertzsprung gap, (5)base of the GB, (6)GB pause, and (7)GB tip — are identified on the temperature derivative. The corresponding locations on the luminosity derivative are also indicated. The abscissa, D , is a measure of the distance along the track in the $\log L$ - $\log T_{\text{eff}}$ plane.

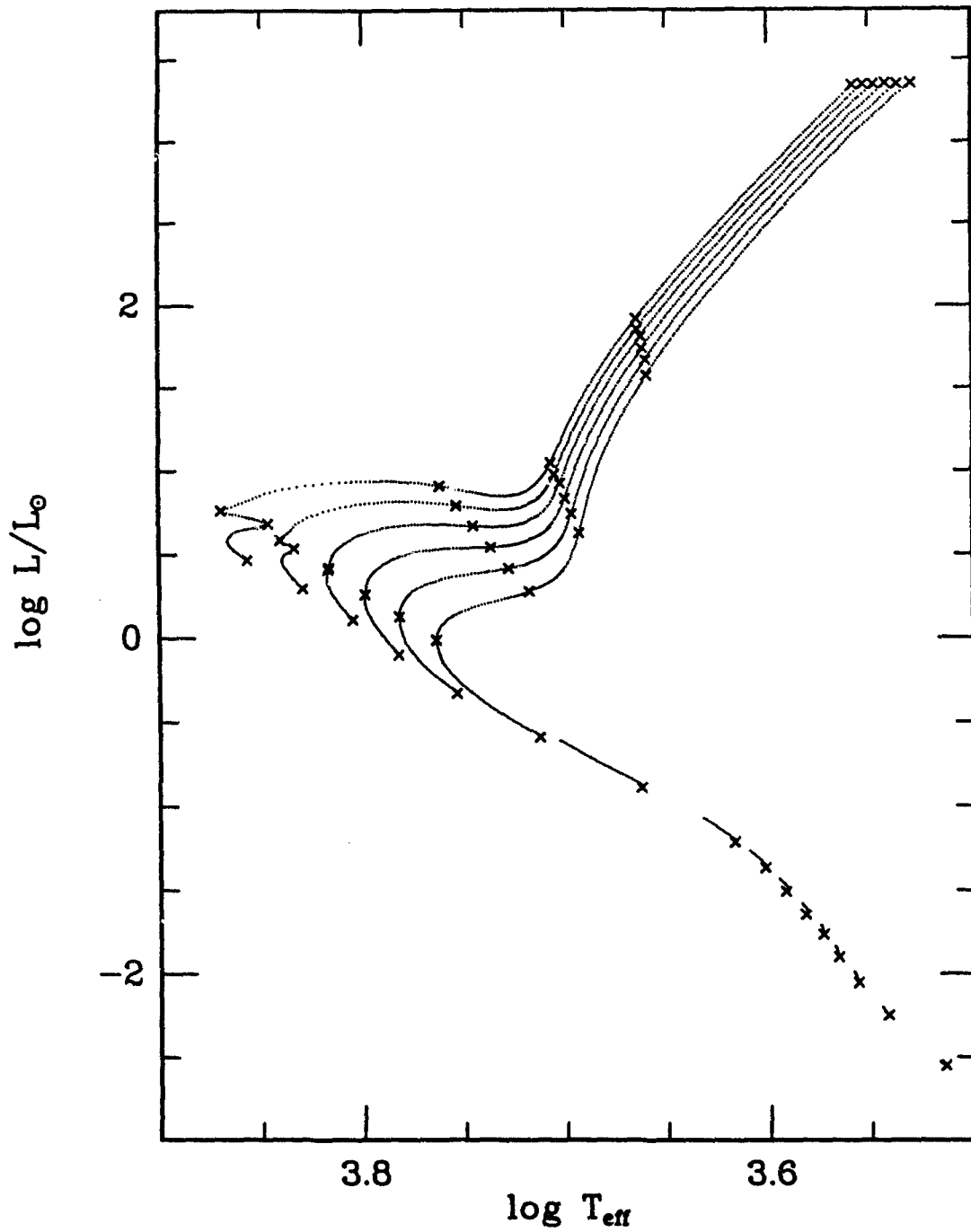


FIGURE 2-2(b) Evolutionary sequences for the composition $[\text{Fe}/\text{H}] = -0.65$, $Y = 0.241$, and $[\text{O}/\text{Fe}] = +0.30$, with the locations of the primary EEPs as defined in Fig. 2(a) given by the small crosses.

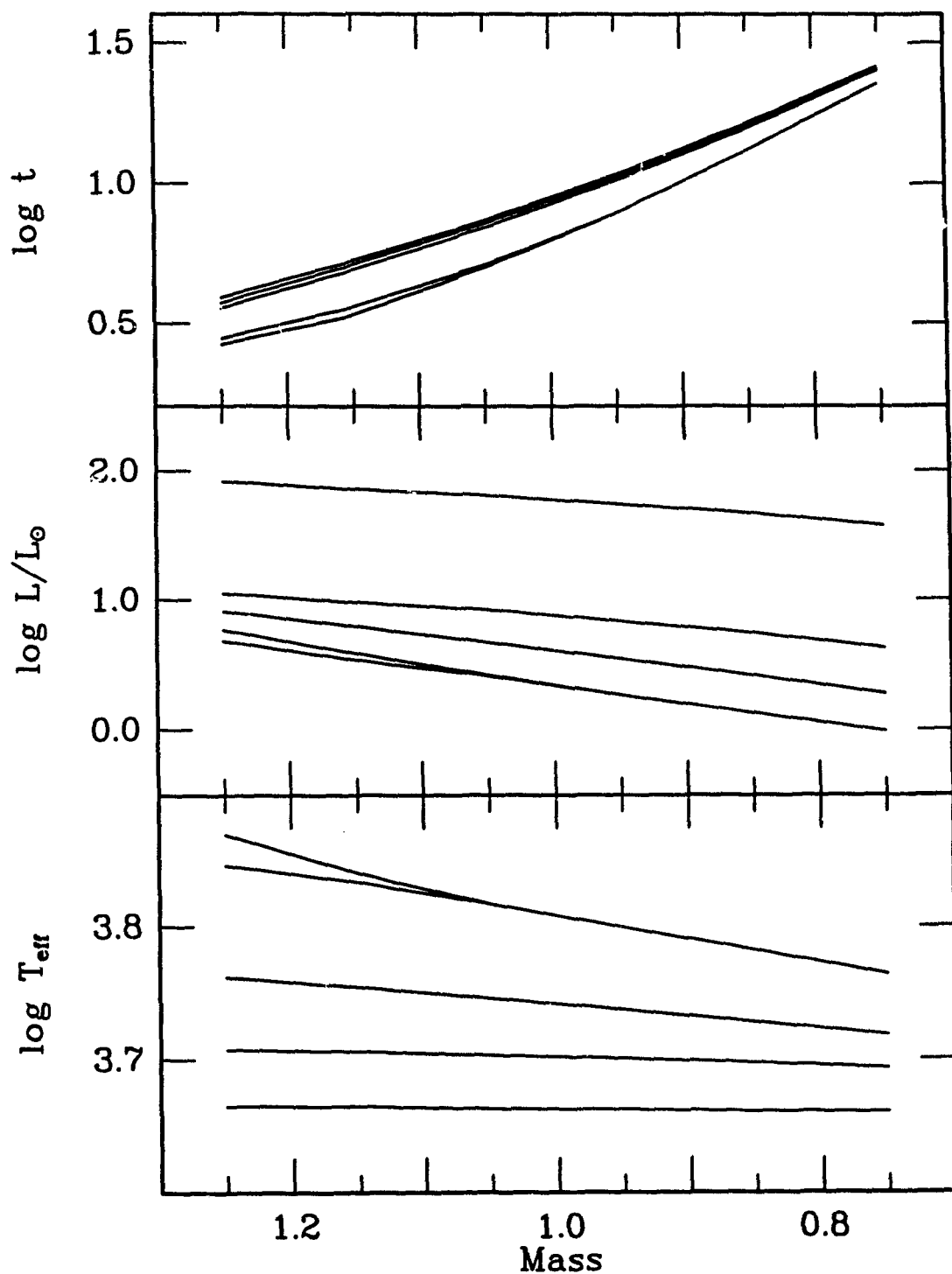


FIGURE 2-3 The interpolation scheme to produce isochrone points from the primary EEPs corresponding to the CHE, BH, Hertzsprung gap and GB pause is illustrated. Note that the development of the BH in the higher mass models shows the largest deviation from linearity.

yields a mass value for which the corresponding luminosity and temperature can readily be determined using the middle and lower panels.

2.4 Joining the Giant Branch to the Main Sequence Track

As described by Vandenberg (1992), the stellar structure equations in their usual Lagrangian form were solved to generate the evolutionary tracks for the pre-main-sequence, main-sequence, and subgiant phases; while the giant branches were constructed using Eggleton's (1971) non-Lagrangian technique. Not surprisingly, the two methods did not produce exact agreement in the region where the results overlapped. Two difficulties were revealed in the initial attempts to splice the two parts of a given track together.

The first problem was that the predicted T_{eff} 's from the Lagrangian code became increasingly noisy as the track approached the base of the red-giant branch (RGB). This was not obvious in a plot of the track on the H-R diagram, where it appeared to be very smooth, but was clearly apparent in the derivative $\frac{\partial(\log T_{\text{eff}})}{\partial(\log t)}$. An appreciable fraction of this noise was eliminated by improving the time-step algorithm after it was noticed that instability in the derivative was usually associated with erratic behaviour in the size of the time-step between models. The remaining noise is believed to be consistent with that expected from the modelling of a star with a finite number of mesh points, the discrete nature of the nucleosynthesis over a given time-step, the errors associated with the various interpolations that are made in constructing a stellar model, etc.

The second difficulty was (and is) associated with the relaxation of the first few

models that are obtained with the Eggleton code (using very short time-steps). Again, the effect is not obvious in a CMD, but can clearly be seen in the derivative $\frac{\partial(\log L)}{\partial(\log t)}$. Typically, 8–11 models along the track are computed before the evolutionary behaviour begins to follow that at the end of the tracks generated with the Lagrangian code. These initial models were deleted before joining the two parts of a given track together.

After dealing with these problems, there remain small systematic differences in $\log T_{\text{eff}}$ and in $\log t$ between the portions of the tracks generated by the two different codes. The shifts are quite small (typically, $\Delta \log T_{\text{eff}} \approx 5 \times 10^{-4}$ at $\log T_{\text{eff}} = 3.7$, which implies $\Delta T_{\text{eff}} = 2.5 \text{ K}$) and are smaller than the uncertainties in the models themselves, but they cause noticeable spikes in the derivatives. However, the Eggleton code produces considerably smoother tracks — because it was designed to follow the evolution of a thin H-burning shell — so the ends of the Lagrangian calculations were adjusted to make a smooth join to the giant branches. The first step in the adjustment was to delete those Lagrangian models with ages greater than the age at the join. Then the effective temperatures of the last 20 remaining points on the post-main-sequence portion of these tracks were corrected so as to produce a smooth match in the $\log L$ – $\log T_{\text{eff}}$ plane. (Remember that these adjustments in $\log T_{\text{eff}}$ amount to only a few parts in 10^4 .) Finally, the age along the giant branch was adjusted by applying a constant Δt at each point, so that the derivatives $\frac{\partial(\log L)}{\partial(\log t)}$ and $\frac{\partial(\log T_{\text{eff}})}{\partial(\log t)}$ were smooth across the join. These techniques have proven so successful that it is not generally possible to detect the location of the join in the $\log L$ – $\log T_{\text{eff}}$ plane (see Fig. 2-2(b), for example), nor are any discontinuities evident in the derivatives.

2.4.1 Idealized Upper Giant Branches

Above the location of the pause on the giant branch, the evolutionary sequences occasionally show evidence of a problem with the interpolation in the tables of photospheric pressures, from which the pressure boundary condition was derived.⁴ One manifestation of the resultant problem is that $\frac{\partial(\log T_{\text{eff}})}{\partial(\log t)}$ is only piece-wise continuous over this region of the CMD, which is almost certainly due to changes from one interpolation regime to another in the pressure tables. Another manifestation of this problem is that some of the RGBs develop a reverse curvature near the tip. Because the model atmospheres are themselves uncertain for giant branch models, and because of the deviations from expected behaviour just mentioned, the decision was made to idealize the upper portion of the giant branch in the following way:

- 1) The luminosity and effective temperature values of the last point on the RGB evolutionary sequence and of the point coinciding with the temperature derivative maximum at the evolutionary pause (the 6th primary EEP in Fig. 2-2(a)) were adopted.
- 2) The slope of the giant branch ($\frac{d(\log T_{\text{eff}})}{d(\log L)}$) at the end of the evolutionary pause was calculated.

⁴ In VandenBerg (1992), adjustments were made of the $\log P$ values originally obtained from published model atmospheres, particularly of those for low $\log g$, in order to obtain predicted RGBs whose slopes on the $(M_{\text{bol}}, \log T_{\text{eff}})$ -plane agreed well with those inferred from infrared photometry for a number of GCs like M32 and 47 Tuc. Although every effort was made to revise this table in a way which would not introduce any kinks in the model sequences, only partial success was possible.

- 3) A quadratic polynomial ($\log T_{\text{eff}}$ as a function of $\log L$) was derived from the two adopted points on the upper GB and the slope of the GB at the end of the evolutionary pause.
- 4) Idealized temperatures were computed from this quadratic, and then these were used to recompute values for $\log g$, to enforce consistency in the output model parameters.

Differences between isochrones interpolated from the idealized giant branches and the raw tracks are illustrated in Figure 2-4 for one of the most offending cases. The adjustments that were made have negligible effects on the computed LFs: all that they really do is modify the shapes of the upper parts of the isochrones to make them look more like the fiducial sequences that are observed.

2.5 Tests of Interpolation Accuracy

Comparisons of the interpolation scheme among the evolutionary grids of different abundances indicate that the largest deviations from linearity in the interpolations occur in the metal-rich grids. The first test of the accuracy of the interpolation scheme is illustrated in Figure 2-5, for the metallicity $[\text{Fe}/\text{H}] = -0.65$ (the second highest metal abundance considered). In this example, a set of isochrones, shown as dashed lines, has been interpolated between the $0.75M_{\odot}$ and $1.05M_{\odot}$ tracks. The maximum difference between the dashed and solid curves at the position of the turnoff amounts to < 0.002 in $\log T_{\text{eff}}$, which corresponds to a temperature difference $\Delta T \approx 25$ K. However, it should be noted that the isochrones and luminosity functions presented in Bergbusch & Vandenberg (1992), of which the solid curves are a small subset, have

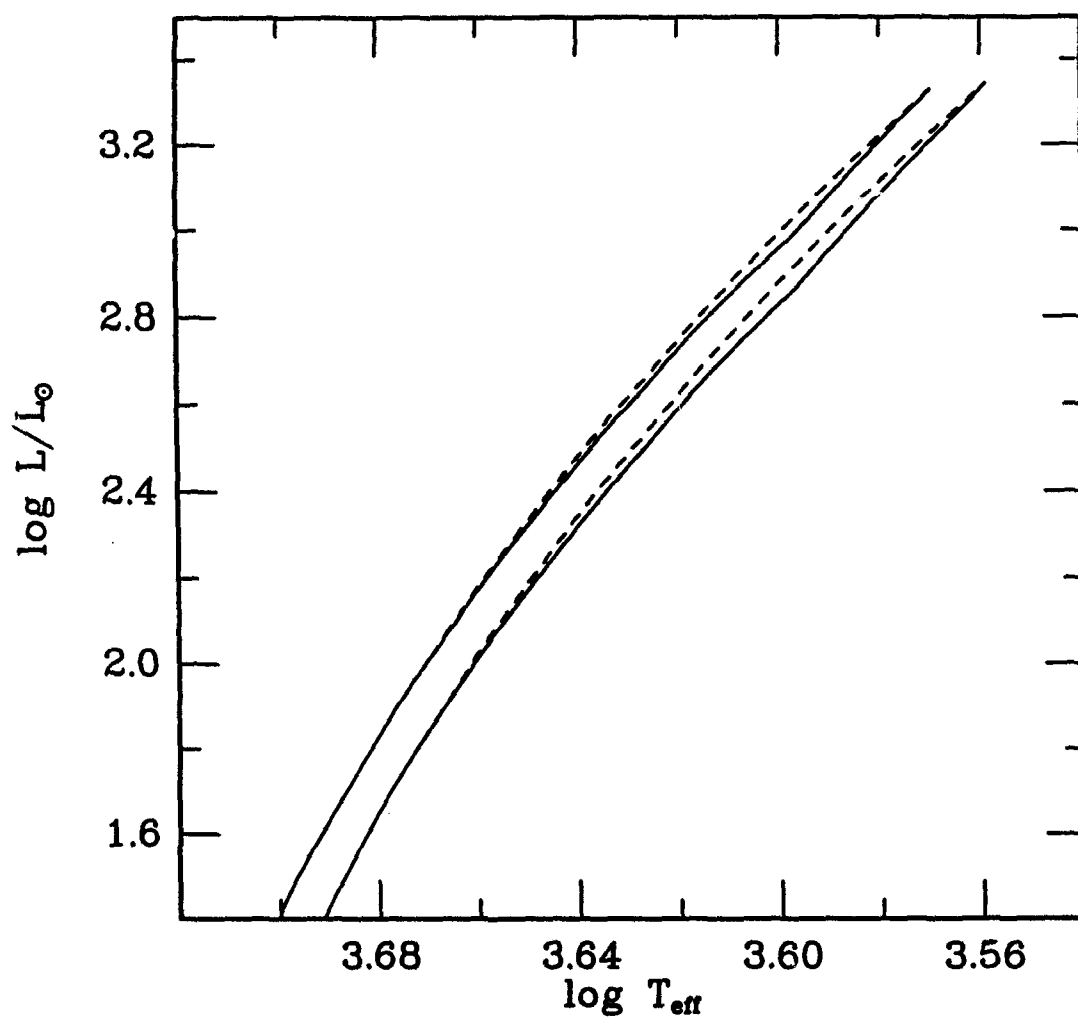


FIGURE 2-4 The differences between 8 and 18 Gyr isochrones derived from idealized giant branches (*dashed curves*), on the one hand, and from giant branches generated by the Eggleton code (*solid curves*), on the other. The deviations of the isochrones, which are most noticeable near $\log L/L_{\odot} = 2.9$, arise as a consequence of the interpolations that are made in the model atmosphere grids of the stellar models.

been interpolated from grids in which the evolutionary sequences are separated by only $0.1\mathcal{M}_{\odot}$, whereas for this test, the spacing is $0.3\mathcal{M}_{\odot}$. The differences between the two sets of isochrones imply that the *upper limit* to the interpolation error at the location of the turn-off, for the full grid, is ≈ 0.0007 in $\log T_{\text{eff}}$, or $\Delta T \approx 10$ K. As indicated in Fig. 2-5, the errors will tend to be even smaller in other parts of the CMD.

The second test of the accuracy of the interpolations is illustrated in Figure 2-6(a), again for the metallicity $[\text{Fe}/\text{H}] = -0.65$. We first generated a set of isochrones with roughly the same spacing between them at the position of the turn-off on the $\log L$ - $\log T$ plane as between the evolutionary sequences. From this set of isochrones, the interpolation scheme was run in reverse to recover the original evolutionary tracks. Figure 2-6(b) clearly shows that the interpolation scheme is extremely reliable, even in recovering the morphology of the blue hook for the $1.15\mathcal{M}_{\odot}$ track. The deviations appearing in the main sequence segment of the $0.85\mathcal{M}_{\odot}$ track are due to the fact that, when the interpolations are run in reverse, five isochrones are crossed, and linear interpolation can produce slight discontinuities at the boundaries of interpolation regimes. The small hook at the position of the turn-off in the $1.05\mathcal{M}_{\odot}$ track is due to the “memory” of the hook feature in the higher mass tracks, preserved by the placement of the primary EEPs in the interpolation scheme down to this track. (See Fig. 2-2(b).) This is just what one would expect from linear interpolation between curves with different morphologies.

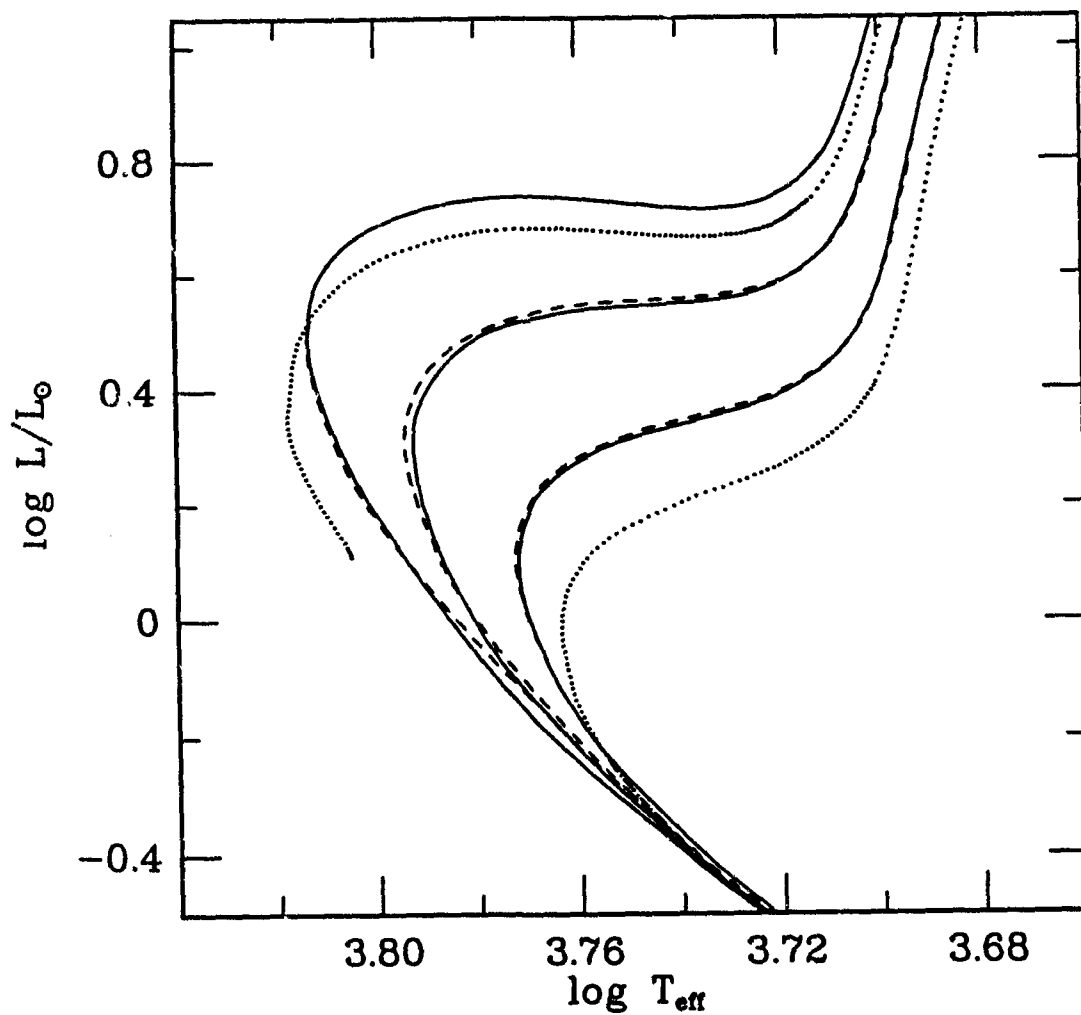


FIGURE 2-5 A test of the linearity of the interpolation scheme with 6, 10, and 18 Gyr isochrones for the metallicity $[\text{Fe}/\text{H}] = -0.65$. The dotted curves represent the two tracks (for $0.75M_{\odot}$ and $1.05M_{\odot}$) that were used to generate the test isochrones (*dashed curves*). The solid curves are the isochrones for the same ages as interpolated from the full grid of stellar models, spaced at $0.1M_{\odot}$ mass intervals.

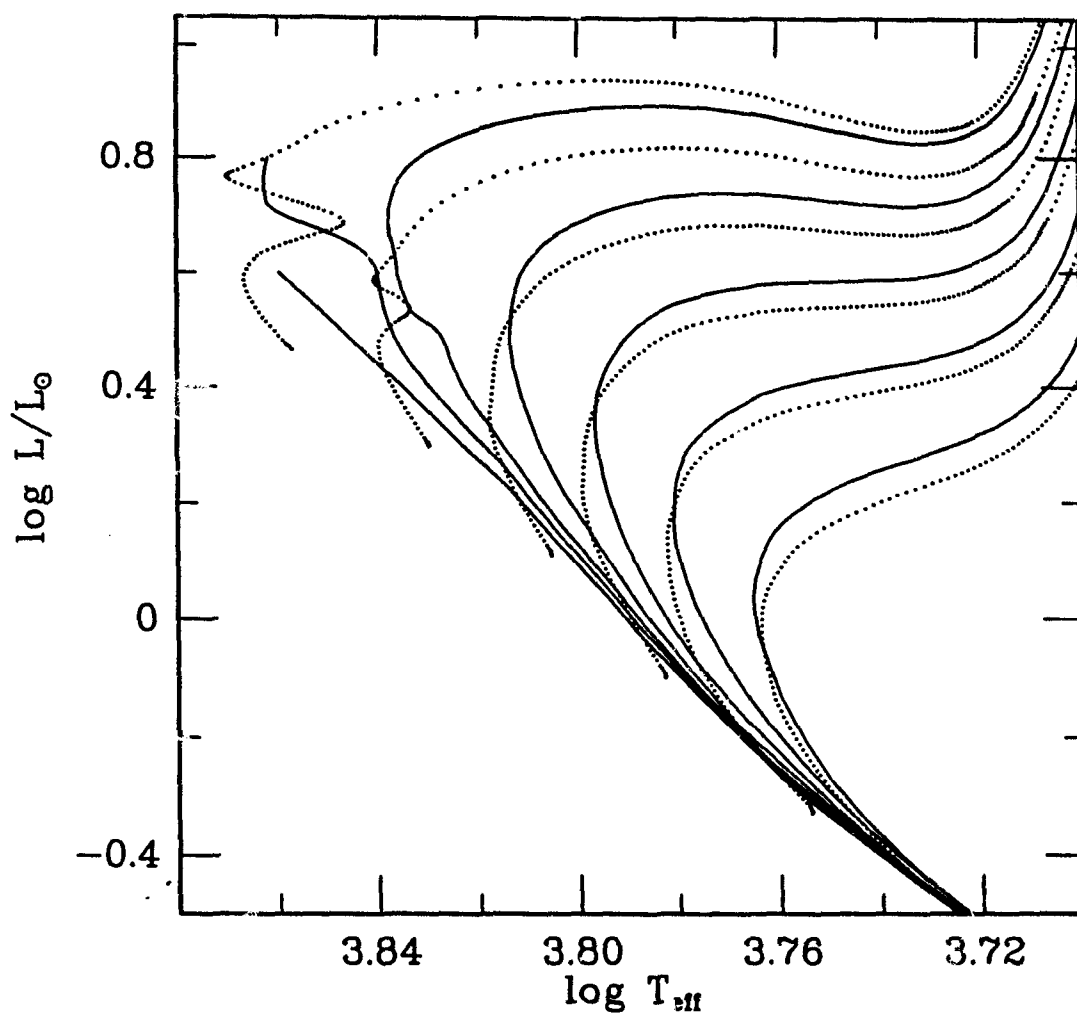


FIGURE 2-6(a) The grid of evolutionary sequences ($[\text{Fe}/\text{H}] = -0.65$) over the mass range $0.75M_{\odot}$ – $1.25M_{\odot}$ is shown as dotted curves; isochrones interpolated from these sequences for the ages 2, 3, 4, 6, 9, 14, and 22 Gyr (*solid curves*) were used to reconstruct the evolutionary sequences shown in Fig. 2-6(b).

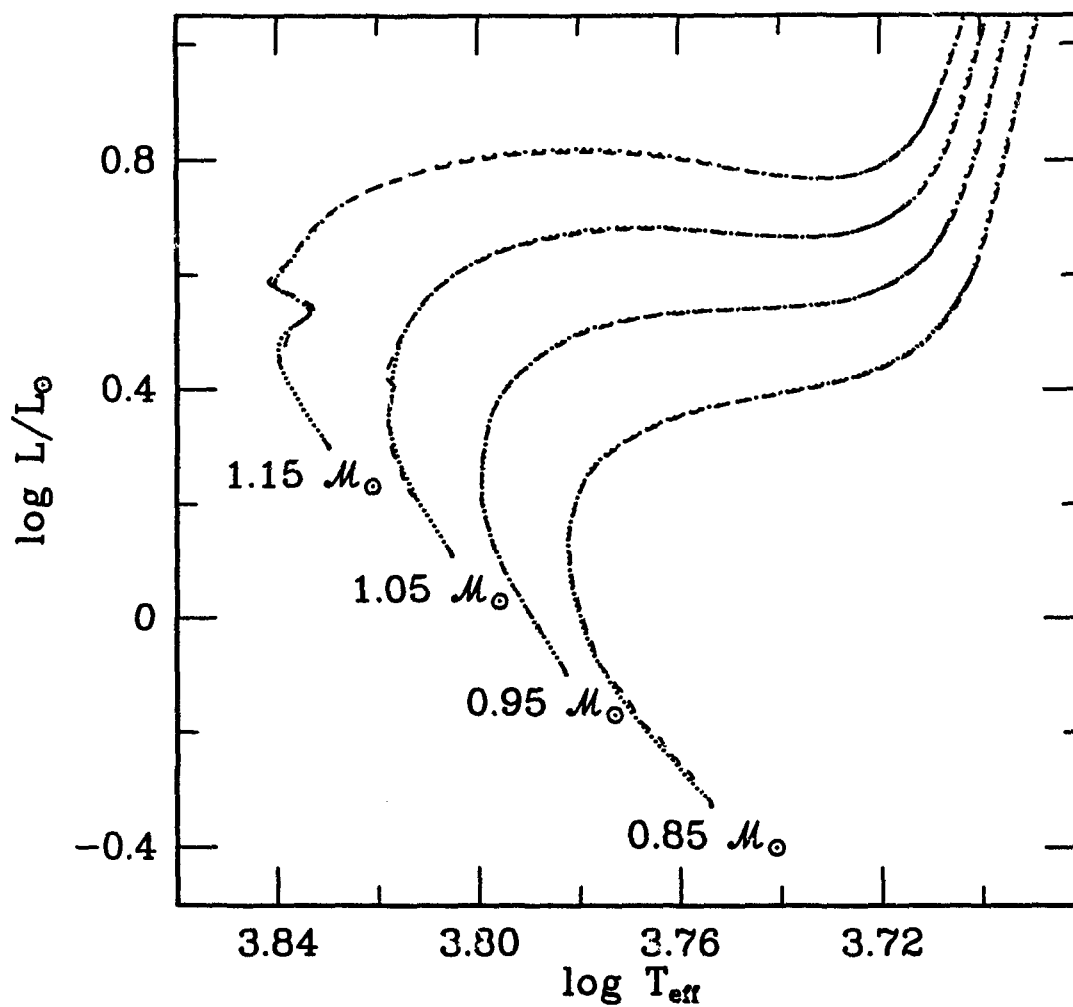


FIGURE 2-6(b) Evolutionary sequences for the masses indicated, reconstructed from the set of isochrones in Fig. 2-6(a), are shown as dashed curves. The original evolutionary sequences are shown as dotted curves.

The major implication of these tests is that a spacing of $0.1\mathcal{M}_{\odot}$ is fine enough to produce isochrones and luminosity functions to an accuracy commensurate with the uncertainties in the evolutionary sequences from which they were derived. However, there is potential for further improvement in the interpolation scheme by more careful consideration of the locations in the evolutionary grids where the structure and evolution are significantly affected by the mass of the model star. In particular, it is desirable to have a much finer spacing of the evolutionary sequences in the vicinity of the transition mass dividing those stars which have a convective core throughout their main-sequence lifetimes and those which do not. Another improvement may be possible by defining independent interpolation schemes for luminosity and temperature.

Chapter 3

Data Acquisition and Reduction

3.1 Observations

The observations of more than a dozen globular clusters (among them NGC 288 and NGC 7099), as well as a few old open clusters (including NGC 2243), were made with the RCA#5 CCD at the cassegrain focus of the 0.9 m telescope at CTIO over two observing runs, the first from 1986 Sept. 7–14, and the second from 1987 Jan. 19–24. The first run was made by the author with the assistance of L. Infante; the second run was made by D. A. Vandenberg, again with the assistance of L. Infante. The RCA#5 chip has a format of 512×320 pixels, and at $f/13.5$, one pixel corresponds to 0.49 arcsec. The chip was aligned with the short side in the north-south direction. Long and short exposures were obtained in both the V and B passbands for overlapping cluster fields to ensure that the photometry for each cluster field could be reduced to the same zero-point. Estimates of the seeing, calculated from the full width at half maximum of the two dimensional gaussian used in the profile fitting photometry, varied between 1–2 arcseconds from night to night, over both observing runs.

Dome flats, bias frames, and dark frames were obtained, and together with the CTIO library fringe frames, were used with the mountain-top package to pre-process the cluster frames and the standard star frames.

3.2 Standard Stars

Observations of standard stars from the lists of Landolt (1983) and Graham (1982) using this telescope/filter/detector combination were obtained each night, over both observing runs. Whenever the sky conditions permitted, observations of groups of standard stars were made at the beginning, the middle, and the end of each night in such a way as to provide observations over a range of 1–2 airmasses, and to cover a wide range in color. Approximately 20 different standard stars per night were observed this way a large fraction of the time, though on several occasions (particularly on the shorter January nights), only two groups of standard star observations were obtained.

Photometry through apertures ranging from 5 to 15 pixels in radius was obtained using the PHOTOMETRY routine of DAOPHOT (Stetson 1987). For these data, the shape of the growth curves for the stellar images is significantly affected by the seeing and the focussing only within the central 8–9 pixels, and at 12 pixels, the aperture corrections are extremely stable. (Averaged over both observing runs, the correction from 11 pixels to 12 pixels amounts to 0.006 ± 0.001 magnitudes.) But by 15 pixels, the combination of sky and readout noise begins to dominate the photon counts, so that, although the growth curves are in excellent agreement, the aperture photometry becomes unreliable. For these reasons, the mean growth curves for each part of the night were used to correct the 5 pixel radius aperture photometry to 12 pixel radius ($\approx 12''$ diameter) apertures.

The transformation coefficients were derived for equations of the form

$$\begin{aligned}
 v &= V + a_0 + a_1 \cdot (B - V) + a_2 \cdot (X - 1.25) + a_3 \cdot t, \\
 b &= B + b_0 + b_1 \cdot (B - V) + b_2 \cdot (X - 1.25) \\
 &\quad + b_3 \cdot (B - V) \cdot (X - 1.25) + b_4 \cdot t,
 \end{aligned}
 \tag{3-1}$$

where v and b are the instrumental magnitudes, V and B are the magnitudes in the standard system, X is the airmass, and t is the time of observation¹. The adopted values for the transformation coefficients were derived by combining the standard star data from all of the nights, over both observing runs, in the following way.

¹ Attempts were made to use equations without the time-dependent terms, but then the residuals, both in B and V , varied systematically with magnitude, in the sense that the brightest standards were always too bright by several hundredths of a magnitude. It was also noticed that the trend in residuals correlated with the length of the exposure, which for the brightest standards were as short as 1". A shutter error of 43 ms (in the sense that the exposures were longer than given in the FITS headers) was deduced, and the existence of such an error was confirmed by Alistair Walker (personal communication) at CTIO. According to him, the shutter error amounted to 30 ms at the corners of the frames and 40 ms at the centers. Most of the frames have the standard stars near the center, but the correction applied to the magnitude for each star was calculated assuming a linear variation in the shutter error across the frame, based on the CTIO figures. After correcting the instrumental magnitudes for the shutter error, the residuals revealed a correlation with the time of observation through the night.

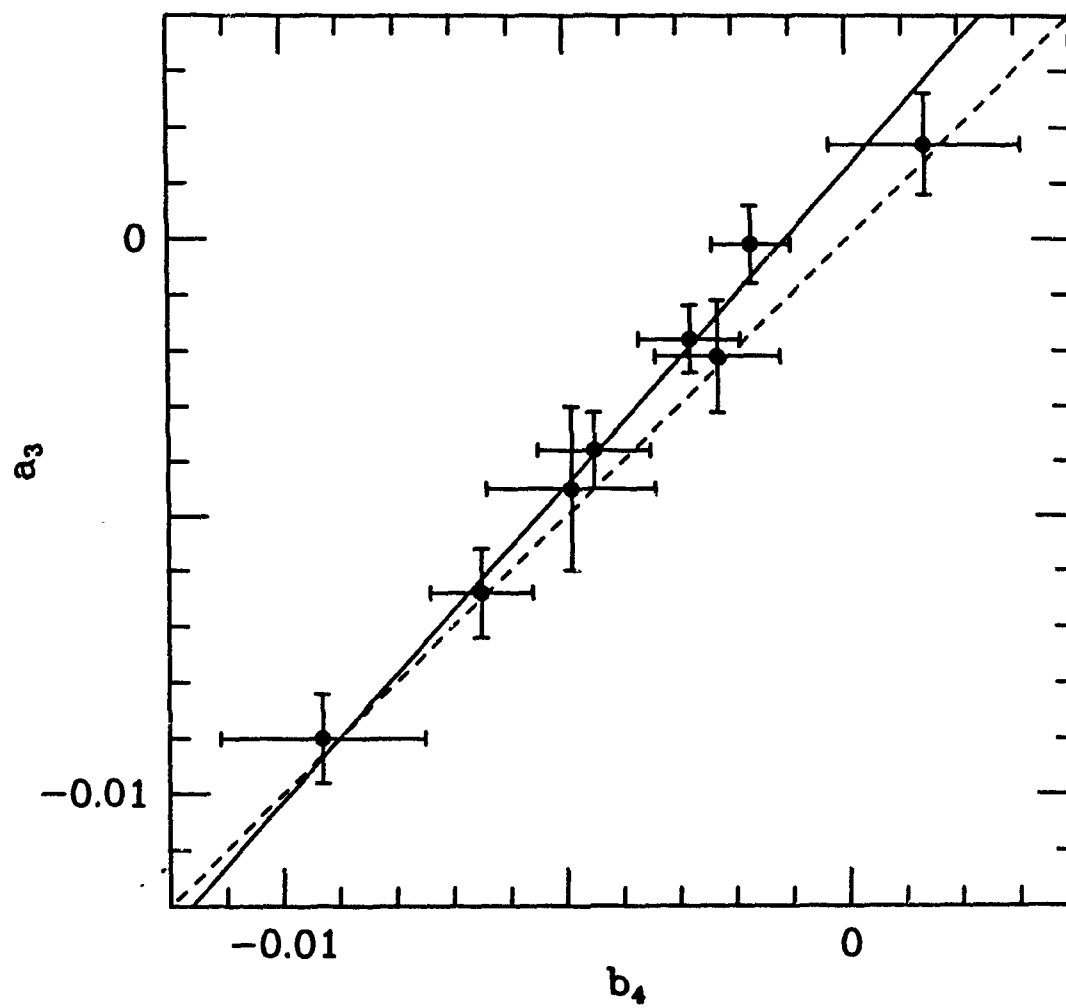


FIGURE 3-1 The correlation between the temporal coefficients in the transformations equations. The solid line is the result of a two-way linear regression; the dashed line has a slope of unity.

- 1) A full fit to the transformation equations was performed for each night on which standard stars had been observed more than once. For short nights, when only one set of standard star observations was made, the time dependent terms were omitted.
- 2) A plot of b_4 vs. a_3 (Figure 3-1) suggests that $b_4 = a_3$. An average value for these coefficients, determined for each night, was then inserted into the transformation equations, and the fit to the equations was repeated.
- 3) Mean values for the color terms (a_1 and b_1), as well as the cross-term b_3 were then determined from this last fit. Estimates of b_3 derived from the short nights with only one group of standard star observations tended to be discrepant, and were omitted from the determination of the mean b_3 .
- 4) With the color-dependent coefficients now fixed, the time-dependent coefficients (a_3 and b_4) were redetermined.
- 5) For the nights on which new values of the mean a_3 and b_4 were found, the color-dependent coefficients were re-evaluated as in steps (2)–(3) above.
- 6) Finally, the weighted means of the color-dependent coefficients (a_1 , b_1 , b_3) were formed, then inserted into the transformation equations to redetermine the zero-points, a_0 and b_0 , as well as the first order extinction coefficients (a_2 and b_2).

Experiments with quadratic color terms for both the V and B transformations, as well as with a cross term for the V transformation, were made to see if the fits could be improved, but gave negative results. The adopted mean values of the color-dependent coefficients are $a_1 = +0.0066 \pm 0.0011$, $b_1 = -0.1413 \pm 0.0016$, and $b_3 = -0.0395 \pm 0.0095$, where the uncertainties are the error estimates of the mean. The

nightly zero-points, zenith extinctions, and temporal coefficients are given in Table 3-1. The over-all quality of the transformations is illustrated in Figure 3-2, where the magnitude and color residuals (*observed - standard*) are plotted as functions of time and airmass, and in Figure 3-3 where they are plotted as functions of magnitude and color.

The need for a temporal term in the transformation equations has been encountered by Stetson & Harris (1988), in a much more thorough attempt to derive the transformation equations. They too found a correlation between the temporal coefficients for the *V* and *B* passbands, and concluded from the slope of the relation (0.76), that a significant part of the effect was due to variation in the extinction. Their conclusion was reinforced by the tendency for the temporal coefficients to be negative, suggesting that the settling of dust out of the atmosphere was the source of the variation. However, in the present case, the slope of the relation is closer to unity (1.14), although the tendency for the coefficients to be negative is also manifest. Although changes in detector sensitivity cannot be ruled out, due perhaps to a slow change in temperature, it seems unlikely since the Dewar was recharged with liquid nitrogen at the beginning of each night and at least once during the night. It is also possible that by limiting the aperture photometry to 12 pixels, systematic changes in the seeing could induce the effect, but such a correlation is not evident in these data. If changes in atmospheric extinction are the source of the temporal terms, then a slope near unity suggests that the changes occur as fairly large particulate material settles out of, or is stirred up into, the atmosphere.

Table 3-1(a). Temporal Coefficients

UT Date	a_3	σ_{a_3}	b_4	σ_{b_4}	mean	σ
1986 Sept.						
8/9	-0.0064	0.0008	-0.0065	0.0009	-0.0065	0.0006
9/10	-0.0045	0.0015	-0.0049	0.0015	-0.0047	0.0011
10/11	-0.0001	0.0007	-0.0017	0.0007	-0.0009	0.0005
11/12	-0.0021	0.0010	-0.0023	0.0011	-0.0022	0.0007
14/15	-0.0038	0.0007	-0.0045	0.0011	-0.0040	0.0006
1987 Jan.						
19/20	+0.0017	0.0009	+0.0014	0.0017	+0.0016	0.0008
22/23	-0.0090	0.0008	-0.0093	0.0018	-0.0091	0.0007
23/24	-0.0018	0.0006	-0.0028	0.0009	-0.0021	0.0005

Table 3-1(b). Zero-points and Zenith Extinctions

UT Date	a_0	σ_{a_0}	a_2	σ_{a_2}	b_0	σ_{b_0}	b_2	σ_{b_2}
1986 Sept.								
8/9	3.0958	0.0020	0.1387	0.0080	3.1968	0.0023	0.2568	0.0090
9/10	3.0870	0.0035	0.1337	0.0092	3.1839	0.0030	0.2524	0.0083
10/11	3.0972	0.0028	0.1251	0.0113	3.1966	0.0028	0.2343	0.0115
11/12	3.0835	0.0036	0.1322	0.0122	3.1810	0.0040	0.2302	0.0132
13/14	3.4995	0.0033	0.1251	0.0092	3.6055	0.0041	0.2570	0.0107
14/15	3.4838	0.0023	0.1026	0.0085	3.5906	0.0033	0.2132	0.0119
1987 Jan.								
19/20	3.0304	0.0020	0.1647	0.0109	3.1407	0.0043	0.2721	0.0285
22/23	3.1424	0.0018	0.1854	0.0064	3.2796	0.0044	0.3351	0.0155
23/24	3.1177	0.0020	0.2040	0.0156	3.2550	0.0030	0.3995	0.0229

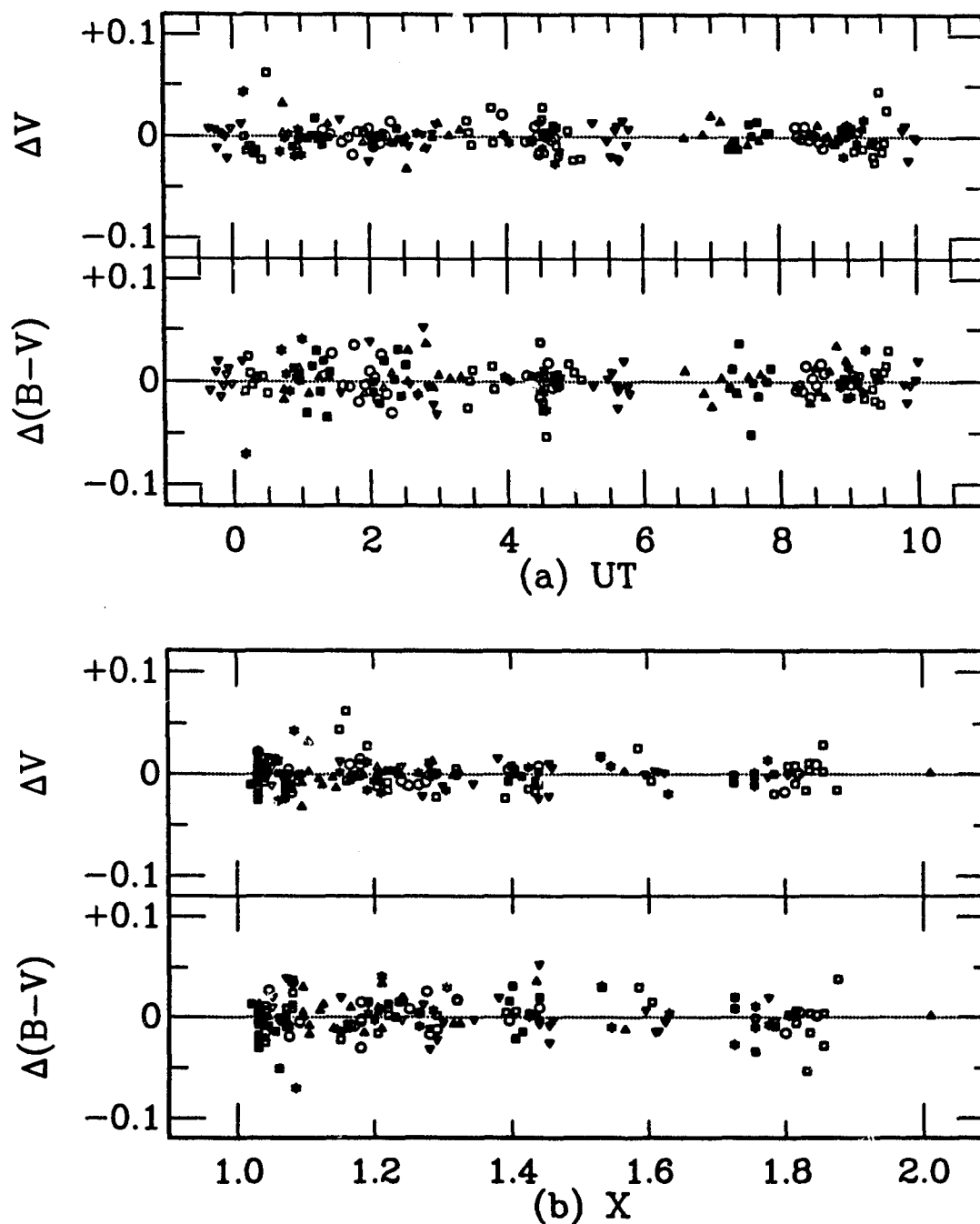


FIGURE 3-2 Differences between the observed and standard magnitudes, ΔV , and colors, $\Delta(B-V)$ as a function of (a) time, and (b) airmass. Each symbol represents data taken from a particular night; the open symbols represent nights from the Sept. 1986 observing run; the solid symbols represent nights from the Jan. 1987 run.

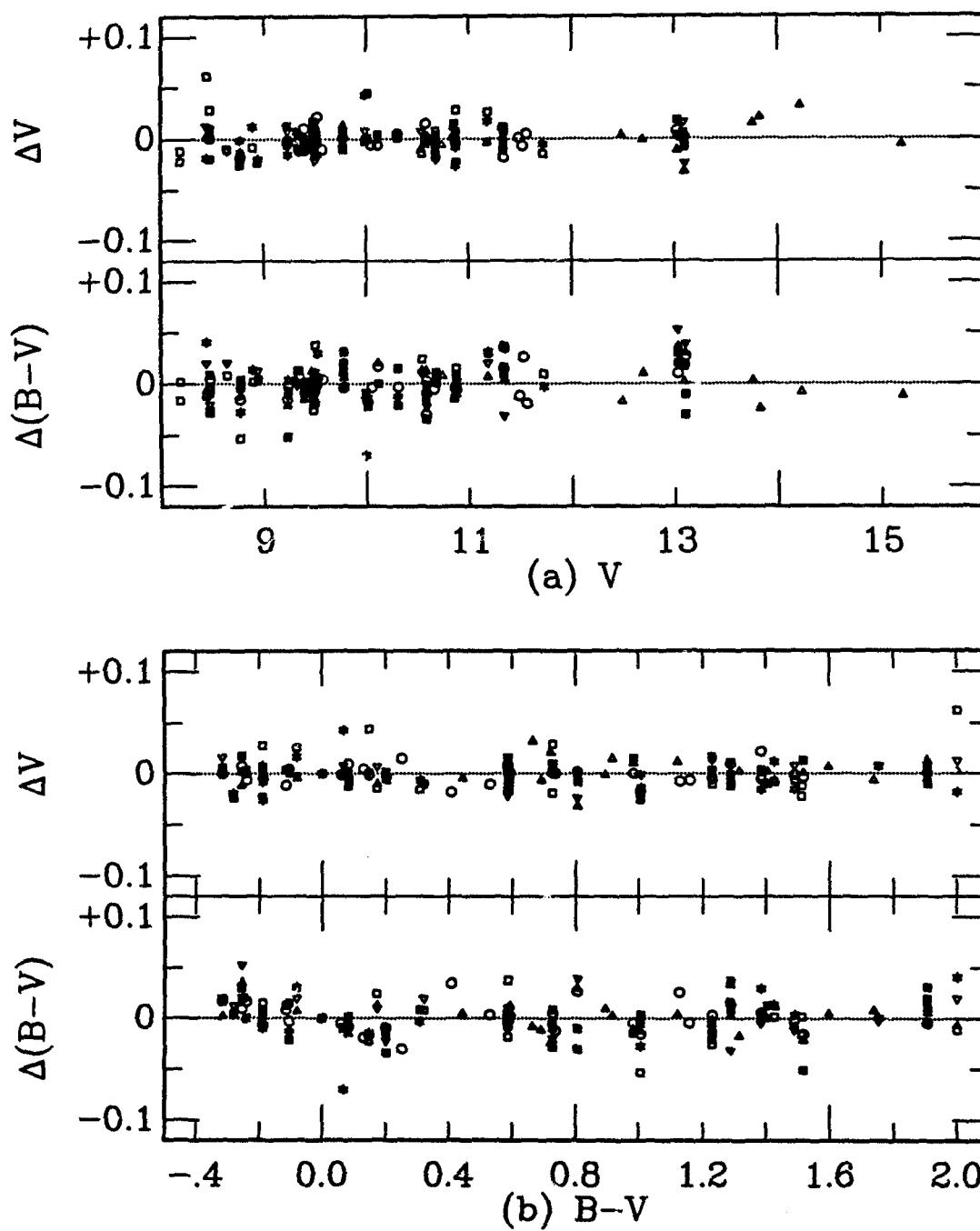


FIGURE 3-3 Differences between the observed and standard magnitudes, ΔV , and colors, $\Delta(B-V)$ as a function of (a) standard magnitude and (b) color. The symbols are the same as for Fig. 3-2.

3.2.1 Cluster Photoelectric Sequences

We have photometry for thirteen stars in common with the photoelectric sequence in NGC 2243 given by van den Bergh (1977), which is based partly on independent observations and partly on the earlier photoelectric sequence by Hawarden (1975). In addition, we have a total of 8 stars from the photoelectric sequences for NGC 288 (Cannon, 1974; Alcaïno *et al.*, 1987) and 6 stars from the photoelectric sequence for NGC 7099 (Alcaïno *et al.*, 1987). However, these stars were not used in the determination of the transformation coefficients initially, so that they could provide an independent test of the standardization.

Table 3-2 shows the comparison for the NGC 2243 stars between the photometry on this independent photoelectric scale and the earlier work. Except for a few stars (eg. 1121, 1206, 1301, 4110 on Hawarden's numbering system), which have large residuals, the agreement is quite good. Star 1121 is considerably brighter in our photometry, but there is no obvious source for this discrepancy, except to note that it is the brightest blue straggler candidate, and it may actually be variable. While our V -magnitude for 1206 is in good agreement with van den Bergh's, there is a significant discrepancy in $B - V$, and when Hawarden's photometry is considered together with the identification of this star as a potential member of the binary sequence, there is reason to suspect that it may also be a variable. (It should be noted that stars 2230 and 2233, which are also potential members of the binary sequence, do not show evidence for variability.) The comparison for star 1301 is not very useful, because van den Bergh indicated that his photometry for this star was uncertain. The one star in this group that was found to be fainter than either van den Bergh or Hawarden

did, namely 4110, is reported by both of them as being crowded. In this particular case, the new photometry is probably more reliable, since profile fitting photometry makes it possible to deconvolve the crowded stellar images. Inclusion of the cluster photoelectric sequence in the list of standard stars was found not to have a significant effect on the determination of the transformation coefficients² for the night on which the cluster was observed, and since there is considerable disagreement among the three sets of photometry, the transformation coefficients computed without them have been adopted.

Tables 3-3 and 3-4 show the comparisons for the photoelectric sequences in NGC 288 and NGC 7099, respectively. For both clusters, the present photometry gives, on average, fainter *V*-magnitudes and bluer colors, although the magnitude of the differences varies considerably from star to star. Such *V*-magnitude differences could be due to zero-point errors, or to small magnitude-dependent terms not included in the transformation equations. However, a detailed star by star comparison of the profile-fitting photometry for NGC 288 by Bolte (1992) and the present study (see Chapter 5) reveals that the present photometry is, on average 0.06 mag fainter in *V*, but only 0.01 mag bluer, with no significant trends in magnitude. Moreover, when the fiducial sequences in the literature, derived from CCD photometry for both NGC 288 and NGC 7099, are compared, shifts of several hundredths of a magnitude (or larger) are regularly encountered.

Since profile-fitting photometry allows for the deconvolution of crowded images,

² Bonifazi *et al.* (1990) also found some difficulties reconciling the van den Bergh and the Hawarden photoelectric photometry.

Table 3-2. NGC 2243 Photoelectric Sequence

Star	V	$B - V$	ΔV^* van den Bergh	$\Delta(B - V)^*$	ΔV^* Hawarden	$\Delta(B - V)^*$	Hawarden Number
21	14.192	0.815	-0.110	+0.022			1121
47	17.839	0.661	-0.001	-0.059	-0.141	+0.011	1206
138	13.682	0.922	-0.008	+0.032			1229
18	15.708	0.557	-0.09 :	+0.26 :			1301
551	15.666	0.584			-0.024	+0.014	2227
528	16.608	0.505	+0.008	-0.035	-0.012	+0.015	2230
526	17.244	0.598			+0.014	-0.012	2233
521	16.185	0.460			+0.015	-0.010	3119
564	17.403	0.528			+0.043	+0.008	3208
159	12.890	1.089	+0.050	-0.031	+0.040	-0.021	4110
353	15.106	0.897	-0.024	+0.027	-0.044	+0.007	4236
21	14.192	0.815	+0.012	-0.005	+0.012	-0.045	4301
27	13.737	0.898	+0.037	+0.018	+0.007	-0.042	4303

*Differences are in the sense (present study) - (previous study).

Table 3-3. NGC 288 Photoelectric Sequence

Star	V	σ_V	$B - V$	$\sigma_{(B-V)}$	ΔV^*	$\Delta(B - V)^*$	ID	Ref.*
5461	12.966	0.015	1.409	0.021	-0.014	-0.041	DD	1
5240	13.272	0.437	1.228	0.437	+0.112	-0.092	EE	1
5432	13.963	0.010	1.076	0.026	+0.043	-0.044	FF	1
5236	15.442	0.008	0.874	0.012	+0.032	+0.024	32	2
3965	14.263	0.025	0.522	0.033	+0.123	-0.068	21	2
1999	13.081	0.190	1.359	0.191	+0.051	-0.001	20	2
282	14.875	0.008	0.952	0.020	+0.076	-0.038	18	2
5064	14.033	0.008	1.103	0.008	-0.007	-0.107	33	2

*Differences are in the sense (present study) - (1. Alcaïno *et al.*, 1987),
or (present study) - (2. Cannon, 1974).

Table 3-4. NGC 7099 Photoelectric Sequence

Star	V	σ_V	$B - V$	$\sigma_{(B-V)}$	ΔV^*	$\Delta(B - V)^*$	ID
6093	12.088	0.008	0.751	0.016	+0.048	-0.019	CC
558	13.161	0.003	1.036	0.004	+0.121	-0.004	FF
6412	13.589	0.005	0.981	0.008	+0.049	-0.019	GG
5958	14.288	0.005	0.771	0.007	+0.068	+0.001	HH
6300	15.239	0.007	0.757	0.012	+0.089	-0.023	JJ
6233	15.365	0.005	0.099	0.008	+0.075	-0.051	LL

*Differences are in the sense (present study) - (Alcaïno *et al.*, 1987).

and since these secondary standards are in fields close to the cluster cores, it may be expected that the new photometry would give fainter magnitudes. Furthermore, the gradient in the unresolved cluster light makes it difficult to obtain proper estimates of the sky around many of the program stars. This is a greater problem for aperture photometry than for profile-fitting photometry, however, because it is possible to empirically model, and then subtract, the underlying cluster light from the CCD images. (This was done for the globular cluster frames.) The colour differences in Tables 3-3 and 3-4 may be attributable to the fact that the cluster light is redder than the sky. For these reasons, the cluster photoelectric sequences were not used to derive the coefficients for any of the transformation equations.

3.3 Profile-Fitting Photometry of the Cluster Fields

The detection of stellar images and the measurement of sky brightness in the region of the detected stars was performed with the FIND and PHOTOMETRY routines of DAOPHOT. Profile-fitting photometry was performed with the stand-alone routine ALLSTAR³, provided by Peter Stetson. After two passes through the detection/reduction algorithms of DAOPHOT and ALLSTAR, virtually every stellar image on each frame had been detected and measured. After some experimentation, it was found that any remaining apparently stellar images that could be detected

³ ALLSTAR automatically divides the list of detected objects into manageable groups on the basis of a critical separation which is calculated from the fitting radius. If a group is so dense that there are too few pixels per star, the faintest star in the group is deleted. Faint stars will continue to be deleted until the critical separation reaches 1.2 pixels. The program can also produce a star-subtracted frame directly.

visually on the image display only survived a third pass through ALLSTAR if they could also be detected with the FIND routine after slightly lowering the detection threshold. Thus a third pass through the detection/reduction step was made to complete the initial lists of objects for each frame.

Each of the cluster fields was covered in four frames (B , V , long and short exposures) and the overlapping regions were covered in at least eight frames. In each of the globular clusters, four overlapping fields were observed, so that the cluster cores were covered on sixteen frames. The lists of corresponding stellar images on different frames were matched by shifting the X and Y coordinates for each frame, and a preliminary master list for each cluster was compiled. This master list was used to produce lists of objects that should have been detected on each frame.

For NGC 2243, because the fields are relatively sparse, it was required that a real object appear within 1 pixel on at least two different frames. (Considering that the FWHM of the stellar images on the NGC 2243 frames is typically ≈ 3.6 pixels, this is a fairly severe matching criterion. However, inspection of the final subtracted images showed that no obviously stellar objects had been missed. On the other hand, the centroids of objects near the detection threshold are probably uncertain by at least 2 pixels, so this matching criterion does discriminate against fainter objects.) This also ensured inclusion of the objects detected on the shallow frames that were saturated on the deep frames. The lists, so constructed for each frame, were then subjected to a final pass through ALLSTAR, from which the final master list of stars was compiled.

The master lists for the globular clusters were compiled using a matching radius of 2 pixels, because of the uncertainty in the centroids of the faint stellar images.

To ensure the validity of detections of the faintest objects anywhere in the cluster fields, an inclusion criterion based on the number of frames on which an object was detected, ND , versus the number of frames on which it should have been found, NP , was adopted. The prescription for inclusion on the list of a long frame, for a star with an average instrumental magnitude ≥ 15.5 , was $ND \geq (\frac{NP}{4})$, rounded to the nearest integer. (A magnitude of 15.5 is slightly brighter than the magnitude at which the frame LFs showed clear evidence of being incomplete.) Otherwise $ND \geq (\frac{NP}{2}) - 1$, rounded up, was used. Only objects which passed these tests were added to the candidate list for each frame. Comparisons between the frame LFs produced from the last pass through ALLSTAR to the LFs generated from these lists of candidate objects showed validity of this prescription. The candidate lists tended to contain an excess of faint objects over the input lists, but the excess was reasonable and relatively few of the candidate objects were deleted by ALLSTAR on the next pass (on average, about 10%).

For the globular clusters, the subtracted images obtained after this last pass through ALLSTAR were median-filtered (thanks, again, to Peter Stetson) with a filter radius of ten pixels, to produce a smooth empirical model of the unresolved cluster light. These smoothed frames were subtracted from the original frames to remove the gradients in the background light, then the median sky value for each subtracted frame was added back. The final pass through ALLSTAR using these modified frames was even more successful than the previous one, in the sense that fewer of the candidate objects were deleted. The master list used to produce the CMDs and LFs was compiled from the output.

3.4 Artificial Star Tests

The probability of detecting a star on a given CCD frame is a multivariate function of at least its magnitude, its colour, and its position in the cluster. Other selection criteria, such as the χ^2 statistic for the goodness of the profile fit, may be imposed to restrict its inclusion in the final list of objects.

The goals of the artificial star tests are 1) to obtain estimates of the external errors in the photometry, and 2) to obtain estimates of the completeness of the stellar sample as a function of magnitude (and possibly colour and position). To implement such tests, the spatial distribution, the luminosity function, and the relation between magnitude and colour need to be known reasonably well *a priori*. Certainly, initial estimates of them may be derived directly from the observations, mitigated by the predictions of model luminosity functions, isochrones, *etc.* The specific details of the tests performed on each cluster will be given later, but the general approach which has been applied to all of them will be outlined here.

Models for the spatial distribution of the stars in a cluster can be derived directly from the observations in the following way. Consider, first, that the probability of detecting a star at the coordinate pair (x, y) is just $P\{xy\} = P\{x\} \cdot P\{x|y\}$, where $P\{x\}$ is the probability of a star occurring at x , regardless of y , and $P\{x|y\}$ is the *conditional* probability of a star having the coordinate y when x is specified. To derive $P\{x\}$, the normalized cumulative distribution for the x -coordinate is constructed from the master list of objects. The conditional probability, $P\{x|y\}$ is similarly evaluated — after partitioning the master list into strips roughly 100 pixels wide in x , a cumulative y -distribution for each strip is made.

A coordinate pair is derived from these cumulative distributions by generating a random number between 0 and 1. This number is used to enter the cumulative x -distribution and thus derive the corresponding x -coordinate. With x now specified, the appropriate cumulative y -distribution is selected (in practice, spline interpolation between the distributions was used), another random number is generated, and the corresponding y -coordinate is derived. Figure 3-4 illustrates the significance of this procedure for the cumulative distributions derived from the master list for NGC 7099.

For each cluster, the cumulative luminosity function used to produce the artificial stars was derived, in part, from the differential LF with the input parameters thought most appropriate, taken from Bergbusch and Vandenberg (1992). However, the cumulative distributions were modified slightly in favour of the bright end of the distributions, to ensure the statistical significance of the tests well above the limit of detection, and, in the case of the globular clusters, to include a horizontal branch component. The V -magnitude distributions were then used to assign the magnitudes to the artificial stars. Fiducial sequences relating the V -magnitude to $(B - V)$, constructed from the master list and from the fiducial sequences in the literature, were used to derive the magnitudes for the B frames.

3.5 Rectification of the LF

The most direct approach for the analysis of artificial star tests (e.g., Bolte 1989) simply computes the completeness fraction for the i^{th} magnitude bin, f_i , as the ratio of the number of stars recovered in it to the number of stars assigned to it. However, this neglects the possibility that an artificial star may be recovered in a bin different

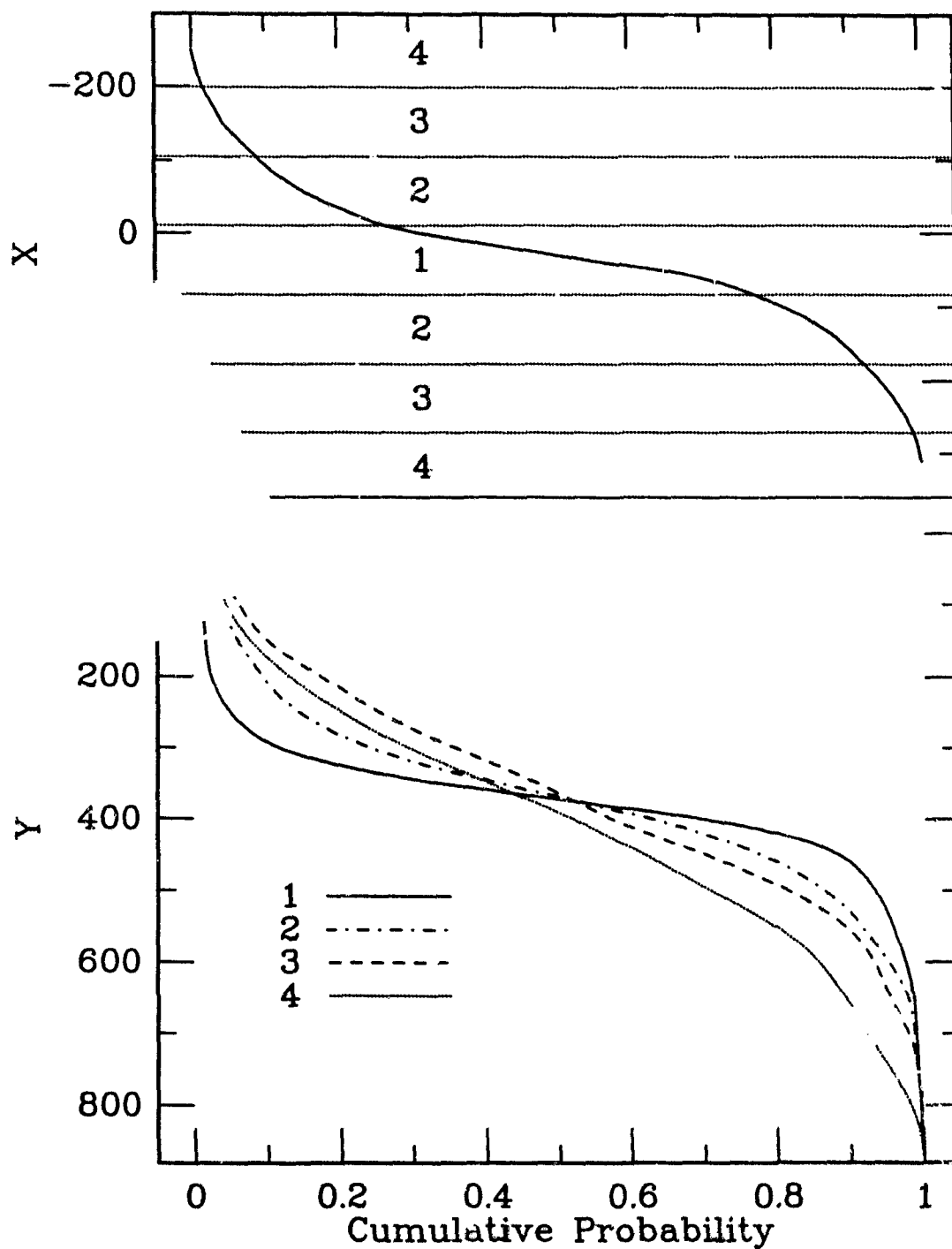


FIGURE 3-4 The top panel shows the global cumulative x -coordinate distribution derived from the master list of NGC 7099. The lower panel shows the cumulative y -coordinate distributions corresponding to the regions designated in the top panel. Because the central strip through the core of the cluster is clearly deficient in faint stars, a faint magnitude limit at which the sample was thought to be complete was set for each strip, in an attempt to ensure that the artificial star distribution would correspond reasonably well with the true distribution.

from the one to which was assigned. In an attempt to account for this “bin-hopping”, Drukier *et al.* (1988), constructed a recovery matrix from the recovered artificial stars. The weakness in this method is that the matrix may contain elements far off the diagonal, particularly when faint stars are recovered at magnitudes significantly brighter than they were assigned. (See Stetson & Harris 1988, for a good discussion of these points.) This is a particular difficulty in crowded fields, where the artificial star images may overlap with program star images. On inversion of the recovery matrix, these small off-diagonal elements contribute significantly to the error in the completeness fraction estimates.

The problems associated with working in crowded cluster fields are particularly relevant to the globular cluster analysis in the present work, because the luminosity function rises so steeply at the base of the giant branch. Significant forward scattering in the stellar magnitudes may be expected because most of the stars in the cluster fields are faint, and blended stellar images will produce brighter magnitudes. The rectification procedure followed in the present work is derived from Bayes’ Theorem for conditional probabilities, and is based on the method suggested by Lucy (1974), which is similar to that employed by Stetson & Harris (1988). The validity of the interpretation of the artificial star tests also requires that the test frames be *processed in exactly the same way* as the original frames, and that the output from the tests be *subjected to the same selection criteria* as the original master list.

If $\phi(m_t)$ is the true parent luminosity function, and $P\{m|m_t\}$ is the probability that a star of true magnitude, m_t will be recovered at magnitude m , then the observed

LF may be represented as

$$\eta(m) = \int_{-\infty}^{+\infty} \phi(m_t) P\{m|m_t\} dm_t. \quad (3-2)$$

If $Q\{m_t|m\}$ is the "inverse" probability that a star observed at magnitude m has a true magnitude m_t , then according to Bayes' Theorem

$$\eta(m)Q\{m_t|m\} = \phi(m_t)P\{m|m_t\}. \quad (3-3)$$

Integration of both sides of equation (3-3) with respect to m leads directly to an expression for the true LF:

$$\phi(m_t) = \frac{\int_{-\infty}^{+\infty} \eta(m)Q\{m_t|m\} dm}{\int_{-\infty}^{+\infty} P\{m|m_t\} dm}, \quad (3-4)$$

which is the same as Lucy's equation 11, except that the normalization by $P\{m|m_t\}$ has been written explicitly. Equations (3-2), through (3-4) form the basis for Lucy's iterative scheme, which in this notation is expressed as

$$\phi^{r+1}(m_t) = \frac{\int_{-\infty}^{+\infty} \frac{\tilde{\eta}(m)}{\eta^r(m)} \phi^r(m_t) P\{m|m_t\} dm}{\int_{-\infty}^{+\infty} P\{m|m_t\} dm}, \quad (3-5)$$

where $\tilde{\eta}(m)$ is the *observed* LF (a fixed quantity), $\eta^r(m)$ is the LF *predicted* from equation (3-2), and $\phi^r(m_t)$ is the current estimate of the true parent LF.

In practice, the observed LF is partitioned into bins, so that the comparisons are actually made between the observed number of stars in the i^{th} bin, $\tilde{N}_i$, and the predicted number, N_i^r , computed by

$$N_i^r = \int_{a_i}^{b_i} \eta^r(m) dm, \quad (3-6)$$

where a_i and b_i are the magnitude limites of the bin. Similarly, the model LFs are binned, so instead of the continuous function $\phi^r(m_i)$, the quantity

$$\mathcal{N}_j^{r+1} = \int_{p_j}^{q_j} \phi^{r+1}(m_i) dm_i \quad (3-7)$$

is used, where $\mathcal{N}_j^{r+1}$ is the number of stars in the j^{th} bin of the model LF.

The iterative process is initiated by adopting a model LF for $\mathcal{N}_j^0(m_i)$, which is then used to compute $N_i^0(m)$ via equation (3-6). Then, equation (3-7) is used to calculate the improved estimate, $\mathcal{N}_j^1$, and the iterations are repeated until the correction factor for each bin, $\tilde{N}_i/N_i^r$ (assumed to be constant over the bin width) converges to unity.

The form adopted for $P\{m|m_i\}$, is the Gaussian error distribution

$$P\{m|m_i\} = \frac{F\{m_i\}}{\sqrt{2\pi}\sigma(m_i)} \exp\left(\frac{-[m - m_i - \delta(m_i)]^2}{2\sigma^2(m_i)}\right), \quad (3-8)$$

where $F\{m_i\}$ is the probability that a star of true input magnitude m_i will be recovered *at all*, $\delta(m_i)$ is the forward scattering bias, and $\sigma(m_i)$ is the standard deviation of the measuring errors. These parameters can be estimated from the analysis of the output from the artificial star reductions. Because of the factor $F\{m_i\}$, this distribution does not normalize to unity, which is why the normalization was explicitly written into equation (3-4).

Stetson & Harris (1988) adopted a polynomial form for $\phi(m_i)$, and used the method of least squares to adjust the parameters defining the polynomial until the observed starcounts were matched using equation (3-7). This approach was well suited to their analysis because they were concerned with the LF below the turnoff, in which case the power law adopted for the mass spectrum becomes significant. However, the

morphology of the LF through the turnoff region to the tip of the giant branch is not easily represented by a polynomial. Therefore, in the present work, a model LF with input parameters (age, helium content, metallicity) thought to closely match those of the cluster in question was adopted for the initial approximation, $\mathcal{N}_j^0(m_t)$. Experiments performed with a variety of model LFs (i.e., with different compositions, ages, and power law exponent, x) showed that this approach is relatively insensitive to the initial estimate, as long as a reasonable model is chosen.

The result of these calculations is an estimate of the true parent LF from which the observed LF has been extracted. The computation of the completeness fraction for each bin, f_i , is, therefore, quite straightforward:

$$f_i = \frac{N_i^p}{\mathcal{N}_i^p} = \frac{\int_{a_i}^{b_i} \int_{-\infty}^{+\infty} P\{m|m_t\} \phi(m_t) dm_t dm}{\int_{a_i}^{b_i} \phi(m_t) dm_t}, \quad (3-9)$$

where N_i^p and $\mathcal{N}_i^p$ are the predicted and true numbers of stars in the i^{th} bin after the p^{th} iteration, respectively.⁴

⁴ One might be tempted to substitute $\tilde{N}_i$ for N_i^p in equation (3-9) — with some justification — however, the observed star counts do not contain fractional stars, so (3-9) produces a smoother variation of f_i with magnitude.

Chapter 4

The Old Open Cluster NGC 2243

4.1 Introduction

With ages in the range $\approx 3\text{--}8$ Gyr, and metallicities that bridge the gap between the metal-rich end of the globular cluster distribution and the solar abundance, the old open clusters (like NGC 2243) provide valuable constraints on our understanding of the structure and evolution of the Galaxy. Although they are relatively few in number, presumably because low-mass clusters of this age have evaporated or have been disrupted by interactions with the Galactic disk, their ages can be derived from stellar evolutionary theory in ways that are entirely consistent with those used to date globular clusters. In particular, because these systems contain sufficient evolved stars to define the location of the horizontal branch, the magnitude difference between this feature and the turnoff, ΔV_{TO}^{HB} , provides an important consistency check of the inferred turnoff age. Moreover, from the perspective of stellar astrophysics, such clusters allow useful tests of evolutionary calculations since they can be used to trace the development of the convective hook-back feature. This signals the rapid contraction phase accompanying the exhaustion of hydrogen in those stars that possess a convective core throughout their main-sequence lifetimes, and manifests itself as a gap in the stellar distribution near the turnoff.

NGC 2243 ($\alpha_{1950} = 06^{\text{h}}27^{\text{m}}54^{\text{s}}$, $\delta_{1950} = -31^{\circ}15'$) is located in the direction of the Galactic anticenter ($l = 239^{\circ}5$, $b = -18^{\circ}0$), which the reddening maps of Burstein and Heiles (1982) show to be a region of low reddening, $0.03 \leq E(B - V) \leq 0.06$. At a

heliocentric distance of ≈ 4 kpc, it lies more than 1 kpc below the galactic plane. For the record, van den Bergh (1958) was the first to suggest, from an analysis of the fifth brightest stars in selected open clusters, that NGC 2243 was both distant and old. This suggestion was confirmed by Hawarden (1975), who reported the first extensive photographic photometry for this object. He derived $E(B - V) = 0.06$ for the cluster reddening, and an ultra-violet excess amounting to $\delta(U - B)_{0.6} = 0.15$. This *uv* excess, together with Carney's (1979) calibration, implies $[\text{Fe}/\text{H}] = -0.75$, indicating that NGC 2243 is one of the most metal-poor open clusters known. Hawarden also deduced an age of ≈ 5 Gyr — from the color of the turnoff — and pointed out the existence of an apparent gap near $V = 16.1$.

A second photometric study, by van den Bergh (1977), reached ≈ 2 mag below the turnoff and showed the main sequence to be quite wide — possibly indicative of a binary sequence. But, in conflict with the results of the previous study, this investigation yielded $E(B - V) = 0.01$ and $\delta(U - B)_{0.6} = 0.06$, which argued for a considerably higher metallicity. However, more recent estimates of the cluster's metal abundance from a variety of techniques [*i.e.* Washington photometry, Geisler (1987) and Hardy (1981); DDO photometry, Norris & Hawarden (1978); and high-dispersion spectroscopy, Gratton (1982)], have established that the cluster is indeed a metal-poor system, with a metal content close to that of the globular cluster 47 Tucanae.¹ Worthy of note, finally, is Janes' (1979) independent estimate of $E(B - V) = 0.05$

¹ Although $[\text{Fe}/\text{H}] \approx -1.2$ was believed to be appropriate for both clusters in the late 1970's and early 1980's, a value near -0.7 has been generally accepted since the time of Cohen's (1983) paper.

mag for NGC 2243, based on the DDO photometry of Norris and Hawarden.

A recent CCD study of NGC 2243 (Bonifazi *et al.* 1990) presents a well-defined CMD that clearly separates out the single stars from the nearly equal-mass binary components: there are two distinct stellar sequences separated, at a given color, by ≈ 0.75 mag. Bonifazi *et al.* suggest that the binaries contribute up to 30 per cent of the total stellar population and argue that the gap evident at the top of the main sequence is significant at the 3σ level. Through comparisons with synthetic CMDs, they conclude that the cluster metallicity is $Z = 0.003 - 0.006$, the age is in the range 3–5 Gyr, and the reddening is $E(B - V) = 0.06 - 0.08$.

In what follows, a new CMD and the first LF for NGC 2243, based on CCD observations, are presented and discussed. However, unlike the Bonifazi *et al.* (1990) study, whose data were calibrated using van den Bergh's (1977) photoelectric photometry, the new photometry is independently calibrated using the Landolt (1983) and Graham (1982) standards, as described in Chapter 3. Furthermore, the latest oxygen-enhanced isochrones (Bergbusch & Vandenberg 1992) are used to determine the cluster's age.

4.2 Cluster and Background Fields

The observations of NGC 2243 were made on the night 22/23 January 1987 with the 0.9 m telescope at CTIO. Two overlapping cluster fields were observed, as well as a background star field (field 3) $\approx 15'$ north of the cluster, for which only long exposures were made. The journal of the observations is given in Table 4-1.

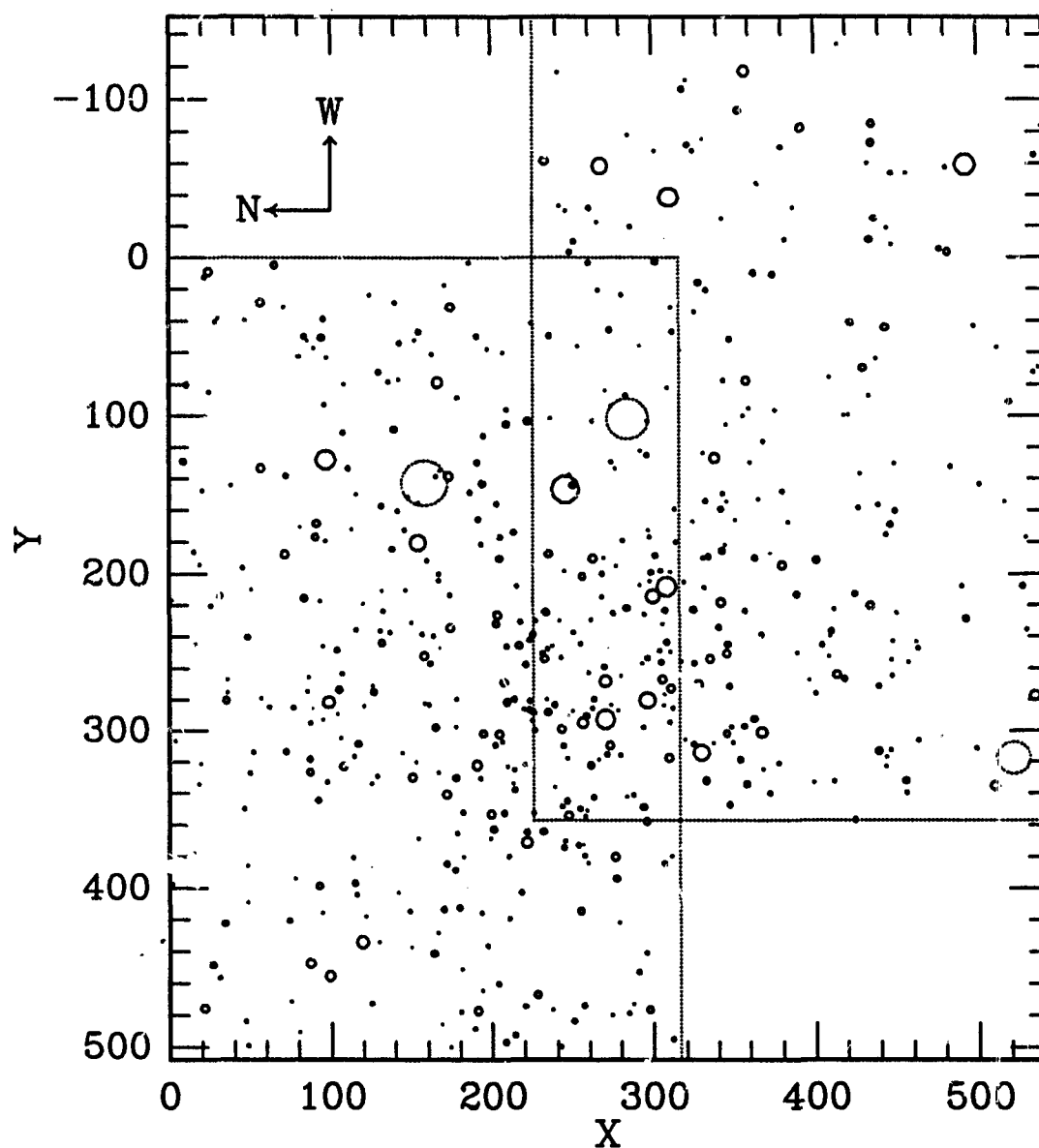


FIGURE 4-1 A finder chart for the two NGC 2243 fields, showing the positions and magnitudes of all of the objects that survived the detection/reduction process as calculated by ALLSTAR. The three stars indicated by dotted circles were saturated on all the frames, so their positions have been estimated, and their magnitudes taken from Hawarden's paper.

Table 4-1. Observing Log

Field	Filter	Exp. Time (seconds)	Airmass	FWHM (arcsec)	UT of observation 1987 January 23
field 1	B	200	1.06	1.8	1:34:15
field 1	B	1500	1.05	1.9	1:39:44
field 1	V	150	1.02	1.8	2:06:02
field 1	V	900	1.02	1.7	2:09:45
field 2	B	200	1.00	1.8	2:29:44
field 2	B	1500	1.00	1.8	2:34:50
field 2	V	150	1.00	1.9	3:00:59
field 2	V	900	1.00	1.7	3:04:41
field 3	B	1500	1.00	2.0	3:27:01
field 3	V	900	1.01	1.8	3:54:02

Figure 4-1 shows the two cluster fields with all of the objects that survived the final pass through ALLSTAR, following the detection/reduction procedures outlined in Chapter 3. The large dotted circles indicate the locations and the approximate magnitudes of the three brightest objects, which were saturated on all the frames on which they appeared.

The CMD for the complete list of objects that survived the detection/reduction procedure is shown in Figure 4-2, and the photometry is listed in Appendix A. The most striking feature of the CMD is the well-defined and populous binary star sequence (*cf.* Bonifazi *et al.* 1990), but the red edge of the lower giant branch and the presence of a small HB clump at $V \approx 13.7$ are also easy to detect. Visually, this CMD is nearly identical with that presented by Bonifazi *et al.*, even to the extent of illustrating the same 6 blue straggler candidates. However, although the turnoff colors agree to within ≈ 0.01 – 0.02 mag, the main-sequence and giant branch loci tend to be systematically redder at progressively fainter and brighter magnitudes respectively, than the Bonifazi *et al.* observations. Regarding these differences, Bonifazi

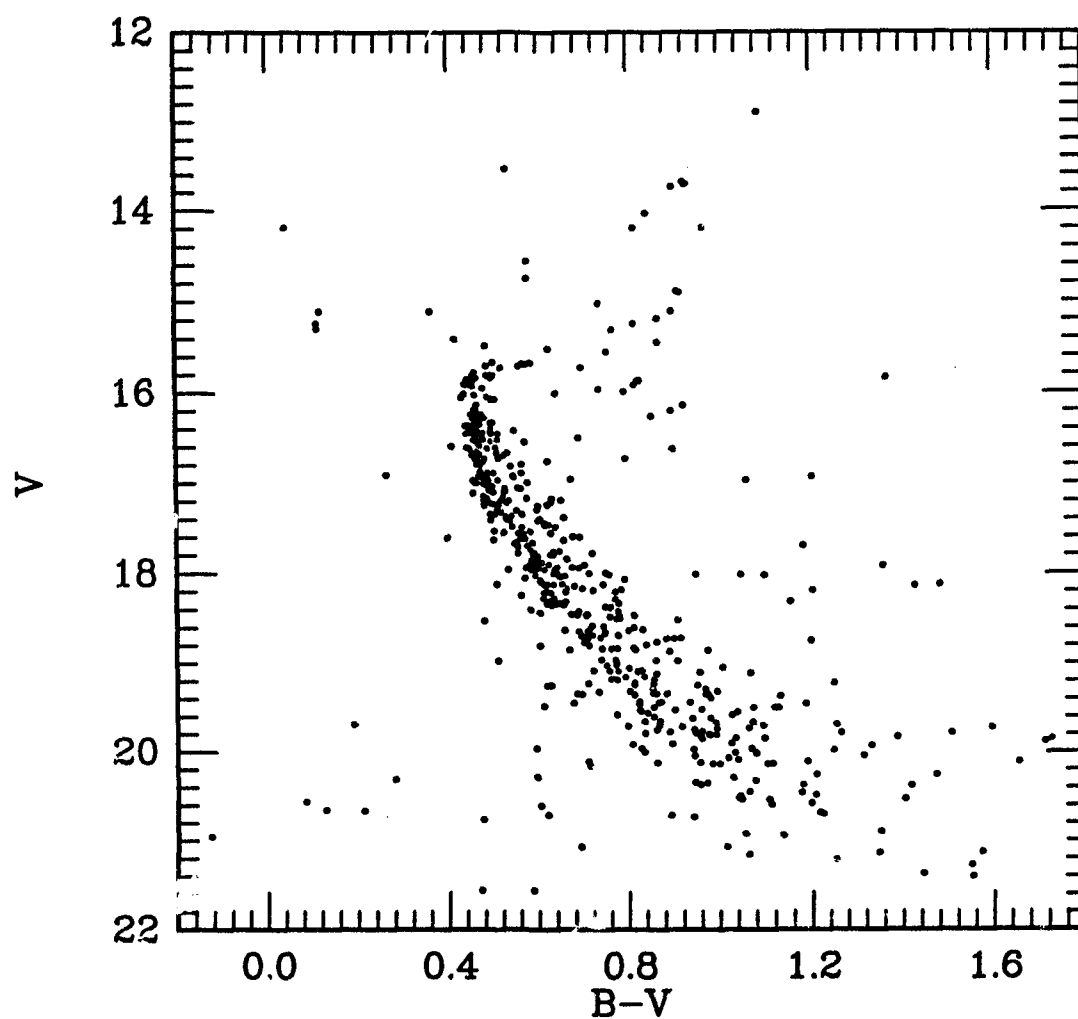


FIGURE 4-2 The CMD of NGC 2243 containing all of the objects that survived the detection/reduction process.

et al. found small trends in the B and V residuals as a function of $B - V$ for the standard stars used in their calibration, which led them to comment that systematic errors in their colors cannot be excluded.

The CMD for the background star field is shown in Figure 4-3. In this diagram, most of the field stars are fainter than $V = 18.0$, which is quite different from van den Bergh's (1977) field star CMD, in which the limiting magnitude is $V = 18.0$. The latter shows significantly more stars between $14 \leq V \leq 18$, which is somewhat disconcerting, because the area enclosed by the new background field is actually larger by a factor of ≈ 1.25 . However, the center of van den Bergh's field is only $5'$ northeast of the cluster and r contain outlying cluster members. Even in the new blank field, centered $15'$ north of the cluster, most of the stars appear to line up along the principal cluster sequence in the CMD.

4.3 Artificial Star Tests

To obtain estimates of the external errors in the photometry as well as of the completeness of the stellar sample, eight experiments, each with 60 artificial stars ($16.0 \leq V \leq 21.0$) distributed over the two cluster fields, were performed. Since it was obvious from visual inspection of the star-subtracted images, that all the bright stars had been detected, the experiments were performed only on the deep frames. However, it should be noted that these estimates provide *upper limits* for the photometric errors near the turn-off and in the region of the gap, because the magnitude ranges of the long and the short frames overlap between $15 \lesssim V \lesssim 19$ mag, and the magnitudes listed in Appendix A are the weighted mean magnitudes for each star.

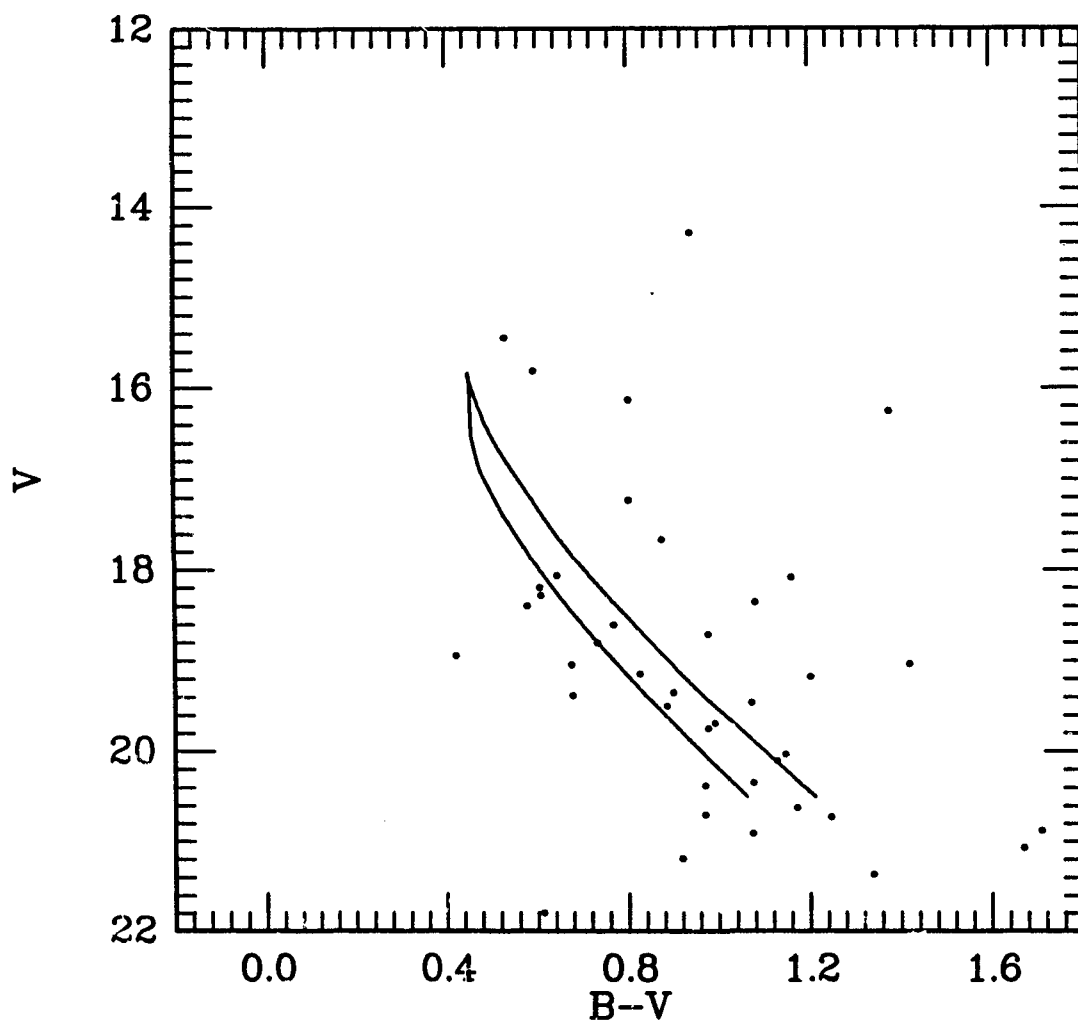


FIGURE 4-3 The CMD of the stars in a field approximately 15' north of the cluster. The single and binary star fiducial main sequences for NGC 2243 are superimposed.

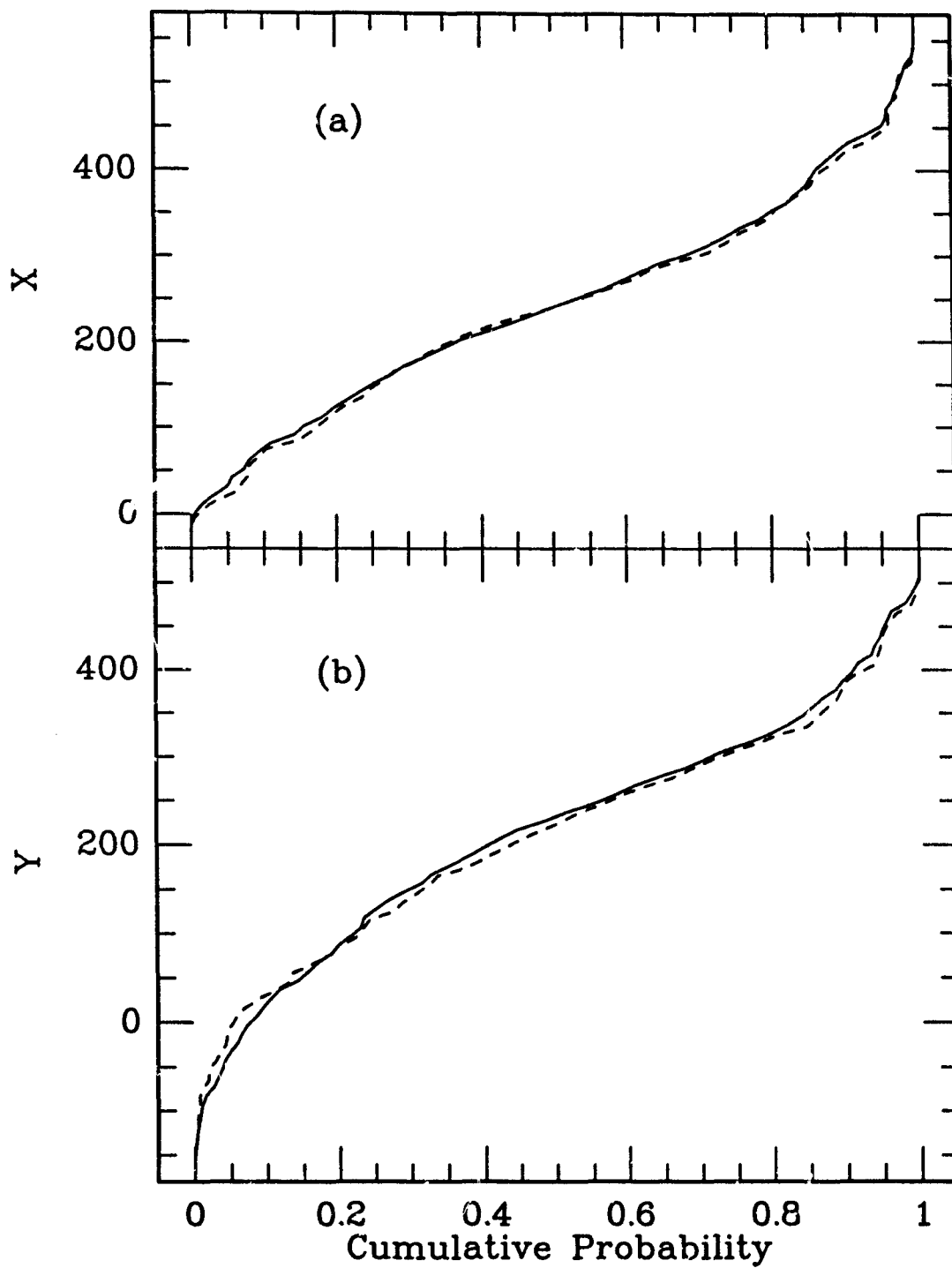


FIGURE 4-4(a) and (b) Cumulative coordinate distributions used to position the artificial stars on the frames. The solid curves give the observed distributions, while the dashed curves are for the estimated true cumulative distribution used to derive (a) the x -coordinates and (b) the y -coordinates.

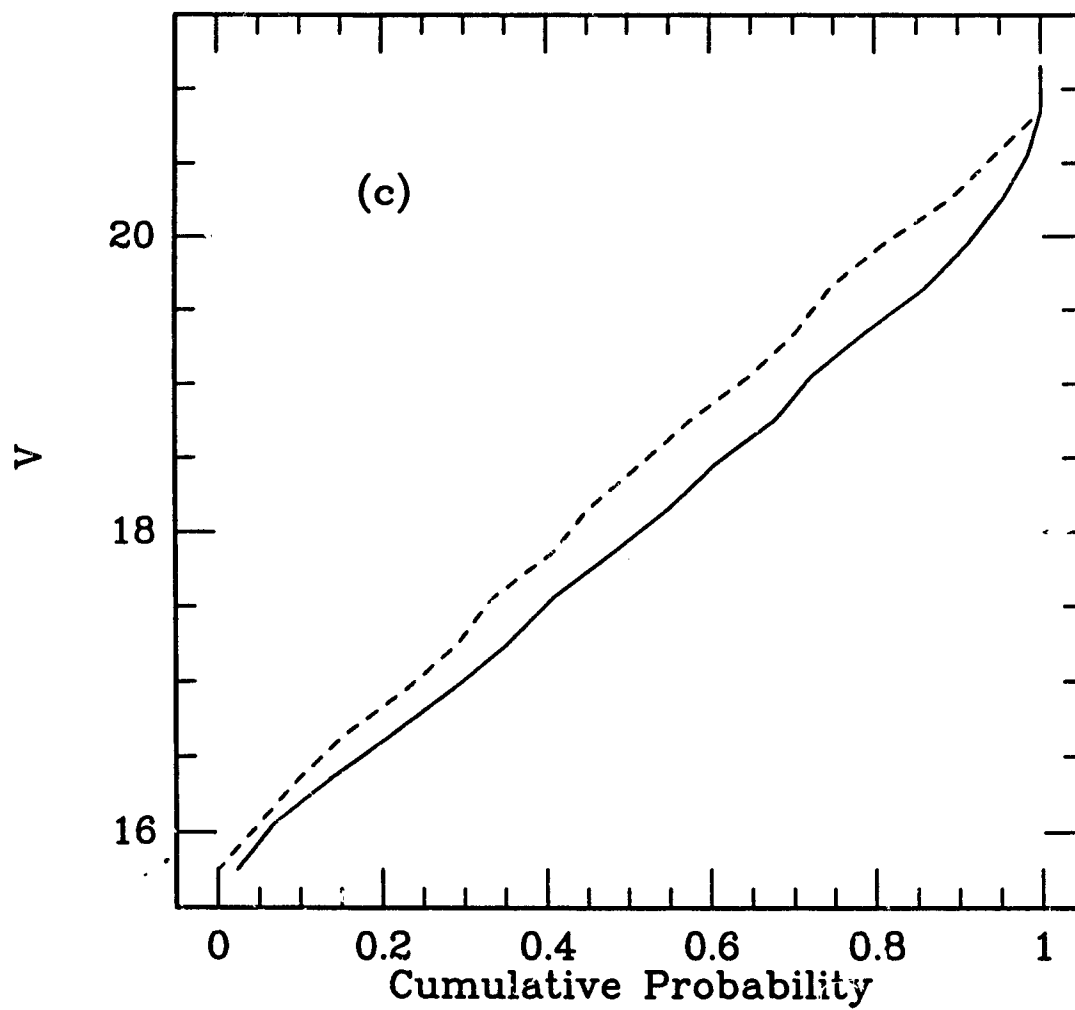


FIGURE 4-4(c) The cumulative V -magnitude distribution used to derive the magnitudes for the artificial stars. The observed distribution is given by the solid curve; the estimated true distribution is given by the dashed curve.

The spatial and the brightness distributions of stars in the cluster were modelled following the methods outlined in Chapter 3, subject to the following caveats. First, since the cluster fields are rather sparse and because of the way the observed fields overlap, there is no strong variation in the y -coordinate cumulative distribution as a function of the x -coordinate. Consequently, both the global x -coordinate and y -coordinate cumulative distributions (shown in Figure 4-4(a) and 4-4(b), respectively) were used to position the artificial stars on the frames. Second, the estimate of the brightness distribution was derived from the cumulative luminosity function (CLF) for stars with $15 \leq V \leq 19$. In model CLFs, with power law mass functions of the form $\phi(\mathcal{M}) d\mathcal{M} \propto \mathcal{M}^{-(1+x)} d\mathcal{M}$ and with typical values of x (e.g., $-1, 0, 1$), the slope of the distribution *increases* with increasing magnitude for $V \geq 18$, the apparent magnitude of the unevolved main sequence. The observed cumulative LF shows just the opposite behaviour, implying either that the level of completeness of the stellar sample rapidly decreases with increasing magnitude, or that at fainter magnitudes, the cluster is running out of stars. As a compromise between these two alternatives, a cumulative LF with a slope slightly lower than that observed was used, and this produced a small excess of artificial stars at fainter magnitudes. Third, to mimic the color distribution, two fiducial loci were drawn by eye along the single and binary star sequences (Figure 4-5). They were then used to calculate the B-magnitudes for the artificial frames, given the V -magnitudes derived from the model V -magnitude cumulative distribution, shown in Figure 4-4(c). For each experiment, one third of the input artificial stars were assumed to come from the binary sequence.

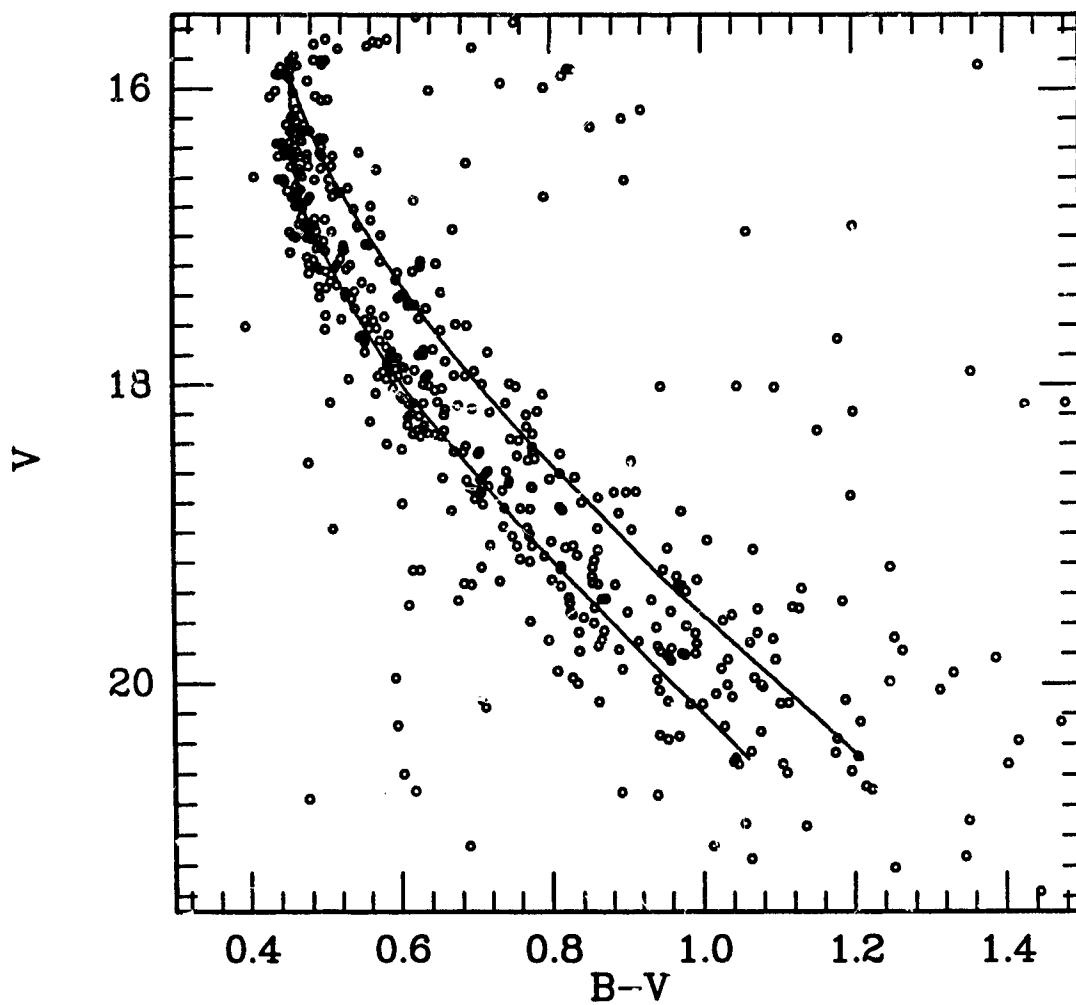


FIGURE 4-5 Fiducial sequences of NGC 2243 estimated by eye, superimposed on the main sequence portion of the CMD). These fiducials were used to construct the relations between B and V magnitudes for the artificial star tests.

Table 4-2. Artificial star photometric accuracy

$\bar{V}$	$\bar{\sigma}_V$	$\bar{\delta}_V$	$\hat{\sigma}_{ext}$	$\bar{B} - \bar{V}$	$\bar{\sigma}_{B-V}$	$\bar{\delta}_{B-V}$	$\hat{\sigma}_{ext}$	n
16.234	0.006	-0.007	0.010	0.467	0.016	0.005	0.008	52
16.839	0.006	-0.010	0.013	0.490	0.017	0.008	0.012	52
17.352	0.008	-0.010	0.013	0.539	0.018	0.007	0.011	52
17.924	0.009	-0.012	0.016	0.637	0.020	0.007	0.014	52
18.532	0.014	-0.010	0.031	0.732	0.027	0.002	0.027	52
19.077	0.020	-0.025	0.039	0.814	0.041	0.009	0.051	52
19.757	0.035	-0.021	0.070	0.963	0.073	0.019	0.100	52
20.322	0.056	-0.006	0.106	1.085	0.127	0.012	0.168	56

The frames containing the artificial stars were reduced in exactly the same manner as the original frames, and then the final list of detected objects was compared with the input list of artificial stars. Again, objects that could be matched at the 1 pixel level were considered to be the same. The differences between the input and output magnitudes and colors, as a function of the output magnitude, are shown in Figure 4-6. Of the 480 artificial stars added, 420 (87.5%) were recovered. These were sorted by the observed magnitude, and divided into 7 groups of 52 and one of 56. For each group, the median observed magnitude and color, $\bar{V}$ and $\bar{B} - \bar{V}$, the median of the internal error estimates, $\bar{\sigma}_V$ and $\bar{\sigma}_{B-V}$, the median of the magnitude and color differences, $\bar{\delta}_V$ and $\bar{\delta}_{B-V}$ (calculated in the sense $\bar{\delta} = \text{median}[\text{output} - \text{input}]$), and the external error estimates, $\hat{\sigma}_{ext} = \text{median}[|\delta_i - \bar{\delta}_i|]/0.6745$, were calculated following the methods given by Stetson & Harris (1988). The results are listed in Table 4-2, and together with Figure 4-6, they show some interesting similarities to the Stetson & Harris analysis, as well as the following two differences.

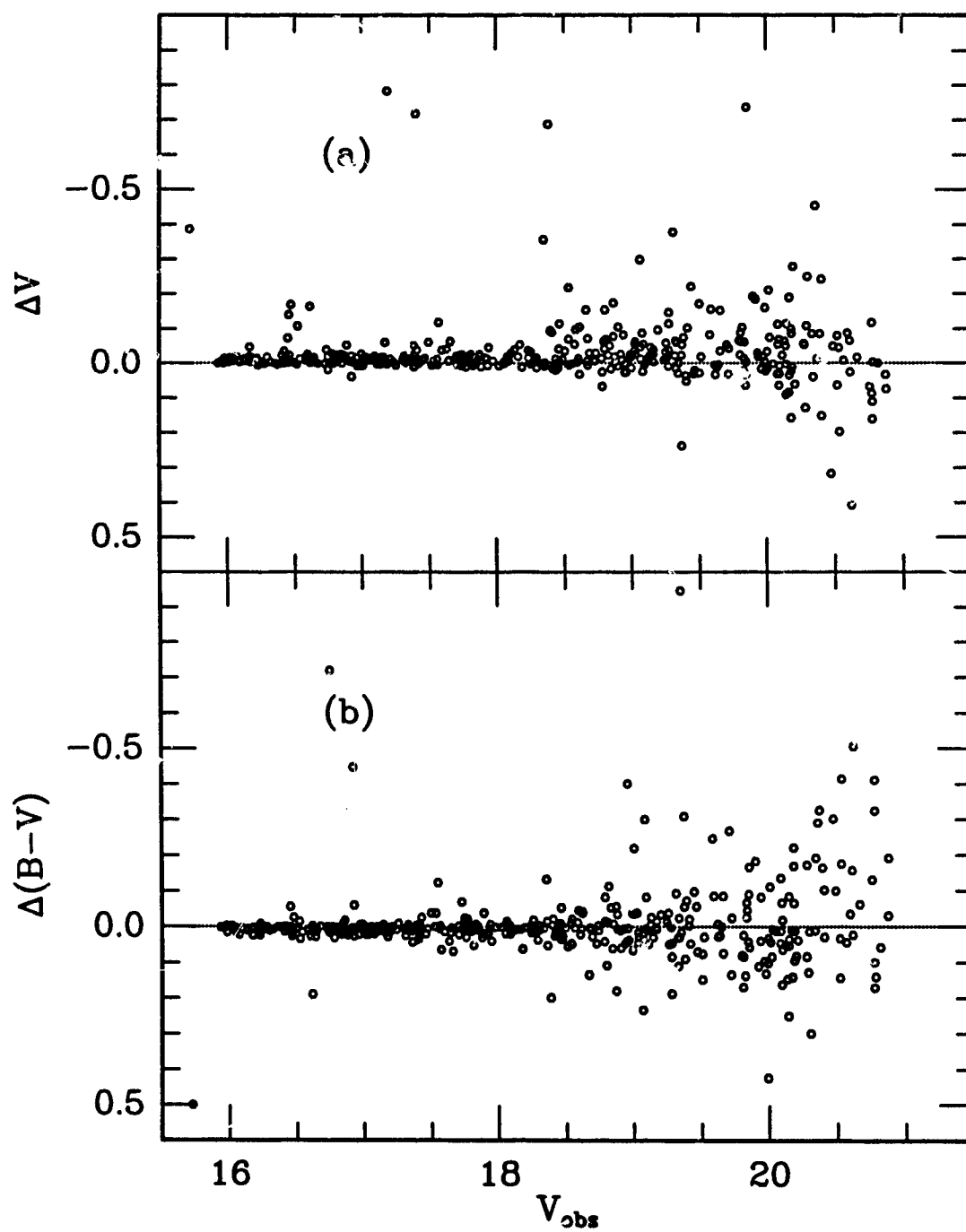


FIGURE 4-6 Residuals in (a) magnitude and (b) color in the sense [output - input].

1. The tendency for the recovered stars to be slightly brighter on average than their input magnitudes is reproduced in these results, but even though the V frames reach slightly deeper than the B frames, the recovered colors tend to be slightly redder than the input colors. Qualitatively, the artificial star photometry at the faint end shows the same kind of scatter as seen in their Fig. 19.
2. Surprisingly, the external errors in $B - V$ tend to be smaller than the internal errors at the bright end. However, it should be noted that the internal error estimates include the effects of frame-to-frame scatter in the standard star reductions (due, in part, to fluctuations in transparency, changes in the quantum efficiency of the detector, etc.), but because each of the cluster frames has been shifted to the mean photometry, some of these effects have been removed. For the V -frames the additional observational scatter in the standard star reductions amounted to only 0.0048 mag, while for the B -frames it amounted to 0.0125 mag, and these were added in quadrature to the profile-fitting errors given by ALLSTAR. When this is taken into account, the external errors in $B - V$ at the bright end agree very well with the internal estimates.

The CMD with both the input artificial stars and the recovered artificial stars is shown in Figure 4-7). A potentially bothersome feature of this diagram is that some of the recovered stars occupy significantly different positions than their input counterparts. These deviations arise mainly because the positions of the input stars

occasionally very nearly coincide with those of recovered program stars², because of cosmic ray events, or because of “bad” pixels on the CCD. Because we have only single B and V deep frames for each field, with only a small region of overlap, it was not possible to perform median filtering of the images to reduce the image defects. In some instances, a faint artificial star was placed almost exactly on top of a significantly brighter program star, so that when the test frames were subjected to the detection/reduction algorithm, the object that matched the position of the input artificial star was really the sum of the two.

Comparison of Figs. 4-5 and 4-7 suggests that a significant fraction of the scatter is due to photometric errors, that both the single and binary star sequences are quite narrow, and that the binary star sequence consists almost entirely of nearly equal-mass binaries. (The photometry of the artificial stars may be expected to show slightly higher scatter than the photometry of the program stars down to $V \approx 19$ simply because that is the magnitude limit of the short frames.) That the output colors from the artificial star tests are slightly redder than the input colors seems to imply that the fiducial single star sequence was drawn slightly too far to the red.

² Some of this confusion would have been eliminated if the output from the artificial star tests had been compared to a master list comprised of all the objects that survived the detection/reduction algorithm on the original frames together with the list of input artificial stars. This improvement was implemented for the globular cluster artificial star tests, but for NGC 2243 only the input artificial star lists were compared to the output lists.

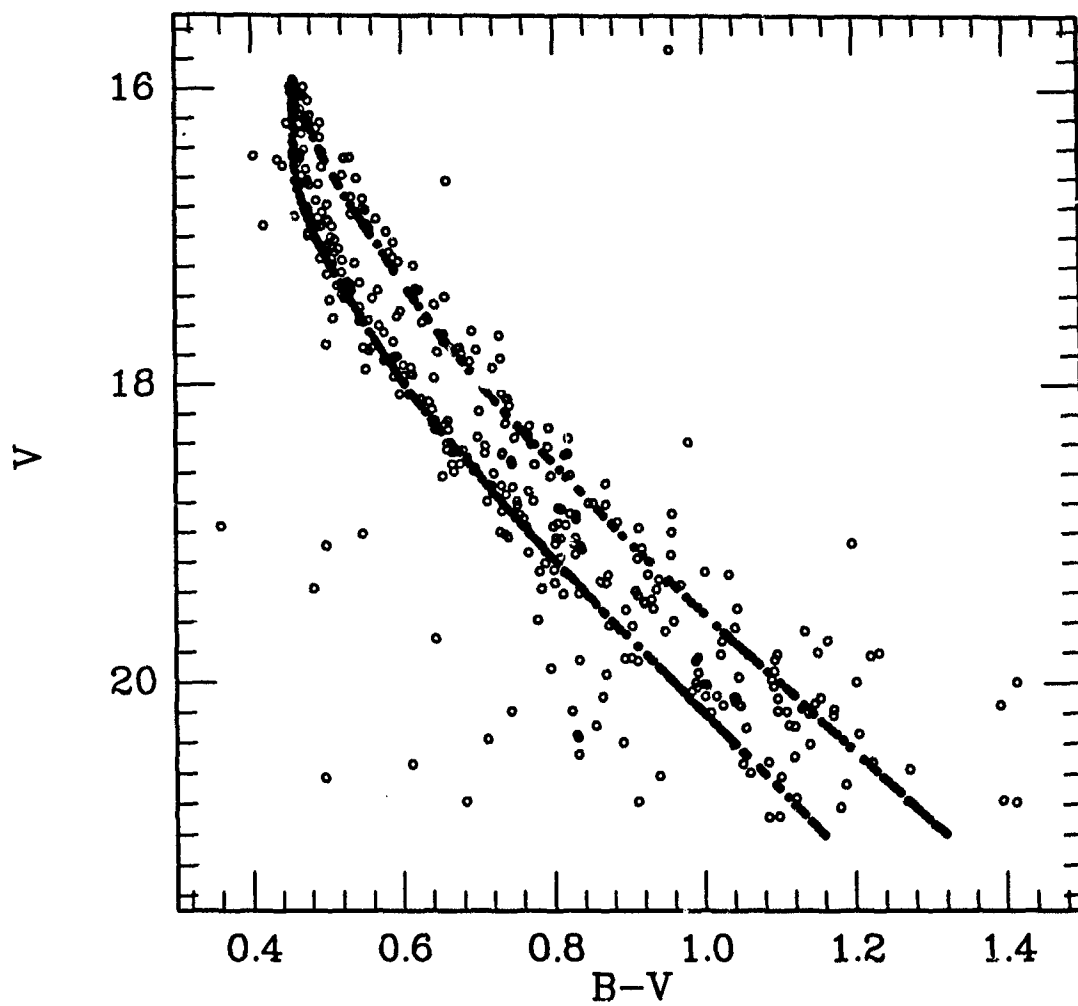


FIGURE 4-7 The input artificial stars are shown as solid circles in with the output of the tests shown as open circles. The output implies that a significant fraction of the scatter seen in the CMD of NGC 2243 is photometric.

While the fiducial line for the binary star sequence was drawn only 0.7 mag above the single-star sequence, the implied narrowness of both of these sequences, together with the qualitative similarity between the observed CMD and the artificial star CMD, indicates that the assumption of an equal-mass binary star sequence located 0.75 mag above the single star sequence is valid. In these respects, NGC 2243 is similar to NGC 2420 according to the recent study of that cluster by Anthony-Twarog *et al.* (1990).

4.4 Cluster Members: the Location of the Giant Branch

According to Collier Cameron & Reid (1987), the mean radial cluster velocity is $+69 \pm 10$ km/s. The new photometry includes 17 of the stars in their sample, most of them located in the sub-giant region of the CMD. Of these stars, 3 are considered not to be members based on their radial velocities. In addition, Gratton (1982) gives the radial velocity of one other cluster star included in the new photometry, as $+61$ km/s, which makes it a candidate for membership. A number of the cluster stars have been observed with UBV (Hawarden (1975) and van den Bergh (1977)), DDO (Norris & Hawarden (1978)), and Washington (Hardy (1981) and Geisler (1987)), photometry to make estimates of the cluster metallicity. One of the stars, (Hawarden's 4301) seems to have discordant photometric properties in all three photometric systems, and is likely not a cluster member. (According to Eileen Friel (personal communication), the spectrum of 4301 shows noticeably stronger metal lines than that of 4303.) A CMD showing the stars identified as cluster members (filled circles and triangles, and 6-point stars) as well as those rejected (crossed circles) is given in Fig. 4-8.

Superimposed on the CMD is an estimate by eye of the location of the cluster fiducial sequence through the sub-giant and giant-branch regions. For the stars fainter than $V = 14$, this is reasonably well defined, but the evolutionary status of the brightest star is uncertain — it could belong to the asymptotic giant branch.

For the “cleaned” version of the CMD, shown in Fig. 4-9, stars which are suspected non-members based on the discussion above have been removed, and, for the region below $V = 16.0$, only those stars for which the error estimate of the mean in both V and $B - V$ is within 0.1 mag have been retained. Stars located ≈ 0.2 mag to the red of the cluster sequences are most probably field stars, while the status of stars on the blue side is not clear. At least some of the stars on the blue side above the turn-off have been shown to be cluster members, and some of them may be binary systems. The blue outliers found below the turn-off cannot be cluster members unless their photometry is very poor, or they may be metal-poor field stars. In either case, they do not help to define the cluster sequences, and have been removed.

4.5 The Color-Magnitude Diagram

As reviewed in §4.1, previous work has shown that the metallicity of NGC 2243 is quite similar to that of 47 Tuc, for which the currently accepted value of $[m/H]$ is approximately -0.7 . In addition, the reddening to NGC 2243 is apparently near $E(B - V) = 0.06$ mag. The new data do not permit independent estimates of these two quantities so these values will be adopted as the presently preferred ones. D. Vandenberg, in Bergbusch *et al.* (1991), has provided a detailed review of the range of interpretations of the CMD that are consistent with typical uncertainties

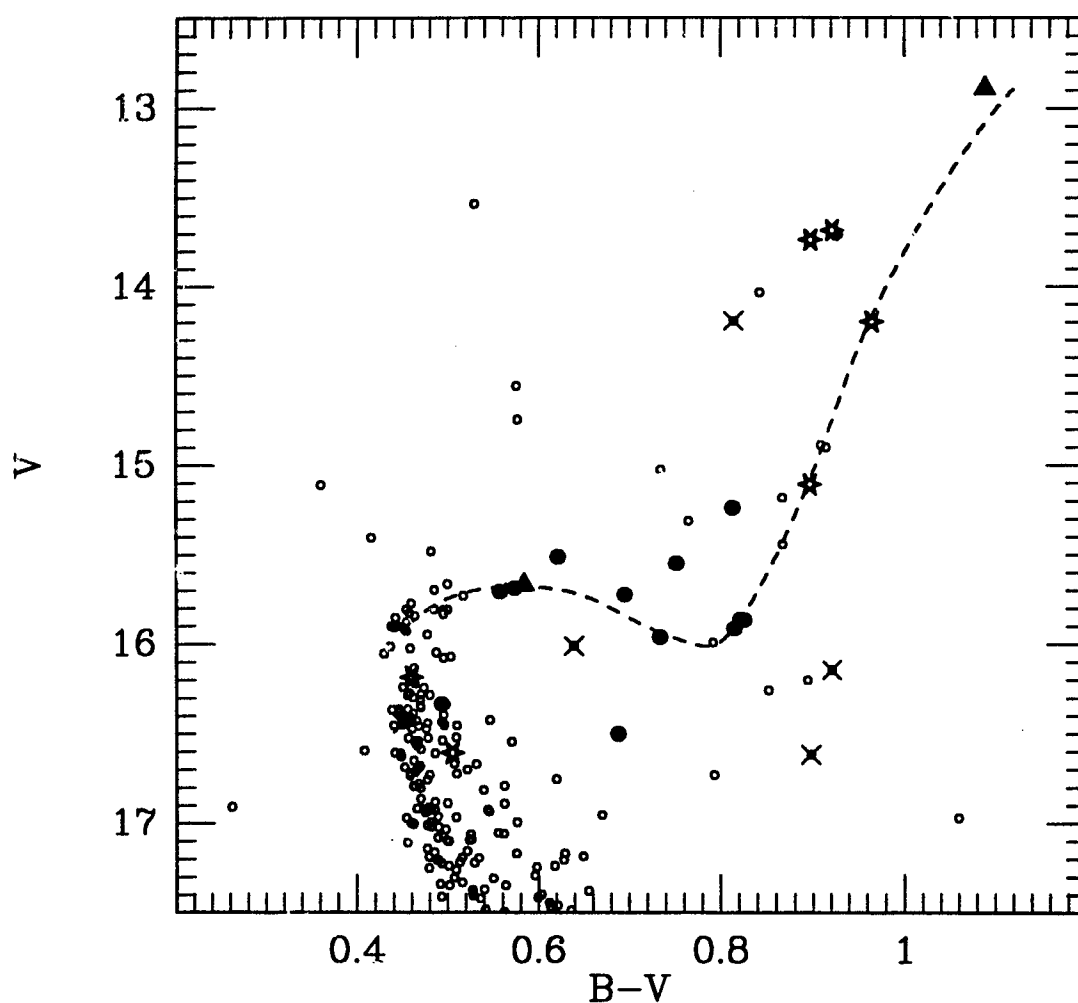


FIGURE 4-8 Suspected members and non-members of NGC 2243, and the estimated location of the giant branch. Membership based on the radial velocity is indicated by solid circles; membership based on photometry is indicated by 6-point stars; solid triangles indicate that both RV and photometric criteria have been met. Non-members are indicated by the large crosses. The brightest star may belong to the asymptotic giant branch. On the RGB, the unresolved binaries should appear brighter at a given colour, and hence lie to the blue of the single star locus. Thus, the red envelope represents the single star RGB.

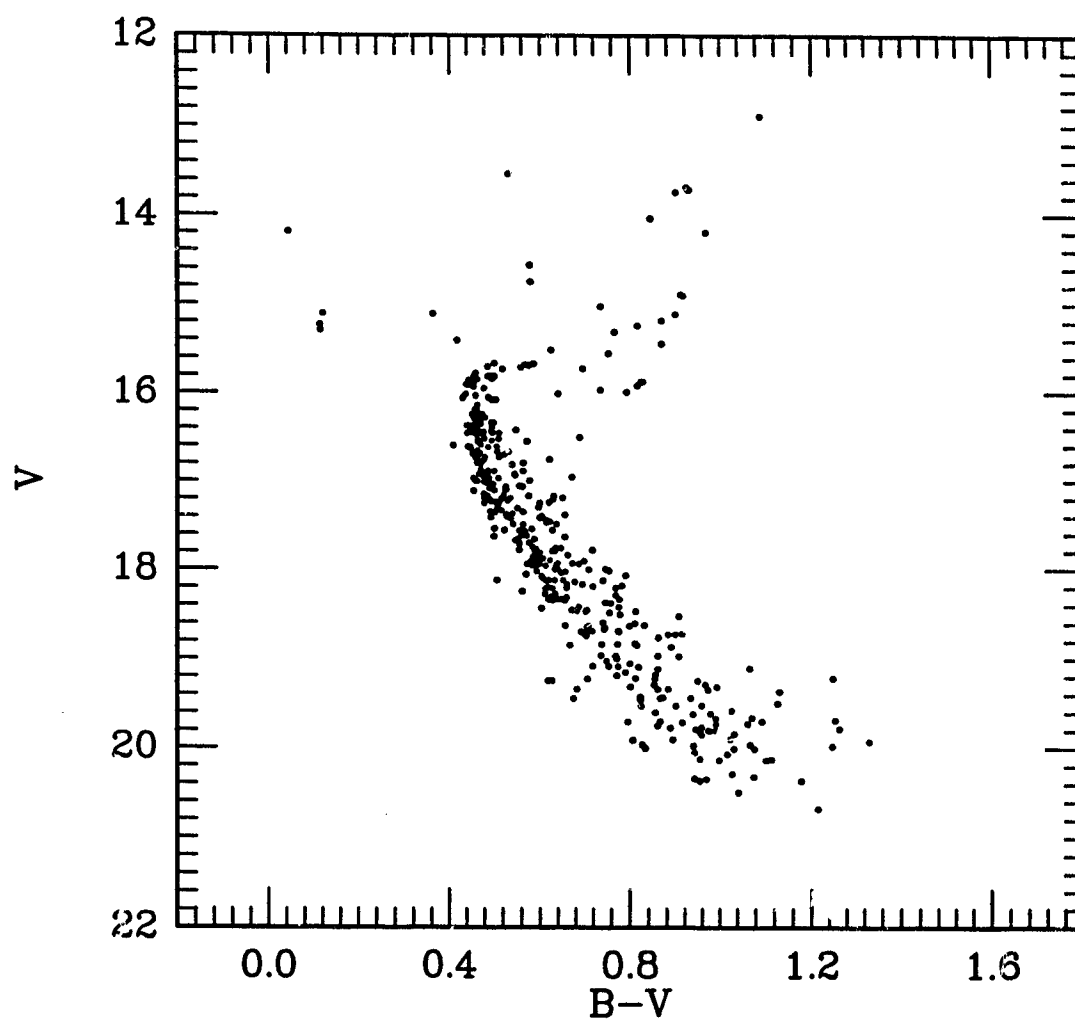


FIGURE 4-9 The cleaned CMD of NGC 2243. Objects appearing in this diagram have photometric errors in the mean $\sigma_V, \sigma_{B-V} < 0.1$ for $V \geq 16$, or are included on the basis of spectroscopic and photometric evidence.

in metal abundance determinations (i.e., ± 0.2 dex) and in reddening estimates (i.e., ± 0.02 mag., at best); the discussion presented there will provide the basis for the interpretation of the luminosity function. However, for completeness, the comparison between NGC 2243 and 47 Tuc, and to the isochrones of Bergbusch & Vandenberg (1992) will be briefly illustrated.

4.5.1 Comparison with 47 Tuc

In Figure 4-10, the fiducial sequences given by Hesser *et al.* (1987) for the well-observed globular cluster, 47 Tuc, are superimposed on the CMD of NGC 2243. Given that 47 Tuc has a reddening of $E(B - V) = 0.04$ mag (e.g., see Hesser & Shawl 1985), its fiducial sequences are shifted redward by 0.02 mag in $B - V$ to account for the difference in reddening between the two clusters, and brighter by 0.25 mag in V to obtain a reasonable coincidence along the unevolved main sequence. What is particularly encouraging about the resulting match is the excellent agreement of both the luminosity and the color of the HB stars.³ This consistency provides quite a strong argument that these systems do indeed have similar chemical compositions, since it is well known from basic evolutionary theory that this feature depends only weakly on the turnoff mass (and hence age).

As alluded to in §1.2, Dorman *et al.* (1989) found $Y \approx 0.24$ for 47 Tuc, independent of the current uncertainty in $[\text{Fe}/\text{H}]$, in order to explain the horizontal branch. Furthermore, the distance implied by their theoretical HB models for $[\text{Fe}/\text{H}] = -0.65$ agrees extremely well with that derived using Vandenberg & Poll's

³ In open clusters, the core-helium burning stars are usually referred to as "clump stars", since they tend to be tightly clustered in a group adjacent to the RGB.

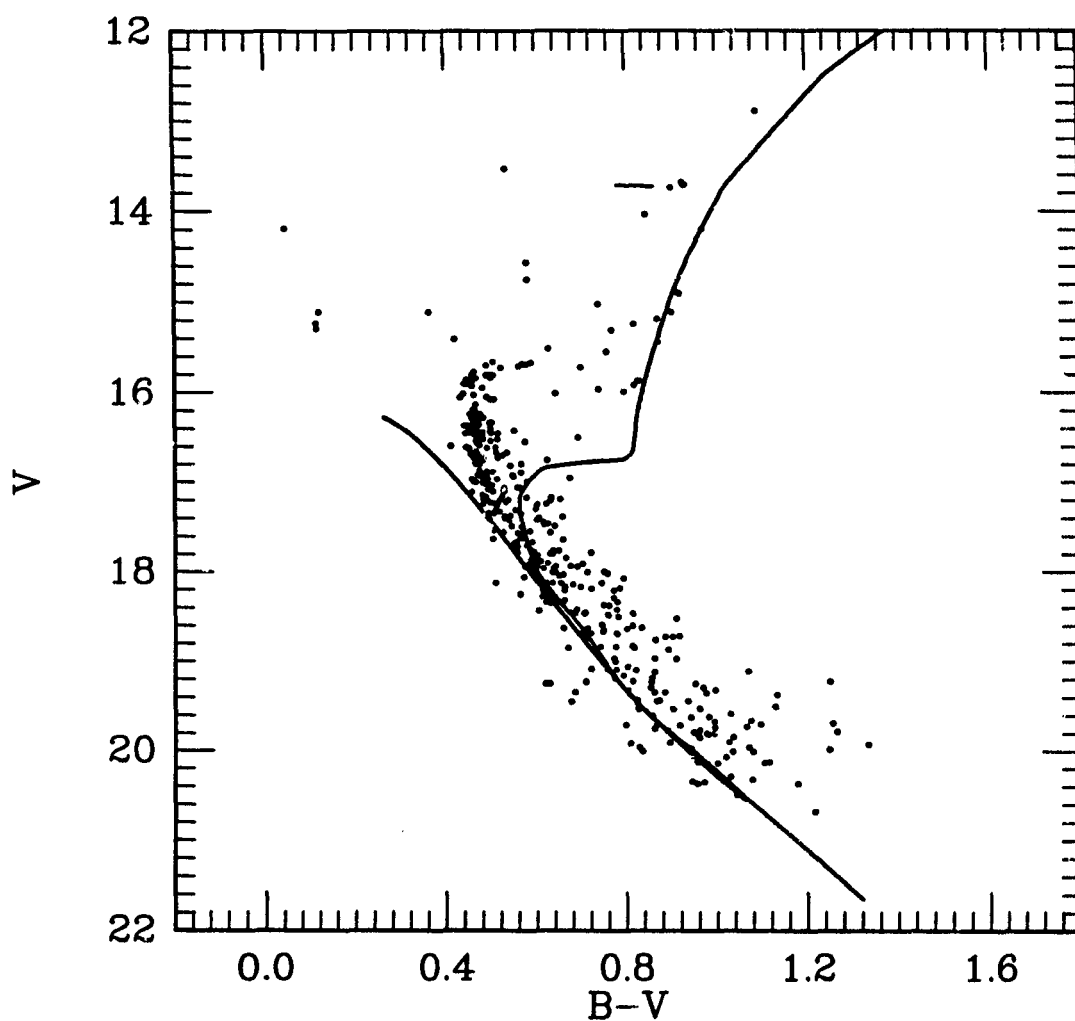


FIGURE 4-10 The fiducial sequences for 47 Tuc from Hesser *et al.* (1987), shifted 0.02 mag redward to account for the small difference in reddening, and 0.25 mag brighter to obtain a reasonable match to the unevolved portion of the NGC 2243 main sequence. Running from $B - V = 0.26$ to 1.06 is the semi-empirical ZAMS of Vandenberg and Poll (1989) for $Y = 0.24$, $[Fe/H] = -0.65$ and $(m - M)_V = 13.05$, after application of a redward adjustment of 0.06 mag to allow for the reddening of NGC 2243.

(1989) semi-empirical main-sequence fitting technique.

The thick solid curve in Figure 4-10, running from $B - V = 0.26$ to $B - V = 1.06$, gives the location of Vandenberg & Poll's (1989) ZAMS locus for $Y = 0.24$ and $[\text{Fe}/\text{H}] = -0.65$, on the assumptions that $(m - M)_V = 13.05$ mag (from the match of the horizontal branches), and $E(B - V) = 0.06$ mag (to take into account the reddening of NGC 2243). The *shape* of the blue edge of the data is very well matched, both by the ZAMS and by the 47 Tuc fiducial sequence, which reinforces the contention of §3.2.1, that the new photometry does not suffer from appreciable systematic errors.

However, there is one problem with the comparison shown in Fig. 4-10. If age is the main difference between NGC 2243 and 47 Tuc, then the giant branch of the former should be somewhat bluer than that of the latter. Model isochrones (*cf.* Bergbusch & Vandenberg 1992) show that, for a given set of abundances, the giant branch, at a given luminosity, shifts progressively to the red with increasing age. This trend has also been confirmed empirically: when the main sequences of the near solar abundance clusters M67 and NGC 188 are aligned, the giant branch of the younger cluster (M67) is considerably bluer than that of the older one (*cf.* Eggen & Sandage 1969). The implication is, then, that if the reddening difference between the two clusters has been correctly estimated, NGC 2243 must be somewhat metal rich compared to 47 Tuc.

4.5.2 Comparison with isochrones

An important advantage of having observed both a well-defined lower main sequence and a horizontal branch is that, together, they can provide a valuable constraint on the metallicity. According to canonical models, the HB gets brighter with lower $[\text{Fe}/\text{H}]$, while the main sequence locus gets fainter,⁴ so there is a unique value of $[\text{Fe}/\text{H}]$ (assuming the same Y) for which both features can be matched simultaneously.

In Figure 4-11, isochrones for 4–14 Gyr from Bergbusch & Vandenberg (1992) and Dorman's (1992) ZAHB locus with the abundances $[\text{Fe}/\text{H}] = -0.65$ and $[\text{O}/\text{Fe}] = +0.30$, together with the 47 Tuc fiducial sequences are superimposed on the cleaned version of the CMD. The match of the isochrones to 47 Tuc is quite good through the turnoff region, but if the location of the giant branch predicted by the models is correct, then the cluster must be more metal poor than assumed. A similar plot for 4–6 Gyr isochrones with $[\text{Fe}/\text{H}] = -0.47$, $[\text{O}/\text{Fe}] = +0.23$ is shown in Figure 4-12. The fit to NGC 2243 appears to be better in this case, as does the location of the ZAHB for both clusters, but there are still serious problems with the fit through the turnoff region. Bergbusch *et al.* (1991) concluded that it was not possible to produce better matches to the data with reasonable abundance parameters, ages, or reddening estimates than those illustrated here. However, they did suggest that convective core overshooting may provide the explanation for the discrepancies between the isochrones and NGC 2243's CMD through the turnoff region.

⁴ Actually, the main sequence stars of a given mass become brighter and bluer. Metal-rich stars, at a given $B - V$, are brighter than the metal-poor stars because they are more massive.

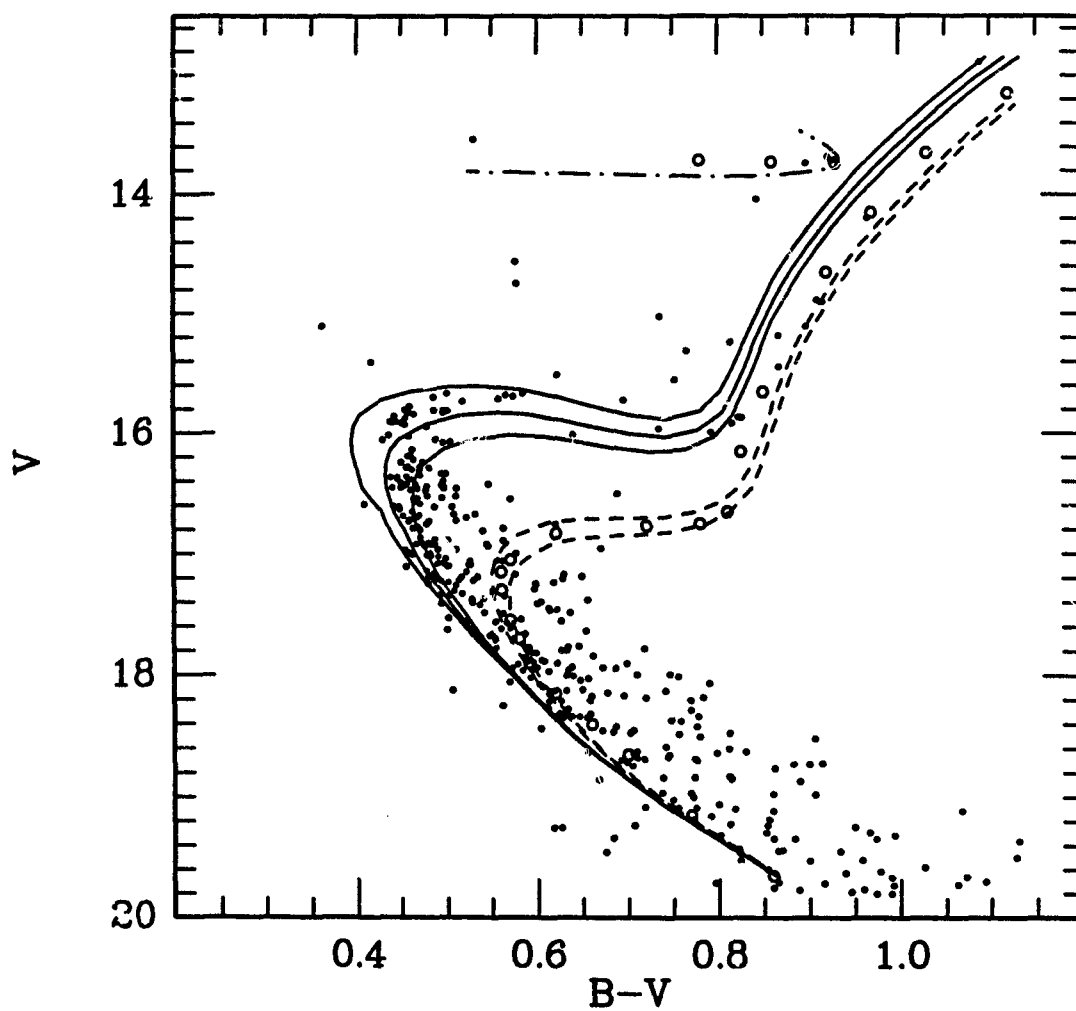


FIGURE 4-11 Superposition on the NGC 2243 CMD of isochrones for $[\text{Fe}/\text{H}] = -0.65$, $[\text{O}/\text{Fe}] = +0.30$, and ages 4, 5, 6 (solid curves), 12 and 14 (dashed curves) Gyr. The red end of Dorman's (1992) ZAHB for the same composition is shown as the dashed/dotted line; the open circles give the Hesser *et al.* (1987) fiducial points for 47 Tuc.

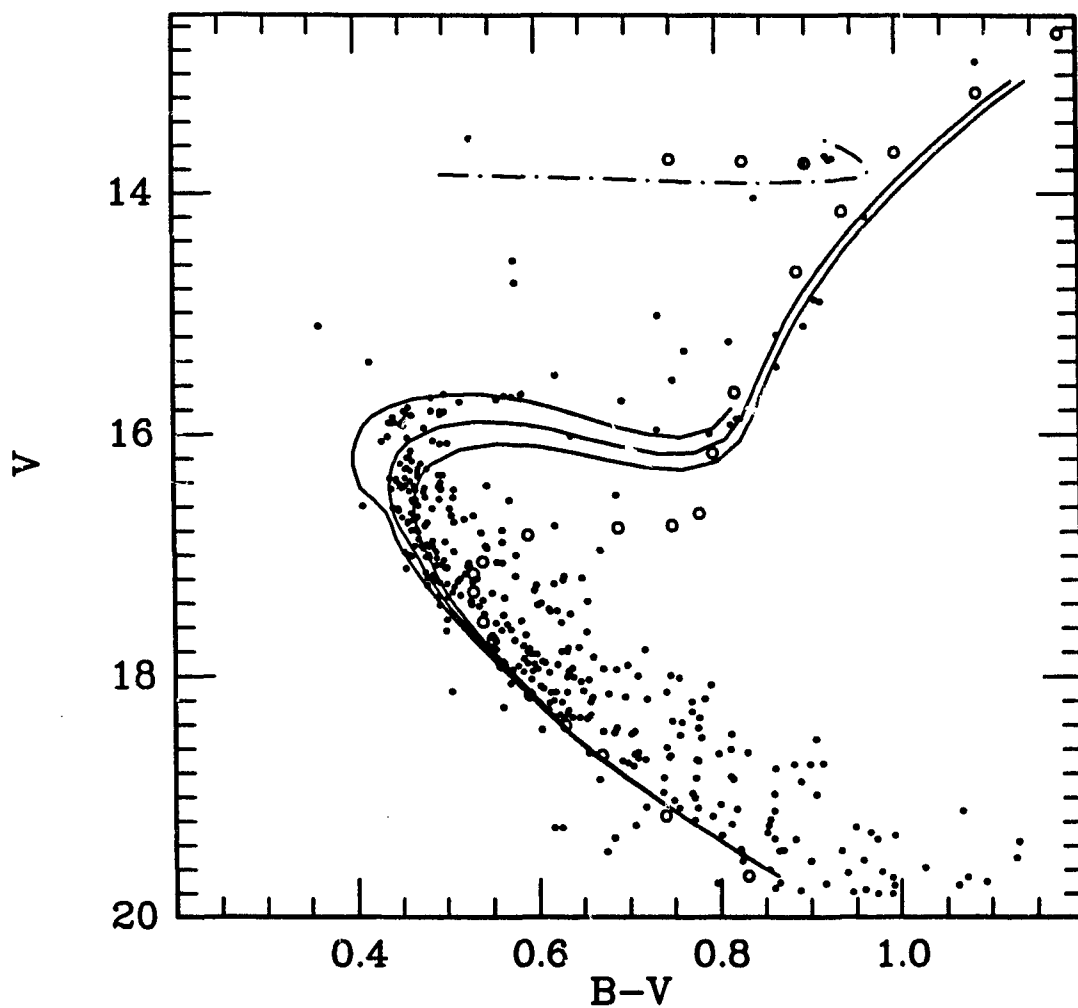


FIGURE 4-12 Similar to Fig. 4-11, except that the isochrones and the ZAHB are for $[\text{Fe}/\text{H}] = -0.47$, $[\text{O}/\text{Fe}] = +0.23$. To ensure consistency with the Vandenberg & Poll semiempirical main sequence fit shown in Fig. 4-10, $E(B - V) = 0.03$ mag (to enforce the match with 47 Tuc's HB) has been applied.

4.6 The Luminosity Function

For the analysis of the luminosity function, the subset of the data corresponding to the “cleaned” version of the CMD (Fig. 4-9) has been chosen, with the blue stragglers removed. A comparison with the field star CMD (Fig. 4-3) shows the advantage of using this subset of the data, because the cleaned version of the field star data retains only the stars which might be considered as outlying cluster members. As mentioned previously in §4.2, van den Bergh’s (1977) estimate of the field star component in the region of NGC 2243 is considerably different from the one shown in Fig. 4-3. Because of this uncertainty in the field star population, no field star corrections have been attempted.

Estimates of the completeness of the sample as a function of magnitude were derived from the probability distribution analysis described in Chapter 3, using the output from the artificial star tests, *subjected to the same selection criteria* as the cleaned CMD, to determine the distribution parameters plotted in Figure 4-13. A model LF with $[\text{Fe}/\text{H}] = -0.65$, $[\text{O}/\text{Fe}] = +0.30$, $x = -0.5$, and an age of 4.5 Gy was chosen for the initial approximation. The computation of the predicted star counts per bin was then performed via equation (3-6), and the ratio $\tilde{N}_i/N_i^r$ was used to adjust the model LF *bin by bin*, until the predicted counts in each bin were matched (to within 1%) by the observed counts. Figure 4-14(a) shows the observed LF together with the initial estimate of the true LF used in the analysis (solid line), as well as a model LF with $x = 2.0$ (dashed line). Figure 4-14(b) illustrates that the method is almost independent of the initial estimate of the true parent luminosity function, as the corrections ($\tilde{N}_i/N_i^r$) obtained after four iterations from the two initial estimates

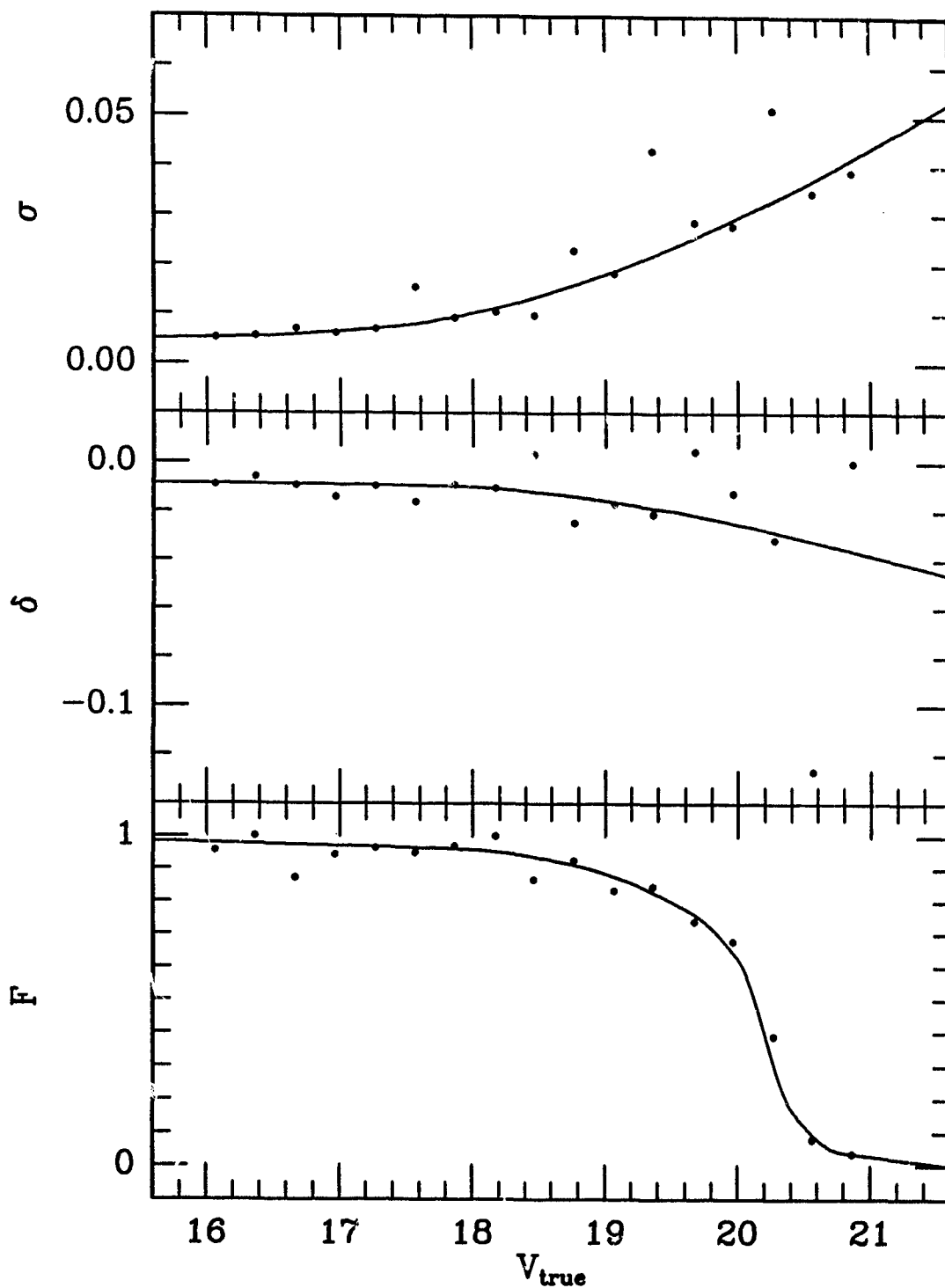


FIGURE 4-13 Probability distribution parameters, as a function of the true input magnitude. The data points represent the estimated mean values of the parameters in 0.3 mag wide bins. The smooth curves are hand-drawn estimates of the relations.

are almost identical. However, there is no observational information about the shape of the LF below the limit of detection, so the contribution to the last bin(s) by the forward scattering of fainter stars depends on the shape of the model LF — but as long as a reasonable model is used, this contribution is insignificant.

The completeness factors, computed via equation (3-9) and plotted in Figure 4-15, show that the observed LF is 90% complete at $V = 19$. The observed LF, the true parent LF, and the completeness factors computed according to equation (3-9) are given in Table 4-3.

The LF, rectified with the completeness factors interpolated from the smooth curve in Fig. 4-15, is listed in Table 4-4. Figure 4-16 is a plot of the rectified LF with three model curves corresponding to the mass exponents $x = -1.5, -0.5$, and $+0.5$ for the composition $[\text{Fe}/\text{H}] = -0.65, [\text{O}/\text{Fe}] = +0.30$, and an age of 4.5 Gyr superimposed. It is clear that the mass spectrum of the core region of the cluster is quite flat, but there is structure in the main sequence and turn-off portions of the LF which is not matched by the model curves. The trend of the data down to $V = 19.5$ suggests that $x = -0.5$ is the most appropriate value for the exponent in the mass spectrum, and it may be that the completeness of the sample has been slightly under-estimated for the fainter bins.

Because the mass spectrum is so flat, the apparent overabundance of stars near the turn-off point cannot be due to the merging of the binary star sequence with the single star sequence. This is illustrated in Figure 4-17, in which model LFs have been computed by assuming that the unresolved binary star LF has the same mass spectrum as the single star LF. The model LF adopted for the binary star sequence

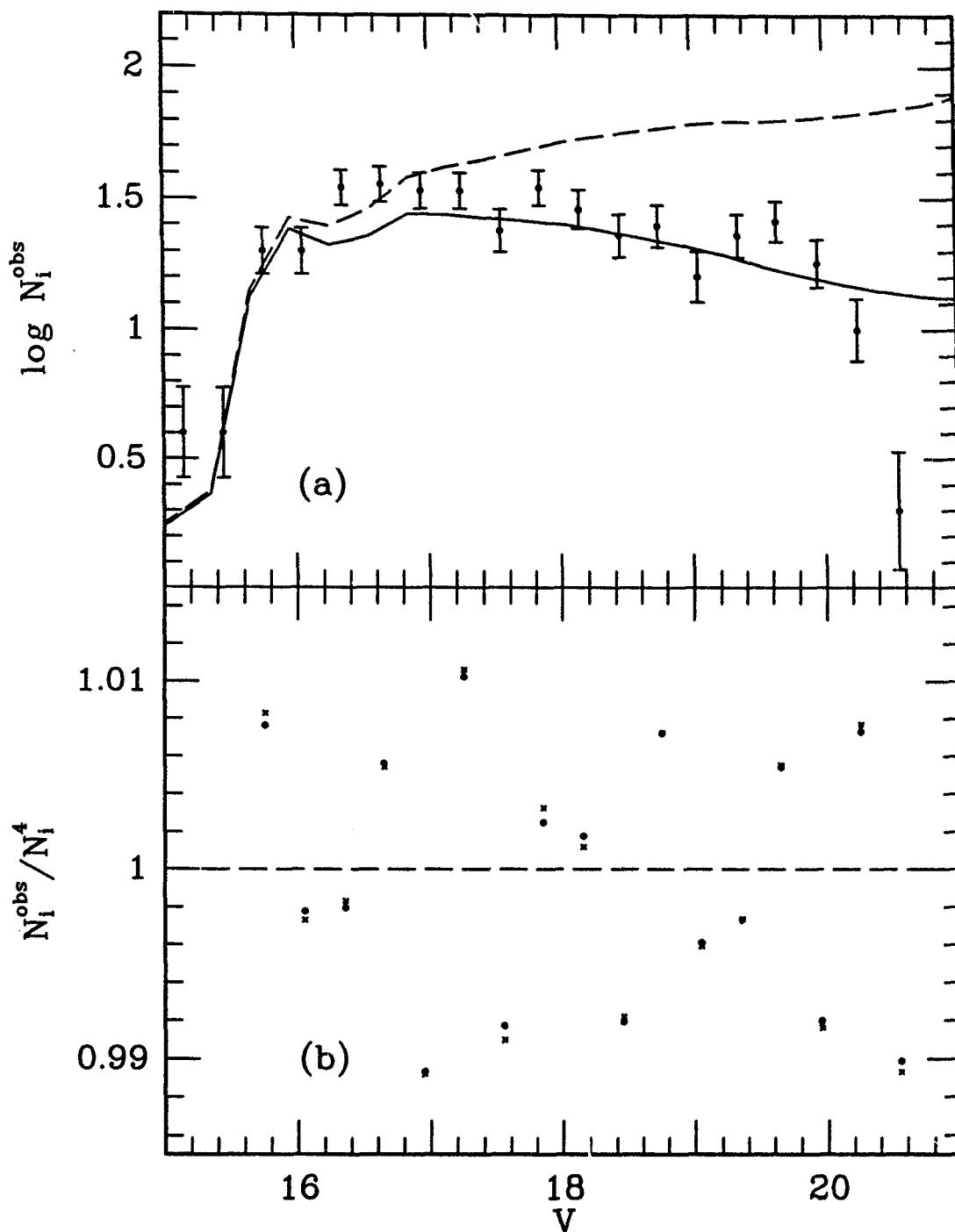


FIGURE 4-14 The observed LF of NGC 2243 together with two initial estimates of the true parent luminosity function of the cluster fields are shown in (a). Both model LFs have the abundances $[\text{Fe}/\text{H}] = -0.65$, $[\text{O}/\text{Fe}] = +0.30$; the solid line is for $z = -0.5$ and the dashed line is for $z = +2.0$. The error bars represent the Poisson counting errors in each bin. Panel (b) illustrates that after four iterations, the two input LFs converge to within 1% of the same values (solid circles for $z = -0.5$ case, crosses for the $z = +2.0$ case).

Table 4-3. Artificial star completeness fractions

V_i	$\tilde{N}_i$	N_i^A	$\mathcal{N}_i^A$	f_i
15.75	20	19.85	20.09	0.988
16.05	20	20.04	20.02	1.001
16.35	35	35.07	35.31	0.993
16.65	36	35.80	37.04	0.967
16.95	34	34.37	34.92	0.984
17.25	34	33.66	35.38	0.951
17.55	24	24.20	24.85	0.974
17.85	35	34.91	35.99	0.970
18.15	29	28.95	30.92	0.936
18.45	23	23.19	24.20	0.958
18.75	25	24.82	27.62	0.899
19.05	16	16.06	18.12	0.886
19.35	23	23.06	26.80	0.860
19.65	26	25.86	34.23	0.756
19.95	18	18.15	28.05	0.647
20.25	10	9.93	31.89	0.311
20.55	2	2.02	24.17	0.084

Table 4-4. Rectified luminosity function

V_i	$\tilde{N}_i$	f_i	$\log \Phi_i$	V_i	$\tilde{N}_i$	f_i	$\log \Phi_i$
12.45	0	1.0000		16.65	36	0.9894	2.0838
12.75	1	1.0000	0.5229	16.95	34	0.9848	2.0610
13.05	0	1.0000		17.25	34	0.9807	2.0628
13.35	0	1.0000		17.55	24	0.9727	1.9151
13.65	4	1.0000	1.1249	17.85	35	0.9626	2.0835
13.95	1	1.0000	0.5229	18.15	29	0.9519	2.0067
14.25	1	1.0000	0.5229	18.45	23	0.9386	1.9121
14.55	0	1.0000		18.75	25	0.9182	1.9579
14.85	2	1.0000	0.8239	19.05	16	0.8943	1.7755
15.15	4	1.0000	1.1249	19.35	23	0.8513	1.9545
15.45	4	1.0000	1.1249	19.65	26	0.7580	2.0582
15.75	20	0.9996	1.8241	19.95	18	0.5924	2.0055
16.05	20	0.9944	1.8488	20.25	10	0.3504	1.9783
16.35	35	0.9943	2.0694	20.55	2	0.0874	1.8824

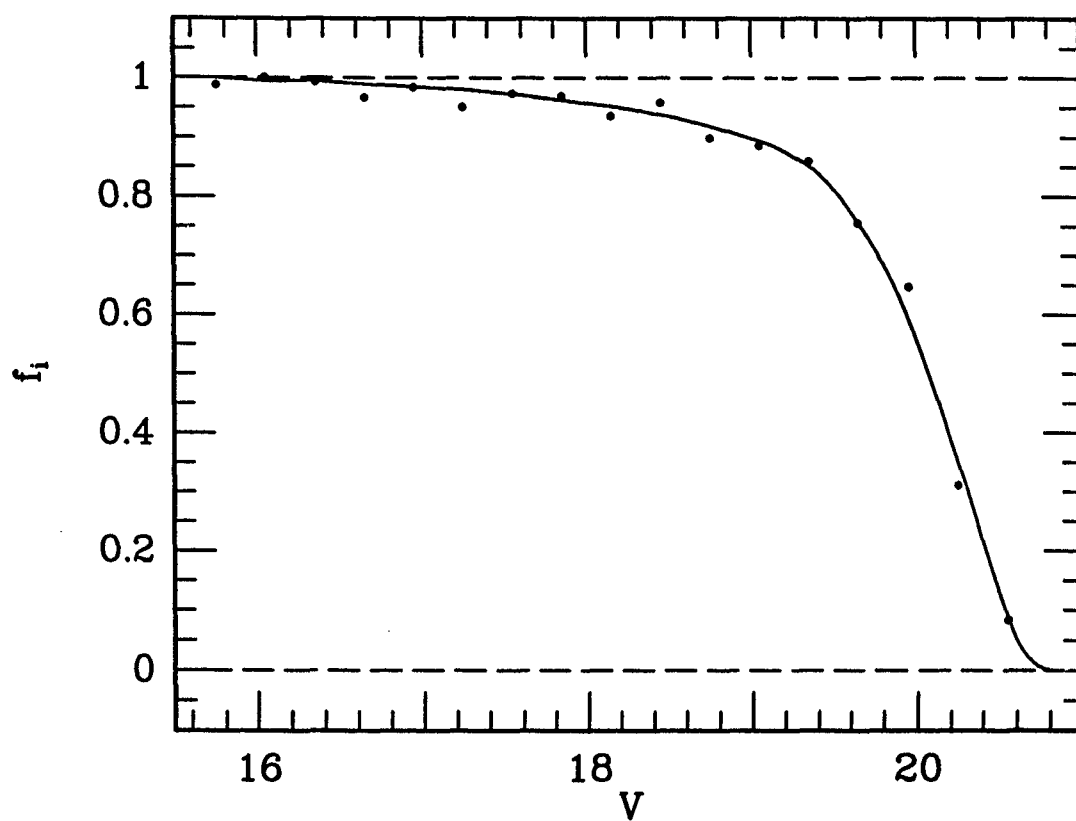


FIGURE 4-15 The completeness fraction as a function of observed magnitude. The smooth curve is a hand-drawn estimate of the true relation. At $V = 19.0$, the sample is 90% complete.

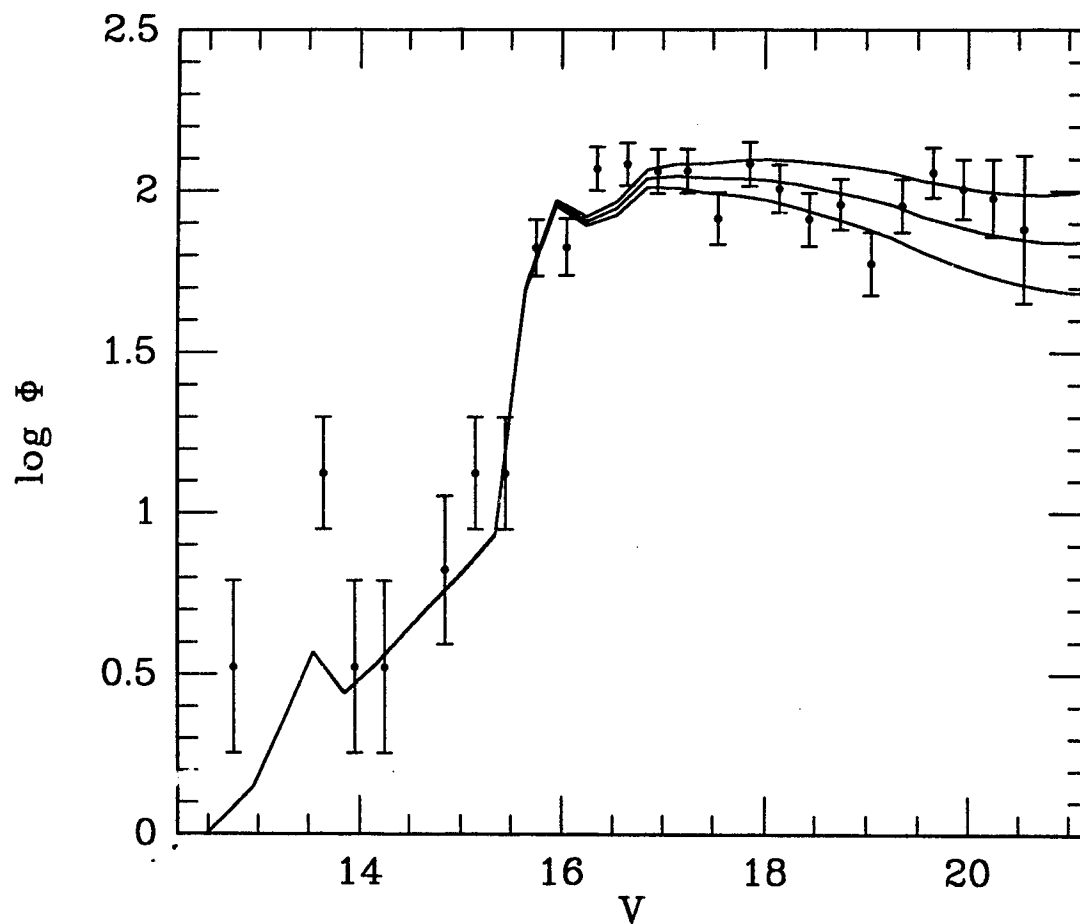


FIGURE 4-16 The rectified LF for NGC 2243. Single star model LFs for $[\text{Fe}/\text{H}] = -0.65$ and $[\text{O}/\text{Fe}] = +0.30$ and $x = -1.5, -0.5$, and $+0.5$, normalized to match along the lower giant branch, have been superimposed. The 1σ Poisson errors in the original star counts are indicated by the error bars.

is the same as the single star LF, except that the bins are shifted brightward by 0.75 mag before being added to the single star LF, and the contribution by the binaries to the starcount in each bin is assumed to be 30%.

4.7 Discussion

A number of old open clusters which are similar to NGC 2243 [i.e., NGC 2420, McClure *et al.* (1978), and NGC 2506, McClure *et al.* (1981)] have well-populated binary sequences as well as a few blue stragglers. The morphology of the turn-off regions in these clusters is also very similar, with the gap near the top of the main sequence turn-off, just above the point where the binary and single star sequences merge, being a consistent feature. It has been suggested by McClure *et al.* (1981) that the gap (or the apparent overabundance of stars above the turn-off) may be caused by the merging of the binary sequence with the single star sequence, in which case the stars above the gap would be the equal mass binaries one would expect to find 0.75 mag above the turn-off. An alternate explanation, first discussed by McClure *et al.* (1978) in connection with NGC 2420 and more recently reinforced by Anthony-Twarog *et al.* (1990), is that convective overshooting in the cores of moderate mass stars shifts the locus of evolution slightly redward near the turn-off, and delays the manifestation of the hook to older ages (lower masses).

The new observations of NGC 2243 lend support to this second hypothesis, because the standard isochrones tend to be too blue through the turn-off region, and the predicted location of the gap is nearly 1 mag fainter than the one observed. Moreover, the LF for NGC 2243 in this region of the CMD is not well matched by model LF's

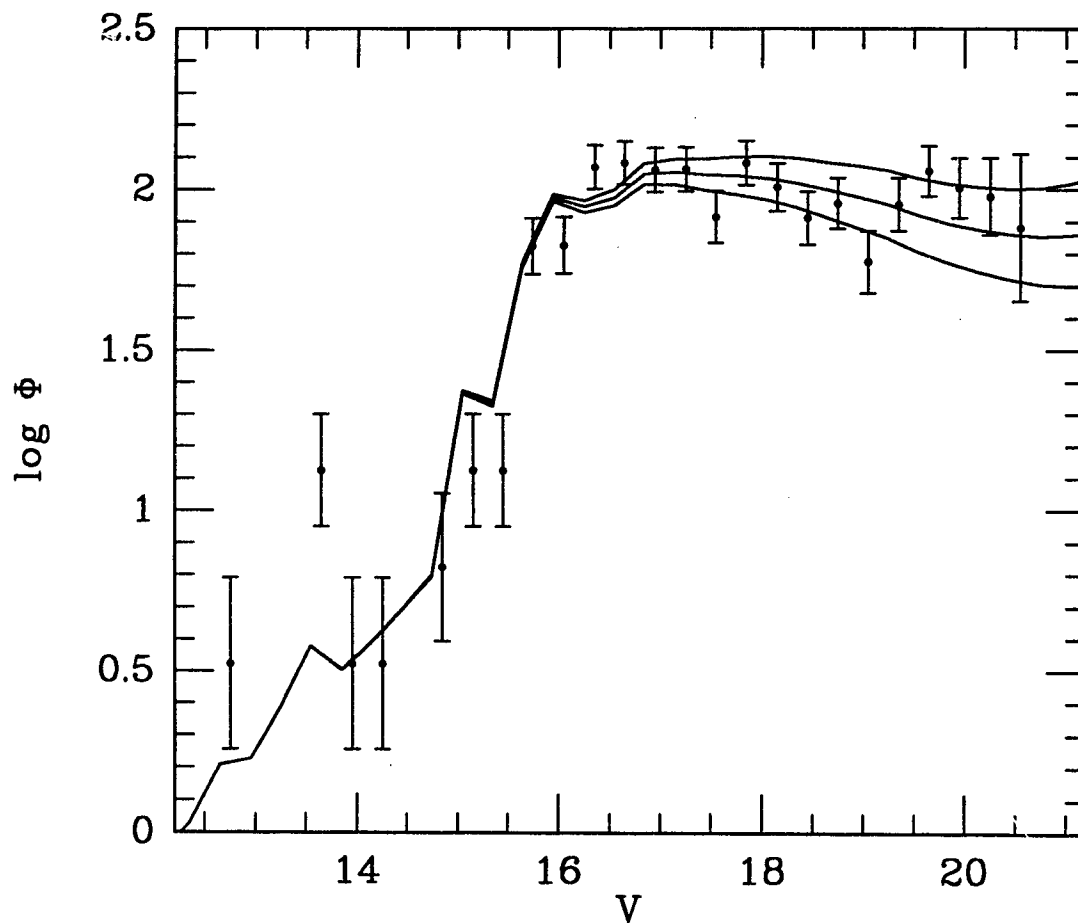


FIGURE 4-17 The same as Fig. 4-15, except that the model LFs contain a binary star component. For each bin, this component was computed by taking 30% of the number of stars in a bin 0.75 mag fainter. The 1σ Poisson errors in the original star counts are indicated by the error bars.

which include a reasonable estimate of the contribution from the binary sequence. In fact, the addition of the binaries does not significantly alter the shape of the LF. One would have to postulate a very different mass spectrum for the binary sequence, or else a much larger fraction of binaries to produce reasonable agreement. Neither of these possibilities is supported by the observations.

Nevertheless, evidence of binary star activity in old open clusters has been presented by Collier Cameron & Reid (1987). In a sample of old open clusters (including those listed above), they detected excess Ca II emission from some of the sub-giants comparable to that from RS CVn variables in the solar neighborhood. The CMD of NGC 2243 shows a number of potential binary stars between the turn-off and the base of the giant branch, and the circumstantial evidence connecting the presence of binary stars and stellar activity with the presence of blue stragglers is very tempting. To what extent the effects of binary star evolution are involved cannot be estimated from the current observations, but because the field star component between $15 \leq V \leq 17$ is small, many of the stars between the location of the turn-off and the base of the giant branch may be binaries. It would be worthwhile to investigate these stars more thoroughly with both photometry and spectroscopy, to determine which are the binaries, and to get some idea of how binary star evolution influences our interpretation of evolution through the turn-off region.

Why does NGC 2243 have such a populous binary sequence? The two fields on which the new CMD is based are located in the core region of the cluster, so the high percentage of binaries detected may be an artifact of the dynamic evolution of the cluster. Although van den Bergh (1977) found half of the cluster stars to lie within

a radius of $135''$, and was able to trace the cluster out only to $380''$, his observations reached only ≈ 2 mag below the turn-off. However, the field star component $\approx 15'$ (18 pc) north of the cluster center has a CMD in which many of the faint stars coincide with the main sequence of the cluster. Whether these stars have evaporated from the cluster is worth investigating, because such clusters are thought to be major contributors to the metal-poor component of the field star population in the solar neighborhood. When the spatial distribution of those stars which can unambiguously be identified as members of the binary sequence (not shown) is compared to the overall distribution of cluster stars in Fig. 4-3, there is no obvious evidence for a greater concentration of the binaries.

4.8 Summary

New photometry of NGC 2243, calibrated independently of previous studies of the cluster, and which reaches ≈ 4 mag below the turn-off point, has been presented. The most notable features of the CMD are a strong binary sequence, which contributes $\approx 30\%$ of the stars, a gap in the turn-off region at $V \approx 16.1$, and a small (but very tight) clump of HE stars.

Over-all consistency between the locations of the single star main-sequences and the horizontal branches is achieved in a differential comparison with the globular cluster 47 Tuc when $E(B - V) = 0.06$ and $m - M = 13.05$ are adopted for NGC 2243, which seems to indicate that the two clusters have similar helium and metal abundances ($Y = 0.24$, $[\text{Fe}/\text{H}] = -0.65$, and $[\text{O}/\text{Fe}] = +0.30$). However, in this comparison the giant branch of NGC 2243 lies to the red of that of 47 Tuc, which goes against

the behaviour predicted by the standard models and implies that the open cluster is somewhat metal rich compared to the globular. Comparisons with isochrones imply an age of 4–5 Gyr, and the best over-all fit to the observations is obtained with $[\text{Fe}/\text{H}] = -0.47$, $[\text{O}/\text{Fe}] = +0.23$, and an age of 5 Gyr.

The LF shows the mass spectrum to be quite flat — the exponent x , in the normal power law, $\phi(\mathcal{M})d\mathcal{M} \propto \mathcal{M}^{-(1+x)}d\mathcal{M}$, is estimated to be ≈ -0.5 . A model LF, constructed by assuming a 30% contribution to the number of stars at each magnitude by the binary star component, and assuming the same mass spectrum for both the binaries and single stars, does not reproduce the detailed structure in the observed LF near the turn-off. This reinforces the interpretation of the CMD, that the convergence of the single and binary star sequences cannot account for the morphology of the turn-off region.

Chapter 5

The Globular Cluster NGC 288

5.1 Cluster Parameters

It is well established in the literature that NGC 288 is unusual among the globular clusters of intermediate metallicity (i.e., $[\text{Fe}/\text{H}] \approx -1.3$) in the Galaxy because of its predominantly blue horizontal branch (BHB). Most such clusters have red horizontal branches (RHBs) — i.e., the core helium burning stars are predominantly to the red of the RR Lyrae gap — while in general, BHB clusters tend to be much more metal poor. Accordingly, metallicity is recognized as the primary parameter affecting HB morphology, but there is evidently at least a second factor. This particular observational fact defines the so-called second parameter problem, first recognized by Sandage & Willey (1967) in connection with NGC 7006, an $[\text{Fe}/\text{H}] \approx -1.6$ cluster with a strong RHB component. Helium abundance, CNO abundances, and age have been suggested as candidates for the second parameter, although cluster-to-cluster variations in the amount of mass lost during evolution along the RGB and/or through the helium flash can also produce the effect.

In synthetic ZAHBs, the lower mass stars ($\approx 0.55M_{\odot}$) populate the blue end of the HB, while the more massive stars ($\lesssim 0.9M_{\odot}$) populate the red end. Thus, differences in cluster ages could affect HB morphologies because, at fixed abundances, the RGB tip mass decreases with increasing age. In this case, clusters with anomalous BHBs would be older than the average. However, such age differences would have to be rather large — Lee *et al.* (1988) find that NGC 288 would have to be ≈ 7.3 Gyr

older than NGC 362, a cluster with nearly the same metallicity, but possessing a red HB.

The helium abundance acts indirectly on the mass of stars at the RGB tip by changing the speed of the evolutionary clock, in the sense that increasing Y produces an increase in the evolutionary rate — and increasing Y in ZAHB models, when all the other parameters are fixed, serves to shift the models blueward (and brighter) by only very small amounts. However, according to the RGB sequences of Sweigart & Gross (1978), if it were the sole cause of the 2nd parameter effect, cluster-to-cluster variations of at least 0.09 in Y would be required to induce the necessary ZAHB mass differences. Such a wide variation seems unlikely in view of the fact that the solar helium abundance is $Y \approx 0.27$ (VandenBerg & Poll 1988), and Pop II helium abundances seem to be near $Y = 0.24$ (Caputo *et al.* 1987).

The situation with the CNO abundances is somewhat more complicated because they significantly alter the balance between the He-core luminosity and the H-shell luminosity, in the sense that the latter becomes more important when CNO abundances are increased. Changes in the structure of the outer layers of ZAHB stars, forced by the detailed balance required among the H-shell luminosity, the temperature gradient, and the opacity, shift those with enhanced CNO redward. According to Rood & Crocker (1985), increasing $[\text{CNO}/\text{Fe}]$ from 0 to +0.5, in a metal-poor cluster such as M15, would be sufficient to reduce the distribution of ZAHB stars from $B/(B + R) > 0.9$ down to < 0.1 (where B and R refer to the number of BHB and RHB stars, respectively.) Moreover, the amount of CNO enhancement required to produce the correct HB morphology varies with $[\text{Fe}/\text{H}]$ in a manner consistent

with the range of observed abundance variations (*cf.* VandenBerg 1992, and references therein). Nevertheless, difficulties remain in accounting for BHBs in metal-rich clusters, and for the fact that the observed CNO enhancement in M15 — a cluster with a BHB — actually is $[\text{CNO}/\text{Fe}] = +0.5$. Such discrepancies can be accommodated by resorting to variable amounts of mass loss prior to the ZAHB.

The first photometric study to reveal the unusual nature of NGC 288 was made by Cannon (1974). Since then, numerous photometric studies of the cluster have appeared (including Alcaïno 1975; Alcaïno & Liller 1980; Buonnano *et al.* 1984; Olszewski *et al.* 1984; Pound *et al.* 1987) and have produced a wide range in the estimates of the distance modulus and age for the cluster. However, differential comparisons with other globular clusters (notably Bolte 1989; VandenBerg *et al.* 1990; Green & Norris 1990; Sarajedini & Demarque 1990), in particular NGC 362, seem to imply that it is older by 2–3 Gyr than the average. Such an age difference works in the correct sense to explain the difference in HB morphology between the two clusters, but it appears to be too small by a factor of at least two for it to be the sole cause.

Distance modulus estimates have been made both from the level of the HB at the location of the RR Lyrae gap, which is not populated in this cluster, (e.g., Cannon 1974; Alcaïno 1975; Olszewski *et al.* 1984) and from fitting the main sequence to an empirical main sequence defined by local subdwarfs (e.g., Alcaïno & Liller 1980; Pound *et al.* 1987). The estimates range over $14.5 \lesssim (m - M)_V \lesssim 14.8$, independent of the method chosen. Much of the variation in age estimates for the cluster, made by comparisons with isochrones, can be attributed to these differences.

Current abundance estimates (Hesser & Shawl 1985; Pound *et al.* 1987; Gratton

1987; Caldwell & Dickens 1988; Costar & Smith 1988) imply $[\text{Fe}/\text{H}] \approx -1.3$. Caldwell & Dickens report $[\text{CNO}/\text{H}] = -0.6$ for NGC 288, and -0.8 for NGC 362. However, this difference is neither large enough, nor is it even in the correct sense to account for the differences in HB morphology, because at high metallicity, HB morphology is not particularly sensitive to CNO abundances (Dorman 1992).

NGC 288 lies in the direction of the South Galactic Pole ($b = -89^\circ 4$), where photometric studies of both red (Lloyd Evans 1970) and blue (Eggen 1970) giants have shown the reddening to be $E(B - V) \approx 0.02$. Cannon (1974) estimated $E(B - V) = 0.04 \pm 0.03$ from a two colour diagram of the giant stars in NGC 288, and typical of reddening estimates adopted by other investigators are $E(B - V) = 0.02 \pm 0.02$ (Buonanno *et al.* 1984), 0.03 ± 0.01 (Pound *et al.* 1987), and 0.015 (Bolte 1989).

Some of the interesting features reported in the published CMDs include gaps in the distribution of giant branch and horizontal branch stars at various locations (Buonanno *et al.* 1984), as well as blue stragglers (Alcaino & Liller 1980; Buonanno *et al.* 1984; Bolte 1992), and a population of main sequence binary stars (Bolte 1992).

5.2 Observations

Four overlapping fields covering most of the core region of NGC 288 were observed with both short and long exposures in the B and V passbands on the night 11/12 September 1986. Estimates of the seeing derived from the stellar profiles range from 1.3 to 1.9 arcsec, with a median value of 1.64 arcsec. The journal of observations for NGC 288 is given in Table 5-1.

Table 5-1. Observing Log for NGC 288

Field	Filter	Exp. Time (seconds)	Airmass	FWHM (arcsec)	UT of observation 1986 September 12
SW field	B	130	1.05	1.9	4:51:53
SW field	B	500	1.04	1.9	4:55:27
SW field	V	60	1.03	1.8	5:04:59
SW field	V	230	1.03	1.7	5:07:10
SE field	B	130	1.01	1.3	5:35:04
SE field	B	500	1.00	1.6	5:40:10
SE field	V	60	1.00	1.4	5:49:48
SE field	V	230	1.00	1.4	5:52:03
NW field	B	130	1.00	1.7	6:15:39
NW field	B	500	1.00	1.6	6:19:25
NW field	V	60	1.00	1.5	6:29:29
NW field	V	230	1.00	1.6	6:32:03
NE field	B	130	1.00	1.7	6:15:39
NE field	B	500	1.00	1.6	6:19:25
NE field	V	60	1.00	1.5	6:29:29
NE field	V	230	1.00	1.6	6:32:03

Figure 5-1 shows a mosaic of the four cluster fields with all of the 5601 objects that survived the detection/reduction procedures described in Chapter 3. Of these objects, only 11 have $\bar{\chi} > 2.0$, and all of these are fainter than $V = 18.3$. The master list is given in Appendix B, and the CMD is given in Figure 5-2. In contrast with the CMD of Buonnano *et al.*, there are no obvious gaps in the stellar distribution along the giant branch, but there are two gaps present in the HB, one at $V \approx 15.7$, and one at $V \approx 16.5$, which corresponds roughly to the location of the HB gap that they reported. Although the photometry through the turnoff region is highly uncertain, an extension of the main sequence above and blueward of the turnoff, consistent with a population of blue stragglers, seems to be present. At the bright end, the photometry is apparently good enough to clearly separate the AGB from the RGB, although the status of the stars brighter than $V = 13.6$ is uncertain.

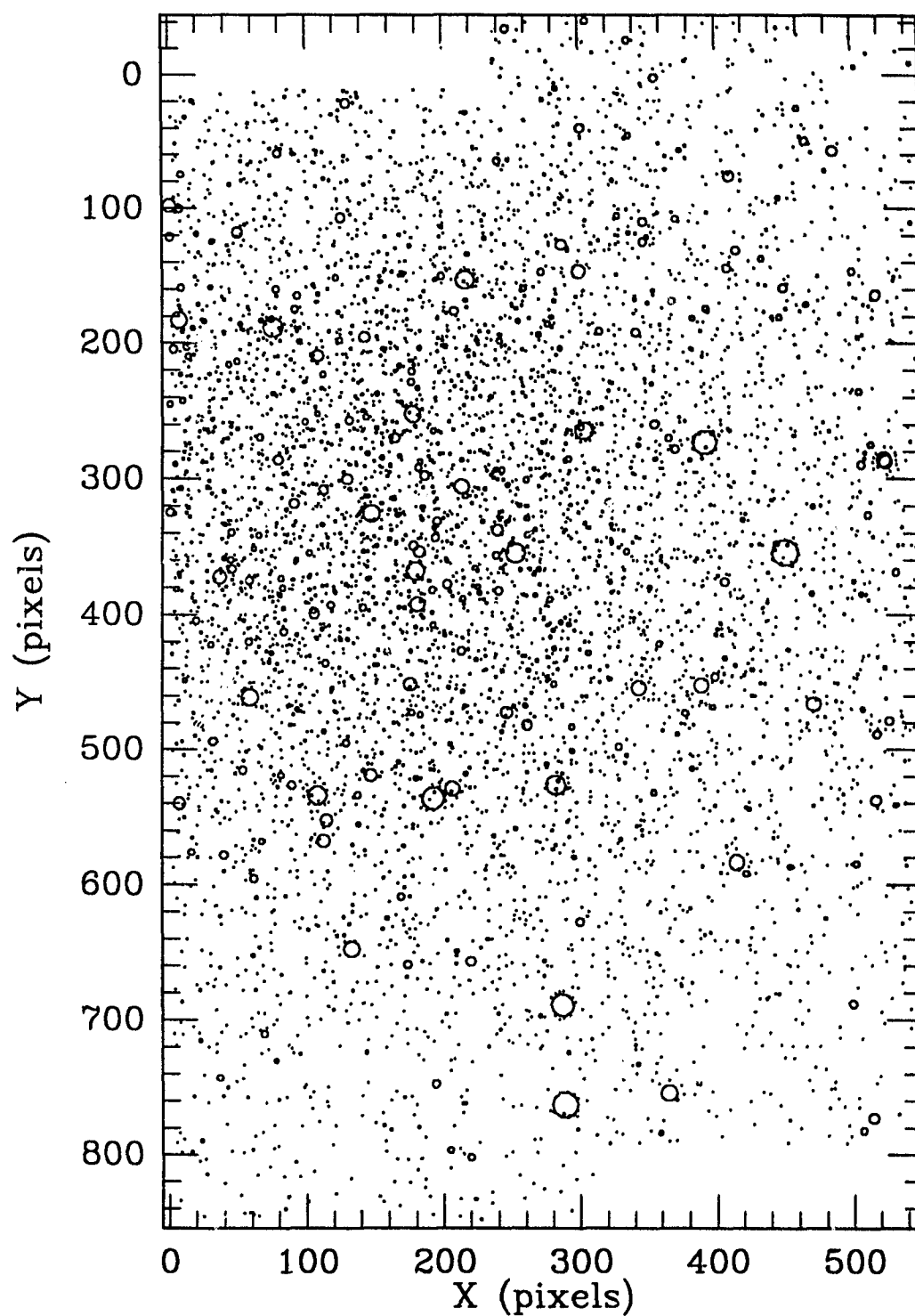


FIGURE 5-1 A mosaic of the four overlapping fields in NGC 288, showing the positions and magnitudes of the objects that survived the detection/reduction process, as calculated by ALLSTAR. The magnitude of each object is indicated by the size of the circle; the brightest star has $V = 12.901$.

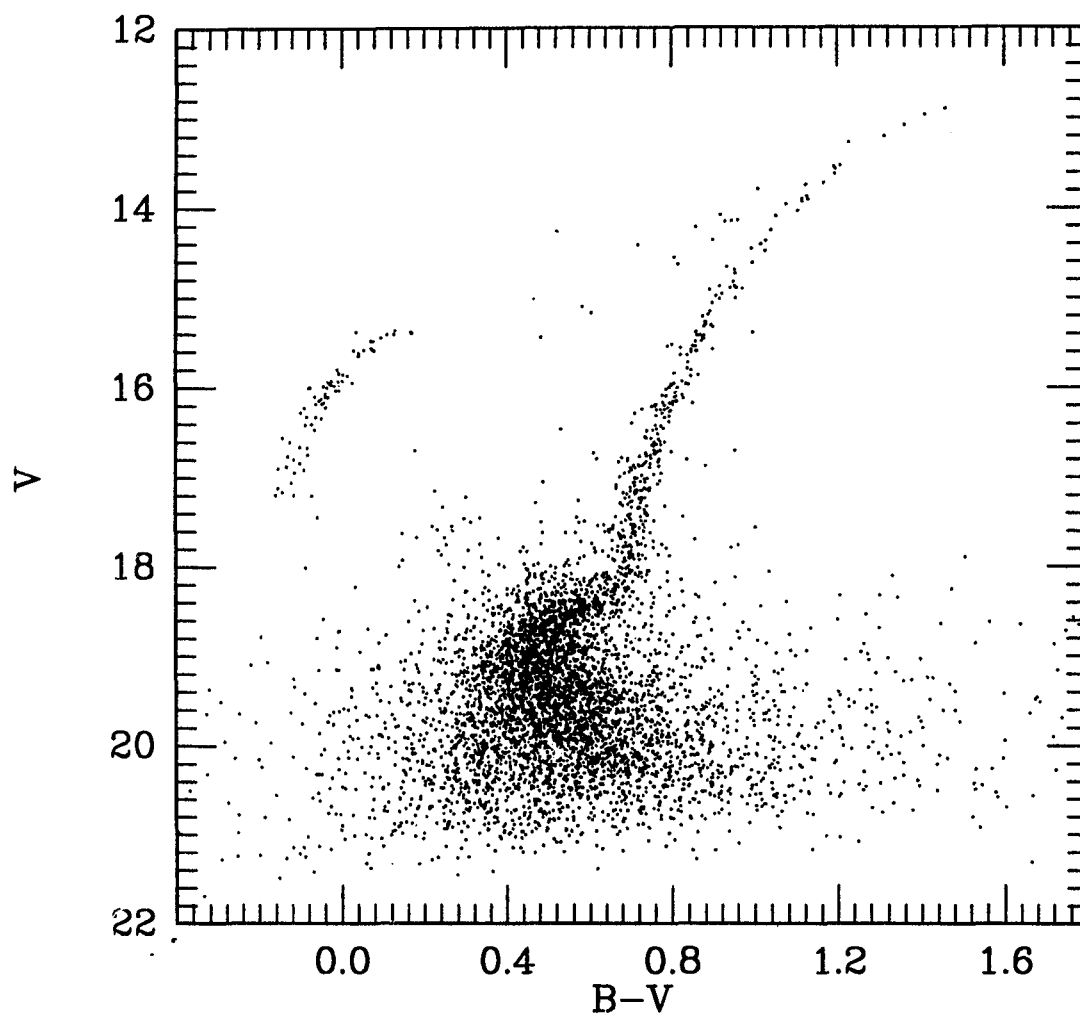


FIGURE 5-2 The CMD of NGC 288 containing all of the objects that survived the detection/reduction process. The population of stars between $0.0 \leq B - V \leq 0.2$ on the horizontal branch has not been observed in previous studies of this cluster. Although the spatial distribution of these stars has not been examined, they may represent a core population analogous to the one reported by Stetson (1991) in the core of M15.

5.2.1 Comparison with other Cluster Photometry

Bolte's (1992) comparisons between his photometry and that of Buonanno *et al.* (1984, 1989), Olszewski *et al.* (1984), Pound *et al.* (1987), and Penny (1984) show fairly good agreement for stars brighter than the turnoff, both in colour and in magnitude. In the region of the turnoff and at fainter magnitudes, differences are more apparent, amounting to a magnitude dependent shift in the Pound *et al.* data as large as 0.04 mag at the turnoff. Penny's photometry is displaced ≈ 0.1 mag to the blue, and seems to be at variance with all the other data. Dr. Bolte has kindly made a subset of his photometry available for direct star-by-star comparisons with the photometry presented here.

There are 81 stars in common between the two data sets. The comparisons, illustrated in Figure 5-3(a), (b), and (c), show that Bolte's V -magnitudes are, on average, brighter by 0.064 mag; his colours are 0.010 mag redder (at $V = 17.0$), with no significant trend in colour with magnitude (at least above $V = 18$). It should be noted that this V -magnitude difference is similar in size and of the same sign as the differences shown in Table 3-3 for the photoelectric sequences — which suggests that the photometric zero-points for the night on which NGC 288 was observed are in error. Such errors can occur if the sky is not photometric throughout the night, but, in this case, the *maximum* frame errors (the difference between the magnitudes computed individually for each frame using equations (3-1), and the mean magnitudes for stars in common on all of the frames) only amount to ± 0.03 mag, with $\sigma = 0.02$ over all 16 frames. This is typical of the frame-to-frame scatter that is normally obtained from profile-fitting photometry on CCD images (see Hesser *et al.* 1987,

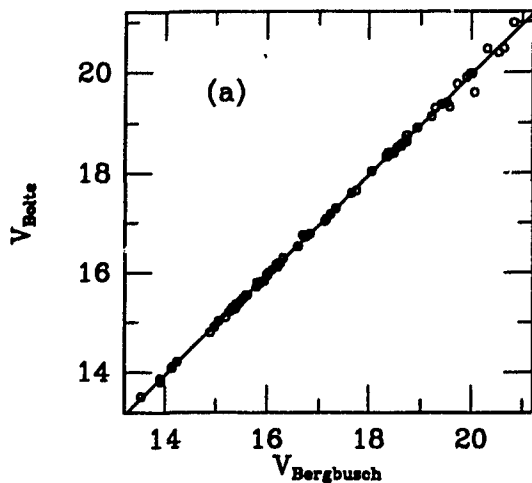


FIGURE 5-3(a) The comparison between Bolte's (1992) V -magnitudes and the V -magnitudes of this study. The slope of the line, calculated from a two-way regression on the data has a slope of one. The magnitude shift, ΔV , calculated at $V = 17.0$ is 0.064 mag, in the sense that Bolte's magnitudes are brighter.

FIGURE 5-3(b) The colour differences, $\Delta(B - V)$, in the sense Bergbusch - Bolte, as a function of magnitude. The solid line gives the result of a two-way regression on the data; at $V = 17.0$, the colour shift amounts to -0.010 mag. The slope of the line is 0.0061, but for stars brighter than $V = 18$, the visual impression given by the data is that there is no trend in colour. The dotted line has a slope of zero and is shifted blueward by -0.01 mag.

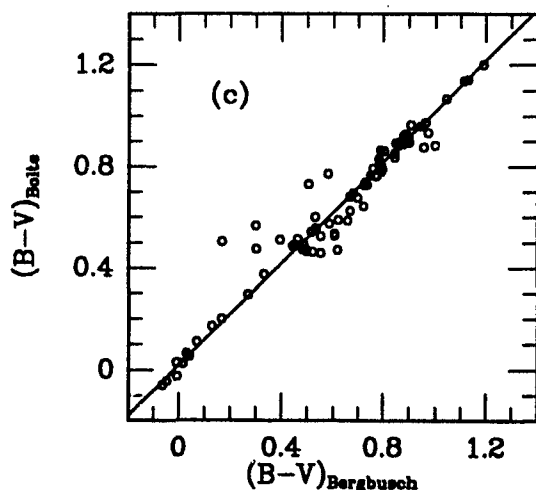
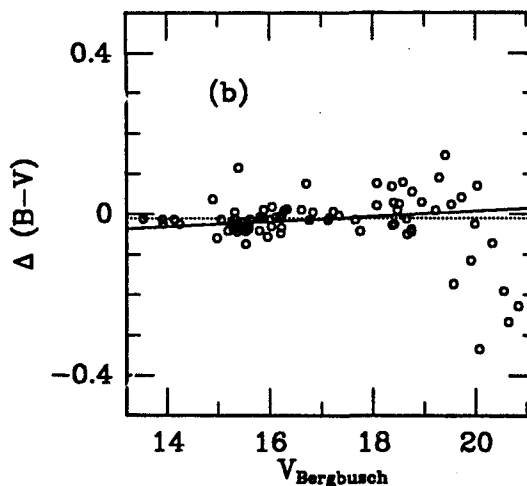


FIGURE 5-3(c) The comparison between Bolte's (1992) colours and the colours presented in this study. A two-way regression formally gives a slope of 0.9996, and a colour shift of $+0.018$ mag at $B - V = 0.56$.

and Stetson & Harris 1988) Moreover, Bolte (private communication) experienced difficulties in establishing his transformation equations due to an error in the voltage settings on the CCD chip. Since no such problems have been encountered with the transformation equations presented in the current study, and because the colour shifts are acceptably small, with no significant variation either with colour or with magnitude, the photometric zero-points of the current study have been adopted for the discussion to follow. As will be made clear in the analysis of the CMD, the only parameters which will be affected by this choice are the reddening, $E(B - V)$, and the distance modulus, $(m - M)_V$.

5.3 Artificial Star Tests

As discussed in §3.3, the two main objectives of artificial star tests are to obtain quantitative estimates of the photometric accuracy and of the efficiency of the detection/reduction algorithm. Care must be taken to ensure that the spatial, brightness, and colour distributions of the artificial stars mimic those of the stars on the original CCD frames. Furthermore, the addition of the artificial stars in each frame must be done in such a way as to avoid seriously altering the degree of crowding. This factor significantly affects the efficiency of detections, and it further affects the reductions through the rejection algorithm in ALLSTAR, when stellar groups become too large for the program to handle. The standard approach is to introduce a sample of artificial stars that is no larger than 10% of the original list of objects detected on a given frame, and then to repeat such experiments several times in order to increase the statistical significance of the tests.

In this study, the CCD frames cover the cluster cores; consequently the number of stars detected is rather large — 5601, in the case of NGC 288 — so a single artificial star experiment could potentially require the detection and reduction of 6161 stars (5601 program stars + 560 artificial stars). Furthermore, these stars are distributed over four cluster fields, and each field is covered by four CCD frames. Obviously, some sort of compromise must be reached between achieving a high level of statistical significance, and completing the experiments in a reasonable amount of time. For this reason, only two experiments were performed, resulting in a total input artificial star sample of 1120 stars (560 stars per experiment), distributed over $13.6 < V \leq 21.5$.

Fiducial sequences based on the new observations are listed in Table 5-2, and are shown in Figure 5-4. Because of the large uncertainties in the data below $V = 19$, the shape of the fiducial main sequence was estimated from comparisons with those in Olszewski *et al.* (1984) and Bolte (1989), and from comparisons with isochrone shapes. Above $V = 19$, the data were partitioned into 0.2 mag wide bins, and histograms (as a function of $B - V$) were used to deduce the location of the ridge lines. The fiducial points obtained from this procedure were then adjusted by eye to produce reasonably smooth fiducial sequences.

The adopted cumulative luminosity function (CLF) used to create the brightness distribution of the artificial stars is shown in Figure 5-5. Plotted in the same figure are a CLF derived directly from the observations and a model CLF derived from a 14 Gyr differential LF with $[\text{Fe}/\text{H}] = -1.26$, $[\text{O}/\text{Fe}] = +0.55$, and a mass spectrum exponent $x = 0.5$. At the faint end, it is clear that the observed CLF is severely deficient because it becomes almost vertical at $V = 21$, which is well below the

Table 5-2. Fiducial Sequences for NGC 288

Main Sequence & Giant Branch						Horizontal Branch	
<i>V</i>	<i>B - V</i>	<i>V</i>	<i>B - V</i>	<i>V</i>	<i>B - V</i>	<i>V</i>	<i>B - V</i>
12.861	1.498	15.700	0.839	18.421	0.620	15.382	0.175
12.900	1.446	15.900	0.818	18.482	0.580	15.390	0.130
12.975	1.403	16.100	0.800	18.531	0.560	15.428	0.102
13.100	1.347	16.300	0.781	18.600	0.524	15.570	0.059
13.210	1.309	16.500	0.766	18.700	0.488	15.843	-0.004
13.543	1.210	16.700	0.755	18.900	0.453	16.100	-0.047
13.700	1.171	16.900	0.738	19.000	0.446	16.300	-0.069
13.900	1.119	17.100	0.730	19.100	0.444	16.480	-0.089
14.100	1.073	17.300	0.721	19.300	0.448	16.680	-0.104
14.300	1.036	17.500	0.714	19.500	0.456	16.870	-0.112
14.500	1.002	17.700	0.703	20.000	0.509	17.200	-0.121
14.700	0.972	17.900	0.700	20.500	0.578		
14.900	0.938	18.000	0.693	21.000	0.665		
15.100	0.910	18.100	0.690	21.500	0.781		
15.300	0.886	18.261	0.675	22.000	0.897		
15.500	0.865	18.350	0.650				

turnoff. The adopted CLF was chosen as a compromise between the two extremes to ensure that a reasonable number of artificial stars would be created in the region just above the turnoff, where the interesting results for this study were anticipated.

A CMD of the input and output artificial stars is given in Figure 5-6. Qualitatively, the CMD of the output looks similar to the CMD of the program stars in Fig. 5-2, with two exceptions. First of all, the blue extension of the main sequence attributed to a population of blue stragglers is conspicuously absent, thus reinforcing the contention that a blue straggler component does exist in the cluster core. Secondly, no stars were recovered in the AGB region (none were created for input). Since the photometry at the bright end is extremely good, it is possible to distinguish between the RGB and the AGB (at least for $V \geq 13.6$) with reasonable confidence.

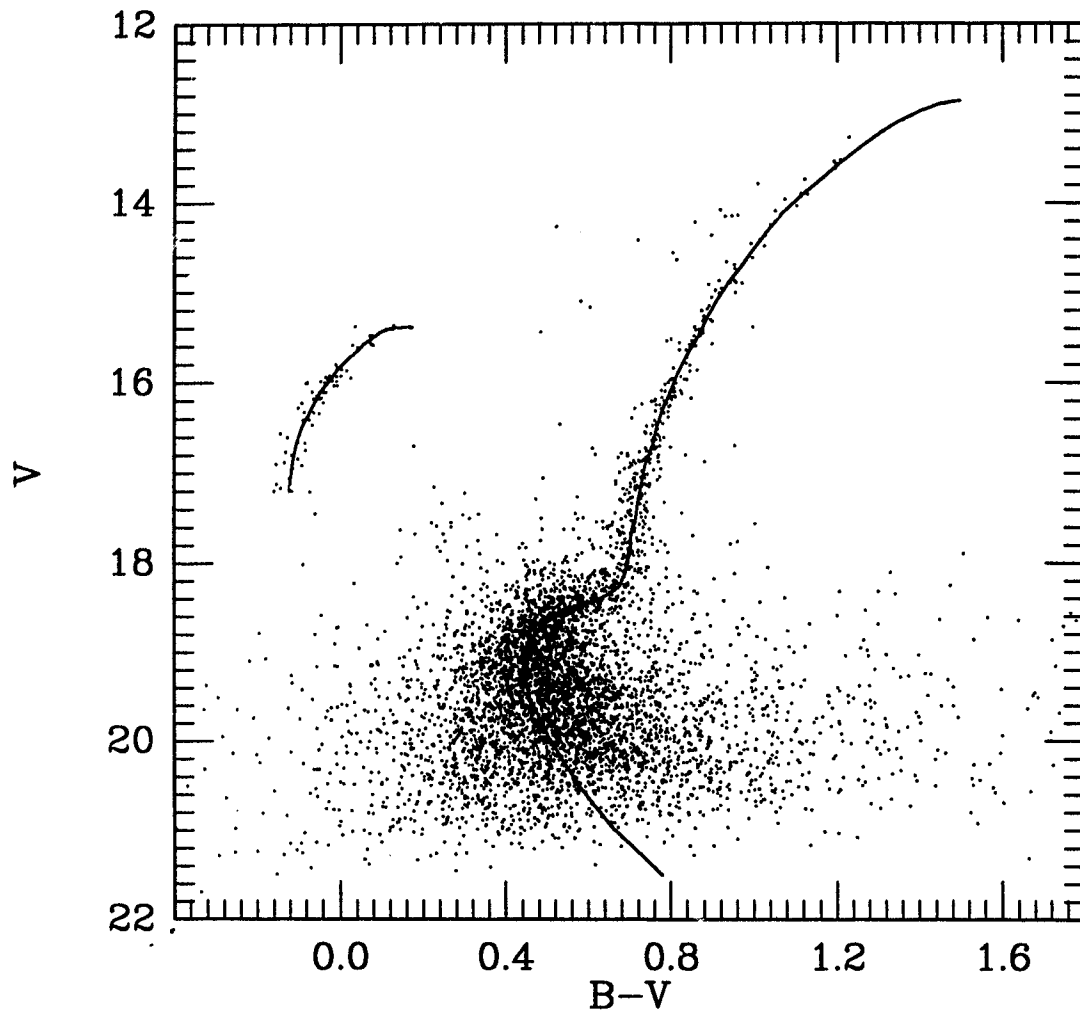


FIGURE 5-4 Fiducial sequences for NGC 288 derived from the observations for $V < 19$; for $V \geq 19$, the fiducial locus for the main sequence was obtained from comparisons with the fiducial sequences of Olszewski *et al.* (1984) and Bolte (1989) and with isochrone shapes.

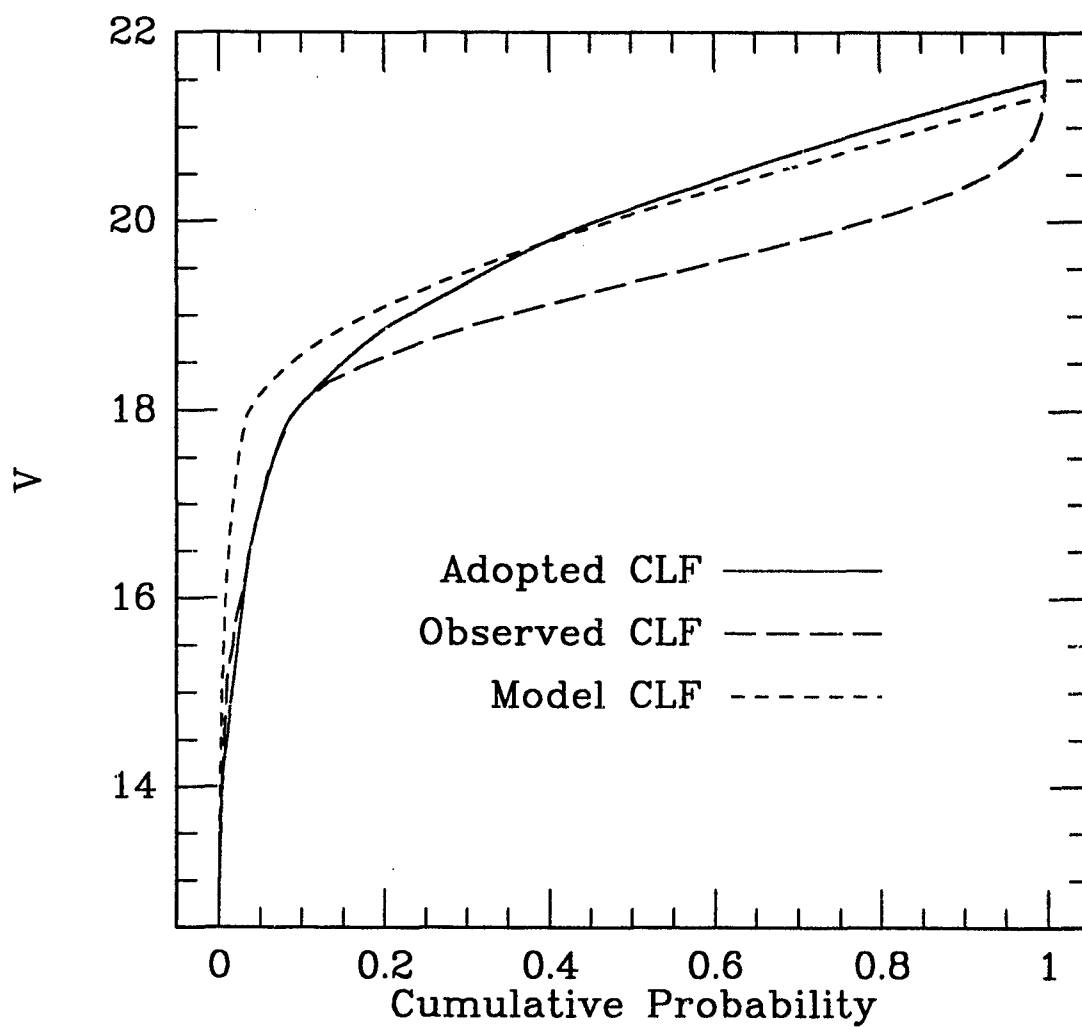


FIGURE 5-5 The adopted CLF used to create artificial stars, together with a model CLF ($[\text{Fe}/\text{H}] = 1.26$, $[\text{O}/\text{Fe}] = +0.55$, an age of 14 Gyr, a distance modulus of 14.75, and a mass spectrum exponent $\alpha = 0.5$ are the model parameters) and the observed CLF created directly from the unrectified differential LF (0.2 mag bins).

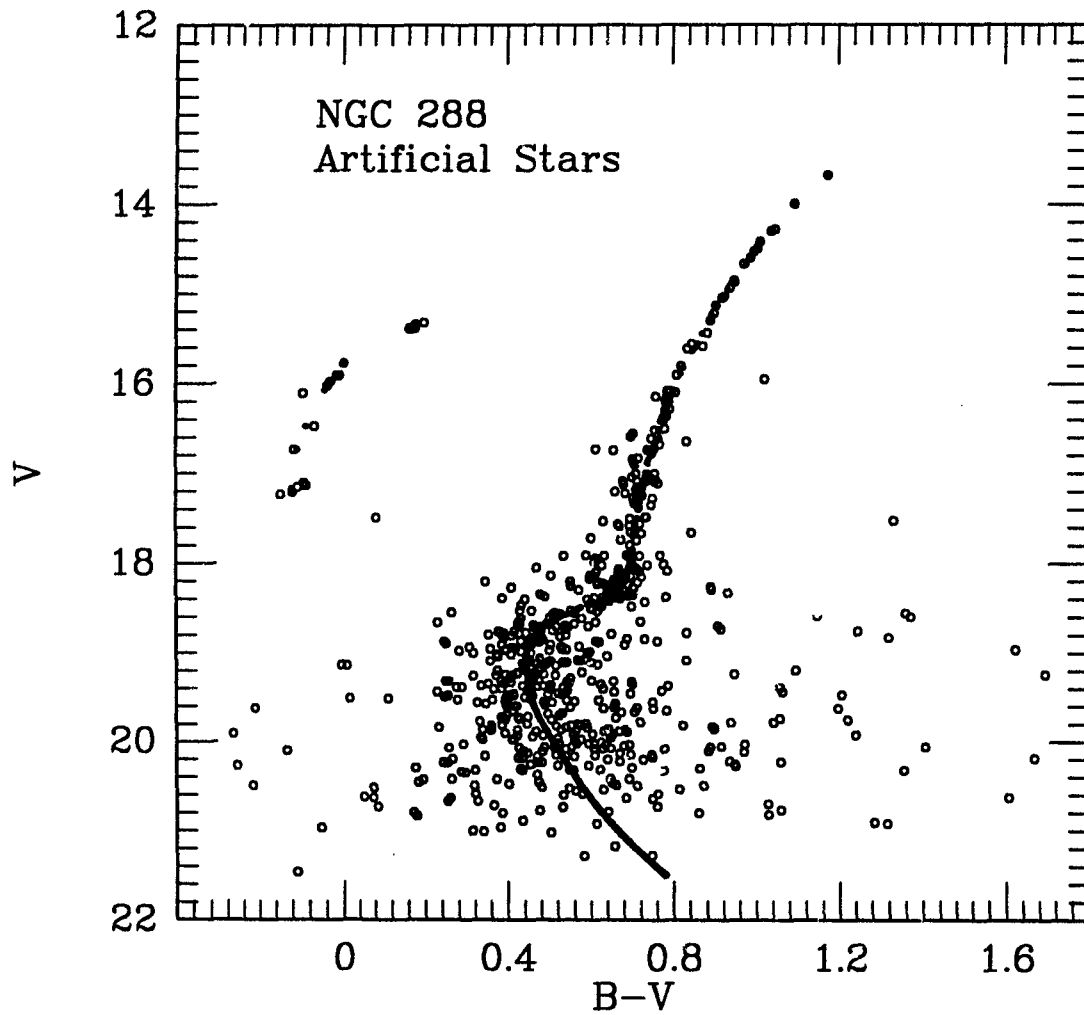


FIGURE 5-6 The input (●) and the recovered (○) artificial star CMDs. A comparison with Fig. 5-2 suggests that most of the scatter in the photometry is due to crowding.

Estimates of the accuracy of the photometry as a function of magnitude, calculated by the methods discussed in §4.3 are given in Table 5-3, and the star-by-star differences in V and $B - V$ are plotted in Figure 5-7. Again, the recovered stars tend to be brighter than they were on input, but curiously, there is a peak in the brightness shift near $V = 19$, which is near the turnoff magnitude. This feature is undoubtedly due to the scattering brightward of faint artificial stars and to the fact that the input magnitudes were limited to $V \leq 21.5$. A very satisfactory result of the experiments is that above $V = 18$, the recovered colours are very close to their input values.

Table 5-3. Artificial star photometric accuracy

$\bar{V}$	$\bar{\sigma}_V$	$\bar{\delta}_V$	$\hat{\sigma}_V$	$\bar{B} - \bar{V}$	$\bar{\sigma}_{B-V}$	$\bar{\delta}_{B-V}$	$\hat{\sigma}_{B-V}$	n
15.389	0.005	-0.004	0.009	0.835	0.012	-0.001	0.007	43
16.732	0.018	-0.004	0.022	0.749	0.033	-0.002	0.019	43
17.501	0.048	-0.013	0.055	0.697	0.059	-0.009	0.033	43
18.168	0.059	-0.050	0.093	0.667	0.127	-0.015	0.058	43
18.385	0.071	-0.008	0.087	0.641	0.109	+0.015	0.055	43
18.687	0.131	-0.009	0.187	0.508	0.192	-0.004	0.070	43
18.876	0.129	-0.098	0.245	0.476	0.189	+0.021	0.095	43
19.099	0.114	-0.118	0.202	0.477	0.248	+0.032	0.083	43
19.308	0.148	-0.036	0.165	0.460	0.249	+0.005	0.087	43
19.471	0.118	-0.053	0.212	0.459	0.196	-0.005	0.123	43
19.718	0.181	-0.047	0.221	0.524	0.250	+0.031	0.175	43
19.912	0.173	-0.080	0.208	0.556	0.354	+0.054	0.144	43
20.113	0.193	-0.063	0.190	0.609	0.296	+0.053	0.182	43
20.340	0.206	+0.044	0.237	0.480	0.337	-0.067	0.239	43
20.771	0.256	+0.071	0.380	0.503	0.400	-0.154	0.353	41

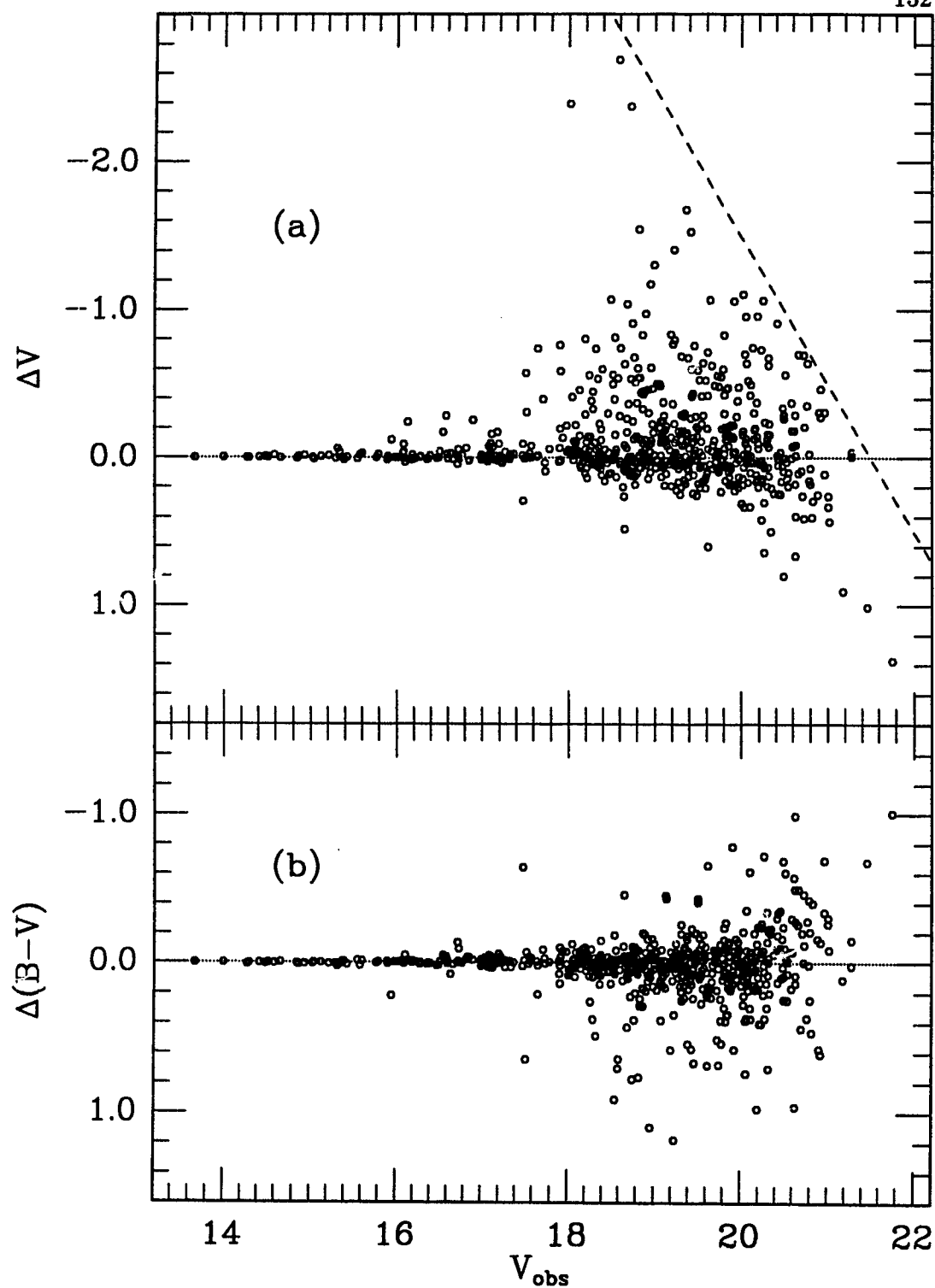


FIGURE 3-7 Residuals in (a) magnitude and (b), colour in the sense [output – input]. Because the input magnitudes were restricted to $V \leq 21.5$, no stars could be recovered in the region to the upper right of the dashed line in panel (a).

5.4 Analysis of the CMD

Figure 5-8 is a CMD of the fiducial points from the main sequence to the RGB tip ($\times$), with Bolte's (1992) fiducial points ($\circ$) shifted by 0.010 mag in $B - V$, and by 0.0635 mag in V , together with the observations of the HB stars. The agreement between the fiducial sequences along the giant branch is quite remarkable, but the differences through the turnoff region are just of the kind that would lead to different estimates of the cluster age. However, since the observations of the present study are highly uncertain at the level of the turnoff, such differences should not be regarded very seriously. For comparisons with isochrones at the turnoff, Bolte's fiducial sequence will be used.

The extreme blue extension of NGC 288's HB offers a good opportunity to constrain both the reddening and the distance modulus by comparisons with model ZAHBs and HB evolutionary tracks. A particularly nice feature of this approach is that the morphology of the blue end of model ZAHBs is not sensitive to metallicity, so that such reddening estimates are, in principle, independent of the metallicity and also of the age of the cluster. A reasonable ZAHB fit to the observed HB — for a given metallicity — fixes the reddening, but the distance modulus may then be allowed to vary to take into account the variation of HB luminosity with metallicity. From Dorman's (1992) oxygen enhanced ZAHB's, the following $M_V - [\text{Fe}/\text{H}]$ relation¹

¹ It is the standard practice of theoreticians to define the reference point for comparisons between HB models at $\log T_{\text{eff}} = 3.85$. Over a wide range of metallicities, this point corresponds reasonably well to an observed colour $B - V = 0.35$.

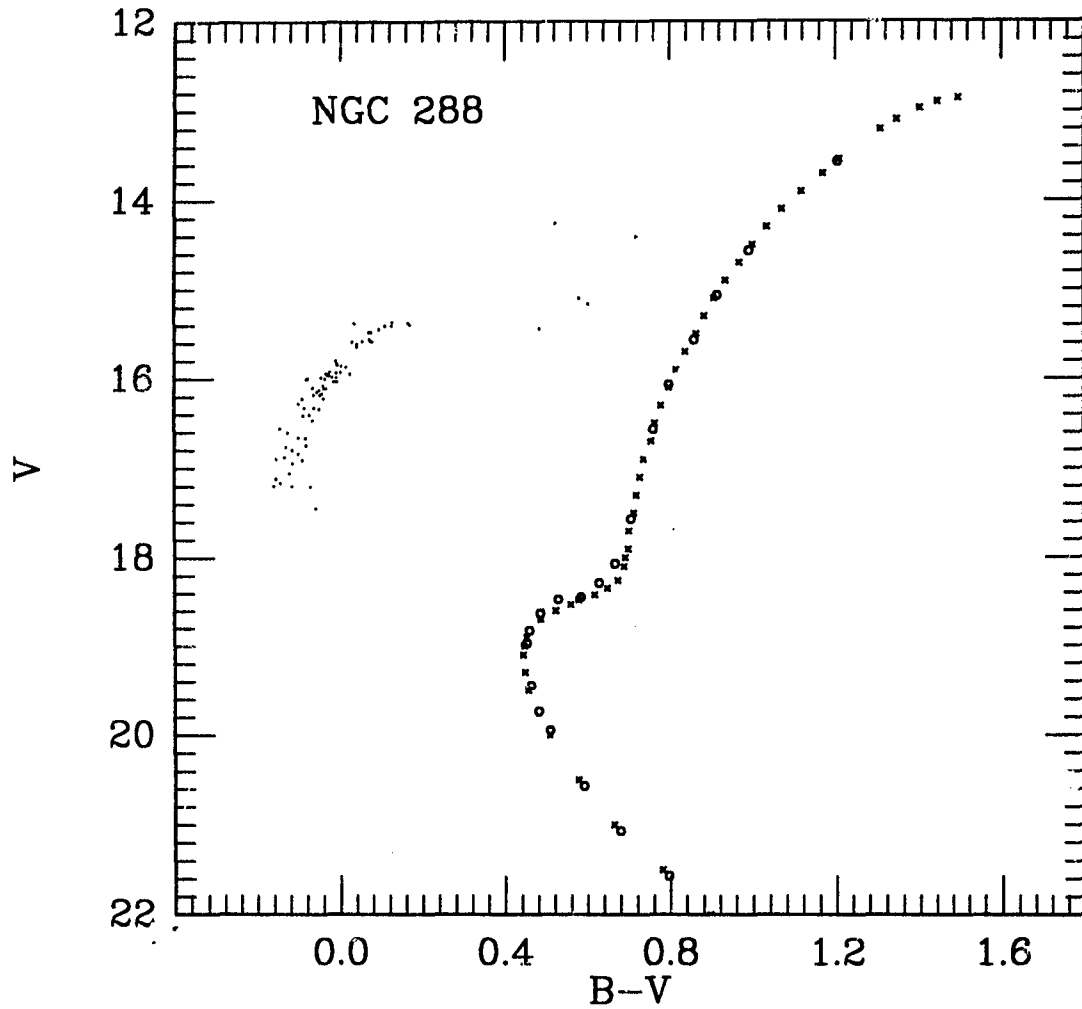


FIGURE 5-8 The fiducial points from the main sequence to the RGB tip ($\times$), with Bolte's (1992) fiducial points ($\circ$) shifted by 0.010 mag in $B - V$, and by 0.0635 mag in V , together with the observations of the HB stars. Since Bolte's photometry reaches much deeper, his fiducial sequence is more reliable below the base of the giant branch.

at $B - V = 0.35$, valid over the range $-0.47 \geq [\text{Fe}/\text{H}] \geq -2.27$, has been derived:

$$M_V = 0.604 + 0.160 ([\text{Fe}/\text{H}] + 1.36) + 0.050 ([\text{Fe}/\text{H}] + 1.36)^2. \quad (5-1)$$

The fits of Dorman's (1992) ZAHB and evolutionary tracks (truncated at $M_V = 0.0$) to NGC 288's HB for $[\text{Fe}/\text{H}] = -1.26$, illustrated in Figure 5-9, show the range of distance moduli and reddening estimates that are consistent with the data and the uncertainties in the photometry. (The ZAHB is shown as a solid line, while the evolutionary tracks are shown as dotted lines.) It is worth repeating that both the shape of the ZAHB locus and the colour of its blue extension are virtually independent of the metallicity, so that the reddening estimates indicated in Fig. 5-9 reflect a realistic range of values. On the other hand, as equation (5-1) makes clear, distance modulus estimates do depend significantly on the metallicity.

The middle panel of Fig. 5-9 shows the best overall fit. Although the distance modulus, $(m - M)_V = 14.90$, is somewhat larger² than the range of the estimates referred to in §5.1, the reddening, $E(B - V) = 0.03$, is consistent with previously published values. In the upper panel, the fit of the ZAHB to the blue extension looks very good, but it also implies that all of the stars near $V = 15.5$ have undergone significant evolution. Furthermore, it is hard to understand why a 'clump' of stars would develop in this location because Dorman's sequences indicate that the evolutionary rate is relatively rapid here. Considering that the external error estimates in the photometry are $\hat{\sigma}_V = 0.022$ and $\hat{\sigma}_{B-V} = 0.019$ at $V = 16.732$, there also seem to be too many stars "below" the ZAHB. At the other extreme, the fit to the bright end

² If Bolte's zero-point had been adopted, the distance modulus would have been $(m - M)_V = 14.84$, which is also near the top of the range of published estimates.

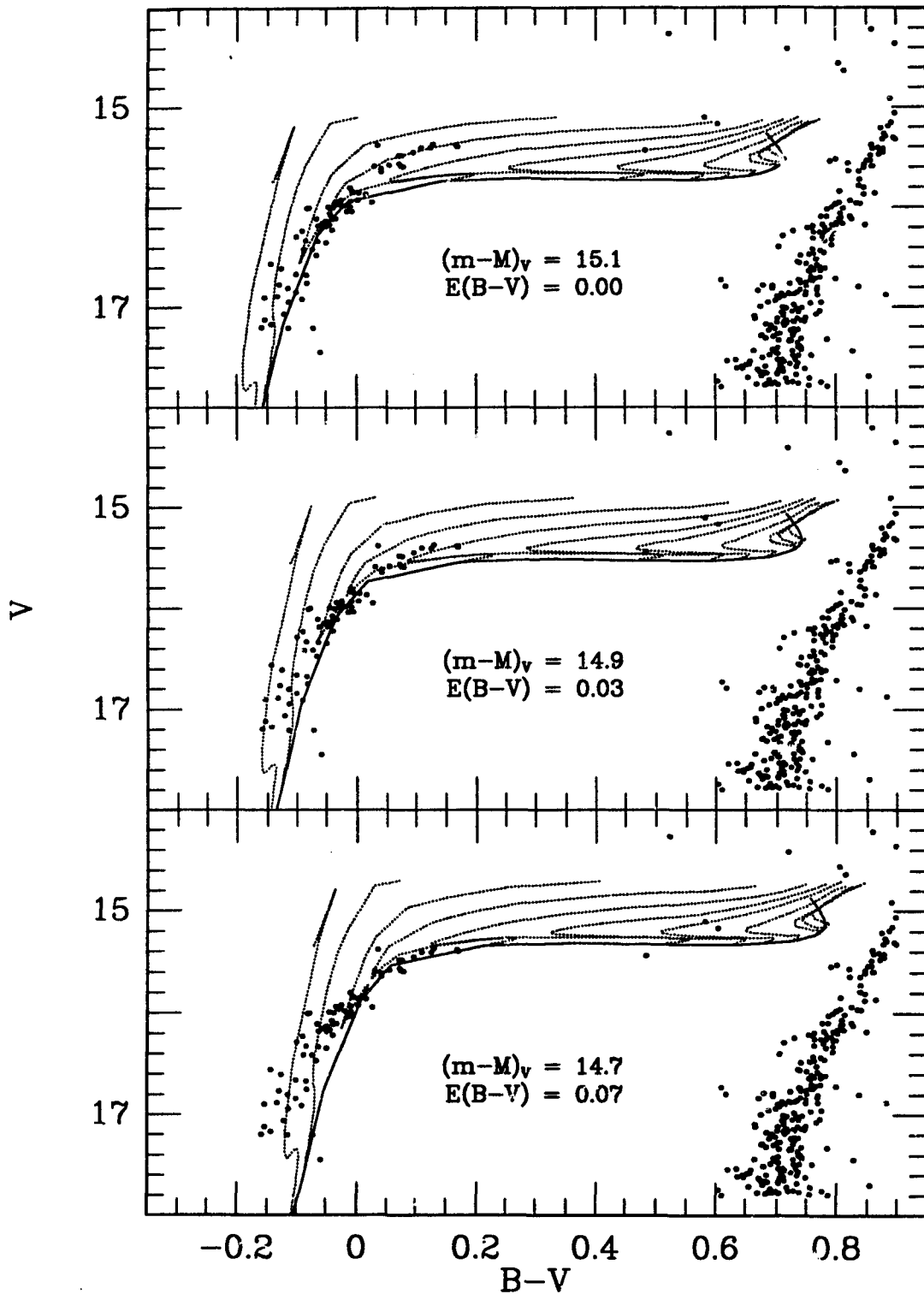


FIGURE 5-9 Three possible ZAHB fits to the observations are illustrated using Dorman's (1992) ZAHB and evolutionary sequences, truncated at $M_V = 0.0$, for $[\text{Fe}/\text{H}] = -1.26$, $[\text{O}/\text{Fe}] = +0.55$, and $Y = 0.236$.

of the BHB in the lower panel looks quite good, but it implies that all of the stars on the lower portion of the blue extension have undergone significant evolution, and the (relatively) high reddening lies outside the range of accepted values for this cluster.

The effect of varying the metallicity on the HB fits is illustrated in Figure 5-10. The middle panel is identical to that in Fig. 9; in other words $(m - M)_V = 14.90$, $E(B - V) = 0.03$ for the $[\text{Fe}/\text{H}] = -1.26$ ZAHB and evolutionary sequences have been adopted, and then equation (5-1) has been used to compute the distance moduli for the other metallicities. The blue end of the HB seems to be fit equally well by all three metallicities, taking into account that the grid for $[\text{Fe}/\text{H}] = -1.48$ starts with a $0.54\mathcal{M}_\odot$ sequence, whereas the other two start with $0.52\mathcal{M}_\odot$ sequences. However, the $[\text{Fe}/\text{H}] = -1.03$ grid seems to extend too far to the red, to the point where the evolved extension of the sequences merge with the RGB, and a metallicity of $[\text{Fe}/\text{H}] = -1.48$ runs contrary to the spectroscopic evidence presented in §5.1. Moreover, when the photometric errors both in V and $B - V$ (see Table 5-3) are considered, the evolutionary sequences for $[\text{Fe}/\text{H}] = -1.26$ seem to reproduce the width in colour of the blue extension, better than either the $[\text{Fe}/\text{H}] = -1.46$ or the $[\text{Fe}/\text{H}] = -1.03$ sequences.

Finally, the comparison of the fiducial sequences with the isochrones of Bergbusch & Vandenberg (1992) for an age of 14 Gyr³, and $[\text{Fe}/\text{H}] = -1.03, -1.26, -1.48$, based on the HB fit in Fig. 5-9, is shown in Figure 5-11. Dorman's (1992) ZAHBs have also been superimposed on the HB observations to illustrate the reddening and distance modulus constraints, and to reinforce the fact that the ZAHB shapes match almost

³ The subgiants would suggest an age slightly greater than 14 Gyr.

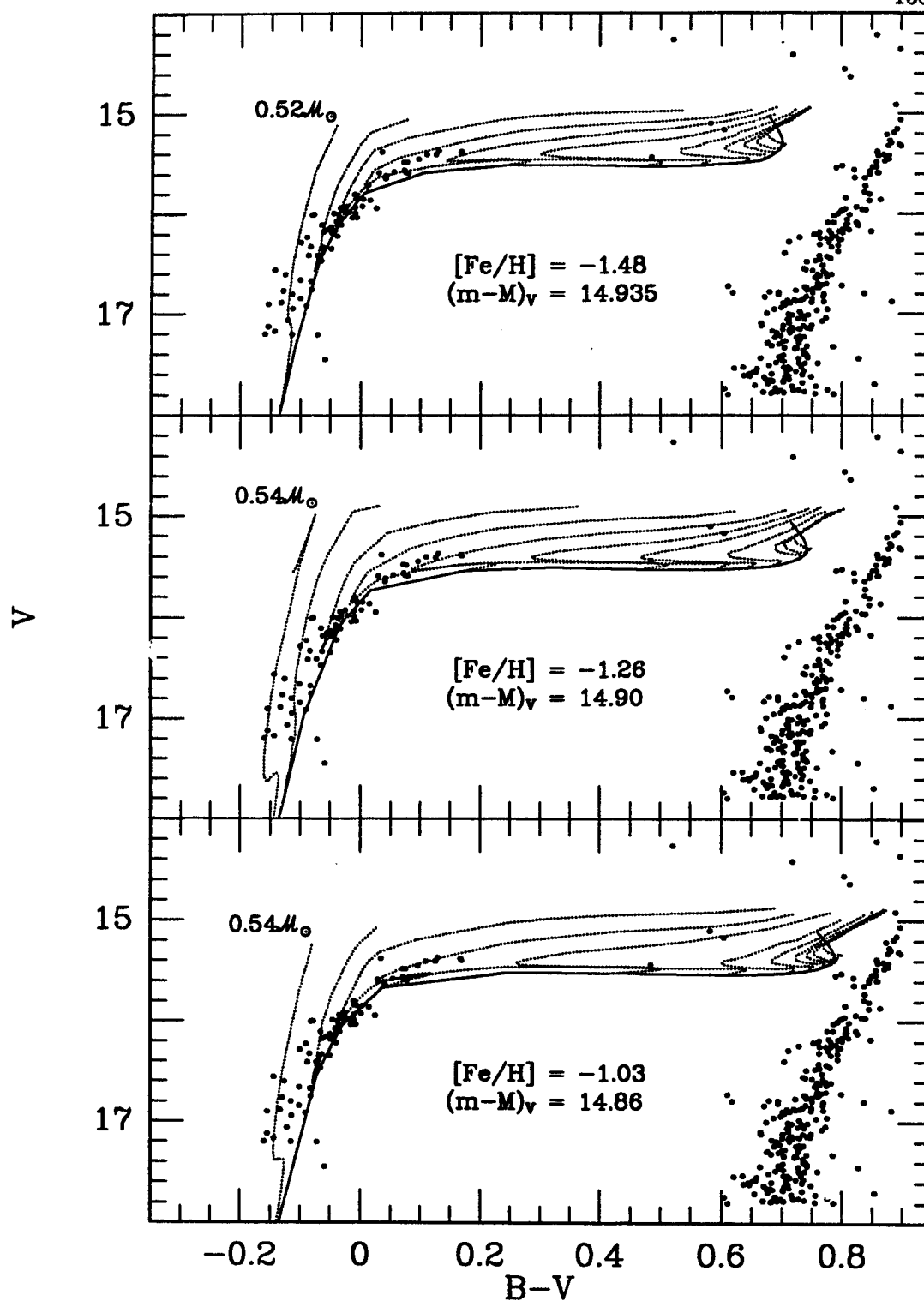


FIGURE 5-10 HB fits for the metallicities given are illustrated, assuming $E(B - V) = 0.03$ for all three cases.

perfectly, except at the extreme red end. The best over-all match is obtained with the $[\text{Fe}/\text{H}] = -1.26$ isochrone; such fine over-all consistency among the locations of the main sequence, turnoff point, giant branch, and horizontal branch cannot be obtained with any other combination of the input parameters. Furthermore, the HB fits do not provide much leeway in selecting the appropriate reddening or distance modulus. For example, a similar fit to the fiducial sequences could be obtained for the $[\text{Fe}/\text{H}] = -1.03$ isochrone if the reddening were increased by ≈ 0.04 mag, but this would force an unacceptable fit to the ZAHB.

Other possibilities, suggested by the fit through the turnoff region in Fig. 5-11, are that either the cluster is younger than 14 Gyr and more metal-rich than $[\text{Fe}/\text{H}] = -1.26$, or else it is older and more metal-poor. These alternatives are explored in Figure 5-12, in which attempts have been made to produce equivalent fits to the turnoff luminosity and colour for 12, 14, and 16 Gyr isochrones and the three metallicities $[\text{Fe}/\text{H}] = -1.03, -1.26, -1.48$. The distance moduli and the reddening estimates required to produce the 12 Gyr, $[\text{Fe}/\text{H}] = -1.03$ and the 16 Gyr, $[\text{Fe}/\text{H}] = -1.48$ fits are reasonably compatible with the ZAHB fits shown in Figs. 5-9 and 5-10, in the sense that an increase in the distance modulus is matched by a decrease in the reddening. However, neither of these alternatives provides as good a simultaneous fit to the main-sequence, turnoff, and RGB loci, and which is consistent with the ZAHB fit, as does the 14 Gyr isochrone. On this basis, the preferred parameters for NGC 288 are: Age = 14 Gyr, $[\text{Fe}/\text{H}] = -1.26$, $[\text{O}/\text{Fe}] = +0.55$, $Y = 0.236$, $(m - M)_V = 14.90$, and $E(B - V) = 0.03$.

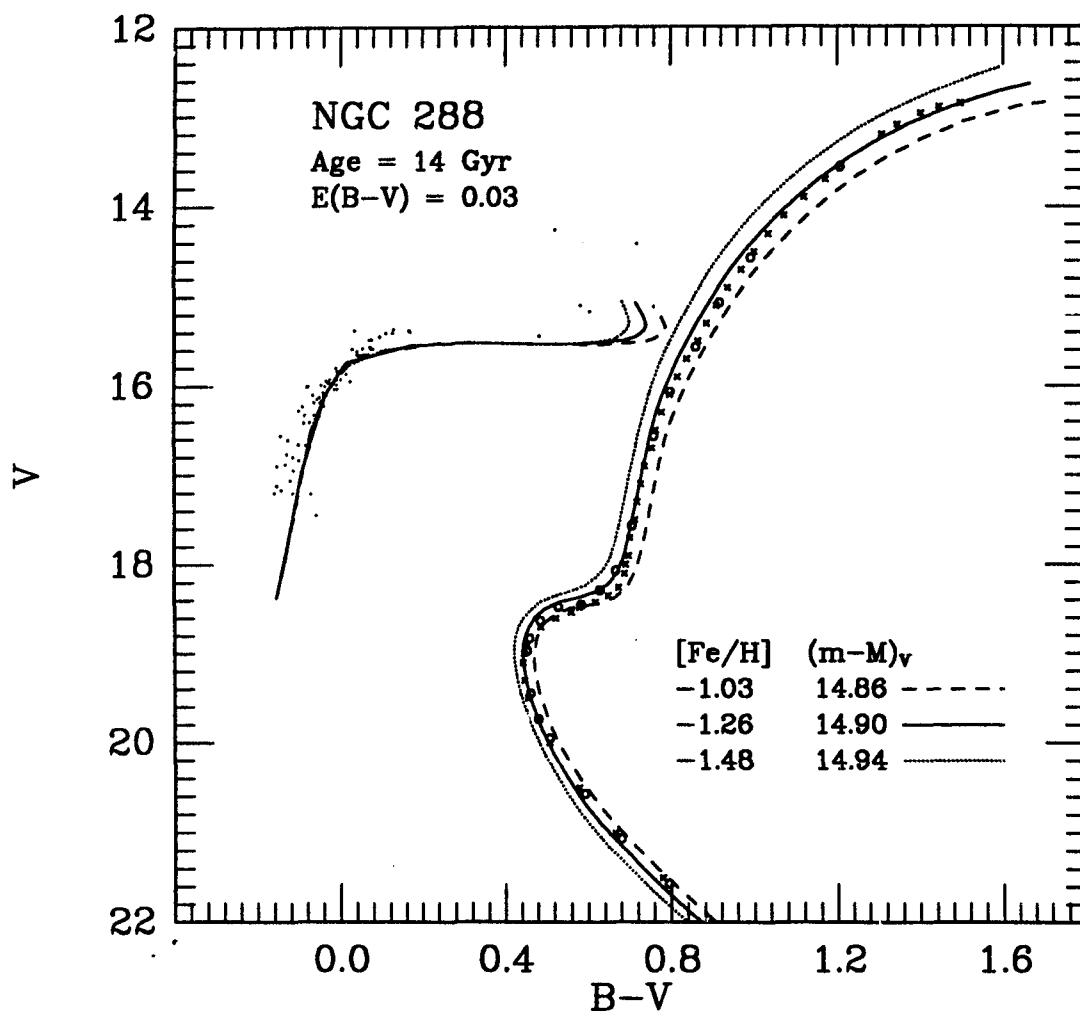


FIGURE 5-11 Isochrone fits to the fiducial sequences for the parameters indicated. The ZAHBs for the three cases have been superimposed on the HB observations to reinforce the fact that the shape of the ZAHB at the blue end is insensitive to metallicity.

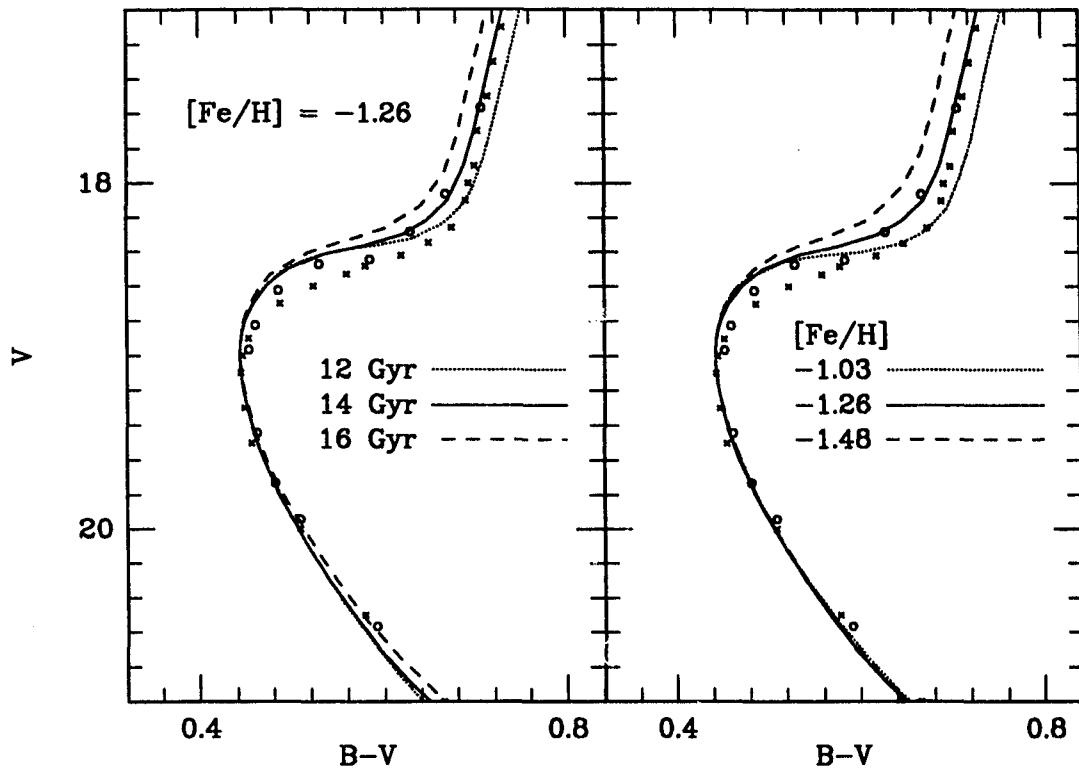


FIGURE 5-12 Alternate fits through the turnoff region for 12 and 16 Gyr isochrones are compared to the $[\text{Fe}/\text{H}] = -1.26$, 14 Gyr. In the left panel, the following distance moduli and reddenings have been applied to force agreement at the turnoff: (12 Gyr, 15.038, 0.049); (14 Gyr, 14.900, 0.030); (16 Gyr, 14.734, 0.014). In the right panel, the line types indicate the same ages as in the left panel, but agreement at the turnoff has been forced for the metallicities indicated by applying the following distance moduli and reddenings: (12 Gyr, -1.03, 14.952, 0.020); (14 Gyr, -1.26, 14.900, 0.030); (16 Gyr, -1.48, 14.819, 0.037).

5.5 The Luminosity Function

Inspection of Fig. 5-2 suggests that, before the observed and predicted luminosity functions can be compared, some attempt must be made to remove those stars (i.e., blue stragglers, AGB, and field stars) which do not properly correspond to the evolutionary state, from the main sequence through to the RGB tip. The criteria that are adopted to extract just these stars from the CMD may be somewhat subjective, but their application must at least result in a 'cleaned' CMD that does not differ significantly in appearance from that of the recovered artificial stars, so that the artificial star statistics may be applied to the program stars with reasonable confidence.

Because NGC 288 is at a high galactic latitude, the contamination of the cluster sample by field stars is negligible, even at the level of the turnoff, so no attempt has been made to estimate this component by observing background fields near the cluster. The procedure adopted for cleaning the CMD makes use of the fiducial sequence from the main sequence to the RGB tip (see Fig. 5-4) together with the estimates of the external errors $\hat{\sigma}_V$ and $\hat{\sigma}_{B-V}$. Tests were made at increments of 0.001 mag along the fiducial sequence to determine whether stars were contained within the error ellipsoid defined by

$$\left(\frac{\Delta V}{3\sigma_V + 0.01}\right)^2 + \left(\frac{\Delta(B - V)}{3\sigma_{B-V} + 0.01}\right)^2 = 1, \quad (5-2)$$

where ΔV and $\Delta(B - V)$ are the differences between the *observed* magnitudes and colour indices for a program star and the test point on the fiducial sequence, and σ_V and σ_{B-V} are obtained from the hand-drawn loci shown in Figure 5-13.

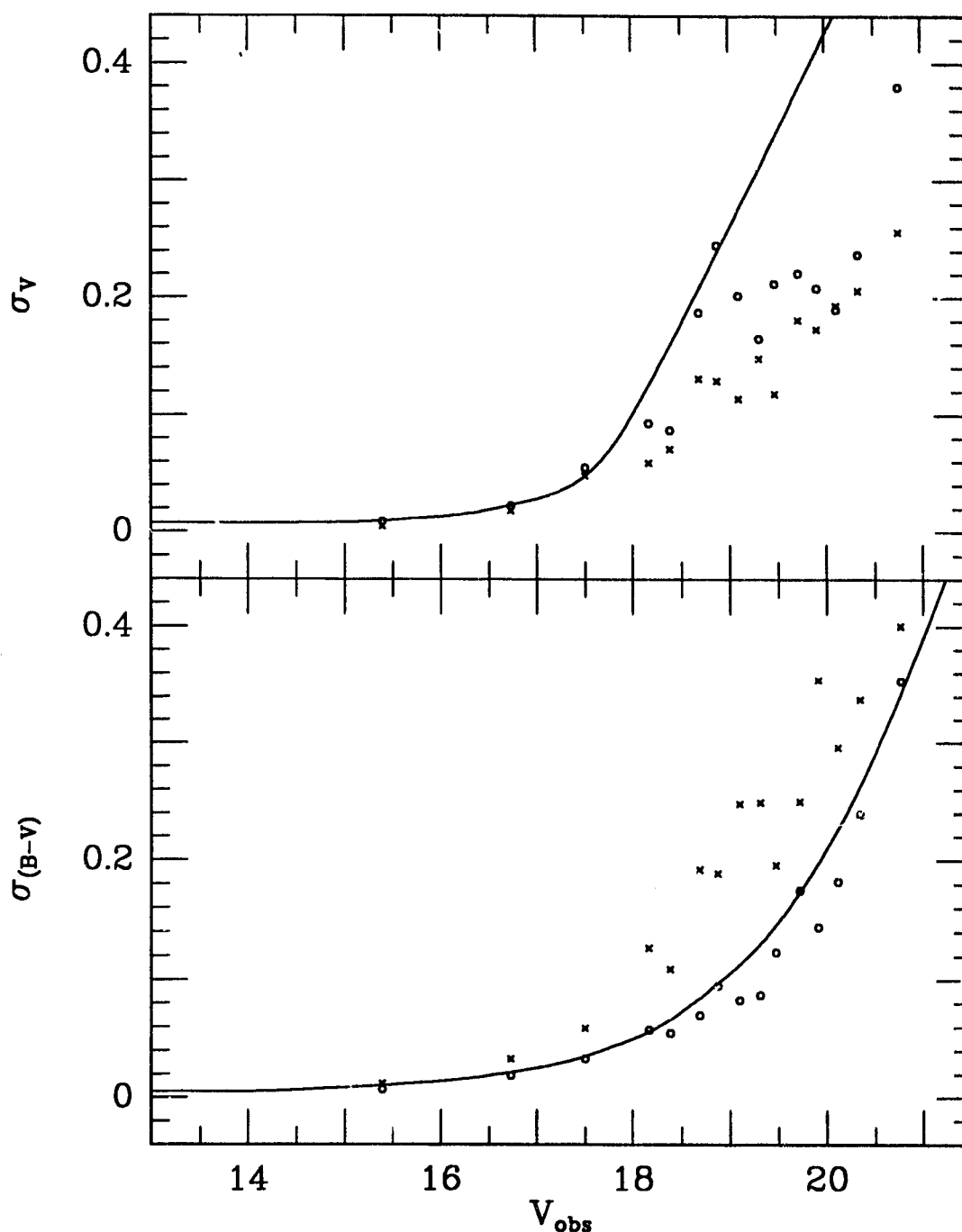


FIGURE 5-13 External ($\circ$) and internal ($\times$) errors, from Table 5-3, as a function of the observed magnitude. For σ_V it should be noted that the error estimates for $V > 19$ are increasingly affected by the constraint imposed on faint star detections, illustrated in Fig. 5-7, in the sense that the errors tend to be underestimated. Therefore, little weight was given to the data points fainter than $V = 19$ when drawing the σ_V curve.) The curves are hand-drawn estimates of the relations used to clean the CMD.

The cleaned CMD, shown in Figure 5-14, compares quite favourably with the artificial star CMD in Fig. 5-6. To be rigorously correct in the application of the artificial star statistics, the same test should have been applied to the recovered artificial stars — in fact, it was done — but the differences in the results are not significant enough to warrant consideration. The essential points to recognize here are that the obvious AGB component (even the star near $V = 13.3$) has been excised, as has the obvious blue straggler component, but the faint component (where the size of the sample is large) has been left virtually untouched. Nevertheless, there probably remains a small, negligible straggler component in the sample just above the turnoff.

The probability distribution analysis described in Chapter 3, employing the parameters (computed from the output of the artificial star tests, as described in Chapter 4) given in Figure 5-15 was used to compute the completeness of the sample as a function of magnitude. The initial estimate of the true LF was made with a 14 Gyr model LF for the abundance parameters and distance modulus quoted in §5.4, and a power law mass spectrum exponent $x = +0.5$, which, according to McClure *et al.* (1986), seems to be appropriate for moderately metal-rich clusters.⁴ It is clear from the hand-drawn loci for the brightward scattering bias, δ , and the recovery probability, F , that the analysis for stars fainter than $V \approx 20.5$ is subject to considerable uncertainty. The results of the probability distribution analysis are given in Table 5-4.

The completeness fractions, f_i , are plotted in Figure 5-16 together with the hand-

⁴ In any case, the exponent for the power law mass spectrum has little effect on the shape of the LF for stars brighter than $M_V \approx 5$, so it has almost no effect on the analysis.

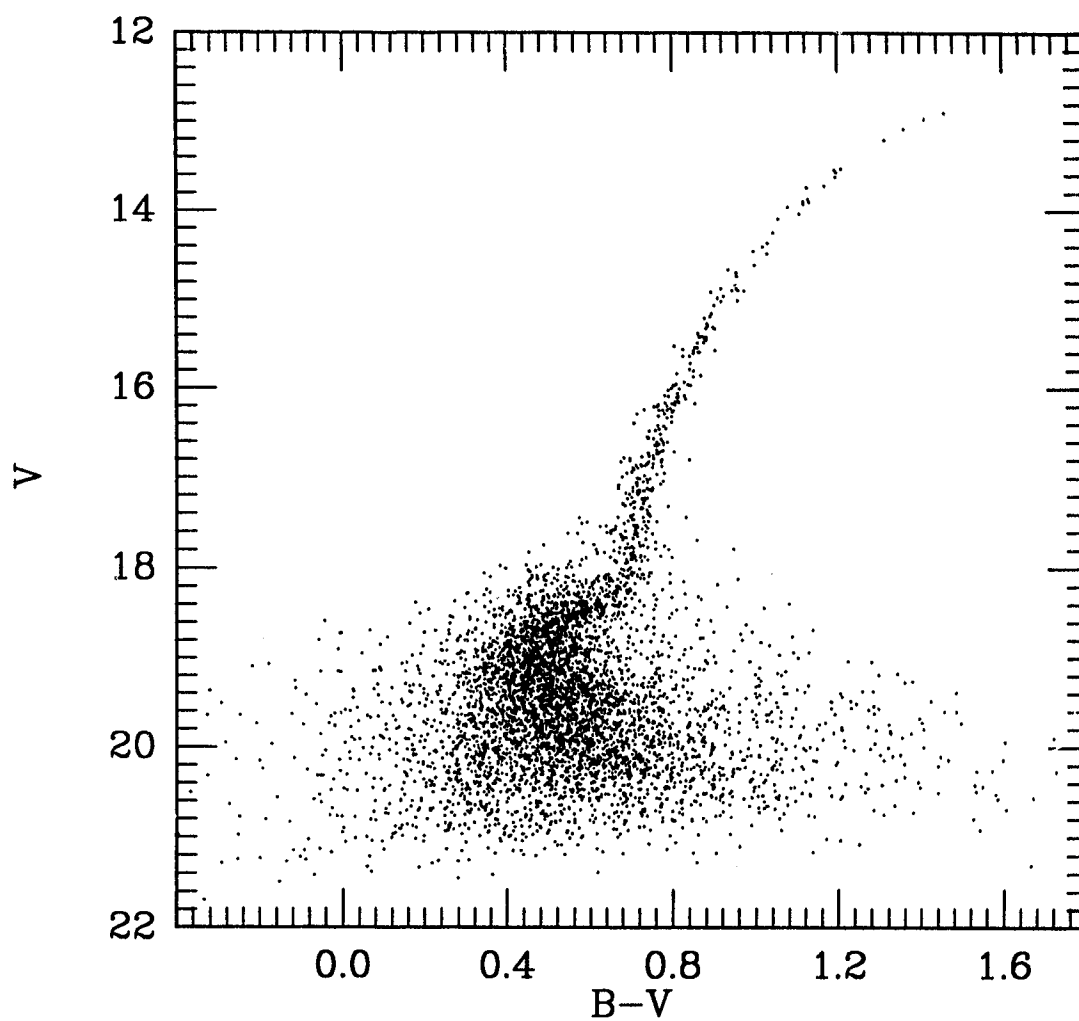


FIGURE 5-14 The cleaned CMD restricted to those stars which are in pre-helium flash evolutionary stages.

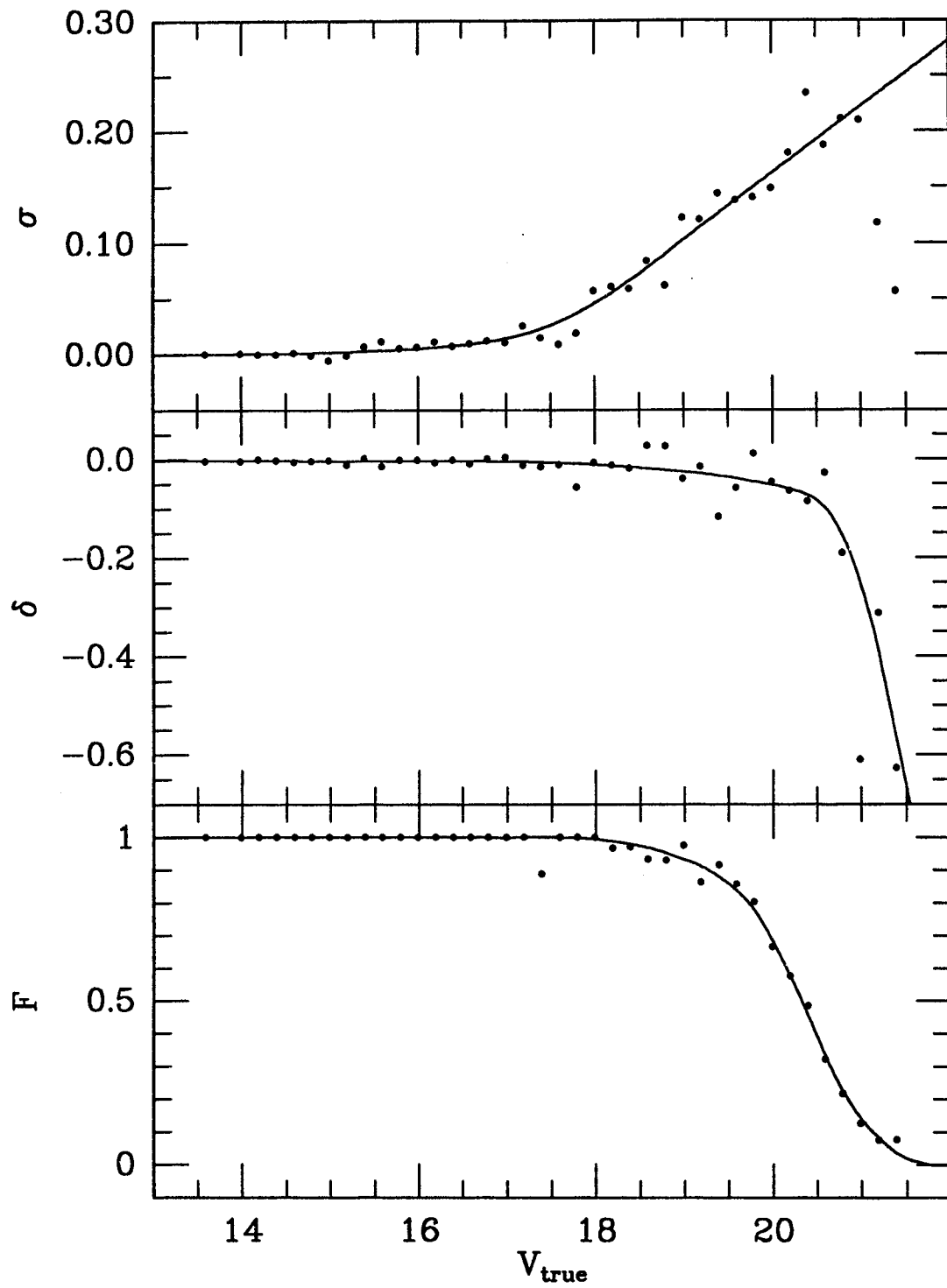


FIGURE 5-15 Probability distribution parameters as a function of the input magnitude. The data represent the estimated mean values obtained from 0.2 mag bins. The smooth curves are hand drawn estimates of the relations.

Table 5-4. Artificial star completeness fractions

V_i	$\tilde{N}_i$	N_i^A	$\mathcal{N}_i^A$	f_i
12.9	2	2.00	1.99	1.00399
13.1	1	1.00	0.97	1.02629
13.3	1	1.00	1.01	0.99035
13.5	3	3.00	3.08	0.97246
13.7	3	3.00	3.01	0.99718
13.9	5	5.00	5.06	0.98884
14.1	2	2.00	1.92	1.04403
14.3	2	2.00	2.00	0.99972
14.5	3	3.00	3.02	0.99216
14.7	4	4.00	4.01	0.99771
14.9	9	9.00	9.14	0.98460
15.1	5	5.00	4.89	1.02174
15.3	8	8.00	7.96	1.00453
15.5	16	16.00	16.20	0.98784
15.7	5	5.00	4.82	1.03817
15.9	11	11.00	11.03	0.99700
16.1	18	18.00	18.08	0.99539
16.3	17	17.00	17.00	0.99982
16.5	13	13.00	12.86	1.01082
16.7	22	22.00	22.09	0.99574
16.9	23	23.00	22.82	1.00783
17.1	32	31.99	32.23	0.99265
17.3	23	23.01	22.35	1.02947
17.5	35	35.00	34.77	1.00639
17.7	40	39.92	39.49	1.01098
17.9	47	47.37	43.99	1.07685
18.1	93	92.06	90.87	1.01309
18.3	158	159.75	144.50	1.10574
18.5	265	263.90	262.51	1.00531
18.7	322	319.93	320.72	0.99753
18.9	373	379.08	378.65	1.00115
19.1	454	444.94	469.55	0.94759
19.3	479	487.25	521.10	0.93505
19.5	512	509.21	585.56	0.86961
19.7	507	501.39	612.50	0.81859
19.9	458	475.44	643.20	0.73918
20.1	442	426.71	716.40	0.59564
20.3	364	348.04	717.94	0.48477
20.5	252	270.62	614.58	0.44034
20.7	176	200.37	584.57	0.34276
20.9	118	117.12	704.07	0.16635
21.1	51	44.86	962.03	0.04663
21.3	22	10.33	1250.09	0.00827
21.5	5	1.40	1639.35	0.00085
21.7	2	0.11	2249.29	0.00005

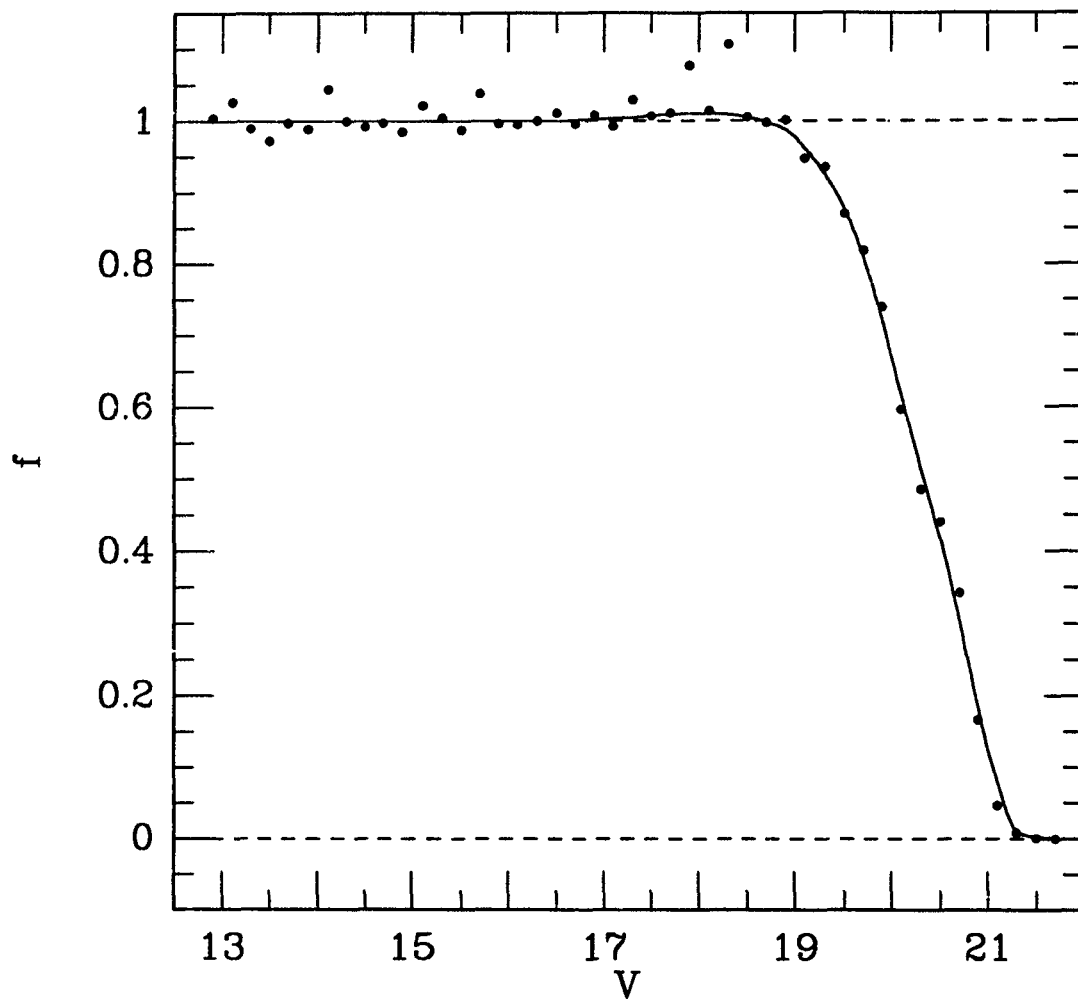


FIGURE 5-16 The rectification factor as a function of the observed magnitude. The smooth curve is a hand-drawn estimate of the true relation. Between $17 \leq V \leq 19$, the LF appears to be enhanced by a small amount ($\approx 1\%$). This is probably due to the combined effects of preferential brightward scattering in the photometry and to the shape of the LF as it rapidly rises by more than 1 dex in this interval.

drawn curve used to estimate the factor required to rectify the observed LF. The one unusual feature in this diagram, is that the recovered sample seems to be slightly over-complete between $17 < V < 19$ — these are the magnitude bins which span the rather large break in the LF that occurs just above the level of the turnoff. Such an effect might be anticipated because stars tend to be scattered brightward (see Fig. 5-7), and the numbers of stars at fainter magnitudes rapidly increases through this region. The significance of this enhancement is difficult to judge from the present data, but the adopted locus suggests that it amounts to $\approx 1\%$, and this will not seriously interfere with the interpretation of the LF. The rectified LF and the rectification factors are listed in Table 5-5.

Table 5-5. Rectified luminosity function

V_i	$\tilde{N}_i$	f_i	$\log N_i$	V_i	$\tilde{N}_i$	f_i	$\log N_i$
12.9	2	1.0000	0.3010	17.3	23	1.0043	1.3599
13.1	1	1.0000	0.0000	17.5	35	1.0071	1.5410
13.3	1	1.0000	0.0000	17.7	40	1.0089	1.5982
13.5	3	1.0000	0.4771	17.9	47	1.0099	1.6678
13.7	3	1.0000	0.4771	18.1	93	1.0099	1.9642
13.9	5	1.0000	0.6990	18.3	158	1.0050	2.1965
14.1	2	1.0000	0.3010	18.5	265	0.9982	2.4240
14.3	2	1.0000	0.3010	18.7	322	0.9875	2.5133
14.5	3	1.0000	0.4771	18.9	373	0.9617	2.5887
14.7	4	1.0000	0.6021	19.1	454	0.9252	2.6908
14.9	9	1.0000	0.9542	19.3	479	0.8755	2.7381
15.1	5	1.0000	0.6990	19.5	512	0.8083	2.8017
15.3	8	1.0000	0.9031	19.7	507	0.7198	2.8478
15.5	16	1.0000	1.2041	19.9	458	0.6156	2.8715
15.7	5	1.0000	0.6990	20.1	442	0.5134	2.9349
15.9	11	1.0000	1.0414	20.3	364	0.4152	2.9429
16.1	18	1.0000	1.2553	20.5	252	0.3038	2.9188
16.3	17	1.0000	1.2304	20.7	176	0.1817	2.9861
16.5	13	1.0000	1.1139	20.9	118	0.0799	3.1695
16.7	22	1.0011	1.3420	21.1	51	0.0112	3.6584
16.9	23	1.0021	1.3608	21.3	22	0.0030	3.8624
17.1	32	1.0032	1.5038	21.5	5	0.0014	3.5591

The first attempt to reconcile model LFs with the observations is shown in Figure 5-17, where 14 Gyr model LFs with $[\text{Fe}/\text{H}] = -1.26$ for mass spectrum exponents spanning the range $-1.5 \leq x \leq +0.5$ are compared with the data through the transition from the main sequence to the RGB. Normalization on the RGB was obtained by comparing the model and observed CLFs at $V = 17.8$ — i.e., the normalization ensures that the models predict the same total number of RGB stars as were found along the observed RGB. The error bars plotted on the unrectified LF indicate a 1σ Poisson error. (At $V = 17.7$, it amounts to ± 0.07 dex, while at $V = 19.1$, where the sample is almost 93% complete, the 1σ error amounts to ± 0.02 dex.)

The observations are best matched by the $x = -0.5$ case, which is somewhat lower than anticipated for a moderately metal rich cluster according to McClure *et al.* (1986). However, since these observations do not probe the faint end of the mass spectrum, the relatively flat LF through the turnoff region may simply be a manifestation of the dip feature recognized in M92's LF (see §1.3.2). On the other hand, the sample is only $\approx 65\%$ complete at $V = 20$, so relatively small adjustments to the rectification factors could alter the locus of the rectified LF below $V = 19$ significantly. Regardless of which of these possibilities turns out to be correct, further comparisons will be made with $x = -0.5$ model LFs.

The composition parameters and the distance modulus employed in Fig. 5-17 are the preferred values obtained from the ZAHB and isochrone fits derived in §5.4. While the agreement between the models and the observations is remarkable, it is worthwhile to explore alternative model parameters, to see how strongly the LF constrains them. In the upper panel of Figure 5-18, comparisons through the transition region are made

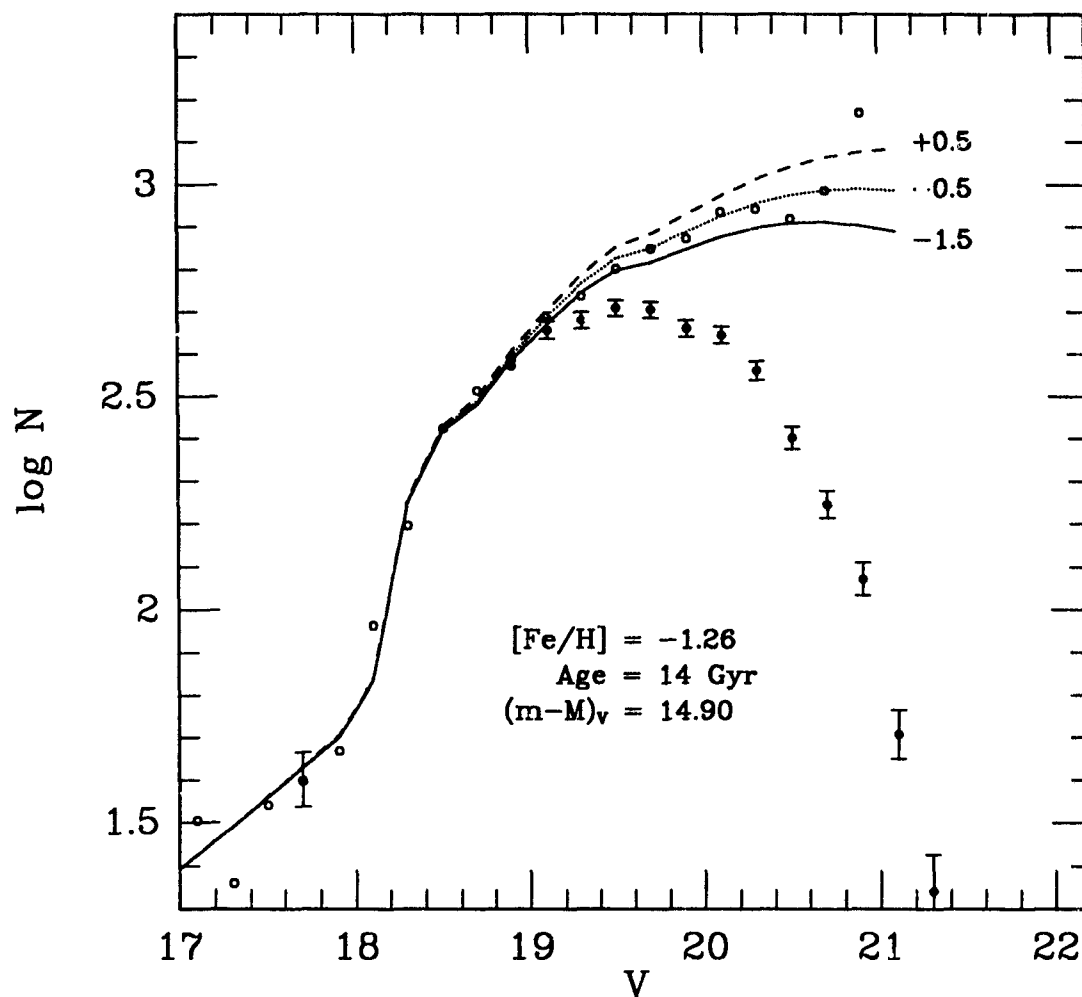


FIGURE 5-17 Model LFs for the parameters indicated are superimposed on the rectified (o) LF for the transition from the main sequence to the RGB. The power law mass spectrum exponents are indicated adjacent to the relevant model curve. The raw observed LF (•) is also plotted with 1σ Poisson error bars to indicate the statistical significance of the match. Normalization has been accomplished by requiring agreement between the model and observed CLFs at $V = 17.8$

with 14 Gyr model LFs for $-1.48 \leq [\text{Fe}/\text{H}] \leq -1.03$. For these comparisons, the distance modulus for the $[\text{Fe}/\text{H}] = -1.26$ fit has been adopted, and then agreement in luminosity at the turnoff has been forced for the other two cases. Again, normalization was accomplished by requiring agreement in the observed and model CLFs at $V = 17.8$. The feature that most clearly distinguishes the three cases illustrated is the subtle bump associated with the transition between the turnoff and the RGB: this is best matched by the model for $[\text{Fe}/\text{H}] = -1.26$ — further reinforcing the results obtained from the isochrone fits. It should be pointed out, however, that neither one of the alternative fits has a serious impact on the ZAHB fits in Figs. 5-9 and 5-10, because the range of distance moduli required by the LF fits can easily be accommodated by small adjustments to the reddening estimates in a manner consistent with the range of published values.

The RGB LF, shown in the lower panel, is difficult to interpret because of the relatively large amount of scatter in the data. Although the bin centered at $V = 15.5$ does contain a small excess of stars, and although it is close to the predicted location of the RGB bump, the statistical contrast is not large enough to make this identification convincing. It is more likely a manifestation of unaccounted for random processes in star formation and evolution. First of all, the stellar sample is known to be 100% complete at least 1 mag fainter than the bump, so the structure apparent in the RGB LF is real insofar as it reflects what is truly present in the observed sample. Even so, some of the structure could be altered simply by choosing different centres for the magnitude bins. The question is, how well does the observed sample represent the total cluster population? Secondly, regardless of whether the canonical models are

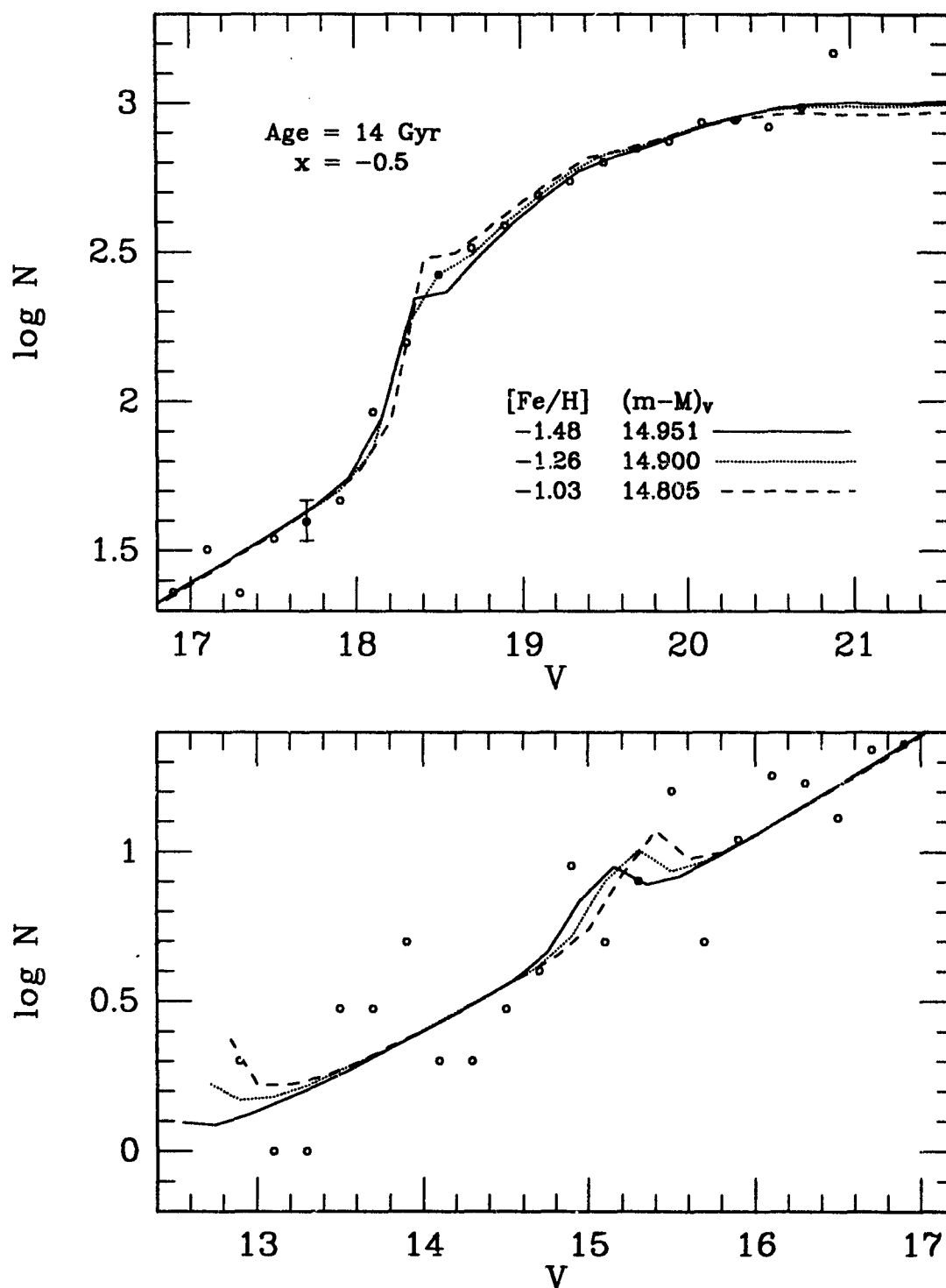


FIGURE 5-18 Model LFs for the parameters indicated are superimposed on the rectified LF. The location and size of the transition bump (upper panel) is best matched by the $[\text{Fe}/\text{H}] = -1.26$ model, while the RGB bump and tip magnitudes (lower panel) appear to be best matched by the $[\text{Fe}/\text{H}] = -1.03$ case.

correct, the observed sample is too small to reproduce a smooth model locus — but even if every RGB star brighter than $V = 16.5$ in the entire cluster had been counted, structure would likely be evident in the observed LF that would not be present in the models.

The effects of age on the interpretation of the LF through the transition are examined in Figure 5-19. In the upper panel, assuming that $[\text{Fe}/\text{H}] = -1.26$ is an accurate estimate of the metallicity for NGC 288, both the 14 and 16 Gyr fits are acceptable, but the 12 Gyr case overestimates the size of the transition bump. Attempts to achieve comparable fits by simultaneously varying the age and the metallicity, illustrated in the lower panel, do not succeed in matching the morphology of the transition nearly as well as do the $[\text{Fe}/\text{H}] = -1.26$ models. An argument against any of the 16 Gyr cases is that the corresponding distance moduli require reddenings near 0.07 mag to ensure reasonable ZAHB fits. (The general trend, conditioned by the ZAHB fits, is for the reddening to increase with decreasing distance modulus. This runs contrary to what one would expect at the turnoff; for an increase in age, at a given metallicity, there must be a decrease in both the distance modulus and the reddening.)

The giant branch CLF is compared with the models in Figure 5-20. The location of the RGB bump in the observed CLF, as indicated by the break in the slope near $V = 15.3$, is 0.2–0.4 mag fainter than predicted by all of the models. If an age of 14 Gyr (shown in the upper panel) is correct, then the $[\text{Fe}/\text{H}] = -1.03$ CLF seems to provide a marginally better fit — it also does a better job of predicting the magnitude at the RGB tip. On the other hand, if $[\text{Fe}/\text{H}] = -1.26$ (shown in the lower panel) is

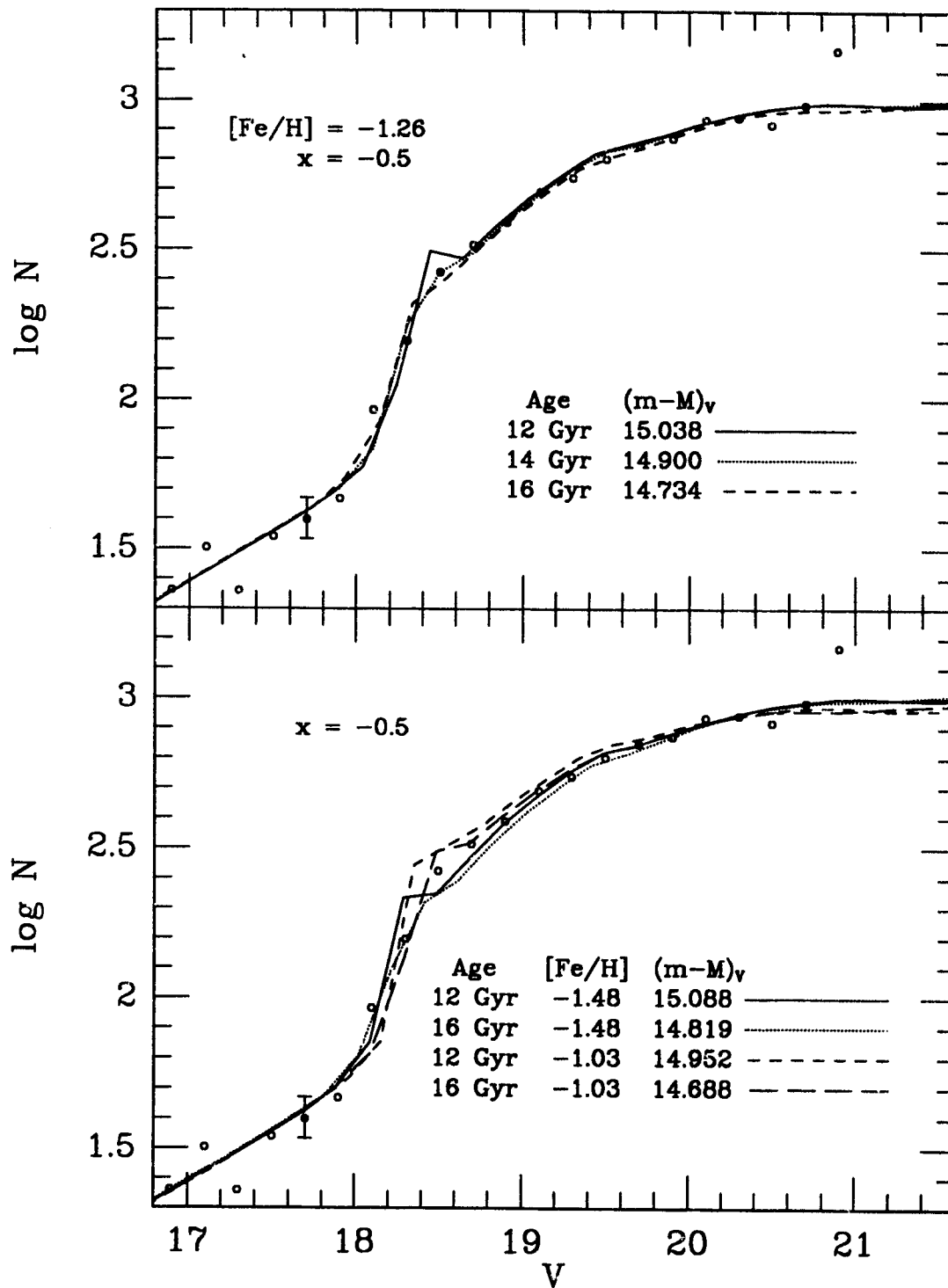


FIGURE 5-19 Model LFs for the parameters indicated are superimposed on the rectified (o) LF for the transition from the main sequence to the RGB. The fit that is most consistent with the size and location of the transition bump is the 14 Gyr, $[\text{Fe}/\text{H}] = -1.26$ case.

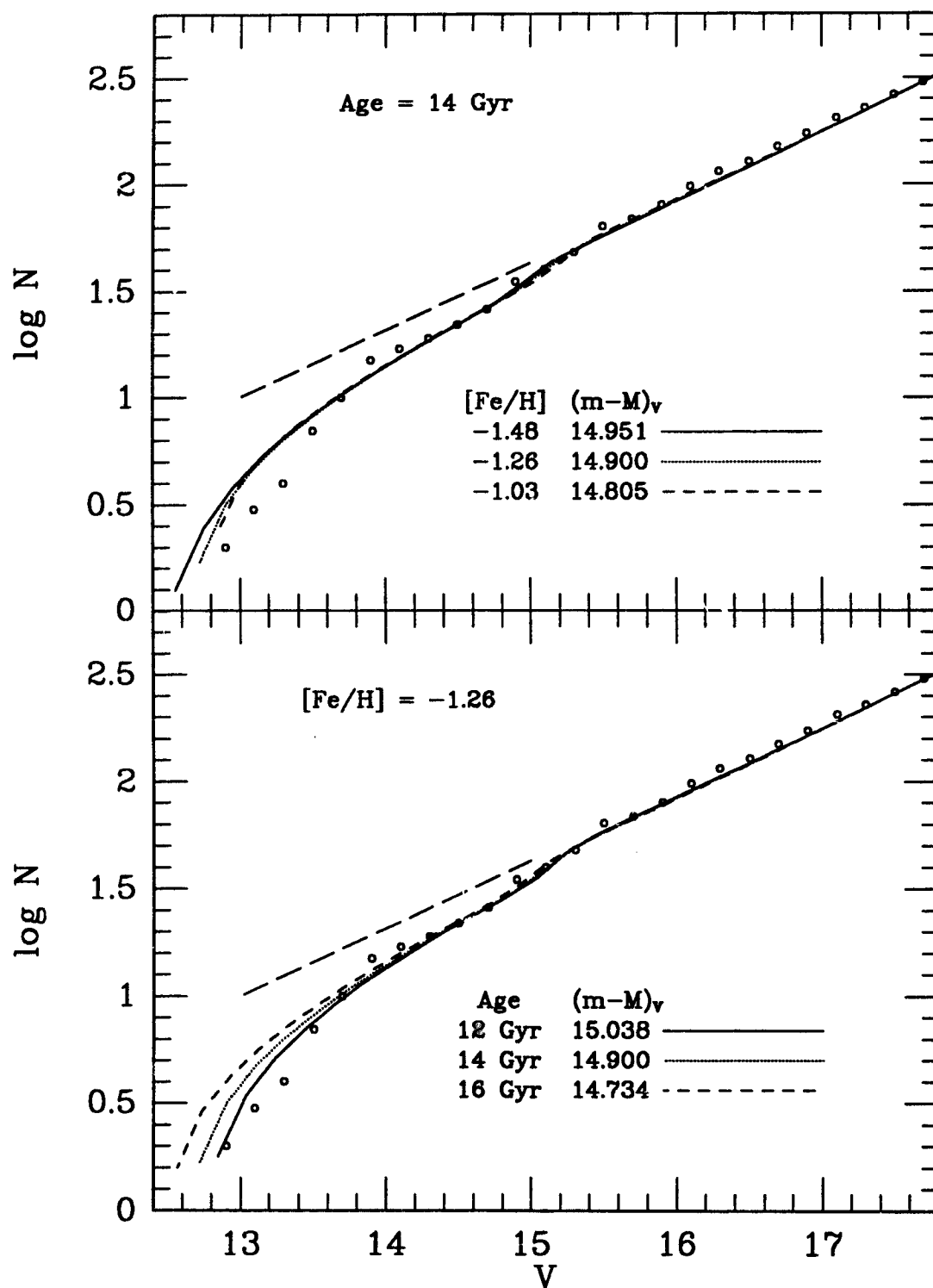


FIGURE 5-20 Model CLFs for the parameters indicated are superimposed on the rectified RGB CLF. The slope of the observed CLF along the lower RGB, indicated by the dashed line, differs slightly from the model CLF slopes.

correct, then the 12 Gyr CLF provides the best fit to both the bump and the RGB tip magnitude. However, these distinctions are somewhat artificial: for one thing, the bolometric corrections for cool stars are highly sensitive to temperature (see Fig. 7, in VandenBerg 1992), and for another, the location of the RGB bump is also sensitive to convective overshooting (*cf.* Alongi *et al.* 1991). Perhaps the most surprising feature of these comparisons is that the slope of the observed CLF (indicated by the long-dashed line) below the level of the RGB bump is slightly shallower than predicted by the models, which implies that the bump contribution is somewhat larger than expected.

5.6 The Helium Abundance

The basic principles underlying the *R*-method determination of the helium abundance have been outlined in §1.2. The recent calibrations by Buzzoni *et al.* (1983) and by Caputo *et al.* (1987)⁵ are both based on the HB and RGB models of Sweigart & Gross (1976 & 1978, respectively), which do not include the metallicity-dependent oxygen enhancements employed in the Bergbusch & VandenBerg (1992) isochrones and LFs and also in Dorman's (1992) synthetic HBs. A calibration of the *R*-method using these more recent tabulations has not yet been performed — but if the degree, or at least the sense, of the oxygen enhancements is correct, the use of scaled solar abundances may produce an apparently metal-dependent variation in *Y* from well-observed cluster HBs and RGBs. Indeed, Dorman (1992) suggests that HB morphology is more strongly affected by the CNO abundances — through their effect on

⁵ The recalibration of the *R*-method by Caputo *et al.* was intended to correct the Buzzoni *et al.* calibration for the effects of HB morphology.

the HB stellar mass distribution — in metal-poor clusters than in metal-rich clusters.

From Buzzoni *et al.* (1983) the following two relations may be used to estimate the helium abundance:

$$Y(R) = 0.380 \log R + 0.176, \quad (5-3)$$

$$Y(R') = 0.457 \log R' + 0.204, \quad (5-4)$$

where $R = N_{HB}/N_{RGB}$, $R' = N_{HB}/(N_{RGB} + N_{AGB})$, and N_{RGB} is the number of stars on the RGB above the level of the ZAHB. Both NGC 288 and NGC 7099 (to be discussed in Chapter 6) have blue horizontal branches, so from Caputo *et al.* (1987) the relation

$$Y(R_{0.9}) = 0.461 \log R_{0.9} + 0.168 \quad (5-5)$$

may be used for both of them, where $R_{0.9}$ is the relation defined for clusters in which $B/(B + R) = 0.9$.

Adoption of $[\text{Fe}/\text{H}] = -1.26$ for the metallicity of NGC 288 in equation (5-1) gives $M_V = 0.621$ as the absolute magnitude of the ZAHB at $B - V = 0.35$, or $V_{HB} = 15.521$ for the apparent magnitude. In most cases, it is not difficult to distinguish which of the stars belong separately to the RGB, HB, or AGB (e.g., compare Figs. 5-2 and 5-14), but a few of them occupy regions of the CMD that makes their status unclear or ambiguous. (For example, the star near $V = 14.2$, $B - V = 0.52$ may not be a cluster member, and the 5th brightest star could be either an AGB or an RGB star.) Buzzoni *et al.* separated the AGB from the RGB simply by comparing the selection made by each of the four authors involved, and then averaged these results; the division between the AGB and the HB was set at 1 mag above the ZAHB on the

evidence of Gingold's (1974, 1976) evolutionary sequences. According to Dorman's (1992) evolutionary sequences for $[\text{Fe}/\text{H}] = -1.26$, all of the HB stars in NGC 288 have masses between $0.52\text{--}0.62\mathcal{M}_{\odot}$. For the brightest case ($0.62\mathcal{M}_{\odot}$), HB evolution terminates at $M_V = -0.281$, which places the division between the HB and the AGB in the current study at $V = 14.619$, confirming the visual impression obtained from Fig. 5-2. However, the principal source of uncertainty in the estimates of Y via the R -method is the distance modulus itself, for which a reasonable (perhaps generous) error estimate of ± 0.1 mag introduces an uncertainty of $^{+11}_{-6}$ in N_{RGB} . Consideration of all these factors leads to the following estimates: $N_{RGB} = 56^{+11}_{-6}$, $N_{HB} = 77 \pm 1$, and $N_{AGB} = 11 \pm 1$ which, when inserted in equations (5-3) through (5-5), give $Y(R) = 0.229^{+0.017}_{-0.029}$, $Y(R') = 0.232^{+0.017}_{-0.030}$, and $Y(R_{0.9}) = 0.232^{+0.020}_{-0.036}$. These values fall nicely within the range of the mean Y -values obtained by Buzzoni *et al.* (1983) ($Y = 0.23 \pm 0.02$) and Caputo *et al.* (1987) ($Y = 0.24 \pm 0.01$), and are very close to the primordial helium abundance ($Y_p = 0.235$) adopted by Denegri *et al.* (1990). Furthermore, they are in excellent agreement with the helium abundance, $Y = 0.236$, adopted for Vandenberg's (1992) $[\text{Fe}/\text{H}] = -1.26$ evolutionary sequences.

5.7 Discussion

The most significant result of this investigation is that it has been possible to achieve a high degree of internal consistency by simultaneously matching a $[\text{Fe}/\text{H}] = -1.26$, $[\text{O}/\text{Fe}] = +0.55$, $Y = 0.236$ model ZAHB, together with a 14 Gyr isochrone and LF (for the same abundances) to the data. The estimated reddening, $E(B-V) = 0.03$, obtained from the ZAHB fit is essentially independent of the adopted metallicity,

but the distance modulus obtained from the same fit depends only on the abundance parameters. Based on the spectroscopic evidence reviewed in §5.1, $[\text{Fe}/\text{H}] \approx -1.3$ seems appropriate for the cluster, which then gives $(m - M)_V = 14.90$ (subject to a possible zero-point error in the photometry amounting to ≈ 0.064 mag, in the sense that the cluster may be closer than assumed). Once these two parameters are set, the match referred to above is virtually unique. However, an age between 14–16 Gyr, and/or a metallicity within the range $-1.26 \leq [\text{Fe}/\text{H}] \leq -1.03$ could also be inferred from the CMD (see Fig.5-11).

A particularly encouraging aspect of the LF fit is that when normalization is enforced along the lower giant branch, the morphology of the transition from the main sequence through to the base of the RGB is tightly constrained by the metallicity, and to a lesser extent by the age. The possibility of obtaining even more populous samples of cluster stars than presented in this study certainly bodes well for this region of the LF as a diagnostic of these two parameters. The situation for the RGB LF is less optimistic. The observed location of the RGB bump is ≈ 0.4 mag fainter than predicted by the $[\text{Fe}/\text{H}] = -1.26$ model. Both the location of the bump and the RGB tip would be better matched by a decrease in the age and/or an increase in the metallicity. Certainly, there is spectroscopic evidence in favour of a higher metallicity for the cluster (e.g., Dickens *et al.* 1991, find $[\text{Fe}/\text{H}] = -1.0$).

The standard approach to the 2nd parameter problem is to compare clusters with similar metallicities, but different HB morphologies (e.g., M3 & M13, or NGC 288 & NGC 362), so as to isolate the parameters that distinguish the clusters from each other. An alternate approach is to compare clusters with similar HB morphologies, but

different metallicities, such as M92 — an extremely metal-poor cluster with a BHB — and NGC 288. The results presented in this chapter imply that neither age nor helium abundance can independently account for the 2nd parameter effect. Regarding the age, Stetson & Harris (1988) estimated 16–17 Gyr as the age for M92, employing $[\text{Fe}/\text{H}] = -2.03$, $[\text{O}/\text{Fe}] = +0.7$, $Y = 0.24$ isochrones. Since NGC 288 is significantly more metal-rich than M92, it would also have to be significantly older — not younger — to account for its BHB. Similarly, this cluster's helium abundance, as evidenced by the model fits and by the *R*-method, is very near the mean value for other galactic globular clusters ($Y \approx 0.23$) which rules out cluster-to-cluster Y variations.

Considering the results of Rood & Crocker's (1985) simulations of the effects of CNO abundances on HB morphology, Caldwell & Dickens' (1988) spectroscopic evidence regarding the CNO abundances in NGC 288 and NGC 362, and Dorman's (1992) comments regarding the weak effect of CNO on HB morphology in metal-rich clusters, it also seems impossible to reconcile cluster-to-cluster CNO variations with the 2nd parameter.

Chapter 6

The Globular Cluster NGC 7099

6.1 Cluster Parameters

NGC 7099 (M30) has been the object of considerable attention in the recent literature for a variety of reasons. First of all, it is one of the extremely metal-poor clusters in the Galaxy — according to Webbink's (1985) compilation it has $[\text{Fe}/\text{H}] = -2.19$, but more recently Claria *et al.* (1988) have reported $[\text{Fe}/\text{H}] = -2.4$, which could make it the *most* metal-poor cluster. Secondly, significant dynamical evolution has occurred in the cluster, as revealed by radial variations of the exponent in the power law mass spectrum (e.g., Richer *et al.* 1988, Bolte 1989, and Piotto *et al.* 1990), and it has a collapsed core (Djorgovski & King 1984). Related to this condition is the observational fact that post-core-collapse clusters — including NGC 7099 — exhibit colour gradients, in the sense that the cluster light becomes bluer towards the cluster centre (e.g., Rose *et al.* 1987; Piotto *et al.* 1988; Djorgovski *et al.* 1991). Thirdly, the cluster contains four known variable stars, three of which are of the RR Lyrae type, and one which is a candidate dwarf nova (Margon & Downes 1983; Shara *et al.* 1990). Finally, polarization measurements (Forte & Méndez 1989) suggest that the cluster contains small amounts of interstellar dust.

Dickens (1972) was the first to recognize that NGC 7099 is an extremely metal-deficient cluster in a photographic CMD study which penetrated down to 2 mag below the horizontal branch. Surprisingly, the ratio N_{HB}/N_{RGB} in Dickens' study implied that the cluster has a relatively high helium abundance. Subsequent photo-

graphic CMD studies by Alcaíno & Liller (1980), and Piotto *et al.* (1987) extended the photometry to approximately 2 mag below the turnoff.

Since 1987, several deep CCD studies of the cluster have been made. An important conclusion common to three of the studies (Bolte 1987; Richer *et al.* 1988; Piotto *et al.* 1990) is that the intrinsic width of the main sequence limits chemical inhomogeneities among the cluster stars to less than 0.2 dex in $[M/H]$. Two of the studies find that, within the errors of the reddening and distance modulus estimates, there is no evidence for age differences among the extremely metal-poor clusters — Richer *et al.* (1988) intercompared M15, M68, and NGC 7099; Buonanno *et al.* (1988) studied M15, M92, NGC 6397, and NGC 7099. Both Bolte (1987) and Piotto *et al.* (1990) adopt $(m - M)_V = 14.65$, $E(B - V) = 0.05$ for NGC 7099, and derive an age of 16-17 Gyr from fits to oxygen-enhanced isochrones with $[Fe/H] = -2.03$, $[O/Fe] = +0.70$, and $Y = 0.235$. But, Bolte's estimate of the distance modulus was obtained from a fit of his fiducial main sequence to the local subdwarfs, whereas Piotto *et al.* obtained both the distance modulus and the reddening from the isochrone fits. Richer *et al.* (1988) obtained a distance modulus of $m - M)_V = 14.85$ from a comparison of their fiducial main sequence with that defined by the local subdwarfs, and derived a reddening $E(B - V) = 0.068 \pm 0.035$ from a two colour diagram of the BHB stars that they observed. (This compares favourably with Dickens' (1972) estimate, $E(B - V) = 0.06$, also from a two colour diagram.) From a comparison with $[Fe/H] = -2.25$, $[O/Fe] = +0.5$ isochrones, they estimated an age of 14 Gyr for the cluster.

6.2 Observations

Four overlapping fields covering the core of the cluster were observed with both long and short exposures in the *B* and *V* passbands on the night of 1986 September 9. Except for two of the frames on which the tracking was slightly poorer, estimates of the seeing derived from the stellar profiles, ranged between 1.2–1.5 arcsec. The journal of observations for NGC 7099 is given in Table 6-1.

Table 6-1. Observing Log for NGC 7099

Field	Filter	Exp. Time (seconds)	Airmass	FWHM (arcsec)	UT of observation 1986 September 9
NE field	B	240	1.06	1.4	4:33:25
NE field	B	60	1.08	1.3	4:47:06
NE field	V	100	1.11	1.2	5:05:01
NE field	V	30	1.12	1.3	5:10:21
SE field	B	60	1.13	1.3	5:13:19
SE field	B	240	1.13	1.3	5:15:37
SE field	V	100	1.15	1.2	5:21:14
SE field	V	30	1.15	1.5	5:23:56
SW field	B	60	1.18	1.7	5:32:27
SW field	B	240	1.18	1.4	5:34:34
SW field	V	100	1.20	1.2	5:40:17
SW field	V	30	1.21	1.3	5:43:02
NW field	B	60	1.25	1.4	5:54:12
NW field	B	240	1.25	1.8	5:56:26
NW field	V	30	1.28	1.3	6:03:05
NW field	V	100	1.29	1.5	6:04:46

A mosaic of the four cluster fields with all of the 6437 objects that survived the detection/reduction algorithm described in Chapter 3 is shown in Figure 6-1. The master list is given in Appendix C, and the corresponding CMD is plotted in Figure 6-2. At first glance, there appears to be something like a sparse second HB sequence located about 0.8 mag brighter than most of the HB stars, but in fact virtually all of these stars are located within 35 pixels ($\approx 18''$) of the cluster centre and have the

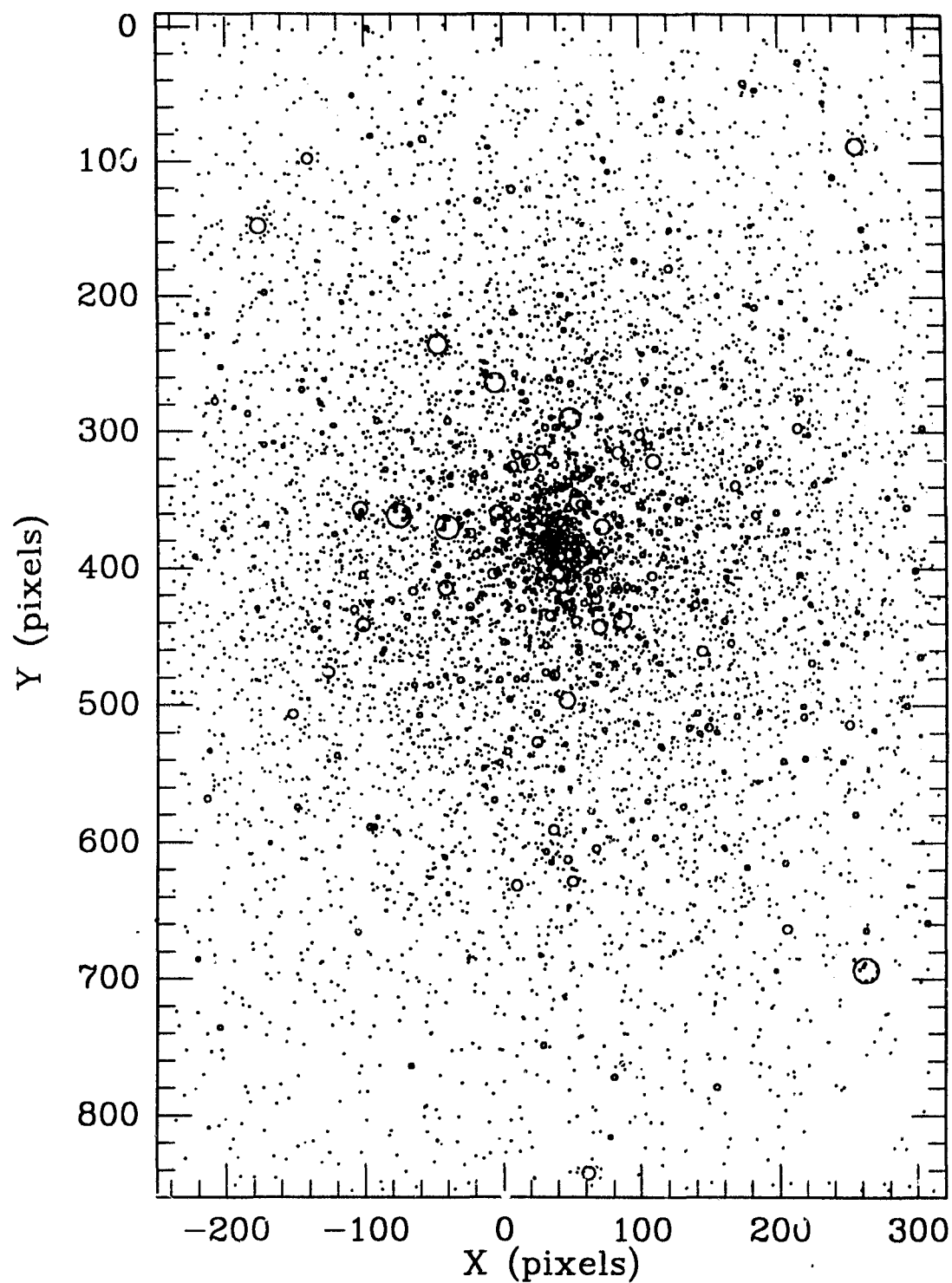


FIGURE 6-1 A mosaic of the four overlapping fields in NGC 7099, showing the positions and magnitudes of the objects that survived the detection/reduction process, as calculated by ALLSTAR. The magnitude of each object is indicated by the size of the circle; the brightest star has $V = 12.088$.

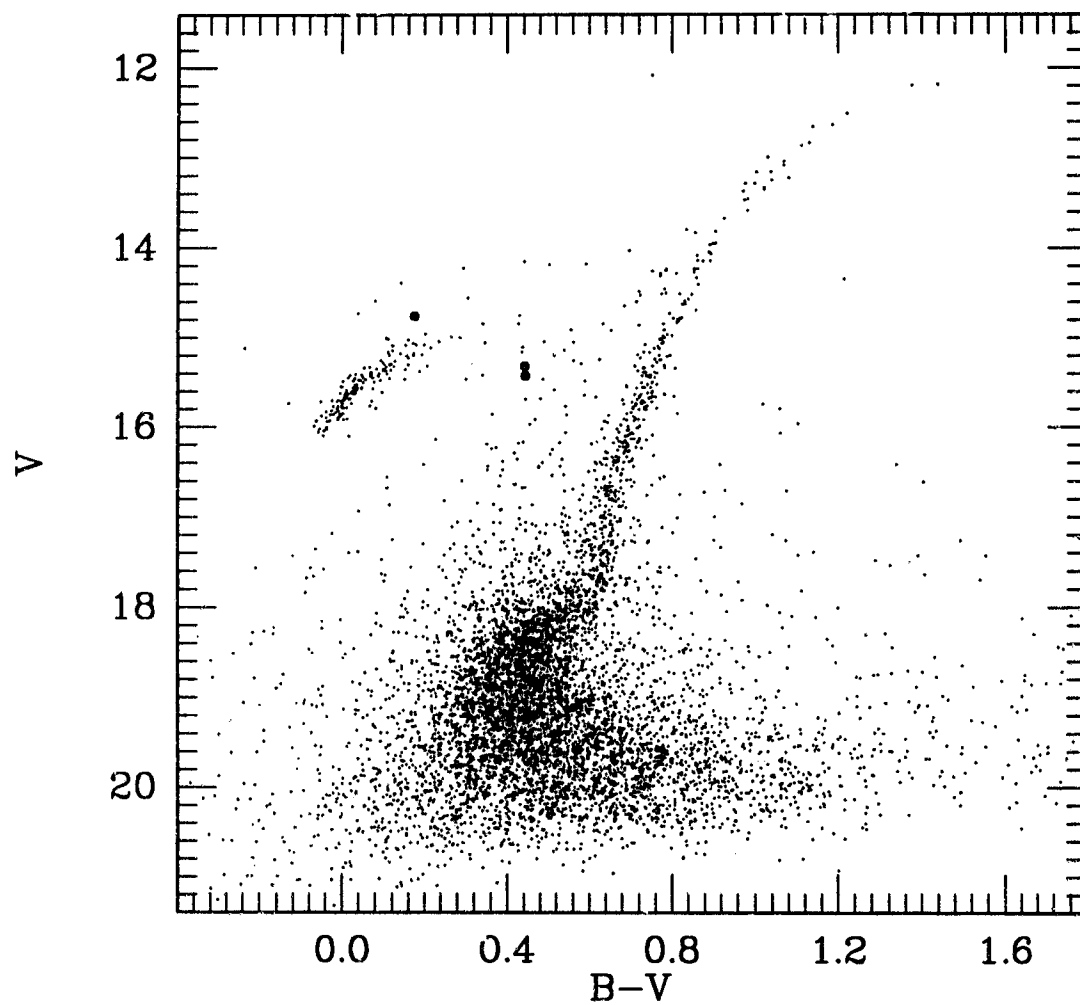


FIGURE 6-2 The CMD of NGC 7099 containing all of the 6347 objects that survived the detection/reduction process. The circled objects are the cluster RR Lyrae variables V1, V2, and V3.

profile-fitting statistic $\bar{\chi} > 3.0$. For the analysis of the CMD, only objects with $\bar{\chi} \leq 3.0$ will be considered. The circled objects are the three known RR Lyrae variables (V1, V2, and V3) which lie within the core region. The photometry of V3 indicates that it is near maximum light. This will be discussed further in §6.2.1.

6.2.1 Comparisons with Other Cluster Photometry

Two of the published CCD studies — Bolte (1987) and Richer *et al.* (1988) — have been calibrated independently of any of the earlier photographic work, so the photometry of this study will be compared to them. Neither data sets were available by E-mail or by magnetic tape, so a page scanner was used to extract the relevant data from the journals. Although every effort has been made to ensure the accuracy of the scanned data, there may yet remain a few inconsistencies with the published Richer *et al.* data, but they are not large enough to alter the interpretation of the comparisons significantly.

The only overlap with Bolte's (1987) data occurs at the bright end (Bolte's Table 2), for which there are 47 stars in common. The comparisons shown in Figure 6-3 reveal that there are zero-point differences amounting to +0.095 mag in V , at $V = 14.7$, and -0.028 mag in $(B - V)$, at $B - V = 0.5$, in the sense that the photometry presented in this study is systematically fainter and bluer. The comparisons with the Richer *et al.* (1988) photometry are shown in Figure 6-4 for the 393 stars in common. The zero-point shifts amount to +0.087 mag in V at $V = 18$, and to -0.010 mag in $(B - V)$ at $(B - V) = 0.7$, again in the sense that the photometry of the current study is systematically fainter and bluer.

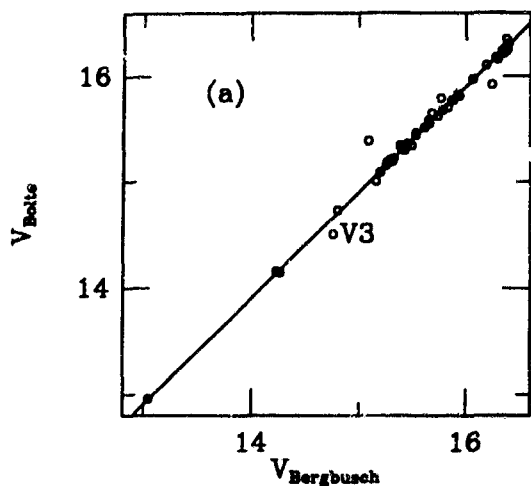


FIGURE 6-3(a) The comparison between Bolte's (1987) V -magnitudes and the V -magnitudes of this study. The line, calculated from a two-way regression on the data, has a slope of 0.996. The magnitude shift, ΔV , calculated at $V = 14.7$ is 0.095 mag, in the sense that Bolte's magnitudes are brighter.

FIGURE 6-3(b) The colour differences, $\Delta(B-V)$, in the sense Bergbusch-Bolte, as a function of magnitude. A two-way regression on the data yields a slope of 0.0001, and a colour shift of -0.029 mag at $V = 14.7$.

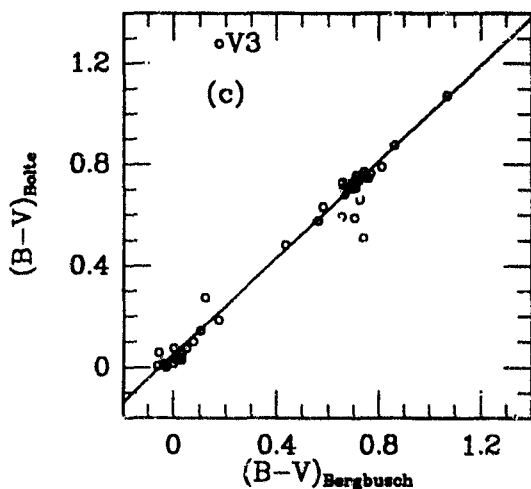
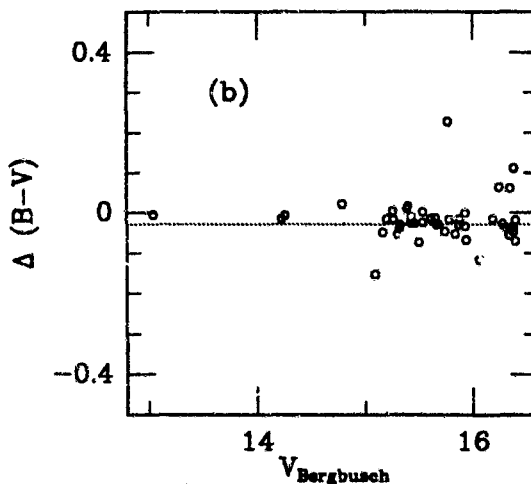


FIGURE 6-3(c) The comparison between Bolte's (1987) colours and the colours presented in this study. A two-way regression formally gives a slope of 0.950, and a colour shift of -0.027 mag at $B - V = 0.5$.

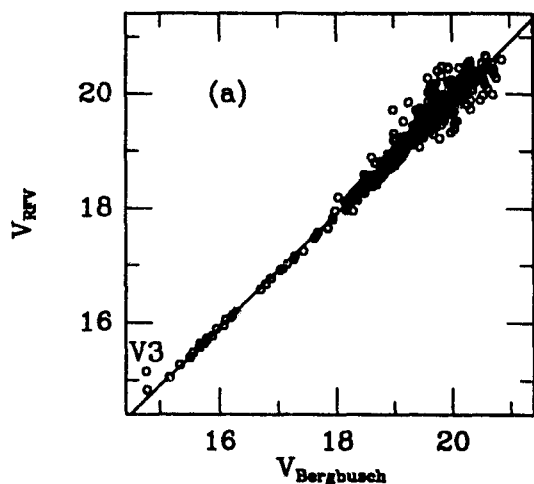


FIGURE 6-4(a) The comparison between the V -magnitudes of Richer *et al.* (1988) (RVF) and those of this study. The line, calculated from a two-way regression on the data, has a slope of one. The magnitude shift, ΔV , calculated at $V = 18.0$ is 0.087 mag, in the sense that the RVF magnitudes are brighter.

FIGURE 6-4(b) The colour differences, $\Delta(B - V)$, in the sense Bergbusch - RVF, as a function of magnitude. The visual impression given is that the RVF data are slightly bluer, and that there is no significant trend in colour.

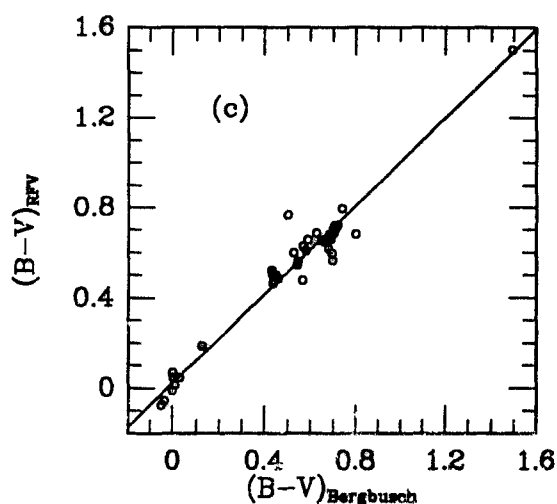
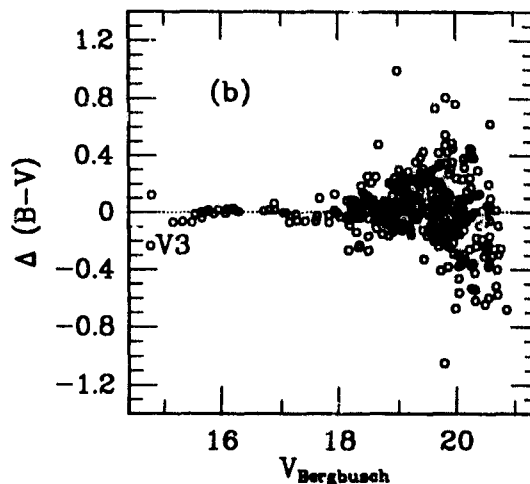


FIGURE 6-4(c) The comparison between the RVF colours and the colours presented in this study. A two-way regression performed on selected data — those stars with $V \leq 18.2$ — formally gives a slope of 0.981, and a colour shift of +0.010 mag at $B - V = 0.7$.

A comparison of the Richer *et al.* fiducial main sequence with Bolte's indicates that they are in excellent agreement at the turnoff, both in the calibration of the V -magnitudes and in the colours. However, the zero-point for the V -magnitude in the current study is clearly fainter by almost 0.1 mag, but the colour differences are quite small and might be expected considering that the region of overlap is close to the cluster centre. Furthermore, there are no strong colour gradients evident in the comparisons.

The night on which NGC 7099 was observed was one of the best obtained over the two observing runs, both for photometric quality and for the seeing, so there is no reason to doubt the new results. Although the maximum frame error — computed to transfer the photometry of each frame to the mean photometry — amounted to almost 0.06 mag, which is somewhat larger than one would like, only four of the sixteen frames required shifts larger than 0.03 mag, while the remaining twelve required shifts smaller than 0.02 mag. Given that the region of overlap for each cluster field included the cluster center, and that the photometry over the cluster centre was the least reliable, such frame-to-frame agreement is quite remarkable. Therefore, to maintain consistency with the photometry of NGC 288 presented in Chapter 5, the zero-points derived from the data presented in this study will be used in the analysis to follow. Because both the distance modulus and the reddening can be derived by direct comparisons between synthetic ZAHBs and the observations, and because the synthetic ZAHBs are fully consistent with the enhanced-oxygen isochrones, only the distance modulus will be significantly affected by the differences in the zero-points.

One particularly interesting comparison involves the photometry of the RR Lyrae

variable V3. There is considerable disagreement over the colour of this star — in Bolte's CMD it has $(V, B - V) = (14.506, 1.279)$, Richer *et al.* find $(V, B - V) = (15.153, 0.409)$, and in this study $(V, B - V) = (14.758 \pm 0.008, 0.175 \pm 0.010)$ with $\bar{\chi} = 1.265$! According to Dorman's (1992) synthetic HB, the photometry — both of Richer *et al.* and of this study — places V3 in the instability strip. While the V -magnitude differences among the three observations are consistent with its designation as an RR Lyrae variable, the colour difference required by Bolte's observation is too large to be physical.

6.3 Artificial Star Tests

Because NGC 7099 has such a dense core, the detection/reduction algorithm has retained only the relatively bright stars near the cluster centre. When the recovered sample is restricted to those objects with $\bar{\chi} \leq 3.0$, only a few stars within a radius of 35 pixels from the cluster centre are included. Nevertheless, because the master list was created by requiring stars to be detected on a minimum number of frames, and because of the way that ALLSTAR arranges stars into groups and rejects faint stars if the groups are too large, it is necessary to insert artificial stars into the central region. However, it is clear from the artificial star tests performed on NGC 288, where the stars are distributed relatively uniformly across the cluster core, that little will be gained by extending the tests down to the limits of detection ($V_{\max} \approx 21$). As a compromise, the artificial star tests have been extended down to $V = 19$, which is fainter than the turnoff, so it should be possible to rectify the observed LF with reasonable accuracy through the transition region. Two tests were performed, each

consisting of 650 stars. The cumulative probability distributions shown in Figure 3-4 were used to distribute the stars over the cluster fields.

Fiducial sequences based on the subset of the data with $\bar{\chi} \leq 3.0$ are superimposed on the observations in Figure 6-5. Along the giant branch, the data were partitioned into 0.2 mag bins, and histograms as a function of $B - V$ were used to deduce the location of the ridge lines. The fiducial points obtained in this way were then adjusted by eye to produce a smooth sequence. (The HB fiducial sequence was obtained in a similar way.) However, because of the large uncertainties in the photometry at the faint end, the shape of the fiducial sequence derived by Richer *et al.* (1988) was adopted for $V > 17.4$. In light of the results of the star-by-star comparisons shown in Fig. 6-4, a magnitude shift, $\Delta V = +0.087$ mag, together with a colour shift, $\Delta(B - V) = -0.010$, should have been applied to their data. Instead, a smoother transition between the two sequences was obtained by ignoring the colour shift¹. To reiterate, the fiducial sequences given in Table 6-2 and used in the analysis of the CMD are based on the photometric zero-points of this study.

¹ When the artificial stars were created, the star-by-star comparisons shown in Fig. 6-4 had not been made because the page scanner was not available. It appeared as though a colour shift of +0.010 mag, which is in the opposite sense implied by Fig. 6-4, was sufficient. Consequently, the artificial star fiducial locus (see Fig. 6-5) fainter than $V = 17.4$ is somewhat brighter and redder.

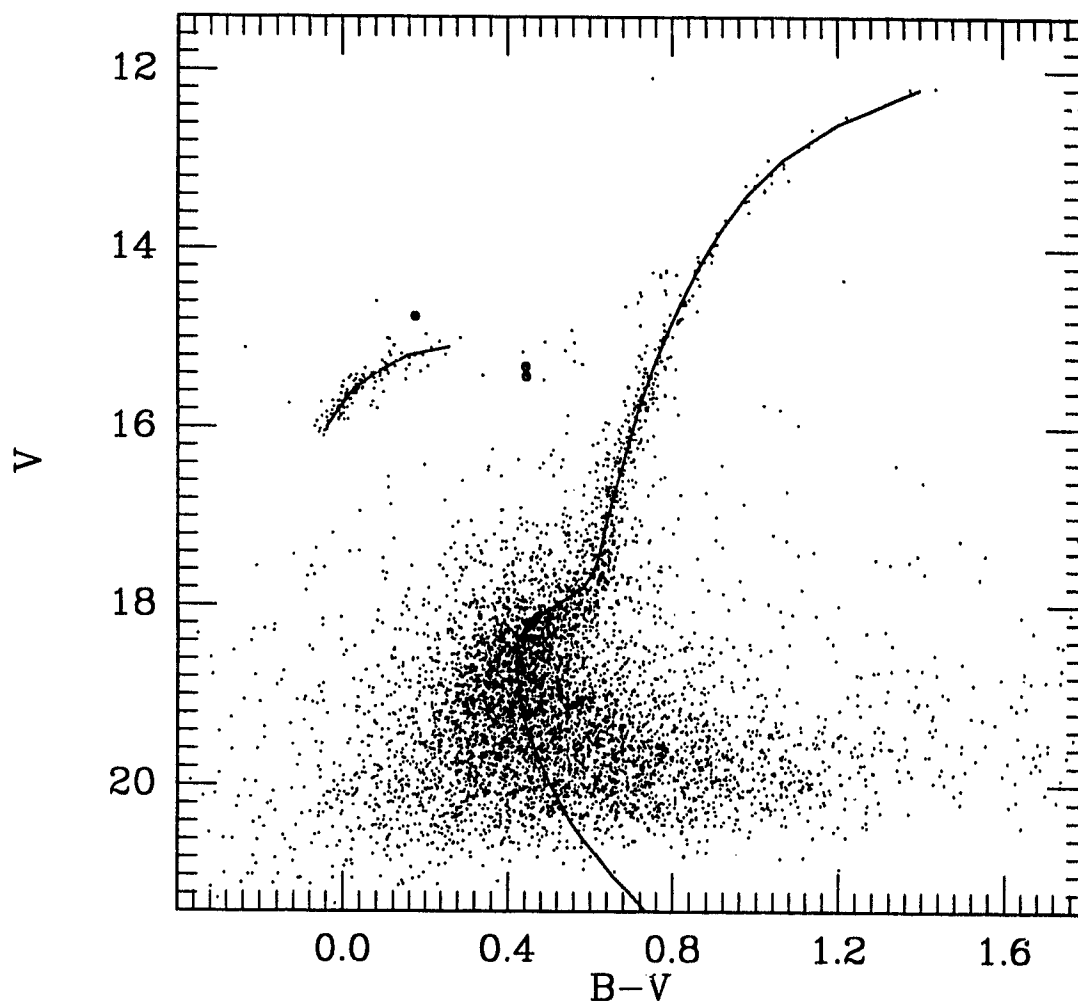


FIGURE 6-5 Fiducial sequences for NGC 7099 derived from the observations for $V \leq 17.4$; for $V > 17.4$, the fiducial locus for the main sequence was obtained from Richer *et al.* (1988).

Table 6-2. Fiducial Sequences for NGC 7099

Main Sequence & Giant Branch						Horizontal Branch	
V	$B - V$	V	$B - V$	V	$B - V$	V	$B - V$
12.200	1.400	17.000	0.642	19.687	0.455	15.100	0.260
12.600	1.290	17.400	0.612	19.887	0.474	15.200	0.155
13.000	1.064	17.687	0.600	20.087	0.494	15.417	0.070
13.400	0.977	17.887	0.572	20.287	0.519	15.600	0.022
13.800	0.914	18.087	0.506	20.487	0.542	16.000	-0.039
14.200	0.863	18.287	0.437	20.687	0.572		
14.600	0.820	18.487	0.413	20.887	0.609		
15.000	0.780	18.687	0.410	21.087	0.643		
15.400	0.745	18.887	0.413	21.287	0.685		
15.800	0.715	19.087	0.418	21.487	0.725		
16.200	0.690	19.287	0.424	21.687	0.766		
16.600	0.665	19.487	0.437	21.887	0.805		

A comparison down to $V = 19$ of the observed CLF with a model CLF for $[\text{Fe}/\text{H}] = -2.26$, $[\text{O}/\text{Fe}] = +0.75$, and 14 Gyr is shown in Figure 6-6. The differences between them imply that the observed sample is incomplete at the faint end, but to ensure that a reasonable number of bright artificial stars would be created, the observed CLF was used as the model of the brightness distribution. The ratio of the number of observed HB stars to the number of RGB stars in the same magnitude range was used to determine how many artificial HB stars should be added.

The artificial star CMD, showing both the input and the recovered artificial stars is shown in Figure 6-7. The recovered stars marked with crosses have $\bar{\chi} > 3.0$, so they were not used in subsequent analyses. The distribution of the recovered stars is quite similar to that of the program stars in Fig 6-2, with the implication that most of the scatter for stars brighter than $V \approx 18$ in the observed distribution is due to crowded stellar images. However, there is a preference for stars to be scattered blueward — at least along the giant branch — and this may account for the discrepancy in the

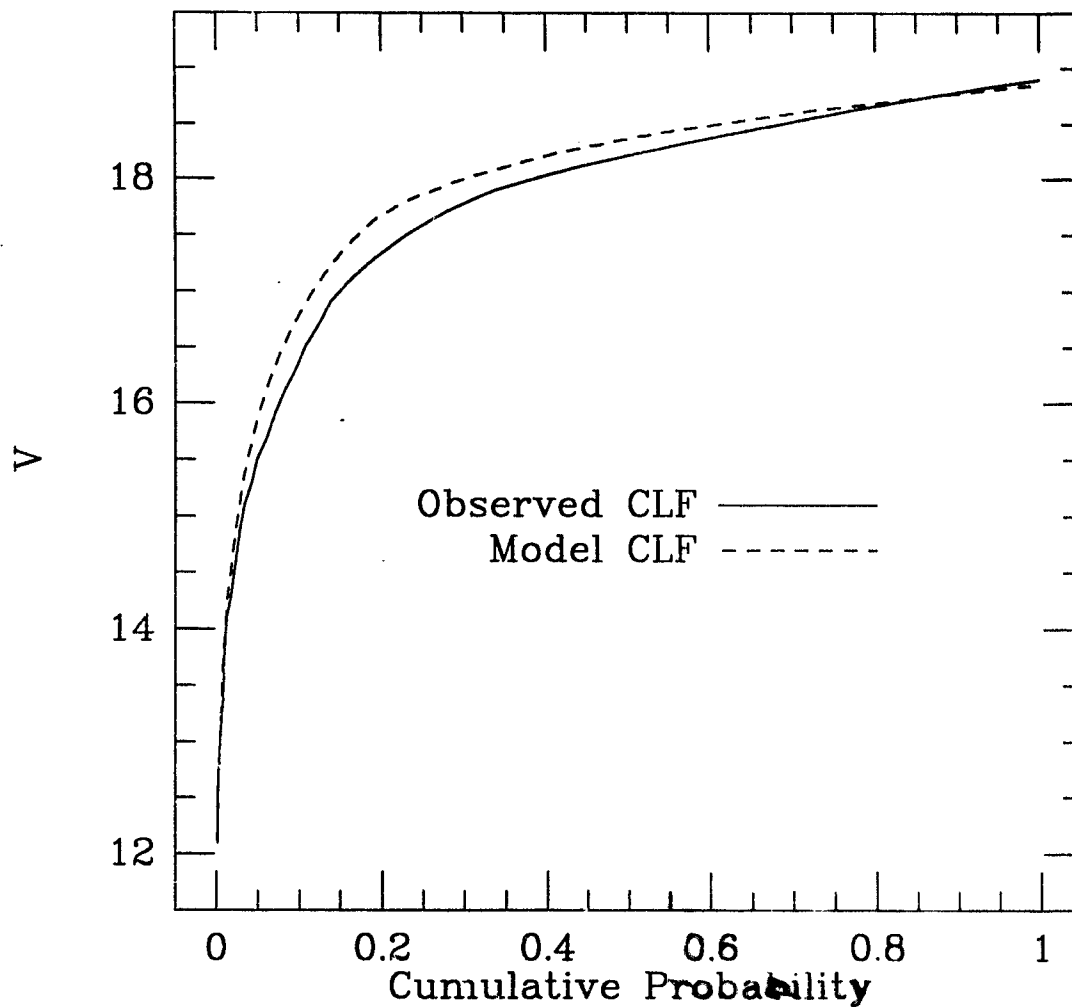


FIGURE 6-6 The observed (unrectified) CLF is compared with a model CLF ($[\text{Fe}/\text{H}] = -2.26$, $[\text{O}/\text{Fe}] = +0.75$, an age of 14 Gyr, a distance modulus of 14.85, and a mass spectrum exponent $x = 0.0$ are the model parameters) down to $V = 19.0$. Although it is deficient at the faint end, the observed CLF was used to assign the magnitudes to the artificial stars so that a reasonable number of them would be assigned to the RGB.

colour shift between the star-by-star comparisons of Figs. 6-3,-4 and that implied by the match of the fiducial sequences near $V = 17.4$.

Estimates of the photometric accuracy, as a function of magnitude, derived from all of the recovered artificial stars with $\bar{\chi} \leq 3.0$ are given in Table 6-3. The star-by-star differences are plotted in Figure 6-8. Qualitatively, the results are similar to those obtained for NGC 288 (see Table 5-2 and Fig. 5-7), although the brightward scattering bias is significantly stronger in this case.

Table 6-3. Artificial star photometric accuracy

$\bar{V}$	$\bar{\sigma}_V$	$\bar{\delta}_V$	$\hat{\sigma}_V$	$\bar{B} - \bar{V}$	$\bar{\sigma}_{B-V}$	$\bar{\delta}_{B-V}$	$\hat{\sigma}_{B-V}$	n
14.553	0.017	-0.013	0.021	0.825	0.026	+0.002	0.015	51
15.432	0.022	-0.010	0.031	0.683	0.034	+0.005	0.021	51
15.974	0.036	-0.017	0.058	0.672	0.053	+0.000	0.036	51
16.499	0.062	-0.076	0.104	0.668	0.092	+0.002	0.040	51
16.912	0.155	-0.139	0.202	0.633	0.225	-0.006	0.056	51
17.173	0.095	-0.091	0.165	0.629	0.119	+0.004	0.058	51
17.384	0.131	-0.121	0.212	0.612	0.216	-0.004	0.082	51
17.571	0.168	-0.105	0.212	0.607	0.217	+0.013	0.093	51
17.703	0.140	-0.298	0.385	0.561	0.208	+0.014	0.093	51
17.817	0.171	-0.150	0.246	0.584	0.267	+0.025	0.105	51
17.953	0.199	-0.091	0.218	0.532	0.264	+0.022	0.093	51
18.069	0.144	-0.130	0.231	0.497	0.223	+0.039	0.128	51
18.166	0.180	-0.145	0.231	0.467	0.262	+0.017	0.114	51
18.254	0.142	-0.074	0.125	0.455	0.187	+0.018	0.116	51
18.347	0.142	-0.097	0.169	0.447	0.250	+0.026	0.089	51
18.449	0.148	-0.068	0.216	0.412	0.264	-0.010	0.099	51
18.541	0.159	-0.069	0.096	0.432	0.220	+0.011	0.092	51
18.664	0.205	-0.049	0.102	0.436	0.267	+0.015	0.117	51
18.805	0.150	+0.033	0.089	0.412	0.260	-0.010	0.086	61

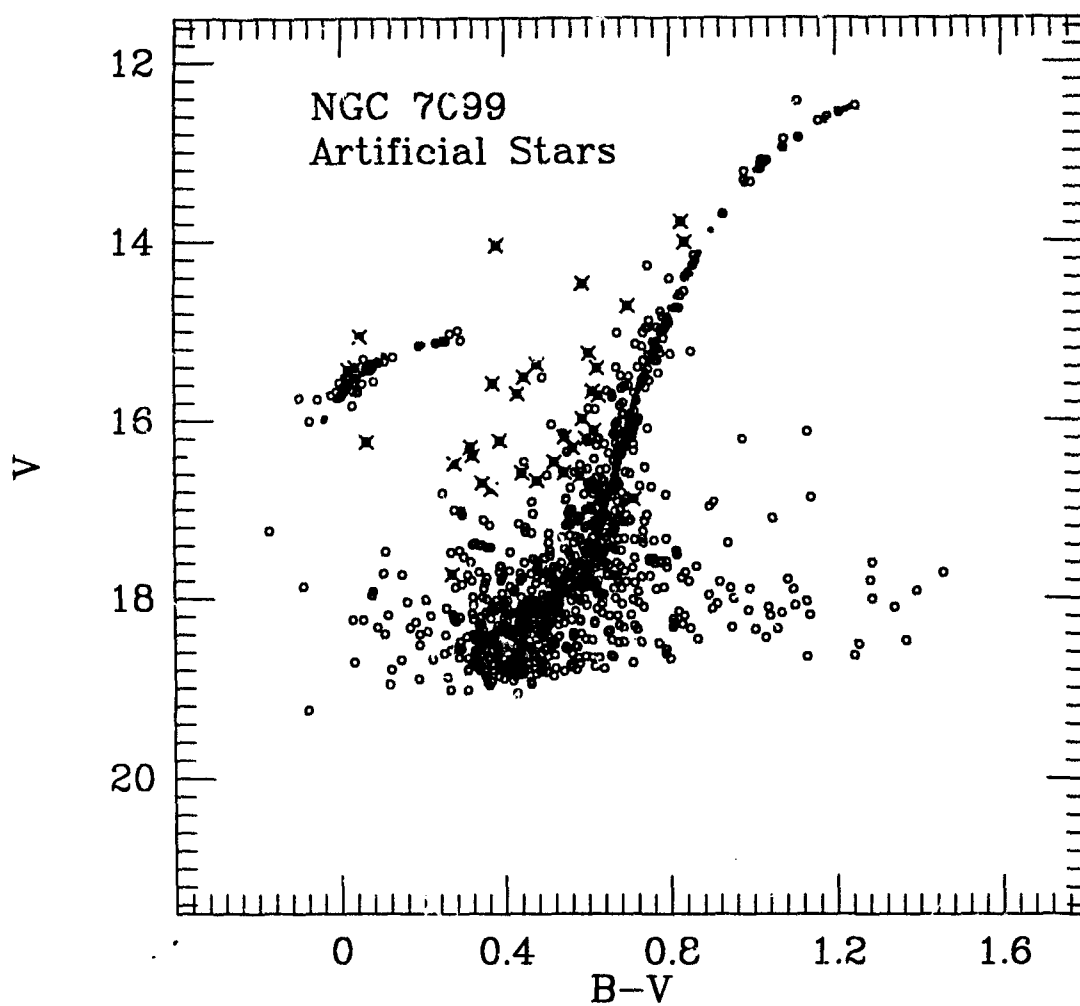


FIGURE 6-7 The input (●) and the recovered (○) artificial star CMDs. Those stars marked with a cross (×) were recovered, but with profile-fitting statistics, $\bar{\chi} > 3.0$. A comparison with Fig. 6-2 suggests that most of the scatter in the photometry is due to crowding.

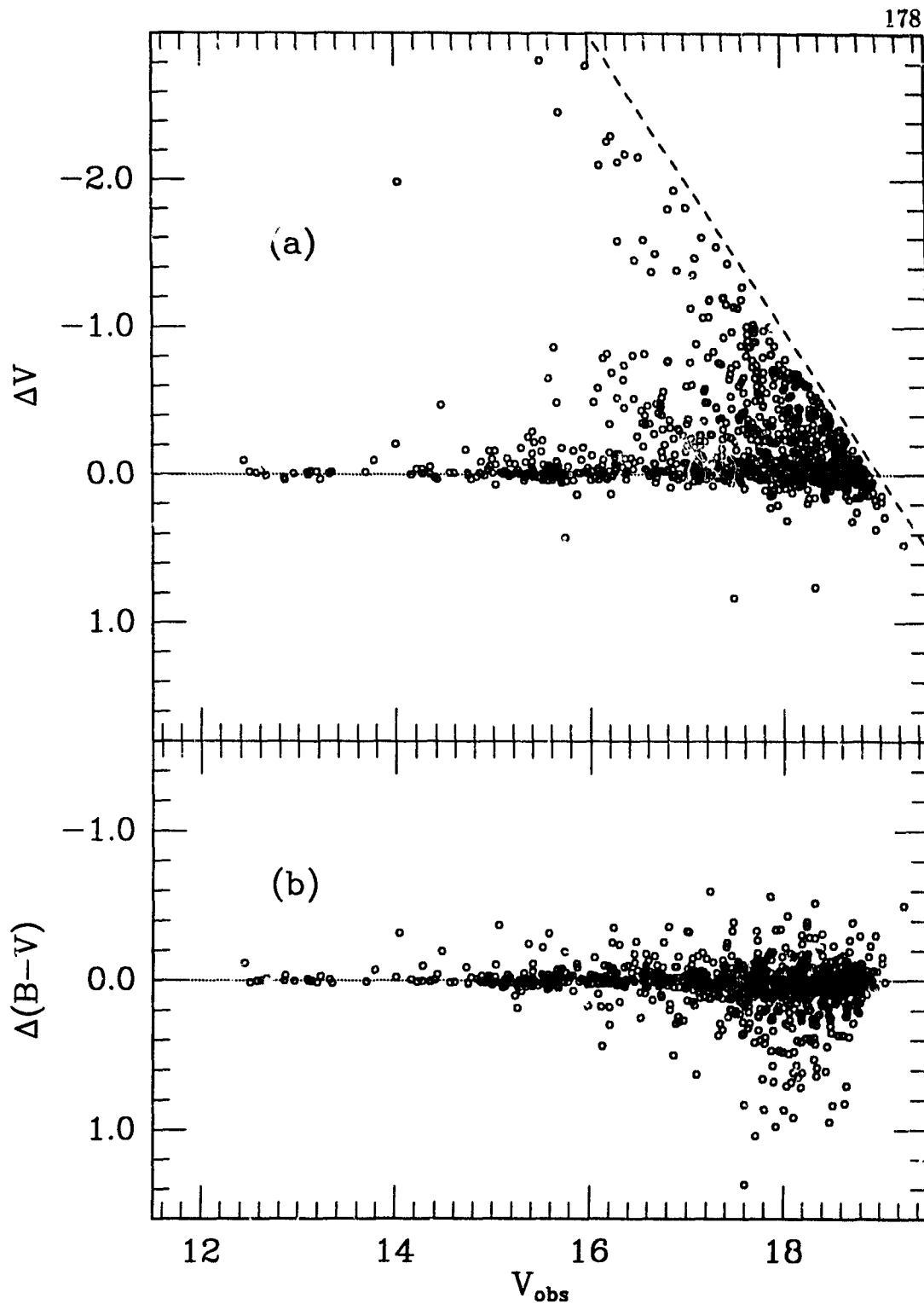


FIGURE 6-8 Residuals in (a) magnitude and (b), colour in the sense [output – input]. Because the input magnitudes were restricted to $V \geq 19.0$, no stars could be recovered in the region to the upper right of the dashed line in panel (a).

6.4 Analysis of the CMD

The CMD shown in Figure 6-9 combines the fiducial main sequence of Richer *et al.* (1988) — shifted +0.087 mag in V to correct for the zero-point difference — with the RGB fiducial sequence of this study, as well as the observations of selected HB stars. Once again, the blue extension of the HB, although not as extreme as in NGC 288, provides quite a strong constraint on the reddening estimate. This is illustrated in Figure 6-10 by the fits of Dorman's ZAHB and evolutionary tracks (in this case, truncated at the point of central helium exhaustion) for $[\text{Fe}/\text{H}] = -2.03$, which restrict the reddening to $E(B - V) \approx 0.06 \pm 0.01$. This agrees perfectly with Dickens' (1972) estimate, based on a two colour diagram of stars in the direction of the cluster, and nicely straddles the estimates made by Bolte (1987) and Richer *et al.* (1988) (0.05 and 0.068 mag, respectively). Of the fits illustrated in Figure 6-11, which use this value for the reddening and equation (5-1) to set the distance modulus, the $[\text{Fe}/\text{H}] = -2.03$ case provides the most satisfactory match because it accounts well for both the BHB and RHB data, as well as the apparent location of the lower AGB. For $[\text{Fe}/\text{H}] = -2.26$, the red end of the ZAHB is not faint enough, and the extension towards the AGB is a little too blue; for $[\text{Fe}/\text{H}] = -1.77$, this extension is slightly too red — but considering the potential photometric errors, any of the three cases is possible.

The isochrone fits shown in Figure 6-12, which employ the same parameters as Fig. 6-11, favour an age near 14 Gyr, and/or a metallicity intermediate between $-2.03 \geq [\text{Fe}/\text{H}] \geq -2.26$. The close-ups of the turnoff region, illustrated in Figure 6-13, imply that an excellent fit could be made with a 16 Gyr isochrone for

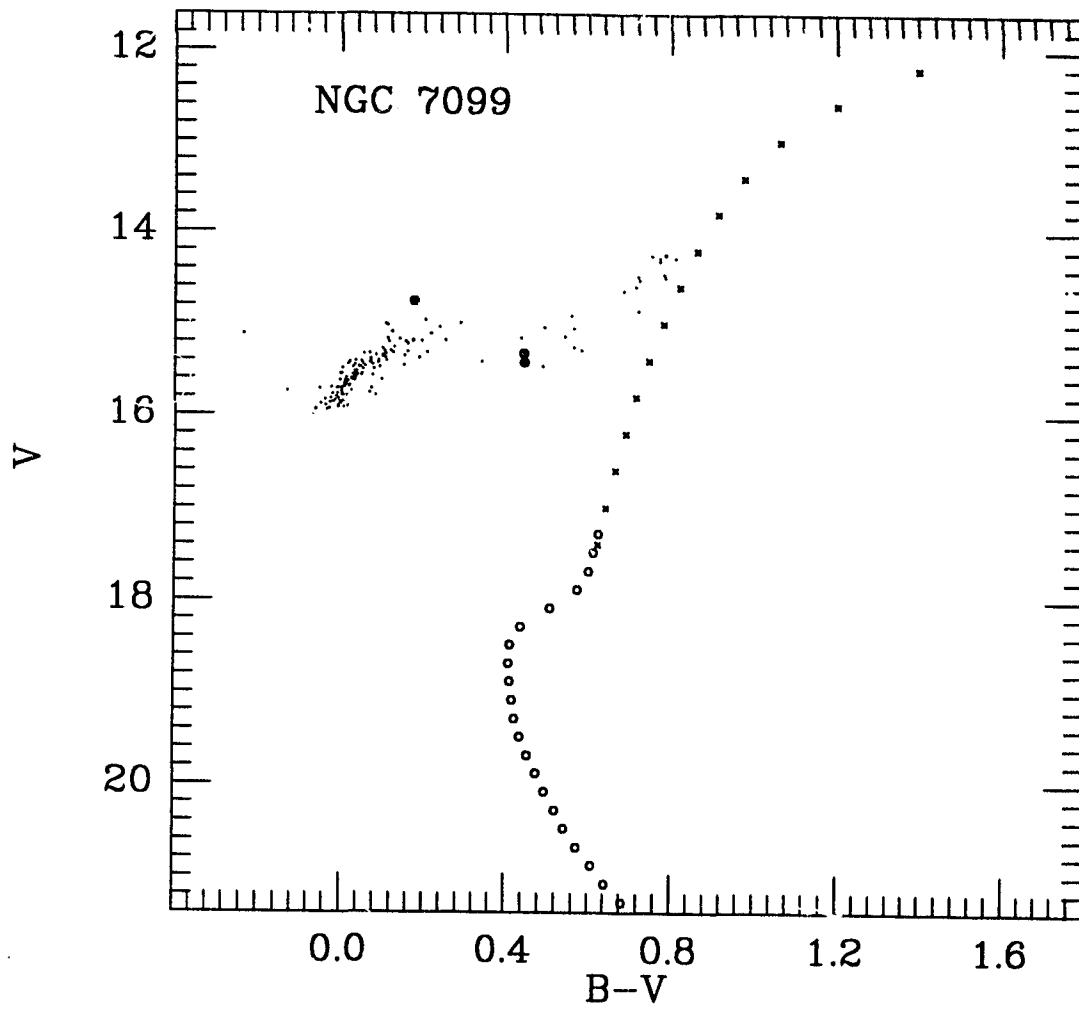


FIGURE 6-9 The RGB fiducial points of this study (*), with RGV's (1988) fiducial points (o) shifted fainter by 0.087 mag in V, together with the observations of the HB stars.

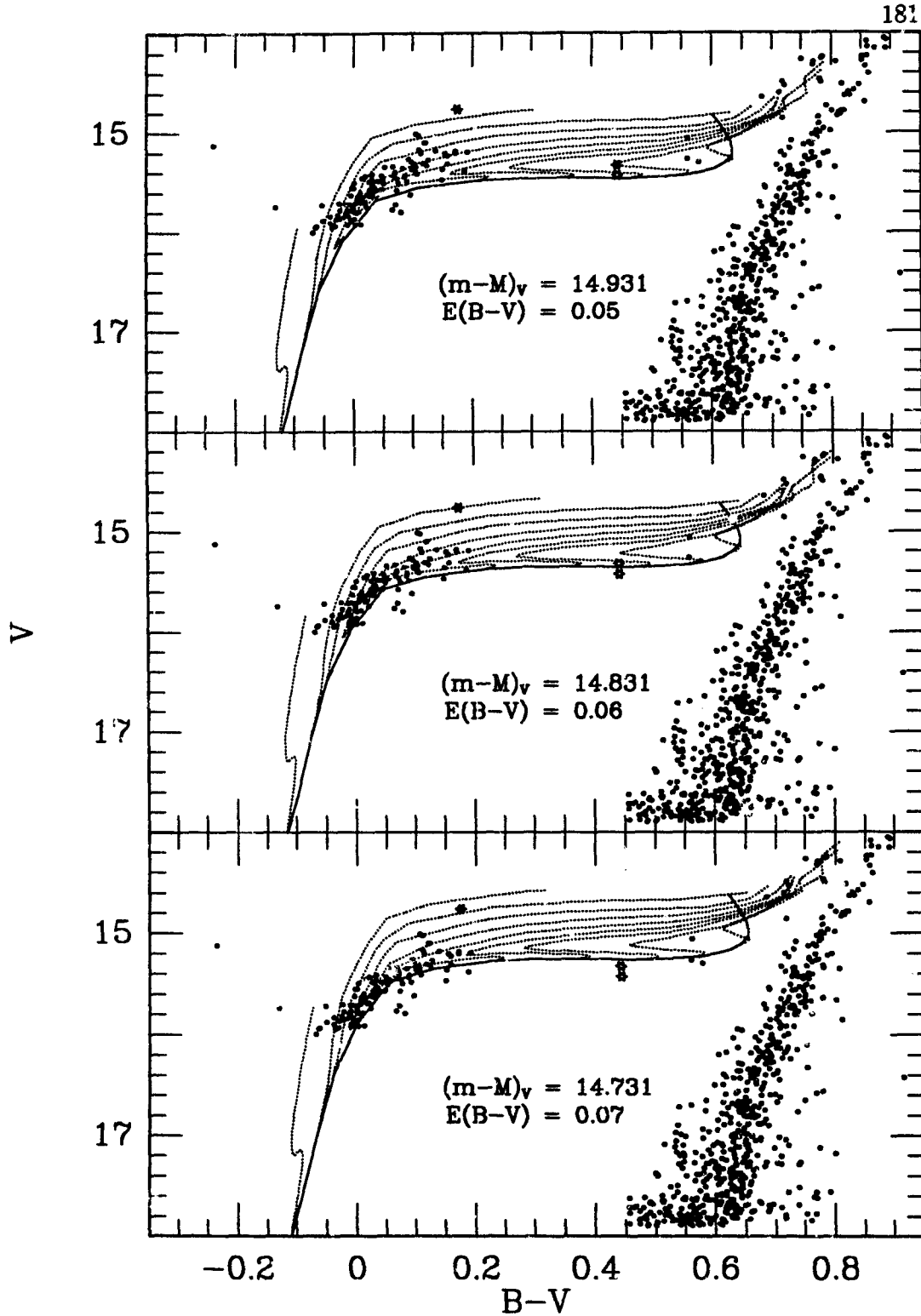


FIGURE 6-10 Three possible ZAHB fits to the observations are illustrated with Dorman's (1992) ZAHB and evolutionary sequences, truncated at the point of core helium exhaustion, for $[\text{Fe}/\text{H}] = -2.03$, $[\text{O}/\text{Fe}] = +0.70$, and $Y = 0.235$.

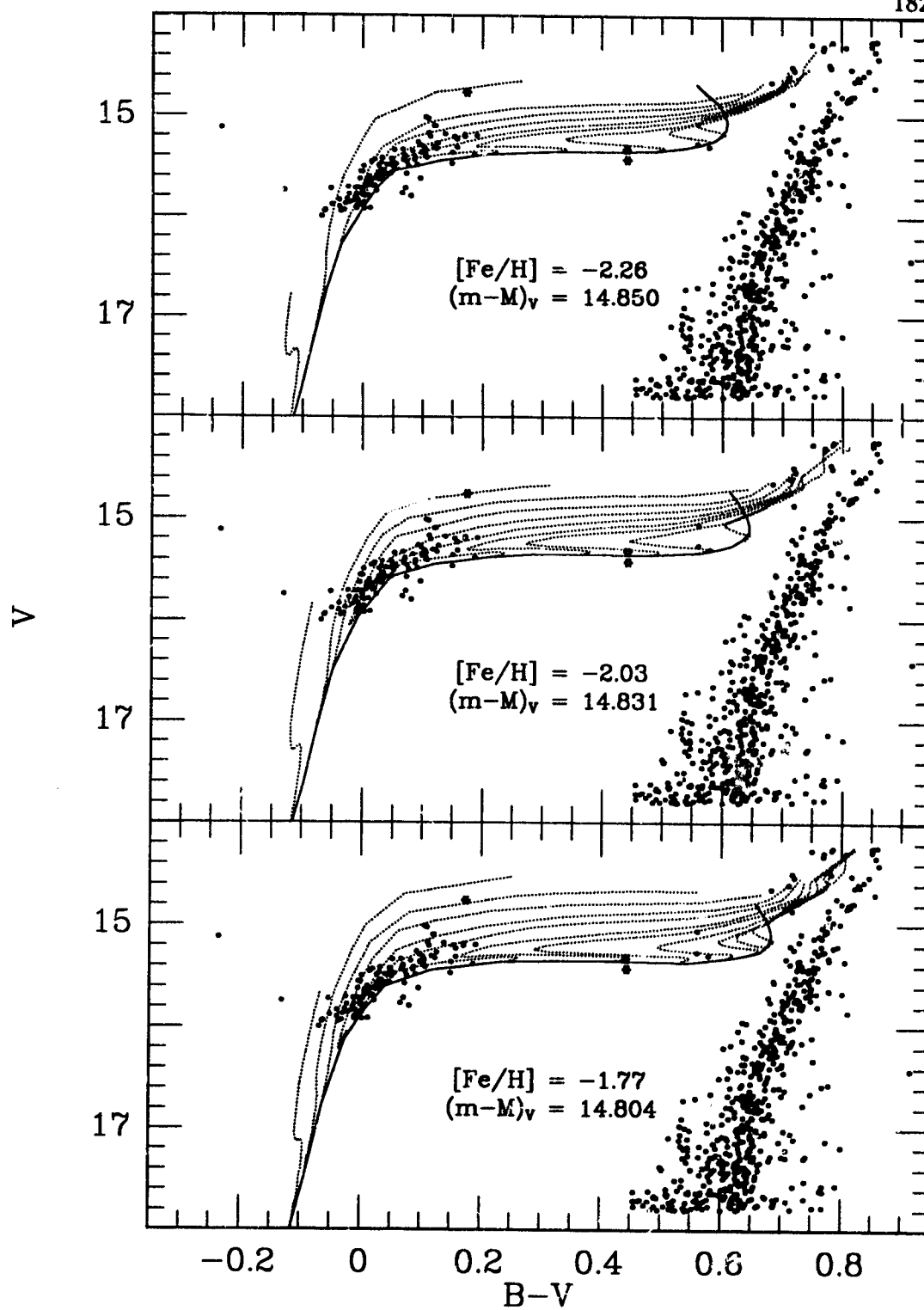


FIGURE 6-11 HB fits for the metallicities given are illustrated, assuming $E(B - V) = 0.06$ for all three cases.

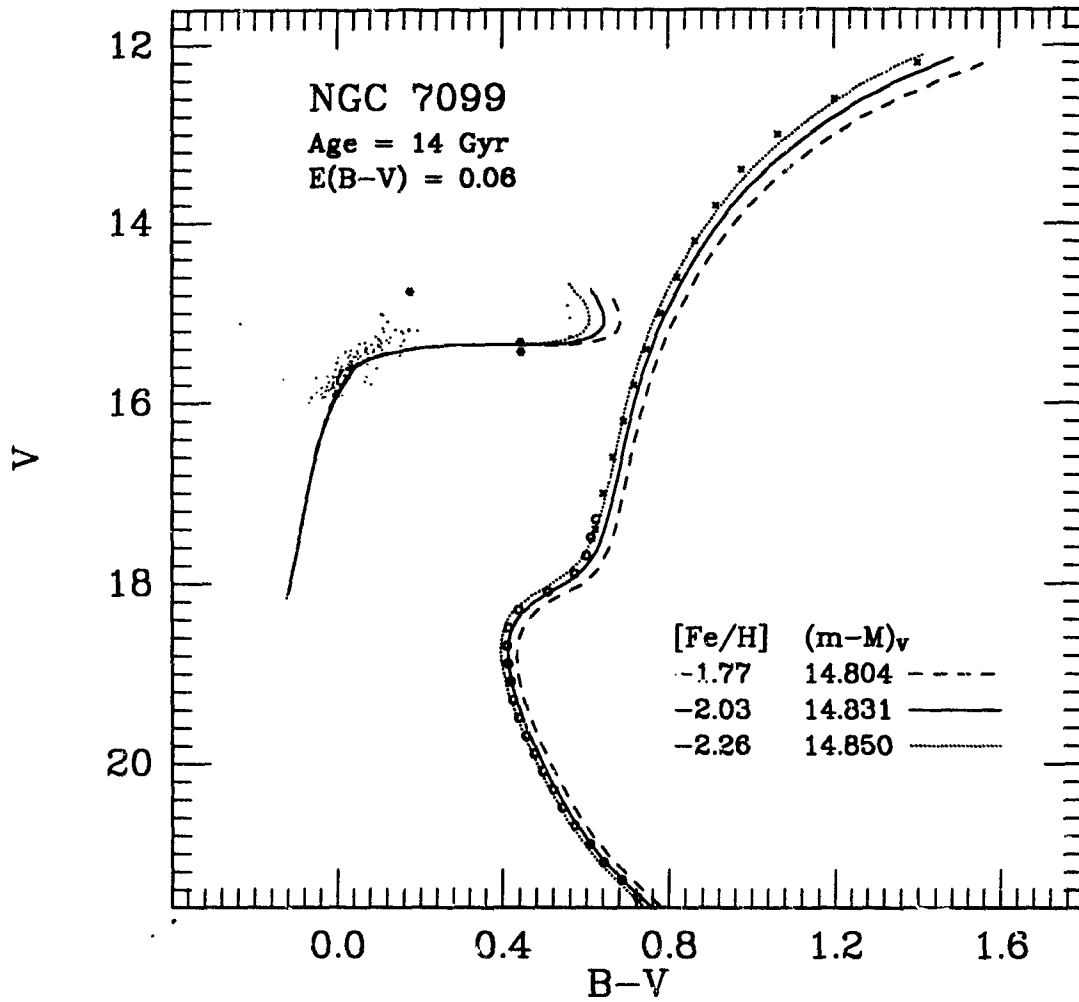


FIGURE 6-12 Isochrone fits to the fiducial sequences for the parameters indicated. The ZAHBs for the three cases have been superimposed on the HB observations to reinforce the fact that the shape of the ZAHB at the blue end is insensitive to metallicity.

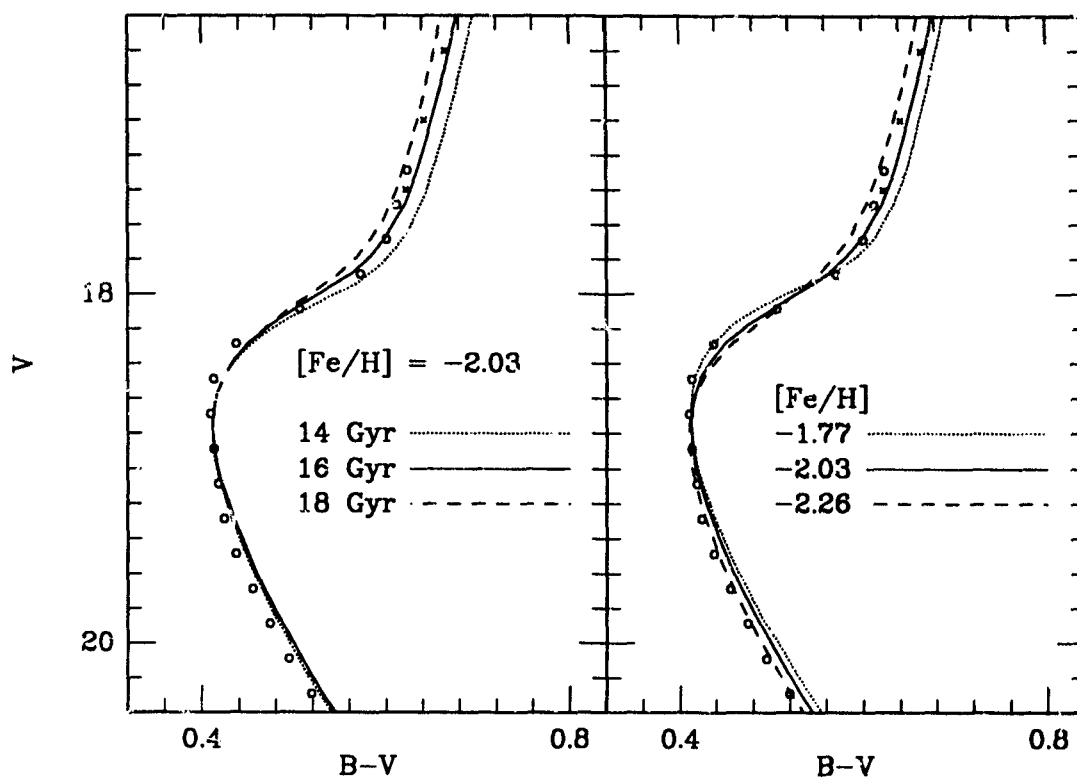


FIGURE 6-13 Alternate fits through the turnoff region for 16 and 18 Gyr isochrones are compared to the $[\text{Fe}/\text{H}] = -2.03$, 14 Gyr case. In the left panel, the following distance moduli and reddenings have been applied to force agreement at the turnoff: (14 Gyr, 14.831, 0.060); (16 Gyr, 14.683, 0.045); (18 Gyr, 14.583, 0.030). In the right panel, the line types indicate the same ages as in the left panel, but agreement at the turnoff has been forced for the metallicities indicated by applying the following distance moduli and reddenings: (14 Gyr, -1.77, 14.676, 0.039); (16 Gyr, -2.03, 14.683, 0.045); (18 Gyr, -2.26, 14.676, 0.039).

$[\text{Fe}/\text{H}] = -2.03$, provided that a reddening slightly lower than 0.045 mag and a distance modulus ≈ 14.68 were adopted. However, this would clearly result in an unsatisfactory fit to the horizontal branch. A fit slightly better through the turnoff than the $[\text{Fe}/\text{H}] = -2.03$, 14 Gyr case, can be made with an 18 Gyr, $[\text{Fe}/\text{H}] = -2.26$ isochrone, but again, the reddening (0.04 mag) and the distance modulus (< 14.68) required would produce poor HB fits. In summary, the best overall match to the observations is obtained with $(m - M)_V = 14.831$ and $E(B - V) = 0.06$ for 14 Gyr isochrones with the composition $[\text{Fe}/\text{H}] = -2.03$, $[\text{O}/\text{Fe}] = +0.70$, and $Y = 0.235$.

6.5 The Luminosity Function

In §6.3, it was pointed out that when the observations are restricted to those objects with $\bar{\chi} \leq 3.0$, very few stars within 35 pixels of the centre of the cluster² remain. Several experiments restricting the sample to only those stars outside a certain radius revealed that at 40 pixels, an acceptable fraction of the input artificial stars ($\approx 80\%$) were recovered at the faint limit of the tests. The recovery success could have been improved to better than 90% by enlarging the restricted zone to a 120 pixel radius, but at the cost of reducing the size of the bright end of the sample significantly.

The criterion for membership on the main sequence and the RGB defined by the fiducial sequence in Table 6-2 and equation (5-2) was used to further restrict the sample. The estimated relations for the external errors in V and $B - V$, used in

² The centre of this "forbidden" region, estimated from the cumulative probability distributions of the stars with $\bar{\chi} > 3.0$, has the pixel coordinates $(x, y) = (35, 376)$.

For the LF analysis, this has been adopted as the cluster center.

equation (5-2), are plotted in Figure 6-14. The CMD plotted in Figure 6-15 contains only those stars outside a radius of 40 pixels, and with $\bar{\chi} \leq 3.0$, which passed this membership test. Comparisons of this CMD with that of the full sample (Fig. 6-2), the $\bar{\chi} \leq 3.0$ sample (Fig. 6-5), and the recovered artificial star sample (Fig. 6-7), indicate that these restrictions provide a reasonable separation of the HB and lower AGB stars from the RGB³, and they do not interfere with the interpretation of the artificial stars tests at the faint end.

The estimated relations for the parameters required for the probability distribution analysis outlined in Chapter 3 are plotted in Figure 6-16. A 14 Gyr model LF, with a power law mass spectrum exponent $x = 0.0$ and the abundance parameters and distance modulus adopted in §6.4 were used to construct the initial approximation of the true LF. The results of this analysis are listed in Table 6-4, and the completeness fractions, f_i are plotted in Figure 6-17 together with a hand drawn curve used to extract the rectification factor as a function of magnitude. Over the magnitude range $14.0 < V < 18.0$, the observed LF is over-complete, but the effect amounts to $\approx 3\%$, at most, so it does not seriously interfere with the subsequent interpretation. The rectified LF is listed in Table 6-5.

³ The photometric errors at the bright end prevent any distinction between those stars which are on either the HB or the AGB, and those which are on the RGB. In particular, one has the impression that a few RHB (or lower AGB) stars have been left in the sample between $14.2 < V < 14.4$, and that some AGB stars remain between $13.0 < V < 13.4$.

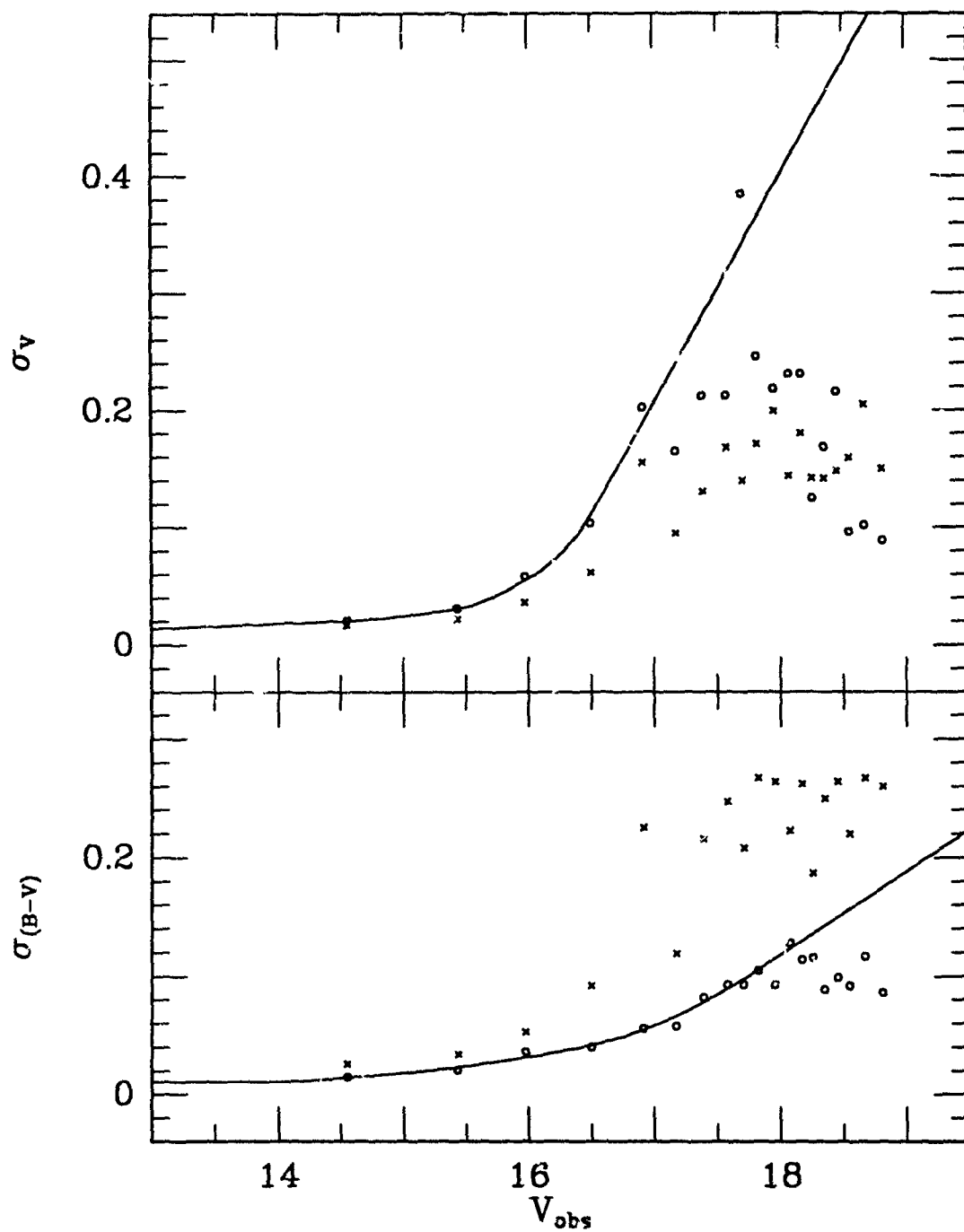


FIGURE 6-14 External ($\circ$) and internal ($\times$) errors as a function of the observed magnitude. The curves are hand-drawn estimates of the relations used to clean the CMD.

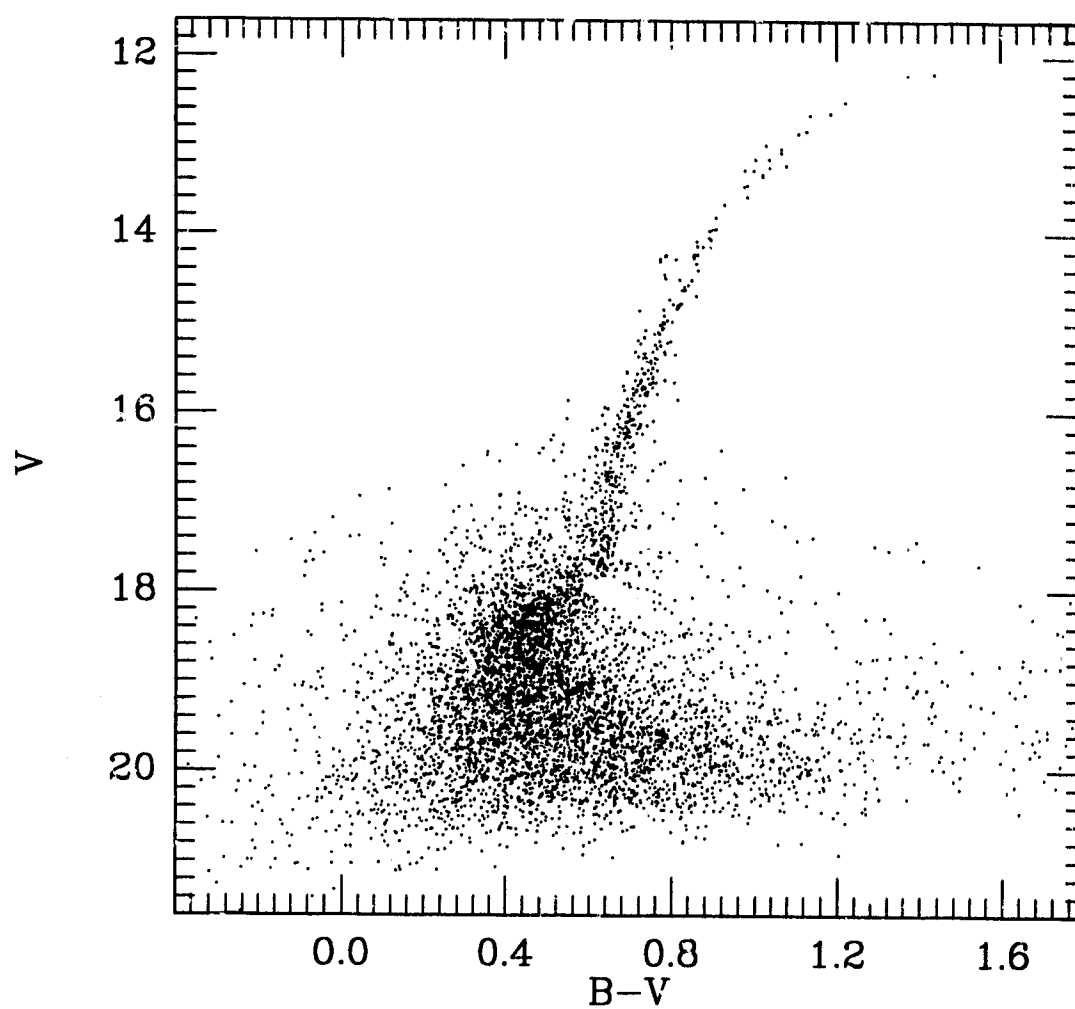


FIGURE 6-15 The cleaned CMD restricted to those stars which are in pre-helium flash evolutionary stages.

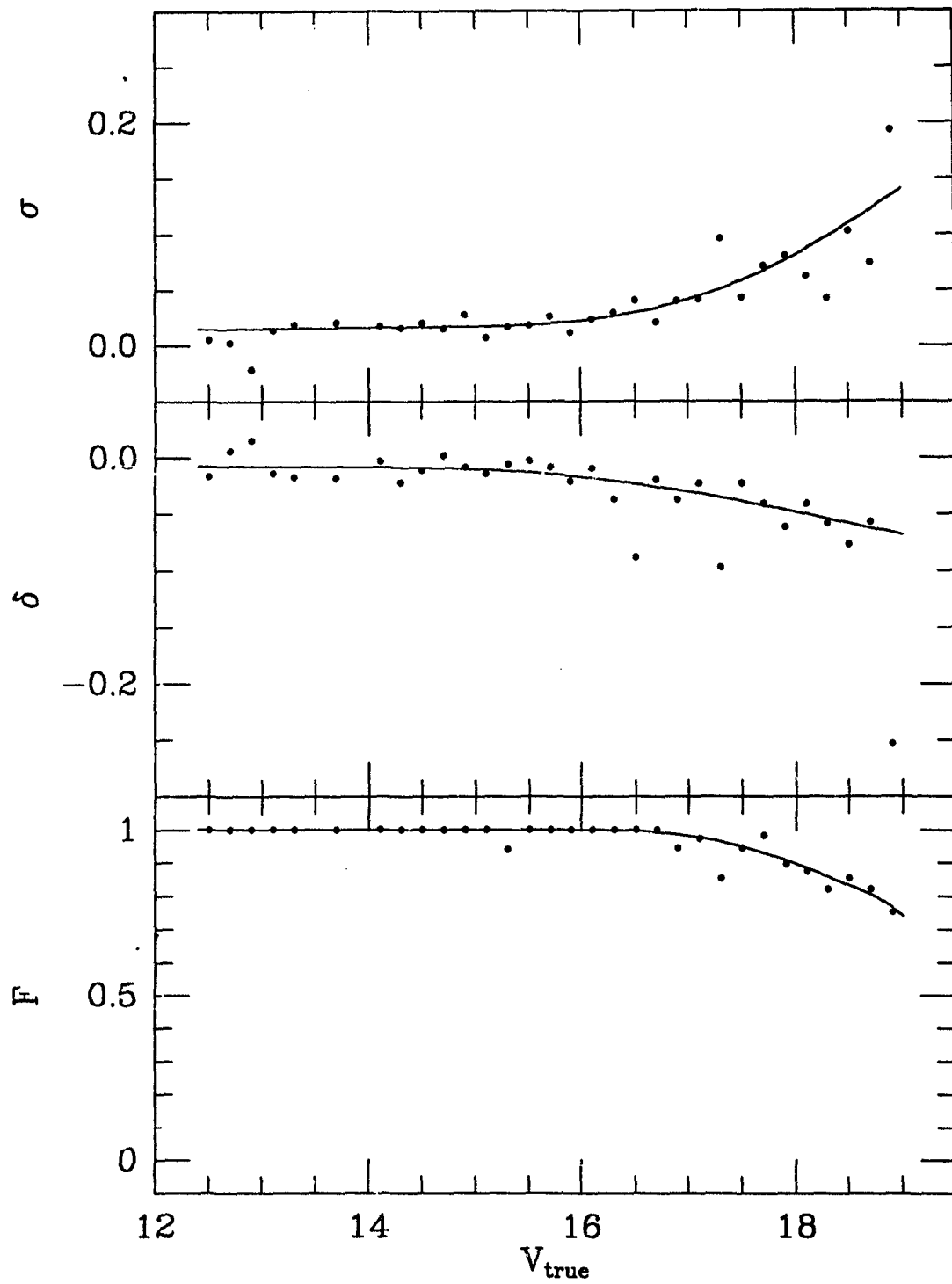


FIGURE 6-16 Probability distribution parameters as a function of the input magnitude. The data represent the estimated mean values obtained from 0.2 mag bins. The smooth curves are hand drawn estimates of the relations.

Table 6-4. Artificial star completeness fractions

V_i	$\tilde{N}_i$	N_i^A	$\mathcal{N}_i^A$	f_i
12.2	2	1.97	2.04	0.96789
12.4	0	0.08	0.03	2.28873
12.6	3	2.95	2.95	0.99860
12.8	1	1.01	9.73	1.03989
13.0	3	2.99	2.96	1.01205
13.2	4	4.00	4.02	0.99566
13.4	3	3.00	3.03	0.99197
13.6	2	2.00	2.03	0.98422
13.8	1	1.01	9.04	1.11651
14.0	6	5.99	5.88	1.01872
14.2	9	8.99	9.10	0.98816
14.4	4	4.02	3.97	1.01122
14.6	6	5.99	5.91	1.01309
14.8	8	8.00	7.94	1.00744
15.0	9	9.00	8.87	1.01538
15.2	12	11.99	11.84	1.01333
15.4	14	14.01	13.63	1.02784
15.6	22	21.99	21.61	1.01748
15.8	22	21.99	21.95	1.00186
16.0	19	19.03	18.48	1.03013
16.2	29	28.97	28.21	1.02715
16.4	28	27.94	28.22	0.99024
16.6	21	21.23	20.15	1.05354
16.8	38	37.56	36.95	1.01667
17.0	32	32.61	31.01	1.05160
17.2	56	55.36	52.50	1.05453
17.4	70	70.92	70.00	1.02785
17.6	91	89.11	90.64	0.98319
17.8	118	120.60	106.21	1.13544
18.0	186	184.75	190.63	0.96916
18.2	250	253.43	247.28	1.02487
18.4	346	332.09	371.96	0.89279
18.6	355	372.19	421.65	0.88269
18.8	431	425.70	492.61	0.86416
19.0	461	459.63	632.19	0.72704

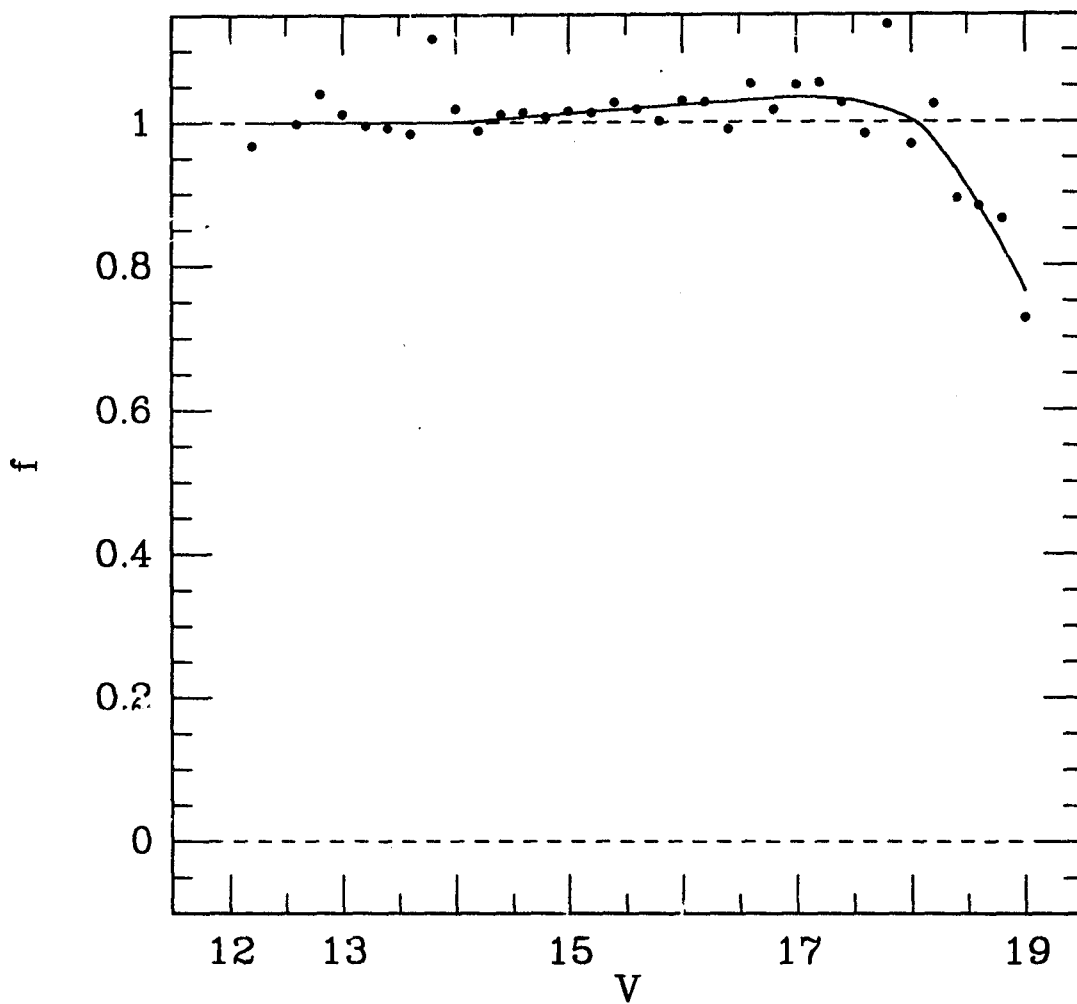


FIGURE 6-17 The rectification factor as a function of the observed magnitude. The smooth curve is a hand-drawn estimate of the true relation. Between $14 \leq V \leq 18$, the LF appears to be enhanced by a small amount ($\lesssim 3\%$). This is mainly due to the combined effects of preferential brightward scattering in the photometry and to the shape of the LF as it rapidly rises at the faint end.

Table 6-5. Rectified luminosity function

V_i	$\tilde{N}_i$	f_i	$\log N_i$	V_i	$\tilde{N}_i$	f_i	$\log N_i$
12.2	2	1.0000	0.3010	15.8	22	1.0216	1.3331
12.4	0	1.0000		16.0	19	1.0249	1.2684
12.6	3	1.0000	0.4771	16.2	29	1.0264	1.4511
12.8	1	1.0000	0.0000	16.4	28	1.0282	1.4351
13.0	3	1.0000	0.4771	16.6	21	1.0307	1.3091
13.2	4	1.0000	0.6021	16.8	38	1.0329	1.5657
13.4	3	1.0000	0.4771	17.0	32	1.0346	1.4904
13.6	2	1.0000	0.3010	17.2	56	1.0336	1.7338
13.8	1	1.0000	0.0000	17.4	70	1.0314	1.8317
14.0	6	1.0000	0.7782	17.6	91	1.0261	1.9479
14.2	9	1.0024	0.9532	17.8	118	1.0164	2.0648
14.4	4	1.0048	0.6000	18.0	186	1.0029	2.2683
14.6	6	1.0072	0.7750	18.2	250	0.9734	2.4097
14.8	8	1.0096	0.8989	18.4	346	0.9313	2.5700
15.0	9	1.0120	0.9491	18.6	355	0.8819	2.6048
15.2	12	1.0144	1.0730	18.8	431	0.8260	2.7175
15.4	14	1.0168	1.1389	19.0	461	0.7645	2.7803
15.6	22	1.0192	1.3342				

The comparison between the rectified LF and model LFs through the transition from the main sequence to the RGB is shown in Figure 6-18. Normalization to the observed LF was obtained by requiring the model CLFs to agree with the observed CLF at $V = 17.4$. Although the 1σ Poisson errors are slightly smaller than those in NGC 288's LF at corresponding evolutionary points through this region, it is not possible to discriminate between the 14 and 16 Gyr fits. Part of the difficulty arises because the manifestation of the transition bump (in this case, near $V = 18.1$) becomes progressively weaker with decreasing metallicity. Over the magnitude range $17.2 \leq V \leq 17.8$, the rectified LF contains more stars than the models predict. Inspection of Fig. 6-17 shows this to be the region in which the observed LF is over-complete — this apparent overabundance of stars may imply that the completeness fractions have been underestimated. On the other hand, it may be a signal that the

cluster is indeed more metal poor than $[\text{Fe}/\text{H}] = -2.03$, because the slope of the transition region decreases with decreasing metallicity.

Both the RGB LF and CLF are compared to models in Figure 6-19. The most encouraging feature of these comparisons is that the models quite accurately predict the RGB tip magnitude. On the other hand, there is no convincing evidence for the RGB bump — there are two breaks in the slope of the CLF, one at $V = 15.6$, which is ≈ 1 mag fainter than the models predict, and the other at $V = 14.2$, which, depending on the age, is 0.2–0.4 mag brighter. It was noted previously that some of the stars which were included as RGB members could actually belong to the AGB. However, if the model LFs and CLFs are to be believed, only 1–2 stars in the region $13.0 < V < 13.4$ and perhaps 3–4 stars near $V = 14.2$ properly belong to the AGB (or the extreme RHB). If the potential AGB stars near $V = 14.2$ are removed from the sample (illustrated by the crosses in Fig. 6-19), then the discontinuity in the slope of the observed CLF, which Rood & Crocker (1985) have taken as the signal for the RGB bump, is virtually eliminated.

6.5 The Helium Abundance

Because of the difficulties encountered in distinguishing between AGB and RGB stars, the R' calibration by Buzzoni *et al.* (1983), given in equation (5-4) will be used to estimate the helium abundance⁴. At $B - V = 0.35$, equation (5-1) gives $M_V = 0.519$ as the absolute magnitude of the ZAHB for a metallicity $[\text{Fe}/\text{H}] = -2.03$.

⁴ The opportunity to make a rigorous comparison among cluster helium abundances is lost by this choice, because of the sensitivity of R to HB morphology (Caputo *et al.* 1987). However, both NGC 288 and NGC 7099 have BHBs.

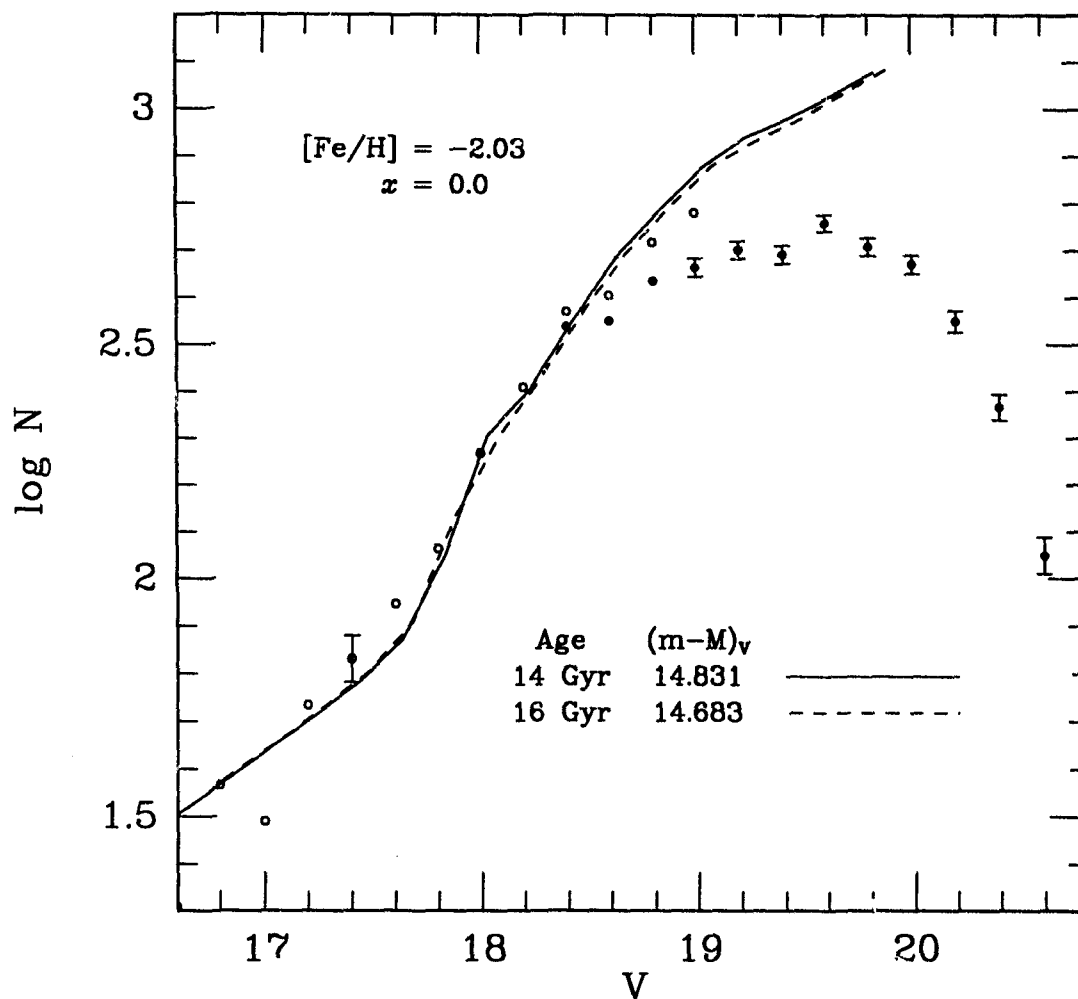


FIGURE 6-18 Model LFs for the parameters indicated are superimposed on the rectified ($\circ$) LF for the transition from the main sequence to the RGB. The raw observed LF ($\bullet$) is also plotted with 1σ Poisson error bars to indicate the statistical significance of the match. Normalization has been accomplished by requiring agreement between the model and observed CLFs at $V = 17.4$

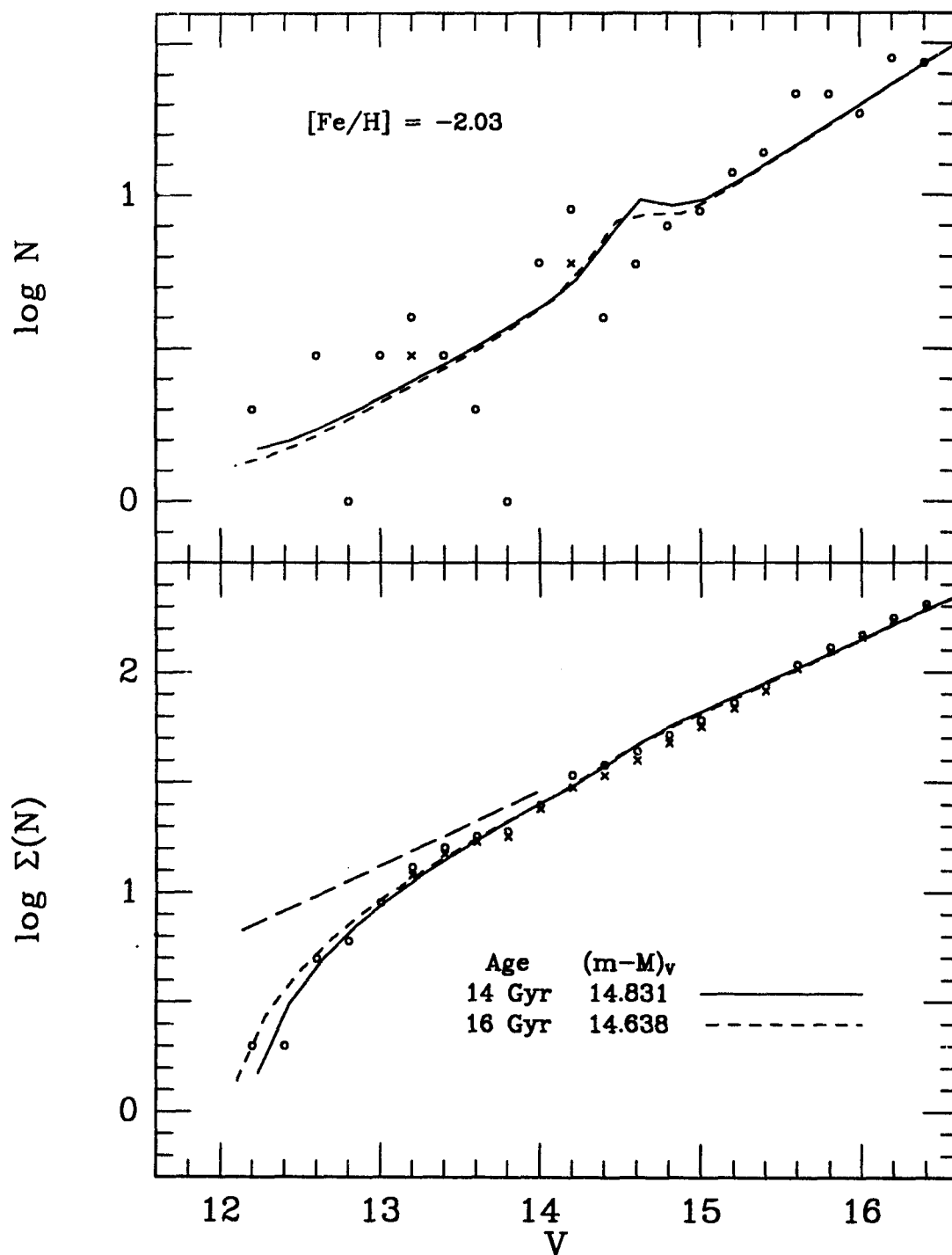


FIGURE 6-19 In the upper panel, model LFs for the parameters indicated are superimposed on the rectified observations. Model CLFs are superimposed on the rectified RGB CLF in the lower panel. The crosses ($\times$) show the effects of removing potential AGB or HB stars from the sample. The slope of the lower RGB is indicated by the dashed line.

Adoption of $(m - M)_V = 14.831 \pm 0.100$ (based on the HB fits illustrated in Fig. 6-10) sets $V_{HB} = 15.350 \pm 0.100$. The sample of stars restricted only to those with $\bar{\chi} \leq 3.0$ is complete down to $V = 16$, from which it is estimated $N_{RGB+AGB} = 93^{+15}_{-16}$ and $N_{HB} = 156 \pm 6$. The uncertainty estimates in these quantities reflect both the uncertainty in the HB level — which causes $^{+9}_{-10}$ in $N_{RGB+AGB}$ directly — and the difficulty in establishing the beginning of the AGB. Increasing the distance modulus by 0.1 mag simultaneously reduces N_{HB} by ≈ 6 stars and increases N_{AGB} by the same amount, because it also shifts the level at which HB evolution terminates to fainter magnitudes. The R' estimate of the helium abundance based on these values is $Y(R') = 0.307^{+0.045}_{-0.036}$.

This result further confirms Dickens' (1972) impression — and that of subsequent investigators — of a higher than expected number of HB stars relative to the number of giant branch stars brighter than the ZAHB. Certainly, such a high helium abundance cannot easily be reconciled with the primordial estimate, $Y = 0.235$ (Denegri *et al.* 1990), the helium abundances in other globular clusters, $Y = 0.24 \pm 0.01$ (e.g., Caputo *et al.* 1990), or the solar helium abundance, $Y = 0.27$ (VandenBerg & Poll 1989). However, if $Y = 0.3$ is appropriate for NGC 7099, then the cluster must be younger⁵ than 14–16 Gyr, estimated from the isochrone fits in Figs. 6-12,13, which could explain why its HB is not as extremely blue as NGC 288's.

6.6 Discussion

One important result of this investigation of NGC 7099 is that, once again, good

⁵ At fixed mass, a main sequence star with enhanced Y will be hotter, and therefore will evolve more rapidly, than a star with lower Y .

overall consistency has been achieved by simultaneously matching a model ZAHB, together with 14–16 Gyr isochrones and LFs, for the abundance parameters $[\text{Fe}/\text{H}] = -2.03$, $[\text{O}/\text{Fe}] = +0.70$, $Y = 0.235$, to the data. However, it has not been possible to constrain these parameters quite as well as was done for NGC 288, mainly because the photometry is less certain due to the extreme crowding of stellar images over the cluster core. An additional fundamental difficulty is that the transition bump, which was used successfully to constrain both the age and the metallicity for NGC 288, is less prominent in the metal-poor LFs.

A second significant result is that the apparent over-abundance of HB stars, first reported by Dickens (1972), has been confirmed. The implication of this result, from the R -method, is that the helium abundance is significantly higher in NGC 7099 than has been reported for other globular clusters, regardless of metallicity (*cf.* Caputo *et al.* 1987) or HB morphology. On the other hand, it does support Sandage's (1983) contention, that an anticorrelation of helium abundances with metallicity is required to explain the period-luminosity-colour relation for globular cluster RR Lyrae stars.

Increasing the helium abundance speeds the evolutionary rate in core-hydrogen-burning stars, so a comparison with $Y \approx 0.3$ models would be expected to result in an age younger than 14–16 Gyr, obtained in this study from comparisons with $Y \approx 0.24$ models. The age reduction would be further enhanced by the HB considerations, because the synthetic ZAHB locus would be brighter, resulting in a larger distance modulus. However, the fact that the CMDs of all the metal-poor clusters — including NGC 7099 — are nearly identical through the turnoff region (VandenBerg *et al.* 1990) argues quite strongly against this.

Interestingly, the possibility of a helium abundance higher in NGC 7099 than in NGC 288, coupled with a younger age for NGC 7099 works in the correct sense to explain the differences between their HB morphologies. In synthetic HBs, comparisons between stars of fixed mass indicate that those with enhanced helium will be displaced slightly blueward. However, if NGC 7099 were significantly younger than NGC 288, then its HB stars would be more massive, and they would be displaced redward of those in NGC 288. This is, in fact, what is observed.

Chapter 7

Conclusions and Future Work

The central purpose of this study has been to evaluate the potential of observed luminosity functions to constrain the basic cluster parameters — i.e., the age, metallicity, and helium abundance. In Chapter 1, a composite LF for M92, assembled from all of the available data, revealed two features in the region of transition from the main sequence to the RGB which are important. The first is the transition bump, also evident in model LFs, which may provide the most powerful diagnostic of cluster ages yet, and which can also help to constrain metallicities, and even helium abundances. Of particular interest, are the conclusions, derived from the comparisons between the model and observed LFs in the transition region, that M92 has an age of 16–18 Gyr, a metallicity near $[\text{Fe}/\text{H}] = -2.26$, and a helium abundance $Y \approx 0.24$. However, the second feature, namely a significant deficiency in the number of stars observed over a 2 mag region just below the turnoff, does not have a theoretical counterpart.

CCD observations of two more globular clusters with BHBs — namely NGC 288 and NGC 7099 — indicate that they have ages of 14–16 Gyr. These results were obtained from simultaneous fits of synthetic ZAHBs and isochrones to the CMD and from LF fits through the transition region. Furthermore, application of the R -method to these two clusters results in a normal ($Y \approx 0.24$) helium abundance in NGC 288 on the one hand, and an anomalous ($Y \approx 0.31$) one in NGC 7099 on the other. Since M92 and NGC 288 have similar HB morphologies (cf. Sandage & Walker 1966, their Fig. 3 and Fig. 5-2 of this study), age cannot by itself account for the 2nd parameter

effect. But, a variation of the helium abundance, combined with an age difference could account for the differences in HB morphology between NGC 288 and NGC 7099.

The comparisons between model LFs and CLFs along the upper giant branch are less encouraging. The RGB bump is very difficult to detect in the differential LFs, and while the location predicted by the model CLFs agrees reasonably well with the observations for NGC 288, it is not at all clear that any feature in NGC 7099's observed CLF corresponds to it. Furthermore, the sensitivity of the predicted bump luminosity to the treatment of convection in stellar evolutionary calculations (Alongi *et al.* 1991) reduces its value as a constraint of basic cluster parameters. On the other hand, the predicted RGB tip magnitude agrees within ≈ 0.2 mag of the brightest star in both of these clusters, reinforcing the contention (e.g., Vandenberg & Durrell 1990) that it can be used as a standard candle. At best, it may be possible to double the size of the sample of bright stars in these clusters, by extending the observations out to larger distances from the cluster center. However, this will not result in a dramatic improvement in the comparisons between the models and the observations because, even so, the scatter in the data will be dominated by small number statistics. Furthermore, the differences in stellar masses between stars at the RGB bump and at the RGB tip are so small ($\lesssim 0.001M_{\odot}$ over 2.5-3.0 mag), that one *should* expect to find an intrinsic "clumpiness" in the distribution of stellar masses in this region of the CMD.

The comparisons of the isochrones and LFs with the observations through the turnoff region of NGC 2243 suggest that convective overshooting plays a significant role in the evolution of stars near $1M_{\odot}$. Certainly, the apparent over-abundance of

stars just above the turnoff — seen both in the CMD and in the LF — cannot be explained by the convergence of a binary and single star sequence. However, the binary star sequence in NGC 2243 is very populous, and a clear understanding of single star evolution through the turnoff for stars in this mass range requires that the binaries be identified. The most attractive approach to such a study would be to use a multi-object spectrograph. However, even on 4 m class telescopes, it is only marginally possible to obtain spectra with a sufficiently high resolution and signal to noise ratio at the turnoff magnitude of NGC 2243. This remains a difficult observational problem.

Of immediate interest for future work is the dip in M92's LF just below the turnoff, which, if it is real, indicates that some important physical process(es) are missing from the stellar models. Large scale fluctuations in the mass spectrum, as suggested by the Stetson & Harris (1988) study should not be evident on this scale because the range in stellar masses is rather small at this level. Populous samples of stars with precise photometry in this magnitude range are easy to obtain even with a 2 m class instrument — but a larger telescope would yield higher quality data. Even if the dip is just an artifact of the old photographic photometry, such CCD studies should provide an excellent diagnostic for cluster ages and abundances because the large samples of stars would make it possible to achieve at least 0.1 mag bin resolution. Already, in the case of NGC 288, the manifestation of the transition bump limits the range in age to ± 1 Gyr and the metallicity to ± 0.2 dex when the data are partitioned into 0.2 mag bins.

It will also be important to derive the LF for NGC 362, for which the necessary

observations have already been made, to determine whether the LF confirms the apparent age difference with NGC 288 as deduced from the colour differences between the turnoff and the lower RGB (*cf.* Vandenberg *et al.* 1990). Because the LF probes the evolution of the energy-generating region of the stars more directly than does the CMD, age differences derived from them are much more reliable.

Finally, the methods of interpolation used to derive the isochrones and model LFs, presented in Chapter 2, can be generalized and improved upon in several ways. For one thing, implementation of separate EEP schemes for interpolation with respect to luminosity and temperature may be expected to improve the overall accuracy of the isochrones and LFs. Secondly, the code can easily be modified to produce temperature functions as well as LFs and isochrones. (It could also be used to generate truly synthetic CMDs for direct comparisons with cluster CMDs.) These may prove useful in constraining cluster ages, because the rate of evolution across the Hertzsprung gap does increase with decreasing age. It would also be useful to generalize the code so that it can recognize primary EEP points in non-canonical evolutionary sequences.

References

Key: The abbreviations in the list of references correspond to the following journals:

AJ Astronomical Journal
 A&A Astronomy and Astrophysics
 AAS Astronomy and Astrophysics Supplement Series
 ApJ Astrophysical Journal
 ApJL Astrophysical Journal Letters
 ApJS Astrophysical Journal Supplement Series
 A&SS Astrophysics and Space Science
 ARA&A Annual Reviews of Astronomy and Astrophysics
 MNRAS Monthly Notices of the Royal Astronomical Society
 PASJ Publications of the Astronomical Society of Japan
 PASP Publications of the Astronomical Society of the Pacific
 ZfA Zeitschrift für Astrophysik

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Appendices

The following appendices contain the CCD photometry for the three clusters NGC 2243 (A.), NGC 288 (B.), and NGC 7099 (C.). Appendix A differs in content from the other two, in that the last entry for each star gives the quantity n , which is the number of (B, V) frame pairs on which the star was detected. In appendices B and C, the last entry for each star is the profile fitting statistic $\bar{\chi}$, which is used as a selection criterion against poor photometry.

ID	X	Y	V	B - V	n	ID	X	Y	V	B - V	n
159	245.82	147.04	12.890	1.089	2	206	235.12	187.17	16.013	0.436	4
20	492.72	-59.36	13.534	0.530	1	339	208.18	268.82	16.025	0.458	2
138	97.17	128.11	13.682	0.922	1	317	232.42	253.85	16.048	0.487	4
235	308.55	207.78	13.707	0.929	2	183	91.54	168.49	16.053	0.429	2
385	270.52	292.76	13.716	0.926	2	98	430.07	69.52	16.071	0.503	2
27	310.47	-38.53	13.737	0.898	1	399	195.20	301.80	16.076	0.495	2
421	329.48	314.29	14.034	0.843	1	6	353.52	-92.88	16.135	0.462	2
199	154.69	180.21	14.190	0.042	1	553	297.37	476.40	16.142	0.921	2
21	268.28	-58.30	14.192	0.815	1	521	254.33	414.48	16.185	0.460	2
360	296.82	280.41	14.196	0.966	2	295	131.95	243.79	16.189	0.457	2
246	300.10	214.08	14.558	0.576	2	12	435.41	-72.73	16.199	0.894	2
531	119.27	433.87	14.744	0.577	2	195	90.60	176.82	16.221	0.463	2
362	98.67	281.63	14.886	0.909	2	363	209.93	281.65	16.239	0.450	2
338	270.68	268.27	14.901	0.915	4	484	295.80	357.69	16.242	0.473	2
2	357.49	-117.39	15.022	0.735	2	215	400.83	191.27	16.258	0.852	2
353	534.13	277.52	15.106	0.897	2	400	345.54	301.83	16.274	0.457	2
398	367.31	301.24	15.107	0.119	2	450	332.31	331.85	16.280	0.470	2
390	256.35	295.03	15.110	0.361	4	227	256.18	201.23	16.283	0.480	4
492	221.73	370.89	15.179	0.867	2	126	222.43	103.24	16.285	0.455	2
106	166.63	78.68	15.236	0.112	2	274	203.12	231.45	16.228	0.461	2
137	338.27	126.89	15.237	0.814	2	359	35.08	280.33	16.311	0.469	2
436	191.10	322.17	15.296	0.113	2	7	435.86	-84.58	16.334	0.493	2
541	98.91	455.42	15.310	0.765	2	43	481.81	-3.31	16.336	0.498	2
537	86.99	447.60	15.404	0.416	2	417	438.97	313.02	16.344	0.469	2
152	173.29	138.43	15.441	0.867	2	300	217.31	245.59	16.352	0.470	2
459	509.95	335.40	15.481	0.482	2	443	87.08	326.65	16.362	0.455	2
340	327.87	270.27	15.511	0.622	2	48	65.62	4.68	16.365	0.445	2
251	342.03	217.90	15.548	0.752	2	545	227.71	467.16	16.367	0.438	2
464	171.92	340.89	15.663	0.500	2	262	233.50	224.12	16.380	0.445	4
551	21.36	475.86	15.666	0.584	2	248	83.86	215.21	16.387	0.461	2
330	413.30	264.16	15.682	0.565	2	245	105.15	273.60	16.394	0.495	2
59	57.03	28.15	15.688	0.573	2	437	261.18	322.36	16.408	0.449	4
62	174.99	31.15	15.697	0.485	2	513	92.91	398.54	16.419	0.456	2
18	233.11	-61.79	15.708	0.557	2	379	234.55	288.19	16.422	0.546	4
214	263.20	190.12	15.722	0.695	4	154	194.62	143.38	16.426	0.465	2
481	247.00	354.14	15.730	0.517	2	395	165.18	297.81	16.432	0.493	2
413	273.68	309.36	15.775	0.459	4	509	277.60	393.81	16.437	0.453	2
344	310.63	272.71	15.806	0.485	4	80	94.36	50.41	16.439	0.477	2
401	205.19	302.37	15.807	0.454	2	255	284.25	221.63	16.443	0.450	4
9	391.62	-81.98	15.808	0.500	2	37	434.24	-11.43	16.447	0.496	2
218	380.08	194.53	15.810	0.495	2	130	139.82	108.64	16.449	0.449	2
480	200.33	353.17	15.828	0.457	2	538	26.31	448.65	16.452	0.440	2
277	174.20	234.35	15.832	0.495	2	69	422.32	41.06	16.453	0.510	2
335	305.68	267.11	15.837	1.368	4	485	201.48	362.66	16.455	0.496	2
318	334.81	253.83	15.842	0.463	2	410	116.97	308.46	16.458	0.467	2
145	57.22	133.56	15.853	0.442	2	213	205.75	190.01	16.472	0.460	2
49	24.74	9.07	15.865	0.822	2	384	362.65	292.33	16.473	0.476	2
207	71.90	187.45	15.867	0.826	2	536	163.80	441.35	16.500	0.688	2
103	358.20	77.51	15.877	0.454	2	298	346.29	244.76	16.519	0.509	2
447	151.12	329.89	15.900	0.444	2	156	250.84	144.17	16.522	0.478	2
313	158.31	252.12	15.900	0.437	2	157	250.12	144.35	16.525	0.456	2
427	309.73	317.68	15.906	0.440	4	486	231.74	364.05	16.537	0.494	2
554	191.10	477.21	15.908	0.450	2	472	294.03	348.63	16.541	0.467	4
501	276.73	379.86	15.913	0.815	2	382	258.46	290.48	16.541	0.463	4
266	204.20	226.01	15.921	0.452	2	257	324.95	222.74	16.545	0.570	2
396	242.83	299.15	15.927	0.454	4	451	455.33	331.89	16.553	0.464	2
439	107.79	322.94	15.946	0.477	2	347	126.93	274.92	16.566	0.466	2
254	434.48	220.34	15.960	0.734	2	203	342.95	185.43	16.587	0.470	2
311	345.46	250.71	15.989	0.792	2	128	209.85	105.05	16.592	0.408	2
72	443.35	44.11	16.010	0.639	2	139	8.53	129.24	16.606	0.441	2

ID	X	Y	V	B - V	n	ID	X	Y	V	B - V	n
528	34.12	422.27	16.608	0.505	2	290	48.27	240.14	17.091	0.526	2
53	328.46	15.82	16.610	0.447	2	13	321.53	-71.46	17.072	0.524	2
267	492.02	228.73	16.611	0.486	2	414	243.85	309.92	17.098	0.499	4
45	302.04	2.61	16.618	0.898	4	357	263.25	279.87	17.100	0.501	4
457	358.05	334.08	16.623	0.448	2	563	214.11	492.51	17.107	0.455	2
448	177.89	330.18	16.628	0.448	2	74	154.95	46.74	17.141	0.477	2
431	354.08	318.65	16.651	0.462	2	173	131.79	157.44	17.152	0.521	2
510	114.76	396.77	16.668	0.507	2	81	347.64	51.50	17.161	0.485	2
209	334.38	189.04	16.670	0.531	2	321	304.89	256.22	17.168	0.575	4
258	307.64	223.15	16.679	0.469	4	79	190.98	40.85	17.168	0.629	2
355	214.38	279.74	16.687	0.452	2	325	161.95	256.90	17.185	0.649	2
343	347.32	271.52	16.694	0.467	2	46	260.59	3.27	17.186	0.479	4
334	418.15	266.83	16.701	0.521	2	224	299.14	198.97	17.191	0.516	4
243	388.85	213.10	16.711	0.463	2	17	534.73	-65.35	17.192	0.534	2
286	225.43	238.49	16.712	0.464	2	412	202.85	309.13	17.204	0.488	2
245	31.56	213.82	16.721	0.458	2	495	244.10	374.15	17.204	0.628	2
73	273.45	45.70	16.724	0.510	4	467	263.21	342.59	17.207	0.490	4
367	238.39	283.52	16.729	0.480	4	316	296.48	253.53	17.217	0.513	4
418	72.26	313.51	16.730	0.793	2	42	248.53	-3.40	17.219	0.529	2
108	10.44	80.04	16.734	0.458	2	39	251.01	-10.27	17.224	0.493	2
94	308.13	243.49	16.754	0.620	4	179	192.19	165.79	17.235	0.501	2
50	363.17	9.60	16.757	0.477	2	312	231.27	250.86	17.237	0.618	4
212	363.40	189.87	16.779	0.468	2	526	74.08	420.66	17.244	0.598	2
141	191.34	129.83	16.789	0.462	2	505	306.68	384.39	17.249	0.479	2
411	324.97	308.81	16.791	0.562	2	41	477.09	-5.13	17.261	0.509	2
468	92.11	344.24	16.792	0.463	2	208	301.67	188.22	17.291	0.596	4
51	374.53	10.89	16.803	0.470	2	99	129.92	72.17	17.304	0.507	2
479	208.01	352.52	16.812	0.539	2	422	271.68	315.17	17.308	0.550	4
519	169.86	413.49	16.864	0.470	2	461	214.74	337.95	17.330	0.516	2
496	14.68	378.74	16.881	0.486	2	151	72.52	138.16	17.339	0.492	2
504	171.84	394.29	16.885	0.500	2	324	325.10	256.86	17.347	0.502	2
429	87.24	318.17	16.889	0.562	2	77	83.72	49.64	17.348	0.563	2
483	424.40	356.65	16.906	0.262	1	549	256.48	473.94	17.369	0.540	2
276	340.20	233.94	16.909	0.479	2	494	253.12	372.80	17.373	0.527	2
470	347.35	347.15	16.918	0.466	2	261	357.36	223.67	17.378	0.655	2
281	409.72	236.47	16.920	0.473	2	146	110.83	133.65	17.386	0.527	2
32	437.39	-24.60	16.922	0.544	2	515	218.69	402.55	17.396	0.603	2
380	225.99	288.52	16.923	0.486	2	564	311.63	494.89	17.403	0.528	2
326	221.23	257.80	16.926	0.482	2	132	195.56	113.00	17.410	0.493	2
518	179.76	412.24	16.929	1.201	2	225	268.95	199.50	17.412	0.599	4
487	221.84	364.43	16.934	0.545	2	162	186.64	148.87	17.421	0.536	2
565	208.44	496.95	16.939	0.475	2	178	449.23	160.52	17.443	0.612	2
5	318.34	-106.14	16.954	0.670	2	463	372.24	340.11	17.460	0.621	2
184	446.12	168.91	16.964	0.489	2	361	223.56	280.79	17.466	0.613	2
469	246.21	345.10	16.967	0.509	4	56	333.32	20.61	17.484	0.541	2
376	223.44	286.51	16.970	0.454	2	397	226.48	299.78	17.486	0.636	4
232	526.70	207.51	16.970	1.060	2	543	204.04	460.00	17.495	0.562	2
291	223.73	241.95	16.993	0.576	2	66	95.73	38.57	17.532	0.501	2
202	138.79	184.44	16.993	0.481	2	263	275.83	224.90	17.542	0.581	4
559	250.19	483.85	16.995	0.459	2	84	143.17	53.83	17.553	0.626	2
307	103.74	248.53	17.003	0.462	2	302	209.40	246.11	17.555	0.522	2
194	205.90	176.68	17.010	0.477	2	136	296.68	125.05	17.558	0.554	4
474	254.51	349.73	17.017	0.482	4	29	260.82	-21.76	17.569	0.566	2
327	270.00	259.09	17.020	0.490	4	76	235.49	48.87	17.594	0.674	4
507	177.28	388.43	17.033	0.498	2	78	235.58	49.63	17.599	0.669	3
242	425.10	212.46	17.053	0.555	2	287	367.08	238.69	17.604	0.397	2
190	214.41	173.63	17.058	0.561	2	540	291.05	452.79	17.617	0.570	2
115	518.90	91.08	17.061	0.525	2	131	107.58	110.52	17.619	0.560	2
176	342.11	159.45	17.073	0.495	2	52	22.09	12.41	17.626	0.500	2
391	356.50	297.21	17.080	0.489	2	171	203.74	156.06	17.633	0.654	2

ID	X	Y	V	B - V	n	ID	X	Y	V	B - V	n
168	332.42	154.35	17.658	0.586	2	60	140.63	28.22	18.130	0.613	2
272	217.71	230.33	17.662	0.550	2	161	379.98	148.06	18.136	1.427	2
477	182.03	352.06	17.676	0.547	2	372	262.28	285.61	18.141	0.677	4
112	283.49	86.98	17.691	1.181	4	462	455.54	339.73	18.165	0.695	2
75	311.79	46.92	17.693	0.553	4	198	314.10	179.94	18.168	0.660	4
342	439.20	271.46	17.702	0.574	2	140	274.49	129.60	18.182	0.783	4
399	403.91	245.14	17.711	0.554	2	100	533.60	72.24	18.185	1.201	2
550	220.59	474.38	17.744	0.583	2	349	399.93	275.98	18.185	0.719	2
371	76.97	285.11	17.759	0.645	2	196	281.69	178.77	18.197	0.617	4
471	243.11	348.51	17.763	0.633	4	260	132.79	223.66	18.204	0.558	2
497	257.39	379.08	17.772	0.590	2	200	193.86	181.57	18.206	0.769	2
547	125.03	472.65	17.777	0.554	2	191	443.65	175.13	18.211	0.626	2
221	305.10	197.80	17.782	0.717	4	512	183.70	398.47	18.214	0.612	2
284	250.14	237.42	17.794	0.632	4	516	116.15	403.94	18.248	0.561	2
542	30.63	456.59	17.795	0.588	2	482	257.61	354.67	18.271	0.611	2
24	447.37	-53.69	17.796	0.626	2	435	220.67	321.57	18.276	0.633	2
329	106.93	263.40	17.809	0.589	2	114	178.90	88.57	18.284	0.769	2
561	188.97	488.36	17.816	0.598	2	105	136.06	78.20	18.307	0.632	2
14	379.89	-70.16	17.817	0.593	2	488	178.48	365.23	18.309	0.624	2
47	186.27	3.32	17.839	0.661	2	567	241.56	499.85	18.313	0.658	2
389	87.34	294.86	17.857	0.584	2	153	165.65	138.66	18.314	1.153	1
388	309.96	294.59	17.874	0.604	4	280	100.71	236.23	18.332	0.618	2
453	97.58	332.90	17.883	0.607	2	434	377.62	321.20	18.333	0.638	2
270	227.04	229.60	17.889	0.588	4	419	51.91	313.77	18.333	0.777	2
558	47.13	483.63	17.894	0.595	2	423	280.12	315.56	18.335	0.646	4
285	156.72	238.36	17.901	0.621	2	535	295.60	440.79	18.347	0.654	2
119	210.03	95.93	17.907	0.698	2	566	48.47	499.05	18.350	0.628	2
452	411.65	332.27	17.911	0.578	2	104	343.66	77.72	18.367	0.747	2
520	148.80	414.32	17.912	1.357	2	405	462.73	306.29	18.375	0.758	2
556	284.74	478.51	17.932	0.638	2	189	146.45	172.34	18.402	0.583	2
375	220.11	286.18	17.936	0.672	2	163	343.36	149.60	18.418	0.686	2
116	96.17	92.83	17.937	0.599	2	226	167.24	199.98	18.419	0.776	2
228	167.47	203.93	17.939	0.686	2	491	245.13	370.29	18.436	0.603	2
445	49.98	327.45	17.942	0.572	2	289	163.55	239.57	18.450	0.671	2
244	173.99	213.38	17.953	0.634	2	220	45.56	196.04	18.451	0.777	2
370	62.08	284.95	17.954	0.593	2	172	439.17	156.63	18.451	0.705	2
253	25.63	220.09	17.959	0.583	2	394	294.25	297.95	18.458	0.683	4
22	480.56	-57.40	17.962	0.532	2	393	348.17	297.66	18.470	0.812	2
278	115.65	235.52	17.963	0.612	2	305	462.36	247.42	18.470	0.702	2
296	254.75	244.40	17.992	0.746	4	478	225.70	352.49	18.482	0.756	2
308	303.77	249.10	17.997	0.709	4	64	325.90	34.62	18.499	0.779	2
111	24.68	84.92	17.998	0.632	2	68	28.40	40.09	18.510	0.770	2
465	288.05	340.99	18.003	0.639	4	373	311.97	285.53	18.517	0.906	4
415	498.74	311.32	18.012	0.755	2	416	446.34	312.46	18.529	0.477	2
127	297.09	103.34	18.012	1.047	1	144	483.17	132.46	18.583	0.716	2
170	154.71	155.66	18.014	0.947	1	192	298.21	176.56	18.586	0.741	4
210	331.12	189.70	18.020	0.592	2	230	319.04	204.93	18.600	0.713	2
204	15.22	186.23	18.022	1.097	2	446	128.90	328.95	18.601	0.811	2
306	234.13	247.80	18.025	0.656	4	315	242.43	253.30	18.623	0.330	4
387	225.07	293.43	18.038	0.647	2	525	210.87	419.06	18.625	0.709	2
35	287.00	-19.48	18.055	0.569	2	55	266.53	20.67	18.629	0.656	4
475	46.28	349.99	18.065	0.790	2	236	489.86	207.99	18.635	0.798	2
442	214.38	325.23	18.076	0.602	2	328	259.62	262.60	18.642	0.705	3
15	324.67	-68.06	18.093	0.605	1	332	447.13	264.87	18.643	0.687	2
407	207.09	306.89	18.117	0.650	2	247	268.90	214.43	18.648	0.745	4
533	197.36	436.46	18.122	0.506	2	133	368.61	116.41	18.666	0.744	2
449	193.19	330.61	18.123	0.619	2	160	20.06	147.73	18.677	0.709	2
174	426.98	158.40	18.123	1.481	2	71	497.64	43.28	18.685	0.717	2
177	141.92	160.32	18.123	0.632	2	502	113.78	380.25	18.686	0.774	2
283	136.88	237.31	18.123	0.741	2	38	382.35	-11.40	18.694	0.776	2

ID	X	Y	V	B - V	n	ID	X	Y	V	B - V	n
408	349.35	307.71	18.695	0.692	2	392	177.84	297.54	19.318	0.731	2
522	193.62	415.59	18.707	0.695	2	275	305.79	231.72	19.334	0.853	2
279	529.14	235.57	18.711	0.735	2	341	126.27	270.95	19.337	0.683	1
57	281.34	23.53	18.713	0.698	3	336	35.88	267.19	19.339	0.860	2
125	262.83	103.22	18.722	0.913	3	346	85.54	274.61	19.343	0.883	1
155	500.77	143.83	18.724	0.882	2	444	166.89	327.05	19.344	0.693	2
265	294.69	225.66	18.726	0.899	4	134	292.83	122.36	19.347	0.973	3
216	160.13	191.48	18.727	0.707	2	524	121.50	417.72	19.350	0.968	1
555	180.43	477.84	18.741	0.704	1	61	71.59	31.03	19.354	0.812	2
365	161.17	283.26	18.749	1.197	2	97	536.82	68.82	19.367	1.130	2
424	114.40	316.25	18.762	0.861	2	466	284.15	342.20	19.388	0.978	3
499	210.89	379.74	18.767	0.698	2	310	388.89	250.36	19.426	0.822	1
70	224.95	41.19	18.791	0.839	2	546	75.17	471.38	19.435	0.870	1
150	247.72	137.73	18.799	0.603	1	309	310.47	249.79	19.439	0.865	4
92	163.04	60.84	18.803	0.709	2	113	433.53	87.51	19.443	0.533	1
234	216.17	207.57	18.824	0.811	2	33	343.28	-24.60	19.448	0.675	1
175	313.15	119.28	18.833	0.738	4	320	317.12	255.86	19.453	1.185	1
256	411.77	222.26	18.834	0.760	2	10	285.54	-77.53	19.463	0.823	1
67	47.17	39.35	18.835	0.773	2	354	57.08	279.07	19.481	0.611	2
511	1.89	397.53	18.845	0.814	1	211	269.78	189.92	19.492	1.118	2
356	178.31	279.83	18.848	0.667	2	193	529.05	176.59	19.496	0.855	2
165	148.51	151.49	18.853	0.973	1	532	129.58	434.06	19.501	1.127	1
456	125.27	333.98	18.864	0.889	2	58	124.72	23.68	19.503	1.073	2
428	246.41	318.00	18.958	0.737	4	181	324.53	167.29	19.520	0.958	1
197	96.81	179.23	18.964	0.769	2	500	182.31	379.84	19.525	0.900	2
109	309.11	81.82	18.969	0.860	4	82	152.36	51.76	19.526	0.824	1
3	241.02	-116.39	18.972	0.509	2	319	446.68	254.78	19.541	0.826	2
430	286.14	318.56	18.974	0.906	3	404	319.31	505.80	19.546	1.038	1
121	420.94	99.25	19.002	0.772	1	506	48.50	385.73	19.559	0.841	1
530	166.04	428.18	19.019	0.771	2	364	158.63	282.39	19.579	1.026	1
34	265.98	-22.45	19.019	0.749	1	96	437.91	63.72	19.582	0.772	2
403	106.35	304.80	19.050	1.006	2	438	210.34	322.84	19.597	0.854	1
552	236.79	476.45	19.055	0.800	2	314	408.21	252.53	19.615	0.978	1
420	144.90	314.24	19.079	0.718	1	333	86.33	285.60	19.623	0.939	1
142	360.71	129.89	19.082	0.828	2	102	142.60	76.90	19.647	0.868	2
454	398.89	333.27	19.083	0.755	1	222	245.11	198.25	19.656	0.834	3
249	1.92	216.77	19.085	0.775	2	149	428.03	136.76	19.658	1.072	1
88	89.53	56.84	19.095	0.818	1	31	207.74	59.84	19.665	0.990	1
95	97.65	63.12	19.099	0.954	2	223	310.69	198.42	19.687	0.191	1
65	30.27	38.00	19.109	1.067	1	28	242.22	-33.13	19.690	1.253	1
101	409.15	75.99	19.112	0.860	2	143	448.70	130.45	19.699	1.093	1
148	168.20	135.15	19.147	0.833	1	264	449.89	225.07	19.703	0.860	1
217	18.71	194.06	19.153	0.791	1	348	35.75	275.40	19.709	0.796	1
158	38.47	144.57	19.173	0.759	2	120	375.77	96.43	19.716	0.915	1
1	414.76	-133.80	19.182	0.855	1	489	154.80	368.48	19.717	1.595	1
441	368.30	324.86	19.186	0.772	2	508	78.11	393.55	19.724	1.062	1
323	293.29	256.82	19.219	0.812	4	182	383.85	167.68	19.732	0.992	1
23	456.44	-53.77	19.223	1.248	1	252	120.31	218.55	19.748	0.860	1
372	456.86	256.30	19.228	0.853	2	377	278.64	286.88	19.749	0.941	1
117	274.52	93.75	19.228	1.818	1	238	331.90	208.64	19.764	0.959	1
54	171.40	17.32	19.229	0.706	2	123	356.36	100.21	19.772	0.888	1
118	359.87	95.08	19.241	0.812	2	166	365.82	153.25	19.779	1.263	1
498	311.07	379.53	19.245	0.949	1	250	93.49	216.87	19.780	1.505	1
63	311.42	31.52	19.250	0.626	4	409	337.20	308.24	19.784	0.835	1
523	94.36	415.58	19.250	0.617	2	86	253.25	55.83	19.785	0.945	3
87	511.59	56.74	19.288	0.852	1	426	443.84	316.77	19.798	0.990	1
476	258.79	350.96	19.288	0.966	1	4	320.95	-111.53	19.799	0.973	2
352	332.75	276.65	19.311	0.801	1	31	246.16	-29.82	19.807	0.953	1
268	261.75	228.96	19.313	0.993	4	527	278.87	421.72	19.808	0.977	1
269	261.39	229.22	19.314	0.993	3	292	447.49	242.76	19.825	0.956	1

ID	X	Y	V	B - V	n	ID	X	Y	V	B - V	n
237	331.21	208.43	19.828	1.387	1	122	418.07	99.72	20.365	1.177	1
440	443.38	323.06	19.840	1.033	1	187	113.09	171.90	20.368	0.954	1
219	277.80	194.71	19.840	1.096	2	381	104.10	289.36	20.374	1.416	1
36	444.67	-18.53	19.845	0.958	1	369	120.56	284.21	20.447	1.063	1
273	150.25	230.64	19.847	1.724	1	241	132.10	210.44	20.455	1.174	1
368	306.32	283.68	19.870	1.710	1	25	365.01	-47.43	20.478	1.205	1
19	433.17	-60.04	19.900	1.024	1	537	395.99	267.28	20.492	1.043	1
503	259.58	383.98	19.904	0.893	1	26	365.72	-46.78	20.516	1.040	1
303	94.98	246.19	19.915	0.807	1	180	351.34	166.25	20.529	1.402	1
240	146.90	210.21	19.928	1.331	1	139	345.31	105.65	20.531	1.105	1
406	3.75	306.45	19.959	1.068	1	514	141.95	402.47	20.532	1.046	1
557	274.38	479.68	19.961	0.826	1	378	249.81	287.24	20.558	0.084	1
229	298.64	204.40	19.961	0.593	2	297	15.99	244.52	20.575	1.196	1
544	193.86	464.56	19.971	0.940	1	432	153.38	319.97	20.589	1.110	1
568	173.80	500.01	19.982	1.246	1	455	213.57	333.83	20.597	0.603	1
548	287.55	473.01	19.998	0.833	1	231	292.48	206.82	20.651	0.128	1
89	198.07	57.68	20.006	1.077	1	383	247.00	290.49	20.660	0.212	1
124	236.23	101.53	20.009	1.032	2	188	297.22	172.33	20.678	1.215	2
16	301.89	-67.82	20.019	1.079	1	331	280.50	264.71	20.696	1.223	1
288	408.94	239.31	20.040	1.313	1	94	79.93	62.44	20.707	0.618	1
358	233.84	279.88	20.045	0.943	1	93	80.80	62.33	20.716	0.891	1
135	330.87	123.61	20.070	1.017	1	271	241.47	229.61	20.732	0.940	1
167	516.05	154.51	20.087	1.038	2	517	48.54	409.01	20.760	0.475	1
539	181.13	451.11	20.107	0.706	1	30	386.88	-31.59	20.896	1.351	1
169	345.90	154.51	20.107	1.654	1	402	476.76	303.50	20.931	1.055	1
301	236.87	246.09	20.109	1.188	1	460	238.49	335.91	20.938	1.135	1
458	18.05	321.26	20.117	0.954	1	351	306.81	276.63	20.954	-0.128	1
107	108.29	79.85	20.121	0.861	2	186	81.25	170.66	21.068	0.689	1
164	116.07	149.67	20.130	1.113	1	560	168.30	485.56	21.069	1.013	1
490	199.89	368.49	20.132	1.102	1	90	316.61	58.38	21.126	1.572	1
40	447.73	-7.94	20.135	0.983	2	85	292.24	55.62	21.136	1.346	2
62	80.19	490.68	20.135	0.999	1	11	331.14	-75.32	21.153	1.063	1
366	274.40	283.28	20.157	0.711	1	110	271.17	83.93	21.211	1.257	1
8	539.12	-83.66	20.251	1.472	2	534	149.78	437.22	21.273	1.550	1
201	344.71	181.96	20.252	1.208	1	205	372.98	186.87	21.369	1.444	1
147	276.98	133.65	20.278	0.595	2	493	256.05	372.18	21.402	1.553	1
433	19.17	321.12	20.285	1.028	1	304	167.63	247.20	21.552	0.587	1
83	85.55	52.25	20.307	0.280	1	374	88.98	285.45	21.554	0.470	1
293	461.25	243.15	20.317	1.076	1	186	97.91	169.96	22.210	0.235	1
239	50.93	209.71	20.340	0.943	1	282	125.51	237.07	22.460	0.610	1
386	94.99	292.91	20.347	0.969	1	233	263.65	207.51	22.520	0.559	1

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2833	450.19	354.26	12.901	1.458	1.706	3082	202.88	377.60	15.369	0.130	1.067
5461	289.02	762.67	12.966	1.409	1.153	3069	405.52	375.72	15.379	0.859	0.925
1999	391.02	273.19	13.081	1.359	1.707	1848	354.74	259.82	15.380	0.168	1.018
4509	192.75	536.27	13.207	1.312	1.215	4085	526.45	478.38	15.380	0.035	0.930
5240	287.2	689.11	13.272	1.228	1.781	2526	0.89	324.93	15.388	0.998	1.153
4430	282.7	526.13	13.528	1.208	1.401	1222	341.19	192.11	15.389	0.859	0.975
1176	75.80	188.52	13.537	1.191	1.133	831	407.65	144.16	15.392	0.170	0.963
2837	252.40	354.75	13.566	1.196	1.961	603	346.70	109.97	15.404	0.110	1.038
4495	108.07	534.27	13.618	1.195	1.058	945	449.16	158.64	15.406	0.126	1.025
901	215.89	152.88	13.721	1.168	0.975	1074	208.02	176.12	15.412	0.869	1.013
2987	179.19	367.88	13.740	1.123	1.201	744	414.87	131.22	15.420	0.878	0.940
1907	302.65	264.72	13.785	1.010	1.404	2448	321.41	317.87	15.422	0.861	1.013
3918	58.75	461.31	13.872	1.125	1.005	2969	45.13	366.50	15.437	0.485	1.100
2533	147.65	325.73	13.897	1.114	1.048	5236	499.40	688.17	15.442	0.874	1.153
1730	7.48	182.83	13.909	1.129	1.230	4164	517.11	488.46	15.449	0.096	1.065
1772	177.24	252.39	13.925	1.113	1.018	66	355.82	2.32	15.456	0.877	0.900
5432	364.86	753.98	13.963	1.076	0.820	4758	40.06	578.39	15.456	0.878	0.880
5064	133.49	647.53	14.033	1.103	0.963	4196	31.98	494.03	15.478	0.871	0.915
4782	414.53	583.31	14.078	0.918	0.923	2592	195.58	331.43	15.480	0.071	1.005
4455	206.83	529.05	14.094	1.052	1.113	292	79.22	58.39	15.483	0.076	1.003
3252	180.90	392.25	14.141	0.961	1.064	3773	398.39	445.71	15.484	0.857	1.061
2330	213.67	305.86	14.145	0.946	1.010	3596	213.28	426.88	15.523	0.801	1.025
3858	343.45	453.89	14.155	0.930	1.331	4979	300.49	627.69	15.537	0.857	1.049
2127	522.85	285.94	14.215	0.859	1.682	3141	239.95	382.16	15.537	0.851	1.077
3843	388.77	452.05	14.246	1.041	1.379	676	0.89	121.52	15.540	0.791	1.238
3965	470.87	465.75	14.263	0.522	1.449	249	465.28	49.66	15.560	0.821	1.033
521	0.62	98.08	14.358	0.898	1.240	1817	131.50	257.02	15.561	0.072	0.958
2149	523.96	287.33	14.370	1.027	1.667	4846	61.56	595.48	15.575	0.900	0.858
3034	36.59	372.60	14.404	1.016	1.133	697	346.74	124.86	15.579	0.055	0.988
851	299.27	146.43	14.413	0.719	1.446	2054	369.80	278.33	15.579	0.847	1.035
3835	175.57	451.23	14.454	0.993	0.893	1351	3.35	204.70	15.583	0.075	1.158
4700	112.82	567.64	14.482	1.025	0.975	10	246.67	-34.62	15.589	0.030	1.485
4618	115.01	552.58	14.555	0.805	0.908	4435	89.86	526.76	15.590	0.079	0.995
4390	147.52	519.30	14.611	0.997	0.957	3056	58.11	374.68	15.591	0.859	0.976
4538	7.70	540.12	14.634	0.815	1.118	5412	194.04	747.23	15.592	0.861	0.998
1398	108.07	209.33	14.660	0.933	1.072	2174	505.78	289.54	15.609	0.846	1.077
4038	245.98	472.38	14.692	0.952	1.077	2713	194.09	343.27	15.614	0.041	1.157
2830	182.21	353.75	14.732	0.954	1.171	533	7.71	100.54	15.637	0.822	1.163
2651	239.13	337.59	14.825	0.949	1.226	5116	173.57	659.21	15.642	0.838	1.103
5488	514.64	772.77	14.874	0.915	0.710	4364	53.71	515.63	15.644	0.041	0.983
282	485.59	56.55	14.875	0.952	1.005	3456	83.66	412.84	15.722	0.839	0.956
715	286.91	127.03	14.896	0.942	1.138	3258	117.88	392.83	15.784	0.838	1.136
1260	143.10	195.52	14.896	0.957	0.880	328	239.68	64.72	15.801	-0.010	0.998
390	409.82	75.90	14.899	0.971	0.965	3685	114.28	436.09	15.808	0.846	0.954
2286	130.15	300.41	14.911	0.890	1.048	5549	219.73	802.16	15.835	-0.007	0.750
4516	516.41	537.48	14.962	0.921	0.973	1561	176.17	228.70	15.841	0.807	1.030
646	49.75	118.01	14.983	0.907	0.785	2853	238.56	356.32	15.847	-0.005	1.218
4117	260.71	481.60	15.005	0.955	1.013	4219	328.16	497.83	15.851	0.004	0.895
972	516.80	163.92	15.016	0.916	0.950	5320	68.99	710.78	15.862	0.864	0.828
3313	105.78	399.23	15.060	0.898	1.074	23	336.01	-26.00	15.864	0.015	0.975
5103	220.10	656.68	15.102	0.582	0.993	1	305.38	-40.63	15.873	0.846	1.268
2461	90.80	318.44	15.156	0.892	0.950	4894	168.81	608.98	15.924	0.002	0.960
1966	164.03	269.81	15.167	0.604	1.115	2543	510.42	326.61	15.925	-0.025	0.968
2133	79.25	286.12	15.190	0.887	0.968	878	198.50	150.02	15.931	0.824	1.258
579	125.55	107.05	15.209	0.875	1.270	1013	367.90	168.77	15.932	-0.009	1.087
131	129.84	21.71	15.267	0.880	1.072	5508	506.94	782.25	15.939	-0.034	1.230
2365	112.68	308.25	15.292	0.882	0.953	1328	12.64	202.73	15.944	0.025	1.030
2262	186.31	297.59	15.309	0.895	0.965	1210	314.01	191.19	15.951	0.806	0.950
211	300.53	40.09	15.322	0.877	1.040	2193	181.66	291.47	15.959	0.834	0.898
2784	178.21	349.07	15.325	0.899	1.065	4201	129.67	495.19	15.960	-0.029	1.019

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
1965	65.86	269.78	15.964	0.840	0.955	4701	67.48	567.88	16.343	-0.049	0.865
853	498.93	146.58	15.967	-0.026	1.103	1151	276.45	185.67	16.377	0.794	0.994
1063	91.77	175.11	15.967	0.801	0.928	3043	81.52	373.42	16.394	0.705	1.325
1486	176.42	220.65	15.969	0.800	1.018	782	433.72	137.12	16.409	-0.073	0.998
954	77.88	159.96	15.973	0.799	0.995	2289	260.60	300.81	16.412	-0.087	1.110
3529	57.87	420.10	15.980	-0.019	1.016	2823	334.37	353.47	16.418	0.762	1.014
3364	19.75	404.38	15.987	-0.009	0.964	1430	49.01	213.56	16.428	0.775	1.063
976	93.17	164.59	15.989	-0.045	0.895	950	258.51	159.09	16.451	0.781	0.923
2670	45.13	339.58	15.998	-0.078	1.146	2839	102.31	354.91	16.461	0.532	1.524
3129	191.68	381.57	16.000	0.794	1.043	1901	192.61	264.44	16.461	0.764	0.910
1967	365.14	269.90	16.000	-0.037	0.953	1453	43.20	216.13	16.467	-0.066	1.212
859	271.42	146.96	16.004	-0.081	1.129	3211	214.51	388.12	16.472	0.756	1.036
2993	531.04	368.51	16.009	0.813	1.053	2696	65.09	341.68	16.483	0.741	0.970
948	8.65	158.89	16.020	0.787	0.978	3124	5.31	381.14	16.515	0.767	1.050
3271	141.69	394.85	16.032	-0.007	1.041	1031	465.46	171.09	16.516	0.768	0.908
4490	137.67	533.84	16.035	-0.015	0.933	3999	396.99	463.31	16.549	0.736	0.975
4743	16.69	576.01	16.060	0.809	0.940	2961	223.12	265.96	16.558	-0.144	0.966
4033	176.51	472.27	16.074	-0.041	0.970	3610	305.96	428.52	16.560	0.739	1.174
4790	501.83	584.37	16.088	0.777	1.128	2571	260.74	329.06	16.566	0.751	1.175
1626	504.26	235.81	16.089	0.824	1.173	2764	443.90	347.80	16.575	0.769	1.608
384	9.02	74.65	16.092	0.786	1.067	1115	382.28	181.23	16.599	0.774	0.970
4389	81.71	519.15	16.100	0.810	0.963	3110	225.08	379.51	16.605	0.759	1.004
4041	376.76	472.68	16.103	-0.065	0.817	1771	106.24	252.35	16.605	-0.126	0.998
4835	421.86	591.53	16.106	-0.033	0.897	1241	270.11	193.58	16.609	0.783	1.003
1055	392.22	174.09	16.109	0.807	0.895	83	283.46	10.38	16.626	0.764	1.031
586	370.43	107.76	16.109	-0.039	0.865	4118	23.20	481.73	16.632	0.775	0.979
5399	36.94	742.90	16.117	0.827	1.087	2153	182.93	287.45	16.639	0.755	0.945
2892	44.54	359.72	16.128	-0.049	1.156	1290	95.00	199.03	16.640	0.755	1.028
2013	513.00	274.55	16.150	-0.055	1.065	5410	386.41	746.70	16.645	0.758	0.980
5538	205.31	796.71	16.150	0.810	1.065	2806	61.48	351.65	16.657	-0.101	0.943
3284	105.14	396.85	16.155	0.802	1.034	4401	178.91	521.24	16.670	-0.083	0.848
2121	291.44	285.43	16.162	0.812	1.078	5511	359.05	783.50	16.696	0.759	1.203
3548	30.28	422.25	16.165	-0.043	0.971	696	31.34	124.68	16.697	0.954	0.860
2217	242.39	253.57	16.170	0.779	1.075	3805	11.56	448.50	16.701	0.774	0.903
1715	1.05	245.30	16.174	0.849	0.903	2425	163.55	314.72	16.702	0.178	0.938
4834	280.95	451.16	16.176	0.795	1.023	284	373.63	56.78	16.712	0.766	0.945
3119	82.52	380.54	16.177	-0.062	1.076	867	169.56	148.42	16.714	0.800	0.950
4173	294.07	482.71	16.181	-0.048	1.004	2544	166.16	326.67	16.727	0.610	0.983
4047	182.78	473.81	16.188	0.763	0.998	3166	468.97	384.27	16.729	0.738	1.025
4091	261.35	341.25	16.190	0.802	1.034	3373	286.21	405.61	16.733	0.762	0.987
3214	277.90	388.58	16.203	0.783	1.040	1333	285.16	203.62	16.735	0.740	0.966
3602	156.64	427.46	16.205	0.763	1.144	4154	112.97	486.34	16.736	0.758	1.181
232	336.37	45.54	16.208	0.760	1.003	1133	67.16	183.09	16.748	-0.082	1.077
1796	143.82	254.59	16.219	-0.039	0.947	943	30.20	158.55	16.754	0.750	0.990
1285	240.68	198.19	16.226	0.791	0.965	3186	80.79	385.55	16.762	0.741	1.011
1403	13.88	209.86	16.227	-0.090	0.898	3063	321.75	375.44	16.764	-0.130	0.964
1871	300.87	262.02	16.239	0.729	1.449	3115	351.32	379.87	16.766	0.723	0.888
3542	357.74	421.78	16.246	0.764	1.000	4014	93.43	470.12	16.781	0.680	0.905
142	459.88	24.86	16.248	0.774	0.895	3982	259.61	467.22	16.786	0.694	1.012
1280	124.89	197.71	16.249	0.783	1.075	1177	17.60	188.65	16.789	0.751	0.938
574	327.53	105.61	16.256	0.799	0.990	3162	226.05	383.90	16.791	0.618	1.028
898	121.59	151.45	16.269	0.795	0.993	2320	246.72	304.71	16.798	0.837	1.052
3396	192.48	407.44	16.283	-0.100	0.935	3177	505.30	384.86	16.800	-0.115	0.968
1688	10.07	242.42	16.284	0.712	1.442	1394	103.88	208.99	16.803	0.770	1.100
1122	74.73	182.03	16.290	0.778	1.260	1138	25.94	183.79	16.812	0.694	0.925
4476	354.44	531.66	16.311	0.763	0.893	1152	51.78	185.97	16.827	0.740	0.938
1513	112.27	223.06	16.317	0.794	1.015	653	20.07	118.82	16.828	0.769	0.998
1108	446.07	180.39	16.326	-0.084	1.050	4012	506.53	469.78	16.830	0.672	0.943
2400	215.91	312.44	16.329	-0.063	1.192	2110	155.17	284.65	16.840	-0.101	1.090
1830	98.90	258.30	16.336	0.783	0.983	1134	254.52	183.45	16.846	0.750	0.986

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
3645	405.49	431.96	16.850	0.735	0.901	2593	228.60	331.48	17.203	-0.115	1.063
4238	294.42	501.03	16.860	0.720	0.938	1876	151.33	262.43	17.204	-0.072	1.335
1641	151.76	237.41	16.867	0.709	0.930	3689	150.50	436.97	17.218	0.301	0.995
3571	281.04	424.89	16.868	0.731	1.059	1011	281.41	168.42	17.219	0.698	1.072
1595	180.85	232.74	16.871	0.723	1.135	4313	167.34	509.45	17.224	0.729	1.356
2770	248.99	348.15	16.875	0.882	1.600	55	502.75	-6.41	17.227	0.736	1.285
3609	74.20	428.41	16.876	0.770	0.975	2136	213.48	286.28	17.232	0.724	1.103
2479	470.04	320.47	16.883	-0.133	0.963	1259	503.71	195.51	17.235	0.688	1.070
1318	201.26	202.08	16.885	0.749	0.938	110	273.50	18.72	17.248	0.726	0.986
2581	418.89	330.30	16.892	0.713	0.981	2628	210.27	335.16	17.248	0.729	1.055
2167	4.66	289.21	16.895	0.702	0.955	4163	371.26	488.31	17.251	0.730	1.108
2894	92.99	359.83	16.898	-0.154	0.956	1959	161.64	269.06	17.262	0.574	1.110
2631	193.56	335.70	16.913	0.705	1.108	4208	205.09	495.75	17.268	0.706	0.863
2968	269.51	366.48	16.913	-0.091	1.128	2074	270.96	280.55	17.275	0.701	1.072
1458	167.36	216.67	16.940	0.699	0.938	1512	8.57	222.95	17.286	0.677	0.978
2215	238.11	293.34	16.946	-0.114	1.024	1891	228.16	263.79	17.287	0.472	0.915
2081	144.72	281.27	16.956	0.687	1.385	721	175.43	127.56	17.289	0.727	1.063
2349	8.82	307.07	16.956	0.776	0.920	3995	251.55	467.77	17.291	0.676	1.067
477	445.70	92.00	16.964	0.758	0.950	3709	523.26	439.20	17.297	0.695	1.008
1331	181.85	203.35	16.980	0.729	0.938	1283	224.56	198.03	17.314	0.683	0.827
4379	216.61	517.88	16.983	0.730	1.060	2101	167.88	283.41	17.319	0.741	1.160
4636	138.65	555.58	16.994	0.675	1.113	4967	159.16	624.79	17.323	0.785	0.900
2885	40.14	358.82	17.005	0.711	1.220	2647	267.08	337.51	17.334	0.704	0.978
5381	78.01	730.51	17.011	0.743	1.015	1861	122.90	261.02	17.336	0.246	0.988
4348	381.91	513.91	17.013	0.717	0.918	3272	171.43	394.93	17.336	0.722	1.076
675	349.56	121.44	17.021	0.735	0.938	48	543.89	-9.31	17.342	0.725	0.835
3020	172.80	371.23	17.040	0.773	1.116	649	336.28	118.39	17.347	0.721	0.970
4804	453.53	586.48	17.044	0.726	0.958	2406	143.63	313.00	17.358	0.735	0.972
909	153.92	154.17	17.051	0.737	0.895	2341	28.70	306.41	17.395	0.739	0.933
2470	255.23	319.79	17.052	0.491	0.967	2727	166.71	344.63	17.402	0.736	1.673
121	17.31	19.66	17.056	0.711	0.918	3001	7.06	369.58	17.410	0.740	0.936
3185	267.37	385.37	17.057	0.709	1.194	3061	499.98	375.24	17.412	0.702	1.206
5772	209.94	649.22	17.061	0.712	1.273	2748	323.19	346.49	17.417	0.742	0.920
3716	261.95	440.88	17.061	-0.122	0.948	3513	125.36	418.15	17.425	0.695	1.041
1661	234.59	239.44	17.073	0.767	0.946	5524	23.93	789.64	17.430	0.742	0.983
4328	275.95	510.83	17.089	0.666	1.015	1808	31.41	256.20	17.432	0.695	0.897
2110	355.60	285.37	17.093	0.712	1.062	1080	123.67	176.80	17.437	0.665	0.853
3386	291.98	407.00	17.112	0.749	0.989	2531	4.08	325.50	17.439	0.828	1.168
2020	342.89	275.24	17.114	0.702	1.077	427	44.12	82.20	17.440	0.727	1.028
2615	111.93	333.96	17.117	0.735	1.168	2358	143.23	307.81	17.444	-0.059	0.995
762	218.00	133.88	17.118	0.667	1.055	1306	13.95	201.09	17.444	0.569	0.983
3794	321.64	447.76	17.121	-0.154	1.001	2486	13.80	321.08	17.455	0.335	0.970
1110	279.34	180.44	17.124	0.748	1.079	407	324.50	79.23	17.457	0.298	0.947
1005	216.24	167.89	17.134	0.741	1.075	3993	215.90	467.62	17.463	0.700	0.979
4569	423.67	544.01	17.138	0.717	0.915	2298	313.38	302.04	17.470	0.703	1.047
3724	426.15	440.71	17.140	0.717	0.933	5366	291.64	724.30	17.483	0.690	1.000
1639	75.81	237.12	17.146	0.713	0.892	3434	111.67	410.90	17.487	0.728	0.999
897	194.05	152.35	17.147	0.727	1.235	1018	349.91	169.66	17.487	0.738	0.858
4767	296.15	579.37	17.149	0.747	0.970	5091	60.83	652.50	17.488	0.759	0.947
158	217.01	28.78	17.150	0.730	0.923	2485	183.97	320.84	17.496	0.589	1.005
1749	141.57	249.93	17.152	0.227	0.890	3155	121.24	383.33	17.501	0.486	1.126
3734	242.65	441.62	17.155	0.701	1.015	2606	303.55	333.02	17.503	0.313	0.938
3878	214.24	456.70	17.161	0.718	0.903	1753	294.41	250.49	17.506	0.679	0.927
4657	252.57	558.42	17.165	0.712	0.919	3029	102.03	372.12	17.509	0.576	0.976
5385	342.66	732.68	17.168	-0.144	1.003	2616	40.30	333.99	17.526	0.710	0.882
970	108.71	163.55	17.171	0.684	0.923	1076	393.38	176.23	17.528	0.703	0.893
683	229.91	122.14	17.172	0.714	0.903	3597	175.47	426.89	17.529	0.732	1.036
4548	530.78	541.29	17.185	0.692	0.915	3050	158.53	374.21	17.530	0.635	1.296
3273	83.18	395.21	17.187	0.713	0.965	2378	39.72	309.57	17.537	0.621	1.148
3659	223.82	433.38	17.197	-0.159	0.962	2079	508.44	280.82	17.542	0.659	1.040

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
5266	270.65	696.82	17.544	0.267	1.056	320	247.49	63.83	17.781	0.682	0.961
2786	151.58	349.20	17.545	0.221	0.990	1897	103.59	264.07	17.786	0.944	0.980
1616	90.05	234.98	17.546	0.713	0.983	4716	170.77	571.19	17.786	0.755	0.878
1343	155.71	203.95	17.562	1.003	0.868	2686	141.52	340.86	17.790	0.786	1.037
294	90.31	59.44	17.563	0.736	0.893	1953	456.54	268.18	17.795	0.610	0.915
4682	236.62	563.59	17.565	0.707	0.978	4116	88.30	481.56	17.808	0.654	0.951
604	43.31	110.34	17.569	0.723	1.048	3058	189.31	374.88	17.814	0.306	1.306
931	10.59	156.68	17.572	0.657	0.908	3433	400.49	410.79	17.818	0.701	0.952
3268	161.22	394.50	17.580	0.652	1.220	1600	111.30	233.16	17.822	0.233	0.995
3410	179.76	409.15	17.589	0.232	0.944	3054	90.17	374.63	17.824	0.133	0.989
4897	63.48	609.67	17.591	0.707	1.248	398	113.15	77.86	17.828	0.613	1.125
2977	255.86	367.11	17.591	0.267	1.029	4729	280.73	573.66	17.829	0.668	0.984
1701	168.92	243.67	17.594	0.645	0.885	1219	40.01	191.90	17.830	0.449	0.985
1207	10.13	191.16	17.596	0.683	1.080	2135	191.18	286.23	17.830	0.631	1.067
3439	280.59	411.41	17.601	0.733	0.954	2451	154.87	318.05	17.836	0.695	0.983
3695	413.70	437.46	17.607	0.637	0.929	3127	102.26	381.46	17.841	0.679	0.895
3362	54.35	404.34	17.616	0.647	0.969	2434	440.16	315.72	17.843	0.614	0.896
4152	242.51	486.21	17.616	0.711	0.996	1868	44.59	261.81	17.852	0.697	1.108
2357	132.43	307.67	17.617	0.748	0.970	660	167.78	119.67	17.859	0.699	0.930
3855	204.20	453.71	17.620	0.488	1.083	1645	141.14	237.86	17.862	0.704	0.960
3047	144.95	373.83	17.621	0.541	1.023	3436	40.63	411.23	17.863	0.705	0.945
2371	2.73	309.11	17.623	0.565	0.940	5030	232.25	640.10	17.863	0.721	0.932
3990	260.37	467.49	17.623	2.341	1.018	307	363.27	71.49	17.864	0.767	0.960
1887	49.58	263.47	17.623	0.145	0.942	3337	185.01	402.09	17.865	0.241	1.066
3514	130.15	418.29	17.626	0.671	0.980	4965	479.58	624.64	17.870	0.729	1.000
1575	352.73	229.79	17.627	0.705	0.920	162	119.16	29.78	17.870	0.706	0.893
4410	284.39	522.99	17.648	2.110	1.500	5585	223.11	833.27	17.879	0.719	1.075
2821	142.07	353.39	17.648	0.712	1.053	3035	163.54	372.65	17.879	0.706	1.102
2130	360.33	286.00	17.650	0.675	0.982	1811	13.32	256.67	17.880	0.794	0.905
1106	440.96	180.30	17.651	0.674	1.063	2465	293.00	319.40	17.883	0.700	0.976
370	479.93	71.65	17.657	0.682	0.935	3902	426.18	459.57	17.883	0.645	0.971
3678	72.74	435.25	17.667	0.685	0.959	3231	18.74	390.18	17.886	0.586	0.929
961	353.81	160.70	17.667	0.702	0.833	1508	29.18	222.58	17.892	0.337	0.853
2614	322.99	333.89	17.672	0.181	0.899	3613	160.04	428.80	17.893	1.506	1.075
3009	265.82	370.09	17.676	0.248	1.122	1823	203.95	257.57	17.897	0.700	1.005
3301	191.70	398.01	17.676	0.702	1.061	5498	156.37	778.18	17.902	0.700	0.983
2904	203.04	360.30	17.677	0.379	1.295	334	60.23	65.27	17.902	0.696	0.960
3483	93.29	414.97	17.681	0.733	0.970	5005	101.33	633.38	17.906	0.685	0.998
3084	129.07	377.69	17.689	0.677	1.066	1199	203.73	190.38	17.906	0.576	0.940
626	199.07	113.80	17.694	0.854	0.923	372	195.45	72.72	17.910	0.737	0.952
4694	330.04	566.60	17.704	0.655	0.790	3588	152.35	426.20	17.911	0.656	1.029
2587	246.95	330.95	17.714	0.756	0.993	2943	13.19	363.94	17.916	0.709	1.039
2209	310.07	292.74	17.718	0.716	0.977	2483	64.51	320.69	17.919	0.722	0.990
2488	343.83	321.52	17.720	0.578	1.060	3686	78.47	436.16	17.927	0.660	0.939
3480	399.37	414.83	17.731	0.689	0.880	2656	331.79	337.99	17.928	0.547	0.896
3504	107.29	417.55	17.739	0.604	0.979	2295	29.15	301.52	17.928	0.147	0.947
1032	21.24	171.16	17.745	0.485	1.512	258	293.97	51.89	17.931	0.661	1.006
3866	119.25	454.65	17.749	0.727	0.998	2882	385.56	358.49	17.932	0.688	0.985
1736	315.74	247.96	17.750	0.333	0.982	3360	84.59	404.16	17.947	0.682	0.970
2576	184.17	330.05	17.752	0.776	1.008	2815	258.46	352.33	17.958	0.543	1.641
3487	201.42	415.21	17.753	0.253	0.896	4284	432.26	505.27	17.967	0.443	1.058
4363	142.10	515.49	17.755	0.719	1.018	1039	7.55	172.31	17.967	0.477	1.133
5336	22.43	715.26	17.758	0.698	1.200	613	54.99	112.39	17.970	0.571	0.673
4270	334.23	503.98	17.763	0.901	0.930	4026	120.77	471.52	17.971	0.380	0.905
1000	340.58	167.28	17.767	0.737	0.973	2134	288.82	286.22	17.975	0.259	1.070
3668	268.54	434.15	17.771	0.669	1.113	2789	261.38	349.86	17.986	0.467	1.311
170	12.42	31.87	17.771	0.685	1.055	1299	224.39	200.43	17.988	0.550	0.873
3988	87.13	467.41	17.773	0.693	0.952	3557	65.40	423.54	17.992	0.539	1.163
5100	273.84	656.36	17.777	0.703	0.903	1973	42.23	270.34	17.996	0.696	0.887
2499	85.27	322.62	17.779	0.441	1.243	732	198.36	129.57	17.996	0.506	0.943

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
3099	130.53	378.77	17.998	0.138	1.054	2637	306.56	336.38	18.125	0.647	0.975
2316	83.70	304.19	18.003	0.394	0.955	1551	60.46	227.62	16.125	0.452	1.015
1282	528.08	197.97	18.005	0.718	0.808	1677	102.05	241.16	18.135	0.586	1.045
887	145.33	151.25	18.007	0.692	1.035	2009	289.52	274.09	18.136	0.516	1.020
2356	253.96	307.61	18.007	0.674	1.016	1240	240.38	193.55	18.136	0.486	1.016
509	282.71	96.50	18.008	0.295	0.909	2949	42.37	365.15	18.138	0.491	1.145
2481	185.37	320.55	18.012	-0.088	0.990	3225	183.16	389.73	18.139	1.913	1.153
2242	85.32	295.75	18.013	0.518	1.043	3725	77.20	440.75	18.140	0.651	0.956
2763	206.19	347.56	18.018	0.448	1.018	2501	160.18	322.71	18.140	0.643	0.920
2508	164.81	323.31	18.018	0.680	0.973	669	157.37	120.73	18.141	0.606	0.898
2040	134.16	277.57	18.020	0.688	1.072	2708	341.41	342.74	18.141	0.553	0.985
1350	257.32	204.61	18.041	0.452	1.190	1930	113.46	266.08	18.142	0.617	0.980
1860	281.40	261.00	18.042	0.699	0.968	4697	61.49	566.70	18.148	0.558	0.875
1535	49.55	225.99	18.044	0.746	0.995	1562	99.05	228.78	18.149	0.570	1.080
3932	472.54	462.55	18.047	0.741	1.418	3281	185.18	396.53	18.150	0.822	1.205
4066	219.76	476.06	18.047	0.705	0.933	3780	474.12	446.10	18.151	0.448	1.011
2765	165.37	347.66	18.051	0.341	1.852	1936	308.14	266.77	18.152	0.271	1.356
5459	214.24	762.10	18.053	1.034	0.917	3136	38.53	381.88	18.155	0.671	1.013
3827	432.53	450.35	18.053	0.669	0.970	4616	411.48	552.25	18.157	0.736	0.865
5370	95.07	725.24	18.060	0.697	0.895	5059	65.79	646.47	18.159	0.535	1.053
2249	83.17	296.30	18.063	0.790	1.053	985	183.07	165.12	18.160	0.686	0.917
1658	226.78	239.15	18.063	0.495	0.975	1884	25.18	263.13	18.161	0.781	0.920
2332	192.05	305.98	18.064	0.642	1.023	2207	263.55	292.73	18.162	0.604	1.083
2869	194.83	357.45	18.065	0.726	1.053	2888	303.18	359.24	18.163	0.600	1.030
276	73.77	55.45	18.070	0.722	1.005	3777	275.63	445.90	18.164	0.504	0.950
4557	171.12	541.85	18.071	0.677	0.905	1636	250.70	236.95	18.166	0.706	1.033
5368	143.93	724.63	18.071	0.517	0.935	3578	451.47	425.56	18.166	0.637	0.819
4712	282.51	570.34	18.073	0.711	0.957	2093	276.12	282.17	18.168	0.536	1.000
225	164.26	42.92	18.074	0.699	0.885	2119	10.35	285.25	18.179	0.576	0.915
2354	289.75	307.44	18.076	0.634	0.993	2623	195.26	334.82	18.181	0.904	1.115
3236	253.63	390.97	18.077	0.576	0.962	3579	189.40	425.64	18.185	0.489	1.140
4177	130.61	490.25	18.078	0.488	1.090	431	142.79	82.50	18.185	0.681	1.043
960	256.37	160.63	18.079	0.555	0.941	4147	360.76	485.58	18.186	0.601	0.840
1632	257.52	236.62	18.079	0.456	0.977	1073	155.16	176.10	18.189	0.450	0.942
3385	402.88	406.91	18.081	0.690	0.933	4358	193.53	514.91	18.191	0.679	0.938
835	100.06	144.29	18.086	0.711	0.933	4223	67.30	498.73	18.195	0.663	0.951
2535	138.47	325.84	18.086	0.740	0.907	1345	132.59	204.16	18.196	0.643	0.883
882	153.70	150.17	18.087	0.634	0.920	3340	339.95	402.35	18.197	0.660	0.969
1293	160.95	199.73	18.087	0.616	0.885	3381	163.99	406.32	18.197	0.526	1.111
1863	179.39	261.12	18.088	0.468	1.067	2072	85.65	280.53	18.198	0.565	0.947
2277	236.35	299.03	18.091	0.356	1.000	822	116.59	143.24	18.201	0.663	0.870
88	128.80	12.07	18.095	0.537	1.080	4360	30.70	515.21	18.202	0.540	0.983
4459	282.72	529.55	18.095	2.701	1.695	2068	218.88	280.36	18.204	0.578	1.070
2496	122.86	322.44	18.096	0.684	0.980	3915	304.77	460.58	18.206	0.665	0.934
2438	4.14	316.47	18.101	0.464	1.140	4258	155.16	502.65	18.210	0.667	0.954
2755	215.80	346.87	18.103	0.629	0.940	2352	6.72	307.24	18.213	0.622	0.938
2537	168.04	325.98	18.105	1.330	1.040	4377	287.28	517.56	18.215	0.427	1.180
3561	321.22	424.02	18.105	0.543	0.950	177	79.02	33.81	18.215	0.595	0.895
857	162.20	146.90	18.106	0.643	0.893	3854	175.36	453.69	18.216	2.952	0.960
4338	164.83	512.74	18.107	0.719	0.995	2776	111.43	348.50	18.222	0.625	0.988
1517	15.91	223.67	18.108	0.457	0.988	2315	107.51	304.12	18.224	0.537	0.980
5079	356.19	650.51	18.108	0.689	0.790	1181	80.62	188.89	18.226	0.033	1.197
476	66.11	91.67	18.109	0.646	1.048	963	185.45	160.98	18.227	0.603	1.023
1487	164.22	220.70	18.112	0.612	0.945	2524	298.60	324.87	18.229	0.694	0.981
3293	379.83	397.35	18.113	0.728	0.951	3031	297.55	372.25	18.230	0.671	1.017
2284	306.23	300.25	18.114	0.509	0.929	2654	161.70	337.97	18.231	0.692	1.045
3807	276.01	448.79	18.119	0.634	0.917	4768	21.12	579.41	18.232	0.516	0.940
3101	221.26	378.79	18.121	0.663	0.983	2176	99.63	289.66	18.233	0.347	0.925
5458	215.77	762.06	18.121	0.954	0.933	2985	224.45	367.72	18.236	0.772	0.969
2311	372.82	303.76	18.122	0.469	0.984	3889	264.29	457.69	18.236	0.662	0.921

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
1420	88.57	212.43	18.237	0.636	0.998	3113	41.33	379.75	18.309	0.510	1.116
5141	112.65	663.93	18.237	0.685	0.880	2750	84.92	346.61	18.311	0.509	1.008
104	85.30	17.00	18.238	0.686	0.983	3997	68.03	468.20	18.312	0.640	0.960
4192	99.03	493.36	18.240	0.532	0.955	1900	409.62	264.40	18.312	0.447	1.020
3942	7.14	463.51	18.244	0.695	0.959	3215	229.30	388.59	18.314	0.484	0.993
1580	208.48	231.60	18.248	0.401	1.025	1520	272.71	224.26	18.314	0.589	0.971
2948	144.56	364.53	18.249	0.483	0.931	768	137.61	134.84	18.315	0.643	0.900
1125	24.06	182.37	18.251	0.626	0.930	746	291.10	131.33	18.316	0.857	1.083
4935	195.22	618.20	18.252	0.656	0.880	3147	174.31	382.68	18.317	0.794	1.128
848	218.24	146.22	18.252	0.417	1.053	1846	315.35	259.74	18.318	0.496	1.134
2677	124.64	340.19	18.254	0.477	1.006	4474	205.86	531.53	18.318	3.023	1.175
4711	134.13	570.33	18.256	1.475	0.968	952	115.82	159.55	18.318	0.576	0.980
2559	239.45	327.86	18.258	0.592	0.974	4120	243.35	482.18	18.319	0.532	0.977
2275	5.93	299.02	18.258	0.689	0.948	192	57.91	36.42	18.319	0.518	1.070
1477	70.95	219.62	18.258	0.658	0.905	3158	322.98	383.70	18.322	1.301	0.896
150	124.51	26.63	18.259	0.644	1.023	2048	15.98	277.88	18.323	0.614	0.860
3377	79.87	406.03	18.259	0.580	0.950	2772	451.82	348.29	18.323	1.206	2.790
1923	289.98	265.56	18.260	0.663	1.100	2872	258.66	357.68	18.324	2.537	1.735
5505	297.76	780.91	18.261	0.687	0.995	1308	58.45	201.13	18.326	0.569	1.128
2243	339.10	295.84	18.262	0.543	0.910	1865	297.13	261.51	18.327	0.427	1.261
1619	164.52	235.12	18.264	0.430	1.130	1124	44.86	182.27	18.328	0.374	1.285
2188	161.09	290.88	18.265	0.355	1.013	5015	127.47	637.38	18.329	0.652	0.903
2817	243.62	352.35	18.270	0.567	1.500	2490	141.09	321.74	18.330	0.497	0.940
2232	127.35	295.17	18.271	0.301	1.138	1410	546.38	210.90	18.333	0.483	0.993
2710	115.87	343.19	18.273	0.659	0.973	1392	17.88	208.64	18.334	0.683	0.898
635	437.44	115.70	18.274	0.688	0.863	3352	149.76	403.55	18.334	0.653	1.034
4698	69.70	567.44	18.276	0.519	0.875	4688	16.94	565.25	18.336	0.699	1.005
4042	149.25	472.90	18.277	0.556	0.911	2331	115.18	305.96	18.336	0.498	0.945
2944	312.73	363.95	18.277	0.619	0.995	2285	239.19	300.30	18.340	0.597	1.010
4159	485.79	487.63	18.277	0.540	1.308	2474	259.64	320.11	18.341	0.757	0.367
1571	323.59	229.19	18.278	0.824	0.945	3044	183.95	373.42	18.343	0.865	1.239
4272	11.10	504.17	18.278	0.651	1.058	2012	195.73	274.51	18.348	0.450	0.920
556	392.90	103.14	18.278	0.708	0.968	4086	261.74	478.57	18.348	0.617	0.981
3189	260.65	385.74	18.279	0.568	0.996	2350	230.59	307.12	18.350	1.342	1.000
1255	151.53	195.10	18.279	0.298	0.875	1349	382.06	204.59	18.350	0.445	0.980
2933	117.31	362.79	18.280	0.465	1.506	4251	179.85	502.11	18.353	0.617	0.940
3431	130.97	410.60	18.282	0.705	0.942	4317	333.06	509.75	18.353	0.620	0.930
2337	185.17	306.23	18.284	0.524	1.165	2704	149.59	342.45	18.355	0.485	1.028
691	313.63	123.72	18.285	0.606	0.917	3582	217.85	425.80	18.356	0.656	0.996
3346	51.03	403.05	18.286	0.638	0.959	2038	90.61	277.27	18.357	0.610	0.947
2692	86.18	341.46	18.288	0.595	1.015	2668	264.79	339.49	18.358	0.427	1.015
757	269.71	132.90	18.290	0.604	1.029	5036	202.80	641.08	18.360	0.718	0.938
2634	154.37	336.17	18.290	0.511	1.030	216	430.74	41.50	18.361	0.657	0.963
2364	229.65	308.23	18.290	0.413	1.057	3810	403.17	449.29	18.361	0.577	1.020
3135	120.63	381.80	18.291	0.340	1.030	1087	490.05	177.80	18.364	0.613	0.965
4927	380.93	617.17	18.292	0.545	0.853	1716	265.66	245.48	18.364	0.586	1.009
3498	278.04	416.81	18.292	0.449	0.985	2983	27.30	367.58	18.365	0.582	0.943
2737	312.03	345.59	18.292	0.559	0.965	3289	146.16	397.08	18.367	0.320	1.069
2030	98.39	276.30	18.292	0.493	1.030	2865	314.19	357.11	18.368	0.570	1.005
716	120.42	127.27	18.296	0.751	0.798	1553	36.12	227.71	18.368	0.269	0.887
470	78.40	89.98	18.299	0.637	0.913	597	304.04	109.28	18.370	0.450	1.035
2092	231.95	281.98	18.299	0.634	0.910	1974	234.57	270.49	18.370	0.357	1.120
1538	256.41	226.34	18.301	0.457	1.081	5417	41.77	750.10	18.370	0.670	0.905
2115	508.10	285.10	18.305	0.633	1.164	2766	431.82	348.00	18.370	0.553	0.999
3771	133.28	445.52	18.306	0.592	0.871	4872	171.35	601.81	18.370	0.536	0.928
2118	71.03	285.22	18.306	0.532	1.008	1917	31.65	265.18	18.372	0.551	0.930
4169	19.19	489.48	18.307	0.660	0.914	722	42.14	127.59	18.375	0.505	0.920
1279	199.89	197.69	18.308	0.401	0.913	4458	258.10	529.53	18.375	0.480	0.943
1258	14.70	195.42	18.308	0.563	0.973	2796	328.45	350.48	18.377	0.556	0.968
3972	287.20	466.68	18.309	0.424	0.964	1423	176.69	212.74	18.378	0.176	1.073

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2288	243.63	300.66	18.379	0.527	1.018	3493	249.78	416.08	18.425	0.599	0.883
2444	512.43	317.20	18.379	0.572	0.994	1550	140.61	227.50	18.425	0.575	0.980
3104	111.60	378.91	18.380	0.668	1.010	2992	266.63	368.49	18.426	0.632	1.108
4574	156.86	544.36	18.382	0.494	0.918	102	138.77	16.80	18.426	0.466	0.978
3432	183.90	410.78	18.382	0.587	1.038	96	279.75	14.35	18.426	0.597	1.010
560	357.66	103.81	18.386	0.538	0.890	2276	272.19	299.02	18.427	0.625	0.968
1046	217.10	173.38	18.388	0.551	1.060	2077	229.50	280.77	18.427	0.620	0.915
4380	48.15	518.00	18.388	0.577	0.918	1921	170.70	265.33	18.427	0.342	1.082
2622	90.31	334.79	18.388	0.430	1.063	2826	144.92	353.51	18.428	0.451	1.022
2570	199.94	329.01	18.388	0.528	0.993	1890	207.06	263.69	18.428	0.459	1.565
1116	262.94	181.28	18.388	0.541	1.024	2067	11.25	280.05	18.429	0.612	0.913
2265	159.28	298.01	18.388	0.620	0.955	842	157.56	145.34	18.433	0.590	0.928
1244	241.73	194.07	18.389	0.670	1.000	1315	198.86	201.88	18.433	0.517	0.948
2441	193.55	316.91	18.389	0.562	1.217	4763	235.86	579.08	18.438	0.491	1.011
1426	104.11	212.92	18.389	0.512	1.190	4285	144.58	505.45	18.439	0.576	0.963
3193	206.97	386.45	18.389	0.502	1.006	4889	175.45	608.47	18.440	0.706	0.853
243	333.52	47.75	18.391	0.565	1.070	3415	156.14	409.28	18.440	0.294	0.970
1197	54.08	190.23	18.391	1.076	0.895	2314	104.55	304.07	18.440	0.455	1.008
3065	27.86	375.54	18.394	0.589	0.954	1730	106.61	247.18	18.441	0.601	1.050
4040	17.90	472.62	18.395	0.620	0.933	4247	59.08	501.93	18.443	1.015	1.016
4165	176.92	488.47	18.395	0.423	1.039	3317	183.46	400.01	18.443	0.828	1.109
4646	341.71	556.69	18.396	0.606	0.980	377	287.89	73.83	18.444	0.503	0.904
4824	39.49	589.99	18.397	0.624	0.860	2527	12.68	325.05	18.444	0.587	1.038
339	32.58	65.79	18.397	0.619	1.033	4316	427.35	509.71	18.445	0.588	1.015
4110	19.24	480.85	18.398	0.446	0.967	3486	403.69	415.10	18.447	0.556	0.906
3623	476.46	430.32	18.399	0.577	1.021	1527	219.09	225.15	18.447	0.506	0.938
389	73.86	75.60	18.400	0.517	0.863	3201	148.94	387.14	18.448	0.379	1.081
1990	110.89	272.65	18.400	0.536	1.015	303	363.55	61.06	18.449	0.588	0.910
3926	185.47	462.16	18.401	0.652	0.934	1880	135.00	262.80	18.450	0.207	0.915
4310	231.49	509.30	18.401	0.636	0.950	1172	279.73	187.95	18.451	0.608	0.939
4345	219.30	513.54	18.403	0.582	0.943	5173	119.92	672.11	18.451	0.624	0.877
2825	393.66	353.51	18.403	0.526	0.945	2561	15.05	327.94	18.451	0.466	1.073
2842	185.82	355.02	18.404	0.755	1.142	3367	371.65	405.16	18.452	0.542	0.954
2426	195.05	314.82	18.408	0.481	1.293	2725	322.35	344.49	18.452	0.441	0.925
1083	202.59	177.17	18.409	0.685	0.973	1826	162.21	257.92	18.452	0.556	1.240
3940	142.29	463.17	18.409	0.612	0.886	5506	161.27	781.46	18.453	0.591	0.975
4555	398.43	541.66	18.410	0.571	1.238	4986	132.06	629.27	18.454	0.612	0.895
1918	396.77	265.18	18.411	0.656	1.175	3068	178.30	375.70	18.455	0.752	1.135
193	284.78	37.00	18.411	0.682	0.893	652	341.38	118.78	18.455	0.469	0.973
2504	58.04	322.97	18.411	0.510	1.003	5451	370.58	759.23	18.455	0.514	1.063
45	378.14	-10.49	18.412	0.664	0.973	4563	421.47	542.80	18.457	0.533	0.903
1962	383.03	269.43	18.414	0.728	1.400	1103	158.77	179.99	18.457	0.495	0.985
4373	261.13	516.65	18.414	0.666	1.025	1208	116.96	191.17	18.457	0.473	0.960
2702	514.64	342.34	18.415	0.662	0.954	4507	178.08	535.75	18.458	0.366	0.950
1906	481.91	264.65	18.416	0.609	0.808	467	265.49	89.43	18.458	0.630	0.928
3468	205.45	414.04	18.418	0.532	0.948	1049	57.37	173.48	18.458	0.805	0.923
1079	151.49	176.68	18.419	0.680	1.013	5262	239.57	695.52	18.460	0.576	0.898
4602	11.27	550.17	18.419	0.528	0.988	2610	28.19	333.71	18.461	0.530	1.005
2471	261.18	319.96	18.419	0.529	0.947	5002	156.07	632.79	18.461	0.578	0.887
3719	283.68	440.34	18.420	0.584	0.957	3071	16.58	375.96	18.461	0.582	1.044
4552	470.24	541.47	18.421	0.575	1.010	2238	427.88	295.35	18.463	0.588	0.933
43	237.16	-11.52	18.421	0.468	0.968	932	436.59	156.97	18.464	0.544	0.933
3095	115.00	378.55	18.421	0.562	1.075	178	259.61	34.32	18.464	0.584	1.035
2435	61.88	315.79	18.422	0.540	0.965	1495	196.86	221.50	18.465	0.386	0.912
1675	300.36	240.95	18.423	0.451	0.901	4934	459.81	618.10	18.468	0.596	0.988
1819	250.03	257.26	18.424	0.587	0.963	1057	451.07	174.27	18.468	0.469	0.923
4439	78.93	527.73	18.424	0.386	0.898	387	275.06	75.03	18.469	0.529	0.893
1400	218.21	209.56	18.424	0.539	0.965	1659	136.16	239.20	18.470	0.406	0.988
3052	45.40	374.52	18.424	0.666	1.041	3023	61.87	371.51	18.472	0.615	0.988
4577	33.97	544.93	18.424	0.928	0.885	2822	67.34	353.41	18.473	0.455	0.992

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2870	402.63	357.48	18.473	0.542	0.908	330	52.78	64.90	18.514	0.531	0.910
3291	118.68	397.20	18.475	0.528	1.333	2941	133.72	363.63	18.514	0.492	1.014
277	81.88	55.52	18.476	0.403	1.100	4704	108.10	568.61	18.515	0.722	0.970
3500	213.75	417.06	18.477	0.571	0.974	3188	106.49	385.71	18.518	0.546	0.903
2089	197.32	281.69	18.477	0.627	1.115	5200	22.57	678.11	18.518	0.538	0.890
5342	340.63	718.47	18.478	0.502	0.970	3518	44.64	418.89	18.519	0.485	0.913
1187	52.43	189.52	18.479	0.494	0.830	1164	352.83	186.79	18.519	0.626	0.895
9	446.28	-35.83	18.479	0.543	0.853	910	214.94	154.19	18.520	0.364	1.000
4340	275.81	512.78	18.480	0.700	1.037	3164	159.78	384.01	18.520	0.498	1.000
5541	16.65	797.94	18.481	0.595	0.930	828	243.13	143.86	18.520	0.623	1.004
1223	133.01	192.15	18.481	0.565	0.963	2111	21.03	284.69	18.521	0.370	1.040
3950	388.49	464.21	18.481	0.525	1.020	215	242.51	41.16	18.522	0.380	1.004
5154	172.85	668.12	18.483	0.588	0.875	2683	242.08	340.72	18.523	0.452	1.215
3870	233.96	455.18	18.483	0.554	1.068	2049	382.76	277.93	18.523	0.651	1.393
2147	269.30	287.21	18.485	0.352	1.063	2008	14.87	274.04	18.525	0.574	0.887
1508	79.47	222.43	18.486	0.577	0.910	3311	254.74	398.93	18.525	0.457	0.962
2279	61.04	299.72	18.486	0.666	0.980	3867	54.82	454.72	18.526	0.560	1.001
184	187.56	34.96	18.487	0.599	0.938	3703	307.01	438.56	18.527	0.598	0.979
1606	222.90	233.95	18.487	0.568	0.943	2939	49.83	363.49	18.528	0.664	1.086
3037	214.64	372.76	18.488	0.675	0.994	5503	181.66	779.46	18.529	0.552	0.903
1167	134.15	187.04	18.488	0.578	0.960	984	297.02	165.06	18.529	0.594	0.963
1741	184.15	248.74	18.488	0.557	1.045	1178	95.26	188.72	18.530	0.462	1.028
981	78.04	164.79	18.489	0.409	1.078	3671	173.80	434.47	18.531	0.636	1.061
2274	347.68	298.90	18.489	0.599	0.975	1424	174.77	212.84	18.531	1.269	1.057
3791	45.86	446.95	18.492	0.627	1.081	4839	177.32	593.08	18.533	0.533	0.790
468	194.32	93.05	18.493	0.503	0.910	2386	30.91	310.56	18.533	0.542	0.952
5018	122.28	637.77	18.494	0.584	0.860	1008	39.90	168.02	18.534	0.258	0.945
5442	170.77	757.05	18.494	0.521	0.885	2534	420.89	325.82	18.535	0.416	0.912
3699	319.79	437.84	18.495	0.562	1.046	2453	66.33	318.08	18.537	0.486	0.990
1804	265.86	255.84	18.496	0.554	1.109	4962	37.30	623.71	18.537	0.577	0.880
2966	263.14	368.46	18.496	0.629	1.138	2355	225.44	307.51	18.537	0.545	1.033
3021	133.51	371.40	18.496	0.472	1.010	873	473.77	149.60	18.537	0.453	0.990
3250	214.97	392.15	18.497	0.582	1.008	750	43.38	131.50	18.538	0.440	0.925
1213	226.61	191.27	18.497	0.480	0.915	3013	180.94	371.14	18.538	0.306	1.100
3458	23.37	413.12	18.497	0.510	0.908	2780	425.83	348.72	18.539	0.527	0.909
2850	29.38	355.92	18.497	0.514	1.057	5264	202.06	695.75	18.541	0.481	0.880
1206	388.16	190.80	18.498	0.666	0.938	2446	304.40	317.44	18.541	0.599	0.990
3022	400.56	371.46	18.500	0.656	0.943	4090	227.19	478.88	18.541	0.426	1.037
5199	62.83	678.04	18.500	0.623	1.072	706	308.27	126.02	18.541	0.528	0.982
3395	276.66	407.42	18.501	0.794	1.033	813	32.69	141.87	18.541	0.367	0.920
3142	204.46	382.19	18.501	0.400	0.977	2749	165.23	346.49	18.542	0.554	1.060
2860	359.78	356.93	18.501	0.502	0.900	4101	163.47	480.00	18.543	0.613	0.959
2454	220.75	318.25	18.502	0.187	1.212	1336	380.70	203.66	18.544	2.503	0.993
39	511.60	-16.52	18.502	0.552	1.077	5210	445.86	680.74	18.544	0.514	0.988
3852	95.24	453.02	18.504	0.566	0.896	2382	192.66	309.79	18.544	0.431	1.055
2059	226.41	278.86	18.504	0.457	0.905	3028	7.43	372.10	18.544	0.584	0.969
4351	190.55	514.41	18.504	0.678	0.935	581	70.49	107.15	18.545	0.564	0.945
1888	27.69	263.48	18.505	0.528	0.938	1540	295.50	226.42	18.545	0.577	0.945
1633	44.71	236.80	18.506	0.619	0.918	3616	2.28	429.36	18.545	0.493	1.111
2840	126.78	354.93	18.506	0.489	1.116	1614	320.91	234.76	18.546	0.265	0.967
958	151.59	160.19	18.507	0.545	0.985	1635	306.13	236.88	18.550	0.585	0.890
2001	272.25	273.21	18.507	0.395	1.020	2594	121.08	331.62	18.550	0.566	1.043
4673	216.90	561.62	18.509	0.517	0.840	3154	205.17	383.25	18.550	0.788	1.027
304	128.39	61.21	18.509	0.587	0.830	1451	178.07	216.03	18.550	0.394	1.053
823	133.48	143.39	18.509	0.581	0.913	3417	71.30	409.46	18.550	0.548	0.970
5101	184.39	656.39	18.510	0.492	0.963	288	469.78	58.06	18.550	0.514	0.942
4659	345.84	559.28	18.510	0.557	0.885	2999	437.40	369.11	18.552	0.547	0.928
4888	85.04	608.46	18.511	0.576	1.030	869	326.79	148.88	18.553	0.538	0.935
3676	54.43	435.12	18.513	0.503	1.130	3080	270.31	377.48	18.553	0.513	1.050
2229	12.58	294.96	18.513	0.584	0.940	2109	280.04	284.44	18.554	0.621	0.965

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2264	274.37	297.76	18.554	0.752	0.971	4683	184.27	563.80	18.601	0.502	0.900
2422	161.65	314.54	18.555	0.562	0.938	3254	174.97	392.67	18.602	0.571	1.091
3451	200.87	412.24	18.555	0.620	0.888	884	18.92	150.47	18.602	0.491	0.938
2230	160.85	295.12	18.556	0.513	0.978	1295	122.74	199.96	18.602	0.536	0.930
2666	71.31	339.16	18.556	0.580	1.062	1450	432.27	215.98	18.603	0.562	0.905
3459	169.96	413.22	18.558	0.519	0.943	3199	289.12	385.84	18.603	0.511	0.926
2088	204.82	281.65	18.559	0.506	1.013	1829	477.55	258.28	18.604	0.503	0.893
2945	454.92	363.97	18.559	0.582	1.308	1470	341.02	218.48	18.605	0.597	1.043
1277	65.20	197.54	18.559	0.528	1.053	4945	359.64	620.60	18.605	0.567	0.893
1762	175.04	250.94	18.561	0.670	1.055	983	229.91	164.88	18.605	0.457	0.913
3334	289.27	401.94	18.562	0.540	1.020	1067	163.82	175.34	18.606	0.594	1.038
2175	136.87	289.60	18.562	0.657	0.988	3145	9.03	382.39	18.606	0.504	0.986
1269	419.23	196.61	18.564	0.505	0.868	2687	77.31	341.01	18.607	0.505	1.124
1893	279.24	263.93	18.564	0.585	0.960	1814	3.89	256.77	18.612	0.582	1.350
1932	386.90	266.49	18.566	1.766	1.915	1902	268.34	264.47	18.612	0.570	1.085
3247	151.32	391.82	18.566	0.415	1.150	97	329.24	14.46	18.612	0.686	0.930
481	3.79	92.12	18.567	0.306	1.085	408	418.61	79.36	18.613	0.470	0.878
256	358.76	51.52	18.569	0.606	0.935	1775	270.54	252.99	18.613	0.162	1.116
2697	172.02	341.74	18.570	0.556	1.243	4801	389.34	585.97	18.613	0.517	0.985
3752	502.71	443.86	18.571	0.481	1.029	2319	118.51	304.63	18.615	0.476	1.023
4222	206.89	498.60	18.571	0.464	0.888	1158	230.53	186.23	18.615	0.439	0.913
1656	78.07	238.98	18.571	0.461	0.912	2041	140.25	277.57	18.615	0.460	1.310
1869	32.79	261.95	18.572	0.468	0.885	1214	233.01	191.34	18.616	0.534	0.942
1530	264.04	225.59	18.572	0.507	0.952	2082	80.08	281.30	18.616	0.520	0.918
2224	231.61	294.04	18.573	0.325	1.038	3628	102.33	430.61	18.616	0.502	1.015
4629	112.58	554.76	18.573	0.857	0.898	2790	115.53	34.09	18.616	0.257	0.963
3591	207.08	426.45	18.574	0.483	1.076	498	293.40	94.40	18.618	0.540	0.974
3243	231.22	391.45	18.575	0.563	0.975	4056	245.28	474.75	18.618	1.566	0.967
1297	74.32	200.28	18.575	0.482	1.082	437	107.25	83.60	18.619	0.430	0.955
677	49.54	121.53	18.576	0.648	0.815	287	108.30	57.68	18.620	0.404	0.933
1417	237.44	212.17	18.577	0.543	0.966	3879	118.60	456.79	18.621	0.492	0.960
2170	131.53	289.37	18.577	0.887	0.890	2342	333.65	306.46	18.621	0.512	0.940
2891	241.98	359.59	18.578	0.551	1.188	405	117.40	79.13	18.622	0.499	1.100
1754	29.22	250.57	18.578	0.459	0.973	2113	388.98	284.80	18.624	0.973	1.062
2540	38.49	326.11	18.578	0.548	0.815	5332	308.27	714.33	18.626	0.503	0.887
543	131.16	101.73	18.580	0.413	0.913	4325	145.80	510.44	18.626	0.491	0.968
3390	146.12	407.11	18.581	0.587	1.030	3691	152.45	437.27	18.626	0.852	0.999
2308	291.08	303.44	18.582	0.563	1.043	4816	201.71	588.86	18.627	0.508	0.863
1983	92.47	271.84	18.583	0.532	0.975	4504	135.02	535.38	18.627	0.366	0.910
2598	245.08	332.01	18.584	-0.045	1.023	4295	373.60	507.42	18.629	0.537	0.955
726	391.55	128.02	18.585	0.541	1.075	4983	536.39	628.32	18.629	0.496	0.973
1007	143.03	167.97	18.586	0.633	0.873	731	165.12	129.48	18.629	0.493	0.930
4044	315.94	473.32	18.587	0.512	0.908	2758	88.65	347.15	18.629	0.538	0.995
2234	236.17	295.23	18.589	0.546	1.113	3348	266.69	403.23	18.630	0.445	0.981
1478	354.21	219.74	18.590	0.521	0.933	4732	143.18	574.66	18.630	0.506	0.890
47	276.46	-9.72	18.590	0.474	0.980	563	277.40	104.57	18.630	0.502	0.882
4813	416.34	588.40	18.592	0.474	0.940	3744	187.47	443.10	18.632	0.431	1.023
3757	142.76	444.34	18.592	0.501	0.948	1341	165.86	203.87	18.632	0.606	0.885
3244	311.92	391.52	18.593	0.545	0.965	1041	158.74	172.59	18.633	0.385	1.005
409	53.03	79.38	18.593	0.447	0.963	2353	71.85	307.41	18.635	0.468	1.055
2034	391.97	276.77	18.593	1.200	1.243	3708	124.29	439.12	18.637	0.574	0.931
1878	59.22	262.49	18.593	0.443	1.028	1795	372.33	254.48	18.637	0.500	0.960
4829	402.85	590.86	18.594	0.438	0.877	240	104.79	47.09	18.638	0.553	0.968
4209	5.72	495.87	18.594	0.588	0.990	4519	344.63	537.78	18.638	0.521	1.043
3560	327.67	423.83	18.595	0.486	0.938	1311	244.85	201.55	18.638	0.488	0.940
3238	99.58	391.03	18.600	0.345	0.906	903	530.05	152.79	18.639	0.570	0.888
1518	211.33	223.67	18.600	0.499	0.980	3469	413.58	414.12	18.639	1.448	0.990
127	135.23	21.34	18.600	0.516	1.067	5450	79.57	759.12	18.640	0.540	0.925
2383	96.36	310.06	18.601	0.517	0.980	1141	91.20	184.13	18.641	0.468	0.988
1665	15.80	239.66	18.601	0.492	1.105	4521	201.45	538.06	18.641	0.737	1.028

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
38	310.35	-16.75	18.642	0.485	0.968	3748	341.44	443.62	18.677	0.531	1.135
2094	67.90	282.22	18.643	0.564	1.005	3818	127.80	449.72	18.677	0.477	0.961
72	282.64	6.39	18.643	0.503	1.120	2862	5.18	356.94	18.678	0.407	1.096
2855	74.82	356.59	18.643	0.557	1.059	2756	338.50	346.99	18.678	0.532	0.916
2729	38.30	344.65	18.644	0.412	0.907	1053	77.56	173.90	18.678	0.588	0.985
1563	98.08	228.83	18.644	1.780	1.215	1858	85.29	260.88	18.679	0.318	0.908
3496	64.13	416.52	18.645	0.607	0.938	3634	276.02	431.10	18.682	0.634	1.005
1773	271.78	252.73	18.645	0.577	1.192	2984	74.37	367.62	18.684	0.502	1.031
2979	310.75	367.33	18.645	0.504	0.975	257	5.01	51.56	18.685	0.536	1.315
2191	142.82	291.03	18.646	0.486	1.025	3497	124.71	416.52	18.685	1.300	1.060
4844	156.31	594.81	18.646	0.428	1.045	1555	228.60	227.81	18.685	0.710	0.928
4403	328.89	522.00	18.647	0.528	0.953	2778	532.88	348.67	18.685	0.415	0.898
262	377.85	53.02	18.648	0.469	0.968	2182	518.30	290.29	18.685	1.134	1.855
3812	179.00	449.48	18.649	0.619	0.876	3200	59.61	386.90	18.686	0.520	0.938
3087	463.79	378.01	18.649	0.449	0.921	1672	221.40	240.73	18.687	0.457	1.005
2779	61.42	348.71	18.650	0.569	0.983	1114	242.09	181.13	18.687	0.474	0.958
2679	195.40	340.40	18.650	1.639	1.113	4022	470.08	471.14	18.688	0.432	0.918
1744	333.19	249.33	18.650	0.605	1.055	2718	293.54	343.78	18.688	0.491	0.939
3530	303.14	420.14	18.650	0.441	1.026	4194	9.67	493.95	18.688	0.491	1.085
1660	260.16	239.26	18.651	0.470	0.951	3156	327.93	383.36	18.689	0.523	0.940
2884	54.52	358.54	18.653	0.491	0.946	1437	127.80	214.80	18.690	0.478	0.910
5010	395.44	635.37	18.654	0.453	0.958	4815	230.64	588.86	18.690	0.063	1.107
3302	299.66	398.18	18.654	0.504	0.929	2669	288.26	339.52	18.690	0.633	0.938
2582	240.55	330.38	18.655	0.484	1.044	3076	52.26	376.45	18.691	0.411	0.961
2510	71.30	323.56	18.655	0.533	1.028	3120	51.63	380.56	18.694	0.609	0.950
2253	408.51	297.36	18.655	0.407	0.950	94	137.62	13.69	18.694	0.254	0.953
254	468.40	51.38	18.655	0.458	1.000	2195	337.44	291.59	18.695	0.489	0.897
132	64.49	22.14	18.655	0.463	0.785	1881	408.15	262.89	18.695	0.629	0.993
3589	452.71	426.22	18.655	0.752	0.950	3921	524.03	461.71	18.695	0.464	0.910
2523	240.18	324.85	18.656	0.645	0.987	4399	183.69	521.00	18.696	0.223	0.893
2974	332.45	366.81	18.657	0.673	0.935	2630	535.92	335.43	18.697	0.562	0.839
3832	435.55	450.76	18.657	0.482	0.983	3625	230.44	430.45	18.698	0.508	0.978
4049	90.38	473.92	18.658	0.457	0.950	3604	254.68	427.90	18.698	0.462	1.058
5469	481.61	764.95	18.658	0.502	0.945	3471	308.23	414.39	18.699	0.528	0.976
2709	144.71	343.12	18.658	0.366	1.047	2302	412.54	302.61	18.701	0.430	0.841
3246	385.87	391.57	18.659	0.448	1.011	3948	369.06	463.98	18.701	0.437	0.979
1399	460.15	209.47	18.660	0.394	0.850	3543	78.49	421.83	18.702	0.385	0.975
3345	31.40	403.00	18.662	0.527	0.916	5591	84.25	840.59	18.702	0.515	0.988
1989	542.17	272.39	18.663	0.530	0.963	4449	290.29	528.51	18.703	2.859	1.490
2733	170.02	344.89	18.663	0.517	1.412	5439	38.66	756.38	18.703	0.470	1.013
310	148.05	62.39	18.664	0.696	0.935	2516	242.17	323.92	18.703	0.302	0.978
3746	405.13	443.45	18.664	0.465	0.947	1209	93.22	191.18	18.703	0.517	1.048
4482	491.99	532.76	18.664	0.455	1.058	526	485.02	98.84	18.703	0.528	0.933
3491	278.78	415.82	18.665	0.320	0.994	2706	60.08	342.68	18.704	0.447	0.988
5152	273.77	367.54	18.666	0.525	0.904	4942	134.25	620.04	18.704	0.435	0.850
5014	391.11	637.01	18.666	0.443	0.967	2588	146.88	330.97	18.705	0.494	0.998
4598	155.05	548.89	18.667	0.473	1.013	4473	199.33	531.47	18.706	0.988	1.380
2369	209.12	308.55	18.667	0.485	1.030	4680	346.17	563.43	18.706	0.586	0.915
2381	286.25	309.77	18.667	0.489	1.106	5561	27.06	814.55	18.706	0.505	0.900
2757	414.41	347.03	18.668	0.541	0.901	3946	120.69	463.78	18.708	0.895	0.942
5132	36.78	661.48	18.669	0.471	0.860	957	282.25	160.16	18.709	0.484	0.976
3550	43.51	422.43	18.670	0.496	0.881	1539	347.53	226.41	18.709	0.527	0.953
4132	258.65	483.75	18.671	0.732	1.011	2644	59.28	337.24	18.710	0.461	1.080
1402	79.12	209.79	18.671	0.536	0.955	4472	193.37	531.30	18.711	1.748	1.233
5246	119.76	692.52	18.673	0.434	0.825	1231	39.87	192.96	18.712	0.311	1.005
2100	189.04	283.24	18.674	0.402	1.107	5227	437.01	684.25	18.713	0.197	0.957
4392	153.99	520.00	18.675	0.553	0.985	1391	282.54	208.59	18.713	0.535	0.950
1785	84.82	253.76	18.675	0.530	1.225	3335	253.39	401.99	18.713	0.484	0.937
2255	277.65	297.13	18.676	0.554	0.970	3943	466.73	463.62	18.713	0.383	1.031
2325	270.12	305.50	18.676	0.444	1.196	2744	129.42	346.32	18.714	0.399	1.105

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2417	81.79	313.94	18.714	0.545	0.995	3312	344.04	398.93	18.751	0.494	1.022
3297	175.95	397.54	18.714	0.516	1.069	1832	165.60	258.55	18.751	0.550	1.217
5601	226.94	848.30	18.714	0.430	0.980	1175	91.87	188.51	18.751	0.468	1.028
876	167.33	149.81	18.714	0.397	1.000	3723	230.82	440.64	18.752	0.569	0.957
4280	324.30	505.01	18.715	0.501	0.795	1123	173.11	182.23	18.753	0.442	0.858
3111	119.90	379.61	18.715	0.385	1.057	1853	345.15	260.56	18.753	0.488	0.890
4632	316.28	555.21	18.716	0.449	0.898	1585	258.05	231.91	18.754	0.440	1.050
3241	43.14	391.17	18.717	0.412	0.985	4542	532.81	540.78	18.754	0.538	0.928
680	484.00	121.95	18.718	0.482	0.935	1357	218.57	205.32	18.754	0.802	0.918
3803	151.41	448.29	18.718	0.381	1.004	988	38.45	165.47	18.754	0.691	0.892
2296	124.42	301.63	18.719	-0.005	1.240	5230	9.67	686.76	18.755	0.523	0.958
34	272.38	-18.56	18.720	0.460	1.520	3137	236.32	381.91	18.755	0.569	1.077
2799	303.27	351.06	18.720	0.498	1.069	3441	295.91	411.46	18.755	0.523	0.961
4919	134.10	614.92	18.720	0.516	0.865	5305	241.00	707.24	18.756	0.538	0.915
4408	388.01	522.85	18.723	0.506	0.788	5582	86.65	831.21	18.756	0.595	0.970
3204	16.66	387.49	18.724	0.630	0.973	3626	259.52	430.46	18.756	0.413	1.076
1941	221.57	267.18	18.724	0.550	0.957	4715	407.10	571.06	18.757	0.445	0.833
3677	187.03	435.12	18.724	0.570	0.998	2715	183.08	343.43	18.758	0.616	1.053
2741	202.75	345.90	18.724	0.561	1.008	1058	253.90	174.36	18.758	1.083	0.964
883	530.49	150.18	18.725	0.472	0.910	4662	279.99	559.81	18.758	0.438	0.996
4635	177.54	555.47	18.725	0.751	0.865	5058	227.46	646.41	18.758	0.394	0.925
1776	181.18	253.00	18.725	-0.009	1.090	654	235.75	118.82	18.759	0.562	0.953
4124	184.85	482.71	18.726	0.489	1.041	2256	234.32	297.15	18.759	0.002	1.046
4684	292.45	564.36	18.726	0.489	0.891	2385	308.98	310.22	18.760	0.535	0.901
3608	42.42	428.37	18.726	0.511	0.918	4204	193.80	495.36	18.760	0.587	0.949
1238	507.10	193.43	18.726	0.548	1.033	4515	88.45	536.93	18.761	0.441	0.863
555	4.82	102.98	18.727	0.632	1.160	4446	219.49	528.33	18.761	0.425	1.008
2767	409.45	348.00	18.728	0.481	0.895	4806	250.41	587.02	18.762	0.480	0.890
3197	73.20	386.74	18.728	0.960	0.942	1078	435.12	176.56	18.762	0.432	1.033
4368	308.17	515.93	18.728	0.488	0.886	4305	192.10	508.54	18.762	0.282	1.200
1940	44.88	237.13	18.728	0.465	0.963	201	328.02	38.32	18.763	0.640	0.920
2405	223.45	312.98	18.730	0.336	1.210	208	6.03	39.37	18.763	0.456	0.970
4492	103.97	533.92	18.731	0.396	0.950	694	32.96	124.41	18.764	0.693	0.833
4160	77.79	487.73	18.731	0.485	0.934	3112	482.87	379.64	18.766	0.460	1.067
3424	249.27	410.29	18.732	0.527	0.902	3426	327.99	410.38	18.766	0.474	0.965
410	130.70	79.51	18.732	0.455	0.938	1838	156.73	259.25	18.767	0.107	1.180
2940	127.58	363.51	18.733	0.455	1.003	2936	165.08	363.11	18.767	0.617	1.041
2317	206.44	304.41	18.734	0.299	1.065	5148	81.90	666.54	18.767	0.423	0.973
2518	315.94	324.23	18.734	0.481	0.923	564	229.96	104.75	18.768	0.449	0.890
1992	38.29	273.01	18.735	0.256	0.890	1440	107.98	214.98	18.768	0.473	1.100
164	435.84	30.15	18.736	0.444	0.910	4626	191.11	554.24	18.769	0.515	0.940
3829	488.19	450.53	18.737	0.400	0.873	2856	266.00	356.66	18.770	0.596	1.186
3230	75.54	390.07	18.738	0.406	0.968	2014	118.40	274.69	18.772	0.609	0.945
4107	465.80	480.46	18.738	0.523	0.858	1474	331.07	219.24	18.772	0.480	1.038
4821	115.89	589.90	18.738	0.493	0.973	1825	299.54	257.85	18.774	0.868	1.300
33	428.34	-18.77	18.741	0.463	0.830	3631	517.56	430.82	18.774	0.525	0.946
2991	43.28	368.34	18.741	2.003	0.967	3202	537.72	387.23	18.775	0.417	0.893
203	478.08	38.52	18.741	0.509	0.900	2989	116.57	368.20	18.775	0.553	1.291
3167	292.26	384.27	18.742	0.494	0.938	4731	89.19	574.50	18.776	0.602	0.977
4735	221.98	574.86	18.742	0.539	1.143	4145	166.80	485.40	18.776	0.545	1.009
754	153.18	132.56	18.743	0.536	0.910	114	124.63	19.18	18.776	0.499	1.077
3038	146.69	372.92	18.744	0.774	1.059	2053	114.20	278.26	18.776	0.487	0.975
3615	238.12	429.30	18.744	0.465	0.940	4052	535.29	474.41	18.778	0.556	1.043
2437	430.52	316.42	18.745	0.481	0.929	1970	343.79	270.18	18.779	0.373	1.067
2368	441.12	308.50	18.745	0.423	0.954	1286	81.13	198.25	18.780	0.495	1.020
1037	257.35	172.01	18.747	0.520	1.040	4029	109.72	471.96	18.780	0.509	1.008
803	246.02	140.18	18.747	0.534	0.966	4342	74.24	512.93	18.780	0.609	0.950
2975	355.92	366.84	18.750	0.527	0.909	2573	128.05	329.23	18.781	0.601	1.008
140	141.29	24.42	18.750	0.522	0.905	1401	389.00	209.69	18.781	0.566	0.905
292	352.41	361.35	18.750	0.495	0.905	1119	195.75	181.61	18.781	0.356	0.897

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
5096	537.57	653.09	18.783	0.468	0.900	1979	125.20	271.27	18.815	0.513	0.988
2580	149.54	330.29	18.783	0.862	1.040	363	522.50	71.04	18.815	0.492	0.955
3169	183.41	384.37	18.783	0.433	1.000	2402	145.50	312.83	18.816	0.275	0.970
4623	37.91	538.31	18.786	0.519	0.952	4221	89.99	498.45	18.816	0.455	0.924
381	409.70	74.09	18.786	-0.196	0.965	1670	194.10	240.32	18.817	0.361	0.900
3219	510.79	388.86	18.786	0.438	1.076	4841	171.18	594.04	18.817	0.459	0.875
1560	321.77	228.56	18.789	0.276	0.945	2643	289.48	337.21	18.818	0.558	0.945
1355	216.37	205.25	18.790	0.276	0.940	5438	17.77	756.27	18.818	0.524	1.225
3216	103.31	388.74	18.790	0.509	0.941	312	378.04	62.72	18.818	0.521	1.113
1822	376.26	257.54	18.791	0.557	0.998	763	159.63	133.93	18.819	0.530	1.043
64	242.65	1.36	18.792	0.552	0.957	90	99.63	12.72	18.821	0.417	1.117
5479	287.53	769.53	18.792	2.589	2.587	4687	442.04	565.22	18.821	0.477	0.975
1568	138.31	229.09	18.792	0.522	0.968	4798	539.02	585.42	18.821	0.530	0.903
4055	46.45	474.56	18.793	0.454	0.898	3447	346.87	411.99	18.821	0.496	0.934
448	278.10	85.31	18.793	0.517	0.968	2602	78.10	332.48	18.821	0.689	0.943
1711	214.96	245.89	18.794	0.558	0.928	3536	391.85	465.83	18.822	0.369	1.013
5202	134.40	678.55	18.794	0.572	0.880	1266	196.75	196.35	18.825	0.469	0.913
4061	478.67	475.33	18.794	0.453	0.850	2827	246.66	353.51	18.828	1.008	2.486
2125	14.30	285.84	18.797	0.501	0.908	5443	56.64	757.06	18.829	0.638	1.033
987	235.76	165.46	18.797	0.318	0.928	2144	149.67	286.78	18.829	0.396	0.980
2604	115.83	273.45	18.797	0.434	0.990	3622	257.40	430.27	18.830	0.557	1.053
2762	251.05	347.51	18.798	-0.060	1.442	4028	122.52	471.88	18.830	0.649	0.903
2716	95.25	343.50	18.799	0.507	0.933	1554	205.90	227.71	18.830	0.462	0.983
29	348.58	-23.08	18.799	0.294	0.920	1544	134.56	226.90	18.830	0.457	0.942
3601	70.83	427.43	18.799	0.406	1.003	1933	154.85	266.50	18.831	0.508	0.953
2902	359.53	360.12	18.799	0.964	0.951	5110	209.62	658.37	18.831	0.440	1.063
2595	91.85	331.71	18.800	0.459	1.013	1344	157.69	204.09	18.831	0.787	0.867
289	112.03	58.20	18.801	0.406	0.918	2911	383.91	360.62	18.831	0.453	0.968
5537	60.64	796.22	18.801	0.499	0.988	1948	401.22	267.64	18.832	0.597	1.130
820	53.74	143.06	18.802	0.575	1.075	1908	11.64	264.80	18.833	0.556	0.983
3621	149.87	430.24	18.802	0.498	1.038	4775	306.67	581.46	18.834	0.511	0.963
3195	174.54	386.56	18.803	0.653	1.114	2721	250.72	344.05	18.834	0.595	1.349
3299	161.64	397.97	18.803	0.497	1.111	3655	388.50	432.50	18.838	0.487	1.034
3605	63.41	428.05	18.805	0.538	1.374	1588	83.48	231.99	18.839	0.522	0.883
115	331.14	19.37	18.805	0.554	0.928	1054	252.62	173.99	18.839	0.563	1.017
2551	203.29	327.13	18.805	0.433	1.020	2469	475.30	319.68	18.839	0.374	0.948
4303	54.12	508.34	18.805	0.445	1.221	538	334.82	100.77	18.840	0.481	0.877
4671	3.65	561.07	18.806	0.612	0.958	236	461.52	46.23	18.840	0.519	0.945
3759	420.03	444.52	18.806	0.298	0.846	2814	443.12	352.25	18.841	1.922	2.580
3279	475.19	396.02	18.806	0.459	0.944	3146	52.54	382.54	18.841	0.237	0.973
2198	466.81	291.91	18.806	0.453	0.917	2017	249.47	274.85	18.841	0.402	1.034
3817	314.12	449.70	18.807	0.490	0.982	2083	65.07	281.48	18.842	0.390	0.963
4881	215.31	605.00	18.807	0.451	0.835	1925	28.47	265.75	18.842	0.594	0.933
1996	161.97	273.11	18.807	0.399	1.008	5041	415.05	641.71	18.843	0.465	0.945
1321	24.42	202.37	18.807	0.437	0.993	4511	476.15	536.44	18.843	0.452	0.950
924	431.09	155.91	18.808	0.300	0.942	3779	197.55	446.13	18.843	0.340	1.228
3181	508.84	385.18	18.809	0.363	1.039	5354	232.81	719.92	18.843	0.494	0.956
4623	291.00	553.23	18.809	0.249	0.896	73	346.11	6.54	18.844	0.701	0.963
1064	172.41	175.18	18.809	0.436	0.933	916	497.47	155.07	18.844	0.502	0.988
3909	301.68	459.91	18.811	0.476	0.942	5185	374.61	674.71	18.847	0.530	0.965
2788	546.32	349.59	18.811	0.770	0.895	1488	281.73	220.73	18.847	0.443	1.008
2312	97.87	303.97	18.811	0.504	1.013	4964	127.36	624.16	18.849	0.522	0.993
487	100.77	92.99	18.811	0.450	0.895	4088	202.40	478.71	18.850	0.406	0.996
552	198.84	102.70	18.811	0.438	0.863	527	104.09	99.09	18.850	0.421	0.893
1204	182.75	190.78	18.811	0.722	1.058	1393	222.75	208.84	18.850	0.354	1.018
1159	359.19	186.28	18.812	0.451	0.860	1667	217.11	239.91	18.850	0.431	0.910
4383	76.82	518.55	18.812	0.553	0.938	1705	300.10	244.06	18.851	0.514	0.921
5532	321.22	791.68	18.813	0.406	0.925	837	5.81	144.44	18.851	0.453	0.835
1482	279.75	220.24	18.814	0.744	1.005	3380	278.06	406.23	18.852	0.507	0.965
1911	22.30	264.93	18.814	0.444	0.900	1205	81.40	190.79	18.852	0.090	1.290

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
4039	206.42	472.53	18.853	0.391	0.990	4301	537.70	508.05	18.891	0.461	0.832
508	139.35	96.05	18.854	0.398	0.798	1662	124.84	239.50	18.892	0.518	1.043
3772	238.11	445.68	18.855	0.487	0.965	3175	219.15	384.73	18.892	0.575	1.106
4803	455.86	586.44	18.856	1.961	0.920	1927	198.08	265.89	18.893	0.688	0.953
2931	72.13	362.61	18.857	0.559	0.998	3978	96.42	467.11	18.893	0.449	0.924
670	197.43	120.84	18.857	0.427	0.910	4091	312.47	479.02	18.894	0.525	0.955
3168	145.31	384.34	18.857	0.606	1.080	2955	173.76	365.29	18.894	0.429	1.141
3314	492.76	399.34	18.857	0.497	0.906	321	227.34	63.90	18.895	0.424	0.935
4639	86.87	556.03	18.857	0.550	0.895	621	197.54	113.21	18.895	0.588	0.845
3540	374.66	421.70	18.858	0.504	0.978	3575	290.28	425.46	18.895	0.505	1.002
4419	197.92	524.59	18.858	1.028	1.098	4079	205.18	477.61	18.895	0.507	1.045
1071	461.14	175.75	18.858	0.360	0.933	4933	268.72	618.08	18.896	0.479	0.873
3429	57.15	410.47	18.858	0.641	0.975	4593	35.36	546.89	18.897	0.390	0.953
3179	168.53	384.98	18.859	0.515	0.996	758	21.94	132.92	18.897	0.569	0.962
4493	201.00	533.92	18.860	1.532	1.120	1607	281.33	234.05	18.898	0.470	1.018
1577	297.41	229.98	18.862	0.426	0.923	2157	24.25	287.68	18.898	0.534	0.865
3006	73.22	369.92	18.862	0.559	1.024	4008	451.44	269.47	18.899	0.480	0.942
1040	511.72	172.36	18.863	0.620	0.940	1396	154.16	209.13	18.900	0.417	0.898
3212	69.28	388.14	18.863	0.467	0.951	1944	294.07	267.40	18.900	0.563	1.125
3118	105.67	380.52	18.865	0.571	0.926	3343	5.64	402.70	18.900	0.555	0.980
2506	184.84	323.19	18.865	1.265	1.075	1778	254.44	253.15	18.900	0.437	0.969
567	132.57	104.94	18.865	0.472	0.938	3941	170.25	463.36	18.901	0.471	0.958
1942	300.47	267.29	18.865	0.194	1.163	709	244.63	126.40	18.902	0.499	0.990
1997	382.25	273.11	18.866	1.721	1.548	4114	382.70	481.42	18.902	0.404	0.818
1951	245.77	267.86	18.868	0.515	0.935	1928	150.70	266.02	18.902	0.598	1.203
1421	15.33	212.50	18.868	0.553	0.920	4332	170.34	511.77	18.902	0.537	0.968
2464	395.15	319.35	18.868	0.497	0.838	4060	266.54	475.31	18.903	0.465	0.957
3674	90.75	434.99	18.868	0.510	1.058	699	82.66	124.99	18.904	0.549	1.003
667	275.96	120.72	18.869	0.455	1.008	3536	134.73	421.05	18.904	0.460	0.976
348	57.79	67.44	18.871	0.409	0.988	686	283.41	122.76	18.905	0.386	1.088
1445	138.14	215.54	18.872	0.545	0.975	843	202.67	145.65	18.905	-0.013	1.013
1912	141.13	264.97	18.874	0.420	0.985	2553	183.26	327.46	18.905	0.336	1.070
2734	265.99	345.00	18.875	0.481	1.041	937	161.21	157.72	18.905	0.506	0.848
1740	74.26	248.62	18.877	0.420	0.845	1346	247.49	204.16	18.906	0.451	0.936
3714	297.31	439.56	18.877	0.480	0.955	2374	504.73	309.25	18.906	0.604	1.026
231	201.70	43.97	18.878	0.404	0.930	226	194.25	42.94	18.906	0.551	0.870
5206	85.18	680.08	18.879	0.563	0.898	977	259.44	164.61	18.907	0.479	0.961
769	87.85	134.93	18.879	0.605	0.860	89	410.22	12.14	18.907	0.825	0.890
1102	126.18	179.79	18.880	0.424	0.903	1265	68.80	196.33	18.907	0.560	1.033
74	257.10	7.36	18.880	0.392	0.928	3884	70.91	456.92	18.907	0.555	0.884
3581	299.46	425.73	18.881	0.396	1.096	354	448.67	68.16	18.908	0.318	0.895
1179	159.48	188.74	18.881	0.480	0.955	2753	16.48	346.69	18.909	0.414	0.992
2247	190.52	296.20	18.881	0.337	0.985	1112	514.43	180.92	18.909	0.614	0.915
4173	434.24	489.95	18.881	0.499	0.945	3682	68.88	435.87	18.911	0.343	1.004
3400	248.21	408.15	18.882	0.357	0.918	3114	69.62	379.84	18.911	0.515	0.981
4794	246.66	584.96	18.883	0.468	0.844	1017	106.87	169.52	18.911	0.368	1.018
4024	96.35	471.44	18.884	0.793	0.900	3240	437.24	391.16	18.912	0.423	0.905
1364	195.31	206.22	18.884	0.535	0.965	3753	219.63	443.87	18.912	0.440	1.142
3159	286.71	383.73	18.885	0.426	0.928	3769	411.32	445.34	18.912	0.405	0.929
1030	249.75	171.08	18.887	0.460	0.963	3906	368.60	459.83	18.914	0.462	0.934
1910	196.06	264.88	18.887	0.379	0.923	1202	57.24	190.60	18.914	0.533	0.918
964	302.42	161.10	18.888	0.502	0.938	332	215.63	64.99	18.915	0.237	1.030
3727	311.99	440.93	18.888	0.518	1.056	5234	141.97	687.82	18.916	0.536	0.947
5176	382.11	672.38	18.889	0.550	0.995	3428	231.23	410.43	18.916	0.583	0.992
2971	36.71	366.53	18.889	0.351	1.159	2196	155.29	291.60	18.918	0.240	1.060
3398	116.84	407.80	18.889	0.478	0.980	2646	206.06	337.32	18.918	0.462	1.043
595	227.99	109.09	18.890	0.412	0.915	2336	203.92	306.13	18.918	0.622	1.065
1033	507.87	171.22	18.890	0.557	0.962	3016	171.15	371.00	18.919	0.944	1.280
2248	241.81	296.20	18.890	0.839	1.065	318	241.03	63.46	18.919	0.324	1.038
3182	258.59	385.18	18.890	0.660	0.855	5084	442.84	651.56	18.920	0.552	1.197

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
3868	209.44	454.98	18.920	0.595	0.991	2024	52.34	275.62	18.946	0.360	0.877
5364	144.16	723.26	18.920	0.665	0.875	2047	85.34	277.86	18.948	0.591	1.060
1480	107.07	320.50	18.920	0.450	1.043	434	350.71	83.14	18.948	0.502	0.888
856	168.57	146.83	18.921	0.880	0.945	1546	54.77	227.28	18.948	0.498	1.010
2359	90.39	307.90	18.921	0.531	1.048	1191	329.55	189.60	18.948	0.588	0.908
3523	26.26	419.19	18.922	0.560	0.917	1163	306.59	186.60	18.949	0.564	0.941
1327	408.24	202.71	18.922	0.616	0.915	3353	273.35	403.57	18.950	0.509	0.941
1145	154.40	184.68	18.923	0.708	0.998	1194	124.68	189.91	18.951	0.398	0.943
3466	431.02	413.88	18.923	0.250	0.913	3295	337.96	397.45	18.951	0.461	0.925
679	176.50	121.64	18.923	0.388	1.008	3957	297.61	464.47	18.951	0.523	0.997
2450	39.29	317.99	18.924	0.418	0.855	922	451.84	155.68	18.951	1.258	0.993
2084	199.63	281.59	18.924	0.345	1.035	283	106.45	56.71	18.951	0.720	0.877
4656	177.61	558.17	18.924	0.285	0.892	2228	182.95	294.89	18.951	0.188	0.945
3900	378.64	459.43	18.925	0.440	1.036	2180	207.14	289.95	18.952	0.280	0.940
2751	299.83	346.61	18.926	0.473	1.106	3066	165.98	375.54	18.952	0.490	1.063
1304	457.17	200.70	18.927	0.454	1.003	2880	202.00	358.11	18.953	0.045	1.305
2497	193.78	322.50	18.929	0.517	1.113	4609	212.03	551.55	18.954	0.488	0.905
2759	41.49	347.29	18.929	0.551	0.980	4699	268.54	567.54	18.955	0.364	0.951
4796	133.01	585.22	18.930	0.531	0.940	2433	230.12	315.63	18.956	0.512	1.015
489	166.50	93.10	18.931	0.469	0.825	1319	19.08	202.08	18.957	0.275	0.887
5396	241.50	740.64	18.931	0.503	0.929	4187	220.62	488.92	18.958	0.453	0.971
3013	102.72	370.40	18.932	0.337	0.967	4695	109.74	566.60	18.958	0.822	0.967
755	404.93	132.60	18.933	0.491	1.018	568	49.66	105.00	18.958	0.486	0.907
902	140.49	153.18	18.933	0.466	1.030	2773	536.60	348.33	18.958	0.457	0.914
2930	91.64	362.26	18.934	0.760	0.936	460	174.36	87.83	18.960	0.489	0.958
4065	138.72	475.97	18.934	0.507	0.926	5555	91.51	805.55	18.961	0.469	0.945
5256	428.16	694.29	18.935	0.455	0.933	1976	39.61	270.92	18.961	0.770	0.910
3242	101.45	391.42	18.935	0.524	0.947	3920	233.37	461.62	18.964	0.560	0.954
4904	259.28	611.22	18.935	0.401	0.889	4562	274.71	542.48	18.965	0.406	0.901
3860	80.04	453.92	18.936	0.458	0.934	1883	141.97	263.11	18.965	0.581	0.885
3967	46.98	466.03	18.937	0.381	0.927	3178	55.62	384.93	18.965	0.587	0.985
4243	183.58	501.37	18.937	0.538	0.961	3801	391.35	447.99	18.967	1.052	2.055
2957	186.08	365.42	18.937	1.086	1.291	4077	129.20	477.49	18.967	0.484	0.925
2959	261.87	365.86	18.938	0.436	1.144	2223	292.43	293.93	18.968	0.443	1.006
185	76.40	35.20	18.938	0.584	0.840	3363	296.87	404.34	18.968	0.501	0.988
3342	136.86	402.55	18.939	0.521	0.971	1086	339.79	177.69	18.968	0.475	0.975
1372	144.99	206.82	18.939	0.292	0.955	2032	96.09	276.41	18.970	0.379	0.963
5092	209.59	652.50	18.939	1.124	1.158	968	282.41	163.25	18.971	0.450	1.020
536	62.11	100.68	18.939	0.529	0.905	1889	105.18	263.61	18.972	0.167	0.987
4341	183.13	512.81	18.939	0.427	0.913	5514	311.71	785.16	18.972	0.463	0.942
35	533.90	-18.09	18.939	0.498	0.990	1898	293.25	264.11	18.972	0.512	1.183
2577	216.42	330.05	18.940	0.423	1.138	5242	116.19	690.36	18.972	0.493	0.818
1042	250.03	173.01	18.940	0.640	1.052	5307	275.52	708.33	18.973	0.477	0.900
3298	4.04	397.72	18.940	0.531	0.989	4997	426.58	631.81	18.973	0.440	0.963
1257	287.21	195.21	18.941	0.490	0.981	3799	277.97	447.58	18.973	0.360	0.955
2159	193.20	288.06	18.941	0.647	1.170	3517	193.91	418.85	18.973	0.462	0.970
5039	374.65	641.57	18.941	0.497	0.935	3399	275.90	408.12	18.974	0.585	0.958
1505	129.08	222.20	18.941	0.418	0.955	583	147.57	107.67	18.974	0.485	0.922
2787	213.67	349.55	18.942	0.557	0.975	3320	313.65	400.35	18.975	0.456	0.977
3683	423.18	435.90	18.943	0.407	0.928	537	328.90	100.68	18.975	0.542	0.930
3544	192.30	421.94	18.943	0.513	1.039	3830	58.94	450.58	18.976	0.763	0.981
978	56.30	164.68	18.944	0.474	1.053	980	340.50	164.76	18.976	0.387	0.978
1943	395.60	267.38	18.944	0.634	1.775	1065	58.13	175.27	18.976	0.349	1.000
5421	325.26	751.14	18.944	0.428	1.023	2560	315.10	327.86	18.976	0.435	1.014
4184	80.41	491.13	18.944	0.577	0.883	3845	190.04	452.33	18.977	0.462	1.006
661	326.36	119.71	18.944	0.320	0.935	3149	282.62	382.83	18.978	0.473	0.933
3303	76.89	398.21	18.944	0.446	0.915	1791	146.31	254.21	18.978	0.325	1.072
4155	104.02	486.50	18.945	0.573	0.974	5491	452.91	774.06	18.979	0.521	0.953
1843	189.66	259.63	18.945	0.546	0.940	1473	370.49	219.17	18.979	0.549	0.890
2608	38.42	333.20	18.946	0.490	0.873	4494	183.14	533.99	18.979	0.539	1.000

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
2601	399.65	332.33	18.979	0.504	1.004	1886	291.01	263.33	19.009	0.283	1.140
2591	139.61	331.33	18.979	0.895	0.895	87	201.36	11.58	19.009	0.355	0.920
868	222.70	148.51	18.980	0.399	1.038	1709	175.89	244.51	19.010	0.469	0.945
3332	273.39	401.74	18.980	0.750	0.954	2155	26.90	287.62	19.011	0.582	0.910
1949	168.79	267.69	18.980	0.787	1.092	4895	393.92	609.18	19.011	0.529	0.983
1835	45.21	259.00	18.981	1.274	1.110	5166	218.90	670.89	19.012	0.409	0.887
3761	168.48	444.71	18.982	0.592	0.920	4385	143.88	518.69	19.012	0.524	1.035
1882	100.38	263.03	18.982	0.670	1.072	4288	493.39	505.92	19.012	0.353	1.005
4103	451.28	480.36	18.982	0.410	0.828	135	69.41	23.54	19.012	0.465	0.810
4958	305.59	623.54	18.983	0.550	0.923	5217	356.64	682.48	19.013	0.458	0.955
3256	32.53	392.72	18.983	0.555	0.894	3987	407.41	467.40	19.014	0.534	0.916
2169	160.99	289.34	18.984	0.375	1.033	353	168.89	67.89	19.015	0.449	0.920
665	328.26	120.19	18.984	0.502	0.955	4082	194.04	477.93	19.015	0.509	0.869
3338	458.83	402.21	18.984	0.448	0.971	2798	218.02	350.69	19.017	0.545	1.040
1834	38.75	258.83	18.985	0.590	1.088	4922	33.97	615.52	19.017	0.596	0.923
4427	113.38	525.56	18.985	0.654	0.975	557	367.81	103.26	19.017	0.477	0.905
4075	49.28	477.18	18.985	0.510	0.955	3903	105.28	459.63	19.018	0.605	1.034
3795	135.11	447.36	18.985	0.444	0.889	1630	390.41	236.45	19.018	0.455	0.860
3898	144.68	458.59	18.986	0.475	0.914	206	511.71	39.24	19.018	0.524	0.898
3372	402.60	405.40	18.986	0.664	0.910	5051	424.03	644.42	19.018	0.457	0.963
4533	297.74	539.26	18.986	0.544	0.923	3930	260.23	462.40	19.019	0.457	0.921
25	254.07	-25.40	18.986	0.467	0.965	2404	94.14	312.92	19.020	0.386	0.925
794	172.07	139.15	18.987	0.404	0.988	2972	469.86	366.59	19.020	0.425	0.938
1707	143.76	244.23	18.987	0.315	0.907	4347	447.48	513.79	19.021	0.812	0.907
1679	137.73	241.27	18.987	0.359	0.963	2515	139.87	323.90	19.021	0.399	1.040
1960	180.31	269.19	18.987	0.375	0.930	5550	183.23	802.98	19.021	0.488	0.787
2717	343.80	343.53	18.988	0.642	0.934	3198	130.61	386.81	19.021	0.537	1.016
5131	151.83	661.04	18.990	0.421	1.030	5478	533.10	769.51	19.021	0.336	0.963
2541	126.41	326.17	18.990	0.325	0.950	4064	32.35	475.96	19.022	0.524	0.944
1353	51.37	205.00	18.990	0.477	1.137	938	386.03	157.88	19.022	0.412	0.988
2419	140.75	314.35	18.991	0.351	0.968	4470	213.64	531.15	19.022	1.998	1.180
926	392.75	156.23	18.991	0.497	0.905	296	92.21	59.77	19.024	0.391	0.910
2407	149.53	313.12	18.991	0.475	0.955	1291	366.36	199.10	19.024	0.428	0.940
3516	62.26	418.72	18.991	0.392	1.025	3715	49.51	439.60	19.025	0.525	0.993
230	408.54	43.78	18.992	0.455	1.023	2334	321.61	306.12	19.027	0.456	0.905
1185	59.53	189.15	18.992	0.483	0.995	2522	129.65	324.76	19.027	0.669	0.952
3322	62.50	400.43	18.993	0.421	1.060	1909	175.16	264.86	19.027	0.875	1.018
1855	178.41	260.68	18.993	0.495	1.170	3365	28.50	33.49	19.027	0.427	0.923
1147	143.29	184.81	18.993	0.446	0.933	5001	175.1	23.66	19.027	0.444	0.893
3831	345.83	450.65	18.994	0.447	1.597	2142	346.2	36.71	19.028	0.508	1.072
1466	315.95	217.72	18.995	0.459	0.970	1708	98.35	244.29	19.028	0.400	0.970
2106	486.74	284.05	18.995	0.455	0.830	2503	231.41	322.95	19.028	0.469	0.960
3692	345.17	437.27	18.997	0.470	0.940	2699	386.77	341.83	19.029	0.295	1.050
3015	63.91	370.79	18.997	0.694	1.005	480	452.72	92.10	19.029	0.385	0.975
1674	32.11	240.92	18.998	0.479	0.848	2805	458.80	351.46	19.029	1.321	1.413
2653	324.61	337.84	18.999	0.735	0.883	1615	144.84	234.93	19.030	0.376	0.935
5287	130.31	702.40	19.001	0.453	0.838	5088	309.41	652.07	19.032	0.505	0.919
4793	352.34	584.84	19.002	0.509	0.873	3969	53.65	466.21	19.032	0.874	0.885
1821	157.58	257.44	19.002	1.097	1.110	561	428.54	103.84	19.032	0.521	0.883
108	286.61	18.52	19.003	0.467	0.955	2809	109.03	351.80	19.032	0.560	1.125
1500	217.57	221.79	19.004	0.470	0.978	5042	135.67	641.84	19.033	0.477	0.938
3324	322.03	400.74	19.004	0.451	0.886	5145	481.81	694.46	19.034	0.486	1.105
1337	507.67	203.69	19.004	0.439	0.835	4237	176.25	500.66	19.034	0.456	0.930
4108	374.22	480.50	19.004	0.413	0.828	1360	260.09	205.66	19.035	0.482	1.120
3341	77.08	402.47	19.006	0.466	0.905	3661	182.19	433.74	19.035	0.637	0.941
2878	306.57	357.98	19.006	0.441	0.986	1098	7.14	179.10	19.035	0.582	1.193
1359	474.46	205.55	19.007	0.363	0.923	3862	99.54	454.09	19.036	0.543	0.928
3913	85.77	460.21	19.007	0.168	1.004	5216	292.11	682.39	19.036	1.398	2.090
833	280.95	144.23	19.008	0.383	1.026	1235	125.33	193.32	19.036	0.477	0.978
1589	12.10	232.01	19.009	0.686	0.950	2064	323.86	279.49	19.036	0.666	0.978

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2011	73.88	274.48	19.039	0.439	0.908	1413	200.17	211.45	19.065	0.345	1.055
3370	347.08	405.35	19.039	0.593	0.915	1307	344.61	201.11	19.066	0.440	0.928
2027	264.78	275.89	19.039	0.510	1.191	248	59.37	49.26	19.066	0.436	1.085
3222	79.45	389.26	19.040	0.633	0.997	2851	271.72	356.08	19.066	0.438	1.009
3226	186.19	389.76	19.041	1.221	1.063	745	318.52	131.22	19.066	0.487	1.048
3630	290.56	430.73	19.041	0.458	0.956	1531	100.34	225.70	19.067	0.142	1.065
3423	321.72	410.28	19.041	0.508	0.983	341	165.85	66.18	19.067	0.537	0.863
840	201.93	144.81	19.041	0.223	0.985	4926	213.15	617.07	19.067	0.410	0.912
5327	188.36	712.79	19.042	0.463	0.907	3636	237.27	431.42	19.068	0.312	0.913
2538	206.43	325.99	19.042	0.981	1.153	3412	64.32	409.20	19.070	0.553	0.935
3644	345.59	431.91	19.043	0.246	0.870	400	55.48	78.26	19.071	0.392	0.988
714	89.39	127.01	19.043	0.593	0.945	1330	111.57	202.87	19.071	0.239	1.018
3449	287.83	412.08	19.044	0.491	0.968	5321	10.13	710.85	19.072	0.429	0.848
2273	147.86	298.85	19.044	0.609	1.028	809	389.64	140.93	19.073	0.621	0.915
1467	14.31	217.73	19.044	0.441	0.928	4199	151.05	494.71	19.074	0.430	0.945
2071	222.62	280.44	19.044	0.438	1.005	2793	149.37	350.10	19.075	-0.180	1.028
3194	75.50	386.55	19.045	0.477	0.983	719	277.70	127.42	19.077	0.408	1.063
293	240.64	59.34	19.045	0.425	1.009	2607	136.90	333.07	19.077	0.634	0.910
659	52.11	119.54	19.046	1.276	0.795	1439	116.71	214.90	19.077	0.462	1.005
2326	436.14	305.60	19.046	0.454	1.019	5375	456.33	728.14	19.078	0.532	0.902
5243	237.08	691.25	19.047	0.490	0.336	3586	94.92	426.04	19.078	0.577	0.900
5486	319.06	772.06	19.047	0.508	1.103	2723	125.95	344.18	19.078	0.488	1.013
1325	309.23	202.57	19.048	0.568	0.968	535	82.17	100.62	19.078	0.466	0.976
2189	45.99	290.90	19.050	0.571	0.938	4306	241.45	507.95	19.078	0.460	0.945
3594	367.58	426.77	19.051	0.534	0.951	800	75.00	140.05	19.078	0.503	0.848
5556	287.09	807.90	19.051	0.421	1.000	1702	94.90	243.80	19.079	0.448	0.973
2629	205.30	362.21	19.051	0.899	1.265	774	410.40	135.91	19.079	0.345	0.855
2472	498.51	319.96	19.052	0.234	0.947	86	179.23	11.25	19.079	0.684	1.023
3638	277.66	431.57	19.053	0.155	0.969	5182	251.33	674.19	19.079	0.473	1.051
30	427.61	-22.51	19.053	0.404	0.805	4011	174.21	469.73	19.079	0.252	0.957
337	314.99	65.73	19.053	0.544	0.920	2916	145.22	360.77	19.080	0.483	0.946
2760	282.72	347.47	19.053	0.482	0.981	4783	445.15	583.47	19.082	0.415	0.778
3007	245.85	369.92	19.054	0.745	0.983	2550	56.70	327.02	19.083	0.339	0.878
4800	150.43	585.94	19.055	0.504	0.830	940	409.02	157.96	19.083	0.469	0.918
3743	267.84	443.06	19.055	0.414	0.965	3931	163.30	462.50	19.083	0.482	0.871
433	64.56	82.75	19.056	0.435	0.880	734	505.14	129.72	19.084	0.524	1.018
3541	2.10	421.73	19.057	0.535	1.100	3993	255.20	455.61	19.084	0.508	0.981
1043	184.74	173.06	19.057	0.440	0.993	4413	77.81	523.26	19.084	0.436	0.905
2478	212.29	320.42	19.057	0.568	1.048	885	86.87	150.77	19.085	0.391	0.897
5509	325.85	782.90	19.057	0.340	0.893	5213	78.59	681.83	19.086	0.541	0.940
1406	129.94	210.34	19.057	0.384	0.883	2183	254.58	290.37	19.087	0.502	0.994
2857	230.39	356.84	19.058	0.439	1.246	3573	56.12	425.07	19.087	0.526	1.053
3375	15.77	405.90	19.058	0.302	0.969	343	176.78	66.66	19.087	0.435	0.870
4143	511.95	485.24	19.059	0.496	1.092	4359	483.71	515.00	19.088	0.398	0.988
3470	441.50	414.34	19.059	0.450	0.914	2659	97.08	338.24	19.088	0.490	1.010
1485	204.46	220.63	19.059	0.493	0.928	4744	268.48	576.19	19.089	0.449	1.195
5245	301.49	692.13	19.060	0.486	0.946	3673	40.88	434.75	19.089	0.507	0.925
2112	41.25	284.75	19.060	0.455	0.893	2039	350.55	277.49	19.089	0.369	0.950
5020	235.38	640.03	19.060	0.448	1.077	2785	412.77	349.11	19.090	0.483	0.911
2771	457.93	348.17	19.060	0.879	1.430	1131	221.00	182.87	19.090	0.454	0.995
1827	20.12	258.02	19.061	0.502	0.870	4058	24.41	474.96	19.090	0.464	1.023
54	410.57	-6.79	19.062	0.519	0.868	558	294.01	103.30	19.090	0.502	0.985
3890	141.77	457.75	19.062	0.510	0.906	1969	67.77	270.12	19.090	-0.419	0.973
4750	505.89	577.21	19.062	0.511	0.838	645	172.15	117.97	19.090	0.460	0.908
3629	443.62	430.64	19.063	0.413	0.934	391	290.71	76.00	19.091	0.413	0.911
2138	123.58	286.33	19.063	0.266	1.253	217	29.54	41.57	19.092	0.447	0.903
5171	235.55	671.94	19.063	0.563	0.908	2126	474.19	285.91	19.092	0.361	0.930
618	228.80	112.95	19.064	0.360	0.900	20	446.27	-26.87	19.093	0.441	1.063
3407	83.36	408.80	19.064	0.473	0.980	1068	24.62	175.46	19.093	0.531	1.270
682	355.32	122.06	19.064	0.400	0.865	3336	336.98	402.03	19.093	0.524	0.900

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
5125	459.24	660.03	19.094	0.513	0.775	3321	71.41	400.39	19.122	0.546	0.973
3070	236.37	375.72	19.095	0.475	1.026	161	74.08	29.65	19.123	0.452	0.885
2212	215.66	293.16	19.095	0.292	0.983	927	19.98	156.39	19.123	0.389	0.875
435	472.66	83.55	19.095	0.368	1.023	3359	328.67	404.03	19.123	0.511	0.916
262	274.81	503.07	19.096	0.439	0.971	3646	376.02	431.97	19.123	0.607	0.929
2259	20.65	297.33	19.097	0.448	0.933	4485	126.53	533.17	19.124	0.439	0.940
3979	71.10	467.14	19.097	0.462	0.955	1479	165.84	219.93	19.124	0.089	0.895
3614	279.96	428.96	19.098	0.588	1.037	1903	403.73	264.52	19.125	0.585	1.000
4567	390.23	543.49	19.099	-0.220	1.025	1252	199.84	194.92	19.125	0.860	0.897
5365	34.32	724.00	19.099	0.584	0.945	4115	91.19	481.50	19.126	0.614	0.990
3379	66.16	406.14	19.099	0.412	0.947	912	59.63	154.32	19.126	0.550	0.938
3356	351.72	403.92	19.100	0.431	0.904	2875	77.37	357.79	19.126	0.411	1.037
1084	91.85	177.30	19.100	0.631	1.013	3901	177.48	459.52	19.127	0.448	0.935
3917	347.34	461.14	19.102	0.500	1.110	2905	164.94	360.30	19.128	0.525	1.103
4736	295.54	574.95	19.102	0.485	0.991	4035	197.02	472.34	19.128	0.437	0.888
904	259.38	153.50	19.103	0.522	0.919	1001	177.26	167.57	19.129	0.578	0.887
776	193.85	136.11	19.103	0.832	0.950	445	218.40	84.62	19.130	0.325	1.105
2589	44.85	331.06	19.103	0.181	0.900	544	252.28	101.90	19.130	0.667	0.911
1175	22.87	187.97	19.105	0.428	1.023	502	85.56	95.31	19.130	0.478	0.975
3053	170.36	374.55	19.106	0.545	1.026	1569	222.37	229.09	19.131	0.413	0.903
1649	279.02	238.36	19.106	0.488	0.945	4970	97.09	625.18	19.132	0.513	0.845
4645	273.66	556.52	19.107	0.542	0.974	3220	141.06	388.91	19.132	0.630	1.035
3545	75.50	422.06	19.108	0.472	1.009	3143	324.68	382.20	19.133	0.870	0.886
2873	13.99	357.74	19.108	0.350	1.287	1552	84.65	227.69	19.133	0.465	0.870
4603	318.73	550.23	19.108	0.523	0.918	2108	53.00	284.35	19.133	0.320	0.875
834	428.03	144.26	19.108	0.404	0.835	1522	269.38	224.47	19.133	0.689	0.986
4633	117.13	555.31	19.109	0.496	0.893	3318	55.42	460.08	19.134	0.495	0.929
1914	163.76	265.01	19.109	0.089	1.482	1226	179.65	192.75	19.134	0.304	1.070
3587	424.85	426.07	19.109	0.331	0.926	1955	62.42	268.85	19.134	0.550	0.975
1529	298.93	225.58	19.109	0.522	0.973	3488	110.01	415.32	19.135	0.528	1.010
5382	221.17	731.09	19.110	0.552	0.923	4353	102.02	514.49	19.135	0.449	0.908
7	402.95	-36.24	19.110	0.377	0.923	2565	248.23	328.40	19.136	0.476	0.919
863	82.29	147.87	19.111	0.435	0.873	1637	237.11	236.96	19.136	0.372	0.986
3819	205.06	449.72	19.111	0.513	1.029	5565	94.79	816.18	19.136	0.453	0.863
2964	243.23	366.39	19.112	1.005	1.035	4244	51.18	501.63	19.137	0.544	0.971
1201	85.41	190.55	19.112	0.765	1.128	4791	461.65	584.39	19.137	0.381	0.850
3755	121.55	443.99	19.112	0.449	0.946	1604	29.55	233.72	19.137	0.419	1.053
3697	162.21	437.78	19.112	0.339	0.957	2457	108.45	318.33	19.138	0.092	0.938
2797	129.39	350.56	19.113	0.365	1.155	1356	19.84	205.30	19.138	0.638	0.863
575	14.66	105.85	19.114	0.581	1.048	4144	528.99	485.39	19.139	0.504	0.952
2449	348.55	317.91	19.115	0.493	0.999	3319	478.40	400.29	19.139	0.388	0.959
3473	218.68	414.51	19.115	0.318	0.914	2272	53.05	298.66	19.139	0.531	0.883
78	270.28	9.25	19.116	0.501	1.080	255	268.36	51.41	19.140	0.485	1.045
3305	434.56	398.34	19.117	0.759	0.928	4400	110.22	521.09	19.140	0.688	0.958
281	89.75	56.51	19.117	0.545	0.903	2722	5.30	344.13	19.141	0.572	1.078
4874	329.78	602.29	19.117	0.454	0.898	1367	365.27	206.46	19.141	0.422	0.970
641	9.34	117.76	19.117	0.493	0.995	3109	133.32	379.37	19.143	0.183	1.020
3455	125.17	412.66	19.118	0.370	0.966	3788	310.21	446.59	19.144	0.466	1.033
2925	192.23	361.98	19.118	0.848	1.073	3224	212.33	389.48	19.144	0.077	1.029
2379	386.68	309.61	19.118	0.566	0.959	2728	142.70	344.64	19.144	0.794	1.138
1647	166.96	238.02	19.118	0.336	1.093	5510	67.93	783.32	19.144	0.368	0.860
1644	100.82	237.80	19.119	0.499	0.950	1620	105.94	235.14	19.144	0.611	0.975
4707	327.84	569.16	19.120	0.347	0.755	137	182.94	23.63	19.144	0.445	0.920
1088	96.80	178.02	19.120	0.469	0.940	4677	153.29	562.83	19.144	0.450	0.900
644	413.93	117.89	19.120	0.373	0.942	2361	74.57	307.91	19.145	0.468	1.138
2843	149.62	355.07	19.120	0.552	1.092	2186	153.55	290.62	19.145	0.500	0.995
5127	308.62	660.48	19.120	0.434	0.959	1671	57.18	240.52	19.145	0.613	0.968
3632	95.90	430.90	19.120	0.363	1.000	4621	89.61	552.76	19.145	0.375	0.888
1409	179.36	210.86	19.121	0.430	1.075	1382	314.72	208.12	19.146	0.551	0.918
426	251.39	82.17	19.121	0.517	0.924	2854	47.27	356.50	19.146	0.509	1.079

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
1129	441.82	182.73	19.146	0.344	1.073	2322	408.80	304.84	19.172	0.412	0.854
4674	301.98	561.98	19.147	0.476	0.882	2141	44.29	286.55	19.172	0.377	0.843
5194	272.86	676.60	19.147	0.501	0.951	3861	38.31	454.04	19.172	0.467	0.963
3505	59.60	417.62	19.149	0.937	0.925	1374	222.27	207.18	19.172	0.599	1.050
1514	217.25	223.21	19.149	0.072	0.980	4356	119.12	514.78	19.173	0.517	0.887
2863	17.66	357.06	19.150	0.520	1.175	2460	465.60	318.43	19.173	0.401	0.981
4961	330.77	623.70	19.150	0.449	0.877	3057	389.43	374.69	19.173	0.463	0.940
5156	207.94	668.39	19.150	0.462	1.003	1991	300.22	272.76	19.173	0.519	1.230
4540	127.96	540.24	19.150	0.674	0.898	703	335.77	125.51	19.173	0.288	0.925
5322	267.16	711.07	19.151	0.420	0.926	1310	313.17	201.54	19.174	0.450	0.911
925	217.99	156.17	19.152	0.420	0.893	2116	101.28	285.14	19.174	0.410	0.935
2545	171.45	326.68	19.152	0.151	1.018	2838	262.80	354.80	19.174	1.047	1.352
5104	295.41	656.83	19.152	0.418	0.973	2025	366.55	275.86	19.175	0.464	0.985
5584	212.41	833.11	19.153	0.397	1.063	3210	158.85	388.11	19.175	0.674	1.000
4637	281.16	555.74	19.153	0.479	0.964	3227	26.68	389.79	19.175	0.453	1.014
2963	274.47	366.25	19.153	1.066	1.068	1248	220.88	194.37	19.175	0.412	0.860
1862	235.99	261.09	19.153	0.578	0.980	2828	195.75	353.69	19.176	0.374	0.927
4122	250.84	482.28	19.153	0.572	0.998	1850	308.74	269.10	19.177	0.754	1.178
3735	228.95	441.64	19.154	-0.013	0.971	5546	53.82	798.64	19.177	0.524	0.890
4142	25.00	485.23	19.154	0.473	0.979	1719	117.65	245.75	19.178	0.413	0.988
5568	296.85	818.37	19.155	0.647	0.832	2569	140.99	328.88	19.178	0.187	0.930
5190	294.96	675.77	19.156	0.470	0.975	2190	72.74	290.96	19.178	0.523	1.043
4282	444.43	505.17	19.156	0.509	0.975	5428	290.32	753.24	19.179	1.338	2.360
148	186.92	26.50	19.157	0.338	0.935	3567	427.05	424.39	19.179	0.395	0.923
3160	142.64	383.82	19.157	0.427	1.167	3763	150.71	444.95	19.180	0.360	0.970
4883	135.44	606.83	19.158	0.580	0.985	4748	135.92	576.54	19.180	0.757	0.920
3310	129.33	398.66	19.158	0.522	0.944	1971	59.19	270.18	19.180	0.415	0.938
3710	301.54	439.24	19.158	0.429	0.967	819	194.65	142.86	19.180	0.476	1.030
3960	121.43	465.14	19.158	-0.007	0.951	2740	227.01	345.72	19.180	0.301	1.142
4778	91.68	581.85	19.158	0.421	0.850	4759	244.28	578.43	19.180	0.454	0.849
3092	89.91	378.41	19.159	0.500	0.965	2564	31.65	328.20	19.180	0.367	0.878
2305	426.25	302.98	19.159	0.425	0.934	4845	511.92	594.99	19.181	0.500	1.075
1395	68.29	209.05	19.160	-0.055	0.985	917	198.83	155.24	19.181	0.306	1.080
892	117.05	151.75	19.160	0.400	1.220	1690	194.48	242.53	19.182	0.634	0.853
1747	107.09	249.74	19.161	0.297	1.008	49	326.88	-8.75	19.183	0.497	0.963
1867	393.66	261.80	19.161	0.803	1.280	2520	170.42	324.48	19.183	0.451	1.027
1101	209.61	179.70	19.162	1.729	1.120	1358	356.29	205.48	19.183	0.592	0.953
1432	11.10	213.80	19.163	0.756	0.910	329	95.25	64.82	19.184	0.495	0.915
741	63.80	130.64	19.163	0.586	0.965	2720	181.22	343.97	19.184	0.703	1.070
3572	196.25	424.96	19.165	0.648	0.990	1895	137.99	264.02	19.184	0.394	0.920
3939	43.97	463.16	19.166	0.515	0.936	2473	374.19	320.09	19.185	0.492	0.946
2530	200.93	325.34	19.166	0.348	1.038	4622	76.07	553.03	19.185	0.492	0.953
685	71.19	122.61	19.166	0.361	0.983	974	90.85	164.36	19.185	0.293	0.895
772	274.30	135.38	19.166	0.368	0.979	3421	343.21	410.06	19.185	0.491	0.926
4906	288.22	611.62	19.166	0.449	0.951	4757	143.52	578.38	19.186	0.622	0.950
5352	389.95	719.66	19.166	0.535	1.018	589	238.86	108.78	19.186	0.466	0.898
4234	284.21	500.23	19.166	0.478	0.911	1673	395.77	240.91	19.187	0.521	0.890
2981	214.11	367.49	19.168	0.493	1.024	417	328.08	80.65	19.187	0.477	0.928
4440	223.02	527.83	19.168	0.630	0.998	2179	186.74	289.89	19.187	0.250	0.970
475	288.10	91.53	19.168	0.585	0.967	4322	190.12	510.12	19.187	0.995	0.950
13	350.19	-32.08	19.169	0.557	0.877	4314	65.80	509.50	19.188	0.533	0.876
473	149.08	90.61	19.169	0.486	0.963	2102	339.89	283.57	19.188	0.557	0.945
3660	506.36	433.51	19.170	0.440	0.955	5348	475.20	719.24	19.189	0.489	0.940
4250	30.74	502.10	19.170	0.532	0.966	718	12.15	127.32	19.189	0.444	0.920
3387	110.65	407.07	19.170	0.563	0.956	4019	192.61	470.65	19.191	0.409	0.895
1496	292.10	221.56	19.170	0.476	0.931	5205	196.46	679.93	19.191	0.389	0.925
5392	370.70	737.21	19.170	0.478	0.915	1712	133.22	244.73	19.191	0.436	0.973
993	421.46	166.14	19.171	0.590	0.998	1693	153.75	243.10	19.191	0.342	0.945
5299	203.93	705.57	19.171	0.528	0.887	1198	321.32	190.36	19.191	0.444	0.933
1916	391.18	265.06	19.172	0.376	1.490	905	173.04	153.61	19.191	0.521	0.882

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
3294	218.01	397.44	19.192	0.491	1.023	305	5.50	61.34	19.218	0.506	0.877
2675	221.79	340.03	19.192	0.417	1.046	5473	277.85	767.10	19.218	0.728	1.438
1435	55.85	214.54	19.192	0.549	0.963	1545	69.20	227.27	19.219	0.563	1.050
91	131.47	13.36	19.192	1.292	1.035	2915	53.18	360.76	19.219	0.748	1.015
107	293.77	18.17	19.192	0.637	0.921	2804	80.60	351.45	19.220	0.440	0.942
1654	336.28	238.63	19.193	0.551	0.905	1320	515.29	202.28	19.221	0.453	0.980
5257	64.42	694.90	19.193	0.445	0.840	3737	82.51	441.93	19.222	0.415	0.894
1981	399.85	271.74	19.194	0.773	1.275	2841	440.92	354.99	19.223	0.844	1.350
1723	173.03	245.98	19.196	1.057	0.963	2309	140.09	303.62	19.224	0.509	1.058
941	99.94	158.28	19.196	0.486	0.925	5099	524.19	656.17	19.224	0.413	1.060
465	30.61	88.93	19.196	0.340	0.983	2946	170.19	364.10	19.225	1.002	1.139
2662	194.00	338.74	19.196	0.316	1.090	3825	61.51	450.23	19.225	0.507	0.991
3707	157.09	438.95	19.196	0.431	0.959	1157	152.19	186.22	19.226	0.296	0.980
3089	490.59	378.26	19.197	0.503	0.983	4866	502.76	600.58	19.226	0.746	0.985
817	238.96	142.35	19.197	0.411	0.981	2852	12.20	356.12	19.226	0.567	1.332
5589	234.95	835.95	19.197	0.622	0.993	1070	341.90	175.53	19.227	0.595	0.913
1288	172.72	198.83	19.198	0.765	0.885	2440	138.46	316.90	19.227	0.581	0.970
412	62.98	80.18	19.198	0.267	0.915	2204	270.25	292.64	19.227	0.367	1.001
3041	227.08	373.08	19.198	0.561	0.974	3603	349.05	427.75	19.227	0.552	0.848
1113	81.54	180.94	19.199	0.470	1.322	1519	400.63	224.23	19.228	0.572	0.945
4514	189.70	536.81	19.199	0.400	1.335	1326	217.23	202.57	19.228	0.764	0.937
572	252.14	105.38	19.199	0.481	0.843	1052	415.68	173.86	19.228	0.433	0.938
1056	73.21	174.22	19.199	0.458	0.970	4037	231.16	472.36	19.229	0.434	0.916
2800	272.41	351.06	19.199	0.513	0.946	1016	185.36	169.44	19.229	0.381	0.983
2362	136.96	307.97	19.200	0.568	0.955	991	380.42	166.00	19.230	0.601	0.880
212	331.15	40.32	19.200	0.570	0.950	1203	49.17	190.76	19.230	0.675	0.933
811	43.64	141.56	19.201	0.463	0.827	2947	364.13	364.36	19.230	0.277	0.938
3606	120.04	428.20	19.202	0.604	1.024	5117	476.28	659.29	19.230	0.431	0.885
2221	313.27	293.88	19.203	0.468	0.999	385	185.57	74.82	19.231	0.453	0.860
1412	244.56	211.15	19.205	0.598	0.986	2529	480.40	325.29	19.231	0.495	0.967
2674	233.05	340.02	19.205	0.419	1.253	4899	219.29	610.12	19.232	0.571	0.923
4879	232.95	603.38	19.206	0.553	0.959	1516	448.96	223.56	19.232	0.595	0.950
383	401.81	74.52	19.206	0.551	0.993	4254	311.41	502.30	19.233	0.486	0.987
2323	159.86	304.96	19.206	0.503	1.112	1689	118.35	242.57	19.234	0.475	0.938
2310	81.41	303.69	19.206	0.218	0.973	1221	62.77	191.99	19.234	0.406	0.942
3637	219.14	431.50	19.207	0.594	1.016	3339	166.27	402.27	19.234	0.689	1.108
1625	53.88	235.73	19.207	0.460	0.863	5263	347.19	695.56	19.235	0.328	0.928
2680	120.97	340.40	19.208	0.597	1.004	4226	116.51	499.56	19.235	0.500	0.955
2514	204.78	323.88	19.208	0.276	1.050	3406	349.68	408.67	19.235	0.387	0.911
2105	260.56	283.96	19.208	0.406	1.053	1153	98.42	186.04	19.236	0.409	1.035
1857	430.59	260.84	19.208	0.389	0.895	612	143.23	111.66	19.236	0.435	0.880
3444	409.39	411.84	19.209	0.363	0.950	4613	292.09	551.98	19.237	0.487	0.920
918	71.88	155.30	19.209	0.554	0.988	547	344.25	102.05	19.237	0.356	0.945
152	36.25	27.17	19.209	0.283	1.612	4010	247.16	469.65	19.238	1.414	1.220
2671	133.74	339.64	19.210	0.699	0.976	5278	110.30	699.74	19.239	0.479	0.963
4550	64.16	541.40	19.210	0.445	0.925	1792	24.28	254.30	19.239	0.459	0.888
1578	372.43	230.06	19.211	0.652	1.043	3823	124.50	450.14	19.239	0.559	0.904
70	289.05	3.28	19.211	0.430	0.898	1014	525.86	168.81	19.240	0.673	1.023
2420	442.46	314.38	19.211	0.572	0.944	1770	131.07	252.33	19.241	0.379	0.963
4161	213.86	488.04	19.211	0.381	0.918	5120	68.26	659.71	19.241	0.470	0.898
63	472.93	-1.42	19.212	0.482	0.990	5169	151.29	671.65	19.241	0.395	1.015
5273	287.91	698.48	19.212	2.194	1.660	2185	104.40	290.49	19.242	0.517	0.952
2258	86.78	297.31	19.212	0.791	1.020	1441	326.57	214.98	19.242	0.490	1.055
725	433.64	127.88	19.213	0.438	0.950	1126	211.21	182.45	19.242	0.822	1.055
2895	68.46	359.87	19.214	0.501	1.070	5586	7.84	833.93	19.242	0.342	1.003
1980	275.38	271.42	19.214	0.330	1.010	4275	398.42	504.52	19.243	0.356	0.900
3968	145.35	466.18	19.216	0.448	0.898	3836	67.93	451.36	19.243	0.654	0.948
4848	452.19	595.63	19.217	0.394	0.888	5052	153.75	644.56	19.245	0.502	1.025
2819	3.40	353.12	19.217	0.535	1.163	2399	219.53	312.43	19.245	0.516	1.135
5429	433.84	770.28	19.218	0.449	0.870	1950	326.34	267.74	19.245	0.549	0.915

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
5211	221.79	680.82	19.245	0.515	0.928	297	108.00	60.09	19.271	0.319	0.940
4411	81.39	523.03	19.245	0.831	0.930	1015	108.49	169.05	19.272	0.756	1.045
4134	380.12	484.10	19.245	0.573	0.822	4253	216.33	502.21	19.272	0.490	1.030
622	68.10	113.33	19.245	0.461	0.968	674	294.43	121.39	19.272	0.464	1.006
235	46.36	46.20	19.245	0.433	0.958	3330	177.44	401.34	19.272	0.574	1.018
3072	73.64	375.97	19.246	0.399	0.996	4318	46.08	509.77	19.272	0.397	0.978
5380	310.48	730.39	19.246	0.438	0.946	4893	275.05	608.96	19.273	0.374	0.898
700	277.46	125.06	19.246	0.472	1.070	2095	15.03	282.27	19.274	0.353	0.855
6	347.33	-36.38	19.247	0.361	0.860	5447	487.88	757.99	19.274	0.611	0.995
896	239.35	152.33	19.247	0.446	0.986	3153	165.72	383.04	19.274	0.740	0.985
4612	7.63	551.92	19.247	0.446	0.993	4441	482.95	528.06	19.274	0.507	0.908
522	222.92	98.44	19.248	0.644	0.908	4444	15.07	528.23	19.275	0.407	0.978
2738	353.63	345.61	19.248	0.431	0.926	1734	135.96	247.68	19.276	0.413	0.910
3944	31.20	463.64	19.248	0.451	0.893	1885	443.32	263.17	19.276	0.516	1.000
599	8.22	109.50	19.249	0.456	0.795	325	291.16	64.06	19.276	0.551	0.983
1836	306.43	259.00	19.250	1.428	1.353	588	46.39	108.46	19.276	0.437	0.908
100	333.52	15.76	19.250	0.569	1.005	2146	217.89	287.06	19.276	0.536	1.233
5472	297.80	766.68	19.251	2.079	1.470	3437	168.75	411.29	19.277	0.291	0.960
5276	59.71	698.78	19.251	0.597	0.868	2898	457.92	359.96	19.277	1.355	1.358
507	158.41	95.94	19.252	0.565	0.943	1245	427.53	194.09	19.278	0.499	0.988
234	186.20	45.70	19.252	0.506	0.923	3527	22.70	420.08	19.279	0.462	0.922
2794	51.75	350.33	19.252	0.410	0.980	2509	377.71	323.51	19.279	0.500	0.941
4093	244.86	479.38	19.252	0.541	0.988	2678	114.66	340.35	19.279	0.278	1.024
5285	340.12	702.16	19.253	0.323	0.973	182	236.14	34.83	19.281	0.546	0.949
1434	201.08	214.54	19.253	0.315	0.935	429	322.08	82.30	19.281	0.442	0.923
4551	244.56	541.44	19.254	0.518	0.893	1842	271.16	259.43	19.281	0.402	1.034
4559	318.87	541.91	19.254	0.350	1.040	2442	249.70	317.10	19.283	0.440	1.003
3882	108.09	456.88	19.255	0.416	0.969	2003	274.70	273.44	19.283	0.752	1.063
3457	173.36	412.98	19.256	0.566	0.961	1386	227.67	208.28	19.283	0.456	0.990
221	412.30	42.64	19.256	0.627	0.955	4397	34.11	520.83	19.284	0.658	0.952
832	287.10	144.18	19.256	0.530	0.990	532	285.36	100.50	19.284	0.506	0.918
1323	241.96	202.39	19.256	0.530	1.021	5193	298.77	676.43	19.284	0.541	0.909
1287	251.22	198.72	19.258	0.473	0.975	4286	320.92	505.69	19.284	0.630	0.835
4969	255.75	625.08	19.258	0.463	0.891	2052	269.04	278.22	19.284	0.684	1.086
1093	58.46	178.53	19.258	0.612	0.910	2388	181.26	311.21	19.285	0.359	1.125
2881	367.23	358.41	19.259	0.408	0.940	1828	373.04	258.10	19.285	0.393	0.970
3647	72.97	432.32	19.259	0.502	1.009	5476	214.39	768.65	19.285	0.619	0.973
344	301.79	66.66	19.259	0.436	0.861	4742	65.94	575.66	19.285	0.525	0.880
5304	172.86	707.12	19.260	0.487	0.743	2227	150.06	294.62	19.286	0.577	0.998
3839	215.65	451.94	19.261	0.456	0.960	4206	454.12	495.57	19.286	0.439	0.972
2711	42.90	343.23	19.261	0.553	0.947	1186	6.33	189.20	19.286	0.579	1.305
4034	98.33	472.30	19.261	0.768	0.397	4126	544.34	482.87	19.287	0.444	0.990
1870	472.82	262.00	19.261	0.551	0.895	1526	95.56	225.04	19.287	0.754	1.048
145	188.71	25.48	19.261	1.008	0.920	4601	217.09	550.07	19.288	0.388	0.868
3002	37.26	369.66	19.261	-0.117	1.310	2887	271.26	359.18	19.288	0.725	1.050
317	257.32	63.33	19.262	0.505	0.929	4788	279.65	583.96	19.288	0.627	0.866
5562	308.16	814.88	19.262	0.501	0.890	3770	210.34	445.43	19.289	0.593	0.981
3326	205.94	400.90	19.263	0.543	1.101	5521	270.83	788.53	19.289	0.392	0.952
3981	176.29	467.20	19.264	0.403	0.939	2990	166.32	368.27	19.290	0.525	1.059
1459	354.50	216.89	19.265	1.374	0.902	2015	233.24	274.72	19.290	0.554	1.035
4365	9.41	515.64	19.266	0.545	0.860	2548	210.51	326.78	19.291	0.662	1.160
2693	24.65	341.47	19.266	0.304	0.894	1446	181.67	215.58	19.291	0.589	1.113
4170	280.35	489.70	19.266	0.471	0.923	3721	447.29	440.44	19.293	0.339	0.894
3798	266.69	447.57	19.267	0.448	0.944	14	461.10	-30.73	19.294	0.455	0.905
3664	288.72	433.86	19.267	0.599	0.955	990	500.44	165.57	19.294	0.152	0.990
3663	436.72	433.81	19.268	0.408	0.965	1963	155.85	269.52	19.295	0.300	1.010
2455	252.79	318.25	19.268	0.562	0.966	245	300.95	47.83	19.295	0.446	0.905
4080	123.79	477.82	19.268	0.641	0.917	2754	140.78	346.77	19.295	0.496	1.070
4306	266.74	508.57	19.270	0.477	0.946	839	205.19	144.70	19.296	0.681	0.963
1938	260.21	266.80	19.271	0.434	1.011	914	233.40	154.46	19.296	0.433	1.020

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
966	44.03	162.29	19.298	0.615	0.983	4780	53.69	582.70	19.317	0.446	1.003
3388	221.22	407.07	19.298	0.558	0.891	1211	292.73	191.19	19.317	0.470	0.931
3140	181.65	382.10	19.299	0.481	1.009	1587	395.50	231.96	19.317	0.326	0.855
3712	255.54	439.43	19.299	0.462	0.944	1069	9.09	175.53	19.318	0.275	1.317
5530	5.74	791.33	19.300	0.371	1.067	4588	103.74	546.27	19.318	0.589	0.948
2080	516.85	280.89	19.300	0.082	1.408	1376	69.22	207.37	19.319	0.820	0.977
4200	288.83	494.77	19.300	0.424	1.013	2057	364.98	278.77	19.319	0.746	0.967
1492	276.91	221.39	19.300	0.343	0.986	4436	216.20	526.97	19.321	0.529	1.020
3813	369.65	449.52	19.301	0.414	0.930	4689	104.18	565.26	19.321	0.332	0.917
1724	282.11	246.12	19.301	0.405	0.951	315	368.59	63.16	19.321	0.422	0.895
4245	372.65	501.67	19.301	0.490	0.893	450	87.33	85.48	19.322	0.235	0.975
1904	457.29	264.55	19.302	0.701	0.868	1873	56.20	262.29	19.322	0.648	0.957
1354	237.55	205.13	19.302	0.429	1.054	1499	285.52	221.76	19.323	0.581	1.040
2287	287.75	300.55	19.303	0.389	1.003	786	191.56	137.82	19.323	0.162	1.020
2896	48.72	359.90	19.303	0.567	1.129	642	262.28	117.76	19.324	0.546	0.964
446	485.93	84.68	19.304	0.452	0.938	3011	139.88	370.24	19.324	0.441	1.005
156	287.38	28.58	19.304	0.633	0.920	2638	82.50	336.49	19.325	0.613	1.030
1722	149.31	245.92	19.304	0.171	0.935	4023	71.47	471.29	19.325	0.555	0.954
3183	256.78	385.22	19.304	0.506	0.994	3797	308.13	447.48	19.325	0.997	0.905
1611	113.63	234.45	19.305	1.004	0.983	3934	278.25	462.58	19.326	0.500	0.948
4271	115.68	504.06	19.306	0.634	0.989	3991	218.27	467.57	19.326	1.061	0.970
2813	398.57	352.20	19.306	0.451	0.964	2834	241.99	354.29	19.327	0.751	1.783
1507	157.95	222.57	19.306	0.804	0.847	5253	170.68	693.64	19.327	0.642	0.995
3355	420.17	403.70	19.307	0.505	0.934	2261	327.47	297.48	19.327	0.576	0.849
3123	87.72	381.04	19.307	0.711	0.988	4452	489.12	528.79	19.328	0.472	1.003
2000	148.35	273.19	19.307	0.502	1.082	1429	227.21	213.54	19.328	0.309	0.988
1748	397.38	249.91	19.308	0.586	0.920	2792	96.46	350.02	19.329	0.566	1.033
4025	150.41	471.48	19.309	0.721	1.018	5239	147.87	688.98	19.329	0.375	0.930
1150	309.49	185.40	19.309	0.578	0.935	3945	175.63	463.71	19.330	0.469	0.927
2558	116.08	327.82	19.309	0.541	0.993	4369	81.90	516.16	19.330	0.234	0.945
136	388.90	23.61	19.309	0.289	0.910	2918	183.48	360.94	19.330	0.736	1.257
4391	129.50	519.49	19.310	0.484	0.952	4150	317.85	485.83	19.331	0.517	0.978
1699	348.14	243.41	19.310	0.643	0.970	253	489.74	51.24	19.331	0.308	0.793
1025	494.62	170.57	19.311	0.497	0.980	607	199.66	110.92	19.332	0.442	0.837
4139	475.62	485.07	19.311	0.506	1.028	4157	252.47	486.59	19.333	0.383	0.940
2475	335.27	320.23	19.311	0.530	0.964	1464	303.66	217.24	19.334	0.606	0.963
1874	331.53	262.40	19.311	0.485	0.930	1166	89.23	187.00	19.335	0.655	1.160
4166	408.99	488.70	19.311	0.526	0.943	3739	468.07	442.36	19.336	0.471	0.918
134	381.24	23.16	19.312	0.423	0.903	2777	543.02	348.54	19.336	0.727	1.024
4352	238.98	514.44	19.312	0.569	0.897	413	147.32	80.20	19.337	0.320	0.968
611	221.75	111.23	19.312	0.527	0.983	327	185.14	64.37	19.337	0.525	1.003
4690	257.78	565.49	19.312	0.436	0.979	333	252.06	591.29	19.338	0.486	0.903
3151	74.97	382.91	19.313	0.514	0.944	657	279.89	119.29	19.338	0.459	1.036
2045	399.17	277.68	19.313	1.003	1.218	5192	503.04	675.97	19.338	0.600	1.158
565	148.06	104.75	19.313	0.405	0.902	2429	112.84	315.20	19.338	0.278	0.930
1281	71.43	197.88	19.313	1.468	1.270	627	181.29	114.20	19.339	0.447	0.915
1503	156.49	221.91	19.313	0.187	0.903	1954	84.74	268.27	19.340	0.535	0.985
5003	179.47	632.81	19.313	0.400	0.885	2199	267.47	292.28	19.340	0.933	1.117
1725	170.72	246.32	19.314	1.123	0.890	2043	51.89	277.59	19.341	0.118	0.883
169	123.99	31.76	19.314	0.606	0.905	2768	10.14	348.06	19.341	0.402	1.047
3477	254.42	414.64	19.315	0.419	0.911	4725	272.98	573.04	19.342	0.576	1.011
1985	101.89	271.91	19.315	0.444	0.960	2086	359.21	281.63	19.343	0.494	0.950
1305	33.09	200.98	19.315	0.623	0.910	171	2.20	31.96	19.343	0.521	1.100
3133	89.56	381.71	19.315	0.576	1.050	3235	275.90	390.85	19.343	0.503	0.969
1919	255.08	265.22	19.315	0.490	1.031	1905	526.18	264.63	19.343	0.352	0.878
1669	319.25	240.21	19.316	0.478	0.985	415	99.80	80.54	19.344	0.504	0.910
707	109.50	126.11	19.316	0.476	1.018	2037	335.59	277.22	19.344	0.519	0.945
4004	160.28	469.11	19.316	0.428	0.976	4886	143.40	608.35	19.345	0.472	0.838
3405	36.08	408.62	19.316	0.527	0.935	1852	112.39	260.49	19.345	0.824	0.945
2914	425.77	360.72	19.316	0.614	0.947	3521	12.60	419.11	19.346	0.404	0.952

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
1225	480.74	192.70	19.346	0.436	0.900	3938	152.90	462.87	19.368	0.574	0.921
2056	288.19	278.47	19.346	0.571	1.049	2889	477.89	359.27	19.368	0.444	0.981
1799	92.70	254.79	19.346	0.638	1.118	1273	234.75	197.40	19.368	0.405	0.963
2347	302.81	306.82	19.347	0.490	0.958	4951	11.43	622.07	19.368	0.429	0.933
2266	264.13	296.07	19.347	0.432	1.027	490	163.76	93.17	19.369	0.471	0.900
3108	149.28	379.35	19.347	0.549	1.125	2648	328.03	337.52	19.369	0.600	0.892
3462	318.85	413.46	19.348	0.542	0.976	2226	377.79	294.54	19.370	0.522	0.980
4331	193.42	511.58	19.348	0.362	1.020	3847	74.16	452.37	19.370	0.497	0.877
454	89.78	86.64	19.348	0.803	1.107	3073	125.91	376.00	19.370	0.683	1.135
1389	174.02	208.44	19.348	0.537	1.058	1515	161.75	223.24	19.371	0.580	0.908
1528	239.53	225.20	19.348	0.473	0.919	5571	174.87	820.90	19.372	0.414	0.953
4279	212.89	504.81	19.348	0.513	1.029	783	259.95	137.38	19.372	0.360	0.955
1899	132.02	264.29	19.349	0.471	0.893	4505	239.79	535.70	19.373	0.438	0.988
996	252.62	166.71	19.349	-0.116	0.976	3558	73.53	423.54	19.374	0.650	1.056
5184	211.76	674.60	19.350	0.557	0.980	442	544.40	84.35	19.374	0.576	0.937
4478	256.05	532.50	19.350	0.359	0.960	921	450.76	155.68	19.374	-0.323	1.120
397	181.90	77.70	19.351	0.532	0.837	2372	167.95	309.15	19.374	0.323	1.063
44	442.43	-10.79	19.351	0.196	0.928	2163	375.30	288.87	19.374	0.404	0.912
2489	496.89	321.57	19.352	0.559	0.929	3864	460.09	454.25	19.375	0.421	0.946
5297	17.54	705.26	19.352	0.615	0.970	3973	223.29	466.81	19.375	0.470	0.998
2996	243.67	368.84	19.352	0.535	1.003	2633	487.30	336.13	19.375	0.426	0.983
739	322.16	130.29	19.352	0.642	0.993	3218	226.58	388.77	19.375	0.660	1.020
2667	297.40	339.27	19.353	0.576	0.996	2168	258.06	289.23	19.375	0.484	0.995
4679	106.74	562.86	19.354	0.592	0.955	1713	360.10	245.25	19.376	0.416	0.933
729	291.64	128.89	19.354	0.598	1.002	4265	380.73	503.21	19.376	0.524	1.035
205	401.43	39.11	19.354	0.541	1.045	2387	358.11	310.94	19.377	0.497	0.984
5094	268.78	652.71	19.354	0.490	1.085	4006	214.60	469.31	19.378	0.162	0.970
2802	112.44	351.26	19.355	0.631	1.042	1381	129.16	208.07	19.378	0.386	0.903
4327	148.37	510.86	19.355	0.796	0.958	2408	274.95	313.15	19.378	0.487	0.998
4215	122.82	496.98	19.355	0.342	1.091	2466	12.21	319.48	19.378	0.537	0.943
3658	290.00	433.25	19.355	0.803	0.890	2445	146.96	317.36	19.378	0.441	0.975
93	326.78	13.64	19.356	0.073	0.943	5411	197.07	747.00	19.379	0.024	0.953
1511	2.61	222.86	19.356	0.598	1.006	229	93.62	43.31	19.380	0.348	0.973
2192	230.63	291.10	19.357	0.475	1.000	2739	453.63	345.61	19.380	1.251	1.472
684	134.48	122.56	19.358	0.587	0.933	4487	282.61	533.63	19.380	1.279	1.407
1533	236.37	225.76	19.358	0.538	0.972	2731	479.20	344.68	19.381	0.461	0.958
2031	435.86	276.37	19.358	0.450	0.855	4534	54.73	539.30	19.381	0.548	0.950
3887	73.55	457.28	19.359	0.435	0.876	165	369.67	30.86	19.381	0.507	1.013
4051	172.92	474.25	19.359	0.626	0.981	4469	100.77	531.10	19.382	0.345	1.045
2605	213.97	332.77	19.359	0.482	1.045	529	535.75	100.17	19.383	0.473	0.925
3010	456.45	370.20	19.360	0.355	0.979	3992	418.93	467.61	19.383	0.394	0.690
356	285.20	68.47	19.360	0.554	0.951	4957	251.72	622.91	19.383	0.307	0.922
4549	185.57	541.33	19.360	1.094	1.173	1937	82.46	266.79	19.384	0.227	0.943
1332	347.71	203.43	19.361	0.495	0.918	1278	23.35	197.67	19.384	0.378	0.907
3895	312.69	458.47	19.361	0.507	0.962	2956	241.65	365.31	19.385	0.418	1.032
3269	297.23	394.54	19.361	0.457	0.926	695	121.29	124.57	19.385	0.438	0.798
3467	54.57	413.99	19.363	0.583	0.969	3815	171.31	449.57	19.385	0.830	0.926
4634	446.69	555.31	19.363	0.605	0.952	5279	284.83	699.77	19.385	0.566	1.273
1945	289.45	267.40	19.363	0.022	1.078	388	26.37	75.29	19.385	0.695	0.928
491	158.50	93.23	19.363	0.453	0.925	766	34.39	134.48	19.385	0.576	0.967
4193	52.95	493.89	19.363	0.507	0.979	2078	296.34	280.78	19.386	0.552	1.207
2104	88.01	283.89	19.364	0.765	0.970	3996	382.51	468.03	19.387	0.523	0.993
1581	223.78	231.63	19.364	0.389	0.905	2586	42.54	330.89	19.388	0.742	0.880
723	53.07	127.63	19.365	0.401	0.928	5164	33.72	670.03	19.388	0.697	0.853
506	309.51	95.91	19.365	0.299	0.903	3717	167.02	439.78	19.388	0.393	0.933
2886	441.22	359.03	19.365	0.891	1.667	4057	75.23	474.84	19.389	0.455	0.929
1735	311.98	247.73	19.366	0.233	1.074	2233	304.97	295.22	19.389	0.413	0.938
5065	425.15	647.86	19.366	0.388	0.913	4529	116.57	539.11	19.390	1.114	1.168
1099	244.96	179.15	19.367	0.509	0.926	122	158.29	19.82	19.390	0.515	0.890
2876	377.63	357.87	19.367	0.453	1.039	2459	98.94	318.41	19.390	0.580	1.093

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
3148	27.30	382.80	19.390	0.590	0.965	1851	244.20	260.42	19.412	0.635	0.998
3374	474.19	405.77	19.390	0.314	0.909	3478	156.89	414.73	19.412	0.480	1.040
497	188.73	94.18	19.391	0.166	0.995	2066	320.53	279.87	19.412	0.532	0.946
1368	272.80	206.52	19.393	0.584	0.823	3925	206.76	462.15	19.413	0.370	0.990
314	209.76	63.12	19.393	0.419	0.885	3873	420.73	455.52	19.413	0.561	0.911
2512	155.00	323.60	19.393	0.911	1.020	1443	229.30	215.10	19.413	0.557	1.013
2161	463.43	283.52	19.394	0.542	0.929	3841	159.69	451.99	19.414	0.538	0.988
1028	458.86	170.88	19.394	0.643	0.935	2225	285.73	294.05	19.414	0.639	1.093
1272	134.65	197.38	19.394	0.683	0.963	4183	252.20	491.02	19.414	0.489	1.002
3285	251.38	396.85	19.394	0.567	0.987	2517	271.61	324.14	19.414	0.497	0.975
637	138.38	115.76	19.395	0.330	0.850	2069	160.41	280.38	19.415	0.229	1.013
5313	21.99	709.81	19.395	0.504	1.013	530	152.27	100.31	19.416	0.647	0.877
4975	170.57	626.67	19.396	0.554	0.867	2923	360.26	361.36	19.417	0.204	0.980
930	126.63	156.57	19.396	0.662	0.938	1995	278.58	273.09	19.418	0.530	0.989
1694	166.31	243.13	19.396	1.482	0.990	5449	242.60	758.50	19.418	0.500	0.876
5180	374.10	673.29	19.397	0.658	1.030	1617	274.66	235.03	19.418	0.497	0.953
4561	143.58	542.45	19.397	0.449	0.935	160	213.78	28.85	19.419	0.360	1.005
713	352.22	126.96	19.398	0.196	0.890	5170	454.00	671.92	19.419	0.711	0.958
406	191.81	79.22	19.398	0.513	0.973	2131	169.43	286.02	19.419	0.591	1.180
4870	258.85	601.46	19.398	0.568	0.940	2154	136.59	287.57	19.420	0.596	1.030
1422	157.33	212.65	19.398	0.349	0.905	1268	78.41	196.40	19.420	1.598	1.285
350	216.36	67.80	19.398	1.030	1.008	1146	473.35	184.74	19.420	0.333	0.970
1697	304.81	243.33	19.399	0.489	0.937	3383	101.12	406.52	19.420	0.733	1.054
1419	209.61	212.33	19.399	0.529	1.000	4696	103.31	566.67	19.420	0.352	1.125
4231	57.96	500.04	19.399	0.435	0.998	479	285.51	92.06	19.421	1.005	0.960
4488	368.70	533.66	19.399	0.592	0.795	3975	363.27	466.93	19.422	0.390	1.048
141	345.66	24.79	19.399	0.617	1.035	1856	488.06	260.68	19.422	0.514	1.008
4084	509.29	478.11	19.399	0.512	1.020	4092	485.14	479.17	19.422	0.601	1.003
1598	193.05	232.98	19.400	0.587	0.960	403	533.28	78.85	19.422	-0.091	0.830
3537	360.31	421.05	19.400	0.403	1.014	50	236.79	-8.66	19.422	0.691	0.933
466	286.94	89.28	19.400	1.064	0.947	2278	192.28	299.33	19.422	0.264	1.045
5460	179.98	762.65	19.400	0.442	0.845	2181	89.65	290.07	19.422	0.711	1.095
4952	144.44	622.19	19.401	1.202	0.935	2432	49.98	315.44	19.422	0.535	0.840
1958	21.25	269.05	19.401	0.486	0.975	379	200.16	74.02	19.423	0.394	1.003
5552	165.32	803.33	19.401	0.502	0.813	3255	139.76	392.68	19.423	0.084	1.052
4415	260.73	524.34	19.402	0.507	1.007	4867	32.54	600.93	19.423	0.609	0.973
4560	21.89	542.26	19.403	0.995	0.913	3086	213.80	377.86	19.423	0.606	0.980
1802	226.05	255.52	19.403	0.841	0.995	3465	179.78	413.70	19.424	0.481	0.963
4112	258.37	481.22	19.403	0.269	1.070	3577	285.83	425.53	19.424	0.563	1.061
5265	281.84	696.60	19.403	1.069	1.291	3787	352.09	446.51	19.424	0.766	1.151
4858	4.20	598.89	19.403	0.587	0.858	1987	303.77	272.13	19.425	0.919	1.400
4722	239.50	572.64	19.403	0.366	0.839	4463	419.84	530.06	19.426	0.577	0.960
899	206.11	152.48	19.404	0.687	0.968	4978	91.66	627.49	19.426	0.532	0.938
3547	541.27	422.10	19.405	0.413	0.951	4638	325.61	555.85	19.426	0.492	0.833
701	253.29	125.06	19.405	0.347	0.931	2688	383.86	341.01	19.427	0.742	1.004
1651	292.63	238.41	19.405	0.414	0.925	4361	28.21	515.25	19.427	0.425	0.967
2018	23.98	275.05	19.406	0.515	0.913	1866	139.66	261.54	19.427	0.810	0.940
2597	236.77	331.98	19.407	0.625	1.189	4728	63.41	573.12	19.428	0.744	0.853
2231	385.35	295.12	19.408	0.510	1.026	1655	425.75	238.64	19.428	0.456	0.928
2652	62.45	337.71	19.408	0.777	0.967	4418	390.78	524.58	19.428	0.401	0.863
5219	121.49	682.83	19.408	0.619	0.840	1045	299.91	173.35	19.429	0.584	0.933
619	509.75	112.99	19.409	0.488	0.973	2604	388.15	332.65	19.429	0.441	0.950
361	337.45	70.00	19.409	0.602	0.985	5218	100.28	682.71	19.430	0.516	0.810
3899	227.72	458.90	19.409	0.454	0.991	4721	103.15	571.49	19.430	0.530	0.983
2376	109.72	309.38	19.409	0.678	1.100	130	19.03	21.70	19.430	0.774	0.923
1188	11.31	189.55	19.410	0.550	1.420	59	281.25	-3.86	19.431	0.477	0.957
5598	64.80	845.62	19.410	0.665	0.868	920	253.30	155.45	19.431	0.404	0.938
5009	74.39	635.36	19.411	0.531	0.925	4477	174.09	531.87	19.431	0.649	0.887
2871	138.86	357.52	19.411	0.348	0.996	3890	186.16	456.82	19.432	0.386	0.945
375	183.74	72.91	19.412	0.570	0.880	1790	291.50	253.80	19.432	0.605	1.018

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
540	158.12	101.31	19.432	0.404	0.868	5174	536.15	672.29	19.456	0.566	0.958
578	242.69	106.61	19.433	0.404	0.864	4228	26.48	499.66	19.456	0.760	0.879
1720	384.77	245.75	19.433	0.442	0.950	246	536.89	48.03	19.456	0.730	0.870
2690	48.72	331.23	19.434	0.733	0.842	3693	28.46	437.34	19.457	0.464	0.946
3806	164.76	448.61	19.434	0.590	0.929	2552	132.70	327.44	19.457	0.633	0.885
1521	13.28	224.27	19.435	0.400	1.043	3059	221.73	374.95	19.457	0.474	0.940
52	361.83	-7.60	19.435	0.409	0.973	2395	89.72	312.15	19.457	0.476	0.967
3533	264.25	420.78	19.435	0.536	0.963	4953	263.79	622.36	19.457	0.601	0.934
53	368.56	-7.08	19.436	0.522	0.913	1532	224.20	225.71	19.458	0.901	0.963
4425	276.45	525.22	19.436	1.206	1.860	593	136.98	108.84	19.458	0.463	0.978
5050	335.13	647.01	19.437	0.486	0.850	1806	429.86	255.99	19.459	0.410	0.860
4857	166.51	598.81	19.437	0.677	0.865	4792	498.52	584.58	19.459	0.548	1.035
1404	76.54	210.12	19.438	0.715	0.970	2063	425.02	279.24	19.459	0.472	0.898
3000	209.41	369.21	19.439	0.551	1.024	77	346.87	8.78	19.460	0.833	0.913
4078	278.68	477.52	19.439	0.642	0.997	1387	351.72	206.37	19.460	0.598	0.902
3526	218.14	419.84	19.439	0.516	1.017	871	367.19	149.10	19.461	0.834	0.930
4464	115.30	530.06	19.439	3.255	0.993	3531	306.21	420.24	19.461	0.545	1.008
2318	130.23	304.49	19.439	0.308	1.173	5044	128.30	642.11	19.461	1.679	0.960
3443	191.51	411.70	19.439	0.997	0.978	1777	195.20	253.05	19.462	0.675	0.870
568	22.32	109.20	19.439	0.505	0.985	1666	285.57	239.82	19.462	0.331	1.065
2401	384.15	312.63	19.439	0.453	1.005	2389	228.24	311.23	19.463	0.331	1.075
1023	296.00	170.17	19.439	0.639	0.990	5578	121.25	829.05	19.464	0.554	0.918
5017	468.19	637.69	19.440	0.670	0.898	3728	103.84	441.13	19.464	0.394	1.005
939	221.37	157.92	19.440	0.751	1.220	1684	110.42	242.16	19.464	0.668	0.988
4337	67.47	512.52	19.440	0.473	0.863	4921	373.37	615.43	19.464	0.396	0.833
1768	214.94	252.11	19.441	0.501	0.930	4733	60.04	574.78	19.465	0.445	0.900
5592	293.20	841.53	19.441	0.422	1.045	209	57.47	39.76	19.465	0.704	0.995
534	119.59	100.56	19.441	0.545	1.015	3251	156.44	392.19	19.466	0.677	0.990
4074	327.94	477.08	19.441	0.432	0.995	821	138.59	143.18	19.466	0.447	0.953
3585	432.50	426.03	19.441	0.537	0.913	3306	228.24	398.35	19.467	0.478	0.976
570	184.12	105.09	19.444	0.637	1.015	5475	280.15	767.74	19.468	1.020	1.445
4599	297.42	549.78	19.444	0.504	0.885	1072	471.35	175.99	19.469	0.507	0.913
2306	499.01	303.01	19.444	0.567	1.021	4094	19.91	479.40	19.469	0.201	0.963
3951	92.63	464.21	19.444	0.405	0.971	1230	74.99	192.95	19.469	0.608	1.107
3494	320.78	416.33	19.446	0.381	0.991	5162	180.71	669.16	19.469	0.431	1.018
2203	358.90	292.63	19.447	0.466	0.935	5337	193.14	716.01	19.470	0.495	0.940
3351	292.78	403.44	19.447	0.469	0.997	4799	231.40	585.78	19.470	0.255	0.977
849	365.99	146.32	19.448	0.413	0.917	4851	296.89	596.08	19.470	0.532	0.894
3331	69.42	401.69	19.448	0.485	0.980	1599	405.18	233.10	19.471	0.560	0.925
4409	412.22	522.93	19.449	0.433	0.975	3859	42.55	453.90	19.471	0.677	1.000
1731	191.82	247.30	19.449	0.782	1.015	129	279.08	21.59	19.472	0.446	0.984
1728	432.44	246.78	19.449	0.499	0.920	2197	274.29	291.78	19.472	0.586	0.936
2568	290.88	328.67	19.449	0.654	0.998	3420	99.68	409.95	19.472	0.683	1.010
1787	114.53	253.83	19.450	0.504	0.985	749	311.24	131.46	19.472	0.416	1.043
5277	457.46	699.26	19.450	0.619	1.007	4125	135.34	482.72	19.474	0.424	0.903
4227	293.13	499.62	19.451	0.023	0.930	3612	93.83	428.77	19.474	0.141	0.947
4479	283.50	532.62	19.451	0.511	1.553	5563	63.62	815.20	19.474	0.556	0.890
3264	539.64	393.76	19.451	0.394	0.968	1590	388.62	232.01	19.475	0.358	0.918
3106	295.85	379.27	19.452	0.522	0.915	4653	113.08	557.92	19.476	0.504	0.860
2557	188.98	327.79	19.452	0.466	1.133	5347	433.07	719.10	19.476	0.553	0.960
969	233.67	163.30	19.452	0.660	0.953	1097	367.18	179.06	19.476	0.681	0.970
1363	90.41	206.18	19.453	0.836	0.920	4048	512.76	473.91	19.477	0.322	1.035
2848	41.38	355.82	19.453	0.973	1.093	2917	312.12	360.79	19.478	0.595	1.070
2639	322.83	336.49	19.453	0.334	0.935	1094	115.14	178.78	19.480	0.623	1.068
2937	142.58	363.17	19.453	0.292	0.920	3479	432.23	414.73	19.480	0.714	0.926
1710	64.88	244.65	19.454	0.352	0.950	3838	354.72	451.86	19.480	0.472	1.184
1448	147.18	215.90	19.454	0.537	1.028	1383	122.30	208.21	19.480	0.495	0.880
351	244.27	67.82	19.455	0.437	0.964	3014	409.00	370.44	19.480	0.595	0.953
3980	410.89	467.15	19.455	0.425	0.897	345	351.34	67.14	19.481	0.492	0.863
2282	14.32	300.01	19.456	0.525	1.025	4789	404.52	584.13	19.481	0.406	1.023

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
3344	541.97	402.89	19.482	0.627	0.901	119	360.31	19.60	19.505	0.750	0.858
1892	224.29	263.91	19.482	0.632	0.975	5343	447.51	718.52	19.505	0.276	1.035
724	227.61	127.87	19.482	0.380	0.960	128	335.26	21.45	19.507	0.414	0.995
2846	59.46	355.53	19.482	0.661	0.932	2859	106.02	356.91	19.507	0.515	1.405
3085	383.31	377.76	19.483	0.429	1.001	1631	125.79	236.60	19.508	0.706	1.105
1844	78.17	259.65	19.483	0.489	1.023	347	319.11	67.27	19.508	0.655	0.965
4073	131.60	476.81	19.483	0.484	0.912	5356	158.27	720.67	19.509	0.557	0.973
3702	23.94	438.51	19.483	0.504	0.959	4617	354.29	552.25	19.509	0.645	0.763
2801	192.75	351.11	19.484	0.669	0.950	1579	421.91	230.82	19.509	0.655	0.890
3116	59.26	379.92	19.484	0.727	1.053	2026	12.34	275.87	19.511	0.185	0.890
1810	526.45	256.55	19.485	0.696	0.955	210	107.82	39.94	19.511	0.332	0.998
4241	138.36	501.23	19.485	0.540	0.890	2103	243.44	283.85	19.511	0.613	1.001
3800	337.93	147.86	19.486	1.420	1.157	1922	122.04	265.55	19.511	0.304	0.985
5188	32.53	675.34	19.487	0.798	0.885	4187	241.35	491.83	19.511	0.714	1.017
1875	310.16	262.42	19.487	1.178	1.310	2463	142.95	319.04	19.512	1.686	0.977
3402	125.00	408.42	19.487	0.383	0.940	3563	486.82	424.16	19.513	0.537	0.963
891	385.49	151.73	19.488	0.637	1.063	3876	252.62	456.54	19.513	0.431	0.904
4171	453.93	489.74	19.488	0.537	0.950	2002	11.47	273.41	19.514	0.747	0.930
3435	246.49	411.22	19.488	0.458	0.924	2492	301.81	322.15	19.514	0.552	0.994
4938	76.65	618.82	19.488	1.674	0.930	2712	319.33	343.26	19.514	0.544	0.930
4685	445.14	564.43	19.489	0.526	0.988	1059	7.94	174.62	19.514	-0.294	0.980
1256	224.21	195.10	19.489	1.227	0.893	3696	195.14	437.77	19.515	0.557	1.010
3203	254.73	387.26	19.490	0.479	0.977	1602	328.61	233.53	19.515	0.622	0.900
3590	42.21	426.26	19.490	0.581	0.845	1019	402.13	169.68	19.516	0.452	1.013
4321	487.09	510.05	19.490	0.605	0.892	1155	70.86	186.15	19.516	1.004	1.087
797	165.29	139.50	19.491	0.638	0.938	1742	356.03	248.85	19.516	0.449	0.930
1764	303.22	251.36	19.492	0.890	1.023	2980	273.41	367.42	19.517	0.114	1.094
2375	248.25	309.33	19.492	0.614	1.038	5140	361.56	663.64	19.518	0.412	0.890
2187	118.09	290.82	19.492	0.412	1.008	4137	523.73	484.64	19.519	0.318	0.975
5118	359.12	659.43	19.493	0.544	0.895	31	289.70	-22.38	19.520	0.496	1.028
2624	107.87	334.85	19.494	0.666	1.130	4896	71.74	609.58	19.520	0.438	0.868
3361	69.06	404.17	19.494	0.235	0.951	3093	58.37	378.51	19.520	0.881	0.950
1803	155.53	255.57	19.494	0.499	1.310	1154	84.31	186.14	19.520	1.239	1.200
1738	346.52	248.09	19.495	0.438	0.925	781	133.95	136.75	19.521	0.575	0.913
2926	447.31	362.00	19.495	1.181	2.172	5300	320.56	705.76	19.521	0.599	0.907
3711	146.11	439.25	19.496	0.503	0.944	2205	206.38	292.69	19.521	0.371	0.947
3276	42.42	395.49	19.496	0.331	1.081	3983	4.99	467.27	19.521	0.547	0.966
2128	531.76	285.95	19.498	0.791	1.195	3261	274.61	393.40	19.521	0.625	1.024
4508	245.77	536.24	19.498	0.558	0.888	3675	282.88	435.10	19.522	0.856	0.944
3481	543.64	414.83	19.498	0.638	0.959	2098	329.81	282.99	19.523	0.675	0.882
2051	59.56	278.22	19.498	0.093	1.040	4319	123.76	510.03	19.523	0.956	0.977
2682	183.96	340.69	19.498	0.755	1.113	1582	278.62	231.63	19.524	0.667	0.988
4518	263.96	537.57	19.498	0.477	0.939	4131	141.58	483.74	19.524	0.454	0.887
5254	262.27	693.85	19.498	0.599	0.918	2879	449.10	358.03	19.525	-0.066	2.445
1864	172.75	263.93	19.498	0.238	1.093	3650	347.48	432.54	19.525	0.163	0.873
1687	327.53	242.37	19.499	0.481	0.928	688	73.67	123.40	19.525	0.652	0.998
844	412.26	145.65	19.499	0.215	0.920	710	326.59	126.66	19.525	0.254	0.935
3430	8.18	410.50	19.500	0.440	0.940	2714	456.31	343.27	19.527	0.515	1.277
3090	389.93	378.28	19.500	1.044	0.913	4308	453.64	509.06	19.527	0.414	0.848
2752	23.04	346.67	19.500	0.414	1.042	5373	359.37	727.29	19.528	0.334	0.882
5231	296.67	687.22	19.500	1.885	1.321	826	144.14	143.67	19.528	0.514	0.958
4649	215.88	557.16	19.500	0.414	0.868	3300	235.48	397.96	19.528	0.533	1.039
428	228.93	82.28	19.500	0.632	0.873	2673	484.30	339.83	19.528	0.503	0.983
1978	105.21	271.11	19.500	0.593	0.990	2690	355.30	341.13	19.529	0.477	0.936
2162	303.12	288.62	19.502	0.516	0.966	4468	414.82	531.08	19.529	0.649	0.915
989	533.14	165.56	19.503	0.565	0.983	1767	232.00	251.94	19.530	0.641	0.940
2663	202.57	338.88	19.503	0.558	1.000	5228	460.74	685.51	19.530	0.625	0.920
3785	72.52	446.42	19.504	0.701	0.935	2107	515.21	284.16	19.530	0.888	1.595
2246	275.26	296.14	19.505	0.144	0.966	3253	205.49	392.52	19.532	0.455	0.975
4539	101.97	540.23	19.505	1.914	0.923	3454	224.73	412.52	19.533	0.418	0.886

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
1739	212.31	248.23	19.533	0.492	0.940	3078	507.91	376.98	19.556	0.455	0.989
1745	92.98	249.37	19.533	0.489	1.087	4416	106.47	524.37	19.556	1.048	1.053
5534	79.45	793.79	19.533	0.593	0.915	1628	217.15	236.24	19.556	0.915	0.943
893	73.73	151.97	19.534	0.609	0.943	1986	188.37	272.08	19.556	0.501	1.013
5142	403.22	663.95	19.534	0.526	0.965	4438	197.22	527.66	19.557	0.764	1.305
186	6.08	35.21	19.535	0.300	0.958	5583	258.67	832.59	19.558	0.489	0.850
3176	17.36	384.84	19.535	0.543	0.956	5462	255.95	763.04	19.559	0.480	1.039
2664	511.90	338.99	19.535	0.387	0.978	3350	412.92	403.39	19.559	0.335	0.899
2156	514.42	287.64	19.535	0.551	1.645	4366	350.13	515.76	19.559	0.483	0.943
2392	352.41	311.68	19.536	0.519	0.935	953	241.65	159.82	19.560	0.402	0.964
3758	10.40	444.50	19.536	0.501	0.917	1021	33.41	170.03	19.561	0.303	0.957
3747	49.57	443.56	19.536	0.461	1.054	291	294.86	58.95	19.561	0.425	1.085
1854	325.36	260.56	19.538	0.662	0.990	5157	354.50	668.67	19.561	0.580	0.965
4568	54.94	543.69	19.539	0.651	1.077	68	279.14	2.51	19.561	0.523	1.050
3233	484.01	390.52	19.540	0.475	1.036	909	57.16	111.11	19.562	0.899	0.985
4912	160.50	612.53	19.540	0.655	0.965	2210	533.41	293.01	19.563	0.725	1.204
875	228.33	149.77	19.540	0.483	0.923	1184	164.04	189.05	19.563	0.509	0.928
2600	454.83	332.24	19.541	0.654	0.955	224	317.90	42.85	19.563	0.761	1.137
1913	158.86	264.98	19.541	0.199	1.108	1362	147.41	206.05	19.564	1.228	0.915
5233	315.94	687.75	19.541	0.435	1.060	2921	270.82	361.26	19.564	0.032	1.099
2908	198.40	360.47	19.541	0.919	1.184	1365	8.06	206.28	19.564	0.596	1.295
2844	323.40	355.22	19.541	0.486	0.926	4654	123.43	558.09	19.565	0.621	0.907
3532	94.73	420.77	19.542	0.540	0.933	3088	276.44	378.21	19.565	0.419	0.929
1755	189.96	250.66	19.543	0.596	0.993	4948	502.89	621.53	19.565	3.884	1.025
4947	55.89	620.99	19.543	0.335	0.940	720	210.05	127.54	19.565	0.578	0.985
2612	374.17	333.83	19.544	0.531	0.999	5484	297.53	770.87	19.565	1.180	1.463
1035	192.18	171.75	19.544	0.497	0.842	3781	262.39	446.36	19.565	0.421	0.980
3411	282.92	409.19	19.545	0.484	0.955	4522	256.40	538.15	19.566	0.541	0.912
4465	127.55	530.28	19.546	0.590	1.013	5341	261.36	718.34	19.566	0.550	0.908
1090	155.01	178.24	19.546	0.541	0.983	5318	3.63	710.49	19.566	0.540	0.910
2211	89.21	293.03	19.547	0.497	0.960	2732	450.06	344.82	19.567	0.880	2.004
585	487.28	107.69	19.547	0.595	0.935	4661	59.07	559.79	19.567	0.335	0.870
3874	52.91	456.42	19.548	1.281	1.100	1864	540.22	261.48	19.568	0.400	0.898
2998	393.44	369.01	19.549	0.441	0.979	1104	196.04	180.01	19.568	0.282	0.910
5066	294.51	648.19	19.549	0.435	0.946	2672	405.87	339.65	19.568	0.460	0.949
3790	269.51	446.94	19.549	0.158	1.000	2123	325.48	285.59	19.569	0.376	0.938
373	405.65	72.85	19.550	0.477	0.965	727	60.01	128.50	19.569	0.415	0.953
3766	188.09	445.06	19.551	0.512	1.010	3463	73.25	413.47	19.569	0.541	0.974
3005	234.49	369.88	19.551	0.303	1.109	238	228.86	46.53	19.569	0.436	0.920
3419	457.91	409.76	19.551	0.476	0.865	1463	499.71	217.10	19.570	0.506	0.990
3871	193.52	455.25	19.551	0.475	1.073	2736	147.26	345.21	19.570	0.439	1.022
2482	226.84	320.59	19.552	0.511	1.215	439	222.65	83.70	19.571	0.559	0.965
524	165.74	98.52	19.552	0.386	0.905	1095	68.34	178.83	19.571	0.523	1.060
4565	183.58	543.10	19.552	0.441	1.027	3986	195.29	467.37	19.571	0.398	0.906
4730	167.34	574.22	19.552	0.543	0.837	1840	358.02	259.32	19.571	0.769	1.010
1534	26.72	225.94	19.553	0.335	0.900	672	497.25	121.02	19.572	0.478	0.973
4259	266.32	502.67	19.553	0.418	0.931	1556	267.19	228.31	19.572	0.361	0.986
1461	170.39	216.99	19.553	0.872	0.950	3223	44.35	389.30	19.573	0.633	1.004
3694	244.30	437.41	19.554	0.482	0.996	3425	195.92	410.37	19.573	0.349	0.909
3460	300.53	413.24	19.554	0.457	1.006	4596	121.54	547.96	19.573	1.091	0.843
1591	42.82	232.22	19.554	0.577	0.933	270	186.11	53.99	19.574	0.405	0.923
1476	266.09	219.46	19.554	0.528	1.008	3172	210.97	384.46	19.574	0.526	1.005
311	341.62	62.50	19.554	0.595	1.100	265	416.88	53.35	19.574	0.621	0.997
975	301.37	164.51	19.555	0.427	0.906	3039	4.59	373.02	19.574	0.331	0.994
864	172.25	147.92	19.555	0.373	0.980	3666	184.27	434.05	19.574	0.482	1.020
3325	235.81	400.76	19.555	0.655	1.019	5008	249.71	634.77	19.575	0.549	1.040
3574	127.22	425.32	19.556	0.318	0.952	1812	339.56	256.68	19.575	0.579	0.925
5393	205.65	737.61	19.556	0.461	0.868	1192	173.95	189.76	19.575	0.849	0.973
1566	200.68	228.96	19.556	0.734	1.002	1920	368.98	265.32	19.576	0.491	1.003
3134	500.89	381.74	19.556	0.313	1.159	4378	164.88	517.73	19.576	0.378	0.943

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
4371	246.88	516.60	19.576	0.503	0.925	2390	108.60	311.32	19.596	0.334	0.960
1379	190.49	207.75	19.576	0.596	0.963	5547	214.89	799.31	19.596	0.874	0.795
4808	3.27	587.30	19.576	0.631	0.933	1984	373.50	271.88	19.597	0.713	1.115
5021	175.28	638.82	19.576	0.910	0.942	3051	428.33	371.32	19.597	0.450	0.949
1254	23.24	195.03	19.576	1.293	0.917	271	78.89	54.05	19.597	0.732	1.033
2201	515.40	292.34	19.577	2.087	1.277	5177	428.88	672.63	19.597	0.554	0.870
5306	66.09	708.14	19.577	0.622	0.865	4524	184.78	538.50	19.597	0.855	1.133
1382	306.95	271.83	19.578	0.613	1.270	2252	340.90	296.84	19.597	0.464	0.930
103	9.42	16.81	19.578	0.437	0.910	1416	71.16	211.95	19.598	0.987	1.010
3282	516.33	396.58	19.578	0.693	1.045	4185	460.41	491.32	19.598	0.380	0.863
2954	364.60	365.24	19.578	0.422	0.920	3528	233.15	420.08	19.600	0.460	0.946
3150	350.68	382.85	19.579	0.616	0.896	5580	189.30	830.85	19.600	0.390	0.983
3760	294.02	444.60	19.579	0.482	0.912	275	325.14	55.30	19.600	0.015	0.880
2742	272.65	345.91	19.579	0.773	0.957	2935	362.61	363.01	19.600	0.359	0.900
4311	258.94	509.31	19.579	0.551	0.914	3004	322.46	369.87	19.601	0.448	0.975
1542	244.10	226.73	19.580	0.506	0.905	3877	378.31	456.68	19.601	0.458	1.036
539	247.68	100.97	19.580	0.511	0.897	181	27.67	34.76	19.601	0.518	0.820
614	73.44	112.53	19.580	0.415	0.988	5033	114.42	640.59	19.601	0.720	0.910
2307	321.19	303.19	19.580	0.463	0.903	4289	149.63	505.95	19.601	0.365	1.073
2006	408.82	273.90	19.580	0.836	0.888	5402	331.06	744.10	19.602	0.494	0.805
2328	174.76	305.80	19.582	0.922	1.112	1234	412.04	193.28	19.602	0.644	0.937
2370	21.69	309.05	19.582	0.468	0.813	4772	177.78	580.77	19.602	0.608	0.843
2613	326.20	333.83	19.582	0.630	0.897	4501	25.97	535.00	19.602	0.491	0.890
807	354.76	140.87	19.583	0.517	0.995	2563	265.45	328.11	19.603	0.704	1.037
1117	248.81	181.35	19.583	0.526	0.952	4586	65.76	545.66	19.603	0.868	0.945
4105	210.44	480.42	19.583	0.643	1.072	2498	104.54	322.55	19.604	0.356	0.960
2495	167.66	322.35	19.584	1.269	1.040	5470	103.97	765.53	19.605	0.583	1.003
1444	220.63	215.51	19.584	0.384	0.928	199	86.84	37.52	19.605	0.420	1.118
1957	491.05	269.02	19.584	0.665	0.880	4525	108.81	538.61	19.605	1.482	1.127
3445	218.53	411.88	19.584	0.348	0.928	2924	219.35	361.76	19.606	0.383	1.013
4575	192.86	544.72	19.584	1.863	1.270	2240	101.31	295.60	19.606	0.464	0.998
1236	108.03	193.34	19.584	0.352	1.093	1497	33.89	221.62	19.606	0.357	0.883
4445	253.04	528.29	19.584	0.547	0.900	3055	376.27	374.66	19.607	0.598	0.935
459	178.59	87.53	19.585	0.248	0.910	4420	291.95	524.78	19.607	1.452	1.160
3762	375.83	444.94	19.585	0.514	0.960	806	122.26	140.80	19.608	0.734	0.920
4326	293.81	510.59	19.586	0.714	0.953	5418	97.93	750.29	19.608	0.523	0.880
5275	100.27	698.68	19.587	0.419	0.875	4510	13.98	536.41	19.608	0.958	1.068
2097	531.34	282.41	19.587	0.004	1.143	1370	157.10	206.64	19.608	0.250	0.943
359	257.64	68.92	19.588	0.386	0.959	2427	210.67	314.95	19.609	0.812	1.013
1377	140.89	207.56	19.588	0.236	0.877	2494	196.73	322.35	19.609	0.406	0.985
3662	491.18	433.80	19.588	0.398	0.963	2867	219.56	357.19	19.609	0.772	1.045
4191	69.16	492.84	19.588	0.422	0.914	4984	116.08	628.85	19.609	0.930	0.848
5144	269.39	664.39	19.589	0.562	0.945	3953	205.87	464.34	19.609	1.057	0.983
188	9.23	35.95	19.590	0.428	0.942	3032	97.61	372.41	19.609	0.668	0.936
4175	108.56	490.07	19.590	0.438	1.035	4020	253.44	470.69	19.609	1.033	1.085
187	367.04	35.55	19.591	0.692	0.948	32	331.62	-20.23	19.611	0.773	0.983
2338	222.82	306.23	19.591	0.631	1.060	233	300.68	45.59	19.611	0.457	0.984
3017	58.28	371.13	19.591	0.412	0.953	3520	529.79	419.06	19.611	0.579	0.975
3327	141.95	400.91	19.591	0.577	1.006	1431	247.39	213.73	19.611	0.516	0.991
1879	87.82	262.55	19.592	0.444	0.960	5283	198.76	701.73	19.611	0.452	1.023
854	92.34	146.61	19.592	0.440	0.985	711	322.59	126.74	19.613	0.410	0.950
1339	107.29	203.82	19.592	0.752	1.060	705	47.23	125.95	19.613	0.536	0.905
1384	393.09	208.24	19.593	0.680	0.945	1342	160.99	203.92	19.614	0.362	0.915
3394	31.23	407.35	19.595	0.644	0.950	616	81.32	112.84	19.615	0.437	0.898
2393	112.72	312.00	19.595	0.649	0.995	5195	187.70	677.16	19.615	0.623	0.955
630	16.62	114.71	19.595	-0.422	1.048	4405	74.68	522.32	19.617	0.443	0.888
5069	457.81	648.57	19.595	0.484	0.940	2290	92.42	300.82	19.617	0.555	0.883
3275	433.60	395.35	19.595	0.420	0.908	478	26.98	92.00	19.617	0.493	0.908
2042	250.63	277.57	19.596	0.764	1.014	3378	336.56	406.04	19.617	0.665	0.891
92	62.80	13.43	19.596	0.554	0.840	1557	213.53	228.33	19.618	0.600	0.965

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
1523	362.52	224.47	19.619	0.517	1.050	3248	150.21	391.90	19.635	-0.124	1.075
5424	336.26	752.08	19.619	0.369	0.820	4852	19.34	596.30	19.636	0.419	1.015
4013	489.47	470.00	19.619	0.410	0.910	4864	106.17	599.97	19.636	0.541	0.885
934	256.78	157.14	19.619	-0.007	0.927	1369	245.39	206.61	19.636	0.397	0.978
2579	52.24	330.26	19.620	0.574	0.870	3846	126.31	452.36	19.638	0.526	0.928
2050	149.08	278.03	19.620	0.246	1.140	4905	26.09	611.61	19.638	0.285	1.020
3613	511.07	429.77	19.621	0.466	0.955	2260	76.12	297.47	19.638	0.374	0.965
3546	87.31	422.09	19.621	0.692	0.900	3309	242.13	398.50	19.639	0.504	0.964
228	219.13	43.21	19.621	0.415	0.968	1038	27.85	172.05	19.639	0.463	1.040
2665	419.06	339.06	19.621	0.495	0.941	1685	232.88	242.33	19.640	0.350	0.900
116	110.71	19.38	19.622	0.605	0.835	4727	218.42	573.09	19.641	0.484	0.943
3865	334.55	54.64	19.623	0.437	1.043	3974	201.45	466.89	19.641	0.473	0.906
425	393.36	82.13	19.623	0.575	0.928	4330	98.57	511.51	19.641	0.327	0.877
3427	403.84	410.40	19.623	0.590	0.928	1161	432.80	186.44	19.642	0.550	0.943
3649	109.09	432.39	19.623	0.682	0.983	2476	179.73	320.33	19.642	0.997	1.000
4943	306.80	620.07	19.623	0.450	0.881	157	145.37	28.62	19.642	0.602	0.863
4570	332.58	544.09	19.625	0.631	0.875	2294	357.11	301.38	19.643	0.561	0.930
4450	454.10	528.58	19.625	0.512	0.748	4506	210.09	535.73	19.643	1.660	1.033
2660	178.02	338.56	19.625	0.385	0.993	4640	20.68	556.08	19.643	0.558	0.955
1837	258.48	259.03	19.625	0.486	1.000	2222	527.37	293.88	19.643	0.906	2.018
2269	203.13	298.52	19.626	0.558	0.985	2583	154.77	330.47	19.643	1.021	1.013
4628	320.28	554.74	19.626	0.438	0.847	5226	431.93	684.18	19.644	0.503	1.008
5597	41.01	844.54	19.627	0.612	0.915	2421	448.60	314.39	19.644	0.549	0.953
1092	31.04	178.41	19.627	0.518	0.874	1380	324.22	207.83	19.644	0.473	0.928
3690	447.29	437.07	19.627	0.680	0.893	351	446.38	159.47	19.644	-0.249	1.070
2901	182.35	360.11	19.627	0.264	1.220	1428	378.62	213.08	19.646	0.861	0.908
2324	101.73	305.18	19.627	0.581	0.987	514	439.19	97.02	19.646	0.550	0.908
1216	543.46	191.51	19.627	0.645	0.838	1452	134.48	216.06	19.647	0.370	0.990
3833	333.92	451.14	19.628	0.672	1.060	2257	11.73	297.26	19.648	0.276	0.998
1813	402.30	256.68	19.628	1.282	1.017	1750	282.26	249.97	19.648	0.448	0.951
1489	252.06	220.82	19.628	0.639	0.918	1570	348.00	229.11	19.649	0.301	0.938
1686	29.78	242.36	19.629	0.240	0.900	4287	282.33	505.76	19.649	0.610	0.911
5539	45.08	797.39	19.629	0.715	0.983	1118	16.46	181.36	19.649	-0.328	1.197
5570	163.30	820.37	19.629	0.467	0.833	105	200.23	17.04	19.649	0.456	0.915
861	156.39	147.56	19.629	-0.021	0.810	4607	40.29	550.95	19.651	0.564	0.900
4571	7.29	544.18	19.630	0.573	1.247	789	379.55	138.08	19.651	0.767	0.940
971	308.41	163.56	19.630	0.575	0.975	2726	187.19	344.55	19.652	0.585	1.032
1062	277.63	174.99	19.630	0.460	1.026	3489	117.45	415.55	19.652	0.517	1.023
4991	107.37	629.78	19.631	1.027	0.873	3914	465.45	460.39	19.653	0.121	1.900
3125	291.17	381.25	19.631	0.369	0.928	5501	121.42	778.45	19.653	0.618	0.833
1964	297.34	269.71	19.632	0.787	1.164	1737	172.59	248.05	19.654	0.057	0.853
4849	311.56	595.85	19.632	0.616	0.955	2158	360.37	287.82	19.654	0.546	0.912
3665	207.77	433.95	19.632	0.383	1.447	322	404.54	63.96	19.654	0.541	0.947
3107	388.82	379.32	19.632	0.597	0.920	227	144.64	43.18	19.655	0.698	0.845
890	225.01	151.60	19.632	1.915	1.100	919	244.30	155.42	19.655	0.294	0.938
4891	490.02	608.91	19.632	0.310	1.008	3288	131.78	396.99	19.656	0.402	0.964
3904	15.82	459.81	19.632	0.541	0.926	2007	212.63	273.91	19.656	0.588	1.043
463	241.18	88.26	19.632	0.607	0.949	1100	54.18	179.67	19.657	0.407	0.937
3916	23.19	460.57	19.633	0.522	0.892	154	314.98	27.84	19.658	0.531	0.968
2747	199.26	346.47	19.633	0.304	1.043	3750	38.82	443.79	19.658	0.617	0.915
2567	82.26	328.64	19.633	0.247	1.050	1111	70.94	180.71	19.659	0.716	1.197
3511	171.83	418.05	19.633	0.664	0.961	1135	170.48	183.47	19.659	0.458	0.863
5436	395.20	755.00	19.634	1.188	1.797	85	86.75	11.22	19.659	0.084	0.890
4382	243.45	518.40	19.634	0.497	0.964	4210	125.64	496.08	19.659	0.173	1.144
3936	458.33	462.79	19.634	0.367	1.074	3165	79.07	384.02	19.660	-0.030	1.065
1603	62.22	233.68	19.634	0.375	0.995	4999	266.19	632.29	19.660	0.469	0.869
1465	312.34	217.45	19.634	0.388	0.947	4651	155.91	557.25	19.660	0.563	0.938
625	354.66	113.76	19.635	0.541	0.990	146	226.80	25.77	19.661	0.314	0.963
1405	115.58	210.29	19.635	0.600	1.005	3094	136.73	378.53	19.661	0.345	1.111
1733	504.47	247.48	19.635	0.829	1.077	2270	167.22	298.53	19.661	0.559	1.110

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
1436	91.42	214.69	19.661	0.530	1.003	3778	52.79	445.93	19.692	0.597	0.989
4678	92.87	562.85	19.662	0.728	0.940	4128	237.74	483.46	19.693	0.596	0.951
4512	488.18	536.53	19.663	0.400	1.010	5480	295.10	770.10	19.693	0.927	1.790
3551	85.22	422.52	19.663	0.626	1.065	1576	390.59	229.94	19.693	0.587	0.983
2462	351.94	318.98	19.664	0.521	1.023	5483	291.67	770.62	19.693	2.278	1.473
2574	360.07	329.48	19.664	0.623	0.906	4597	504.26	548.67	19.693	0.555	0.902
2845	460.10	355.41	19.665	0.520	1.340	2694	501.75	341.49	19.694	0.777	1.091
4113	167.38	481.38	19.665	0.388	0.960	3977	179.91	467.08	19.695	0.507	1.014
2810	372.15	351.81	19.667	0.487	0.915	2868	390.96	357.20	19.695	0.716	1.018
3105	287.78	379.26	19.667	0.607	0.939	4454	123.34	528.92	19.695	0.884	0.933
1797	14.97	254.60	19.668	0.458	0.943	2689	83.80	341.06	19.695	0.204	1.100
3152	31.86	383.00	19.668	0.360	0.941	1142	390.17	184.21	19.695	0.639	0.978
1468	201.48	217.98	19.669	0.520	0.945	438	233.46	83.69	19.697	0.529	0.954
942	38.19	158.33	19.672	0.411	0.933	3464	197.33	413.58	19.697	0.528	0.909
4354	269.78	514.52	19.672	0.416	0.918	4625	82.65	553.45	19.698	0.416	0.913
1449	239.83	215.94	19.673	0.600	1.015	3442	359.30	411.46	19.699	0.627	0.929
336	105.03	65.66	19.673	1.083	0.860	1229	306.15	192.88	19.699	0.735	1.165
1480	264.44	219.93	19.673	0.404	1.032	4162	185.69	488.11	19.700	0.388	0.919
3822	47.70	450.06	19.674	0.512	1.099	4156	142.79	486.56	19.700	0.740	0.885
933	260.57	157.06	19.674	0.888	0.928	5302	70.86	706.50	19.700	0.302	0.877
5325	93.41	711.98	19.674	0.405	0.953	2927	139.10	362.02	19.701	0.597	0.904
2555	84.91	327.63	19.674	1.055	1.075	2313	474.40	304.00	19.701	0.441	1.089
1077	166.81	176.26	19.675	0.464	0.968	179	124.29	34.54	19.701	0.503	0.870
280	222.11	56.44	19.676	0.065	0.890	671	109.54	120.94	19.702	0.589	1.023
4647	363.72	556.72	19.676	0.444	0.870	894	410.05	152.00	19.702	0.608	0.913
1998	325.22	273.18	19.676	0.455	0.948	499	122.97	94.51	19.702	0.274	0.970
2096	388.65	287.34	19.677	1.393	1.313	2611	43.41	333.82	19.703	0.127	0.910
2414	280.59	313.56	19.677	0.470	0.955	2218	28.00	293.65	19.703	0.532	0.877
3196	197.20	386.66	19.678	0.721	1.114	4394	23.05	520.39	19.705	0.489	0.963
1020	201.00	169.95	19.679	0.622	0.905	3786	17.58	447.46	19.705	0.674	0.920
5542	9.09	798.15	19.679	0.546	0.918	4339	122.99	512.77	19.706	0.221	0.837
295	205.40	59.69	19.679	0.550	0.877	4432	100.61	526.33	19.706	1.022	1.030
3503	286.44	417.44	19.679	0.533	1.072	4573	224.90	544.34	19.706	0.420	1.005
2327	298.24	305.65	19.680	0.443	1.059	5588	101.02	834.96	19.706	0.582	0.820
3389	19.53	407.10	19.680	0.705	1.065	4825	160.83	590.57	19.706	0.432	0.935
4297	369.42	507.53	19.682	0.504	0.885	4860	284.14	599.24	19.706	0.480	0.835
4186	190.19	491.38	19.683	0.465	0.914	2091	9.79	281.84	19.706	0.497	0.953
1220	122.61	191.97	19.684	0.608	0.935	949	20.92	158.92	19.706	0.461	1.003
1270	122.33	196.86	19.685	0.980	1.090	2878	485.05	367.14	19.707	0.739	1.018
4498	341.78	534.72	19.685	0.472	0.990	4189	395.99	492.52	19.707	0.448	0.938
3776	13.79	445.87	19.685	0.552	0.906	2245	175.36	296.11	19.708	0.750	1.063
1091	37.29	178.41	19.685	0.348	0.993	1820	137.86	257.33	19.708	0.452	0.930
4076	173.45	477.46	19.685	0.596	0.972	455	164.75	86.70	19.709	0.466	0.833
5403	364.84	744.46	19.686	1.738	0.967	3875	275.30	456.53	19.709	0.548	0.982
584	526.43	107.67	19.686	0.533	0.908	4770	14.46	579.98	19.709	0.631	0.950
1366	375.74	206.39	19.687	0.462	0.915	2988	506.29	367.88	19.709	0.491	0.917
3844	209.80	452.22	19.687	0.308	1.091	3461	9.98	413.29	19.710	0.543	0.940
4520	439.86	537.85	19.688	0.410	0.893	2642	135.69	336.56	19.711	0.540	0.930
4096	218.03	479.65	19.689	0.426	0.928	380	318.82	74.05	19.712	0.401	0.985
5260	69.32	695.42	19.689	0.737	0.820	3731	432.31	441.48	19.712	0.491	0.886
5394	355.97	738.69	19.689	0.564	0.967	5567	132.10	817.78	19.712	0.781	0.965
4920	12.10	615.13	19.690	0.529	0.915	3651	358.28	432.58	19.713	0.394	0.907
1253	203.01	194.92	19.690	0.317	0.893	4960	34.84	629.55	19.713	0.704	0.928
139	284.92	24.16	19.690	0.579	0.944	3064	511.55	375.47	19.714	0.315	0.973
4541	492.96	540.37	19.691	0.517	0.900	5293	101.55	704.23	19.714	0.509	0.835
1782	331.84	253.52	19.691	0.596	1.077	483	430.29	92.30	19.714	1.034	0.890
4836	59.04	591.82	19.691	0.370	0.910	1140	386.34	184.09	19.714	0.575	1.180
3640	192.68	431.65	19.691	0.538	0.968	4595	346.47	547.63	19.714	0.530	0.938
3564	200.56	424.22	19.692	0.559	1.029	4406	199.24	522.45	19.715	0.035	1.090
1085	528.93	177.67	19.692	0.539	0.798	1597	467.34	232.79	19.715	0.451	0.948

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
5011	172.80	635.38	19.716	0.477	0.887	1766	297.75	251.82	19.737	0.426	0.996
505	262.05	95.78	19.717	0.752	0.956	3919	326.50	461.59	19.737	0.569	0.965
877	317.56	149.95	19.717	0.570	1.133	1682	184.24	241.71	19.738	0.856	0.920
1760	242.07	250.92	19.717	0.626	0.934	778	74.46	136.37	19.738	0.764	0.857
5238	243.15	628.55	19.717	0.578	0.944	4987	77.62	629.28	19.739	0.639	0.897
4292	506.30	507.11	19.717	0.495	0.755	2632	234.81	335.97	19.739	0.201	1.355
2562	226.97	327.95	19.718	0.998	1.065	1752	128.85	250.23	19.741	0.699	1.013
4944	74.94	620.34	19.718	0.897	0.873	1700	279.32	243.47	19.741	0.336	0.963
504	248.14	95.70	19.719	0.630	0.902	2366	151.51	308.29	19.741	0.552	1.013
1169	203.10	187.17	19.719	0.654	0.960	3701	163.50	438.31	19.743	-0.210	0.975
2724	153.17	344.44	19.719	0.195	1.132	689	238.94	123.68	19.744	0.702	0.977
4585	551.65	545.55	19.720	2.260	0.723	3401	478.73	408.29	19.745	0.380	0.955
2556	271.88	327.76	19.720	0.508	0.972	3764	392.56	444.96	19.745	0.274	1.190
4355	162.55	514.65	19.721	0.446	1.023	4062	253.02	475.33	19.745	1.998	1.065
272	21.96	54.52	19.721	0.343	0.865	5259	354.79	695.30	19.745	0.459	0.845
628	125.09	114.34	19.721	0.634	0.945	3826	485.82	450.28	19.745	0.383	0.933
3789	519.91	446.92	19.721	0.519	0.935	3452	66.68	412.29	19.745	0.358	0.939
2774	485.38	348.39	19.722	0.626	0.929	5281	78.40	700.17	19.745	0.903	0.988
4050	239.20	474.09	19.722	0.509	1.100	1548	42.86	227.29	19.746	0.478	0.953
2423	15.87	314.59	19.722	0.409	0.935	5224	294.76	683.40	19.746	0.873	1.480
3749	280.06	443.76	19.724	0.501	0.956	3286	356.62	396.85	19.746	0.428	0.956
168	540.87	31.66	19.724	0.668	0.855	4544	113.56	540.84	19.747	1.317	1.665
5384	356.27	731.85	19.725	0.279	0.953	3277	402.89	395.57	19.747	0.543	0.990
1680	39.04	241.47	19.725	0.309	0.820	5525	365.33	789.97	19.747	0.330	0.650
1144	147.14	184.50	19.725	0.740	0.960	569	41.18	105.07	19.748	0.435	0.890
2521	274.57	324.60	19.725	0.749	0.937	1650	366.14	238.36	19.748	0.654	0.973
5296	489.28	705.13	19.726	0.494	0.867	3266	329.50	394.09	19.748	0.395	0.952
3751	273.08	443.85	19.726	0.836	1.023	517	307.82	97.64	19.748	0.103	0.913
485	122.72	92.93	19.726	0.350	1.093	111	318.87	18.82	19.748	1.150	0.950
4481	287.86	532.72	19.727	1.398	1.643	1621	348.31	235.14	19.749	0.669	0.915
218	333.70	41.75	19.727	0.330	0.910	1629	363.52	236.29	19.749	0.481	1.008
468	307.89	89.51	19.727	0.461	0.875	4996	241.45	631.43	19.750	0.704	0.935
1006	6.98	167.91	19.728	0.280	0.985	4901	6.01	610.16	19.750	0.468	0.920
1120	366.07	181.66	19.728	0.578	1.035	4993	109.18	630.84	19.750	0.295	0.837
2685	22.20	340.84	19.729	0.600	0.895	1217	192.86	191.54	19.752	0.659	0.863
1274	152.54	197.45	19.729	1.165	0.980	2085	20.07	281.61	19.752	0.529	0.907
1228	57.60	192.87	19.729	0.956	0.967	1195	450.67	189.91	19.752	0.402	0.933
573	194.25	105.48	19.730	0.378	0.863	4642	181.07	556.39	19.752	0.834	0.908
441	226.63	84.28	19.730	0.562	0.905	2129	76.04	285.99	19.753	0.360	1.025
4928	222.96	617.20	19.730	0.753	0.998	3024	207.10	371.66	19.753	0.289	0.993
4496	319.38	534.40	19.731	0.320	0.993	2626	98.35	335.07	19.754	0.482	1.140
3287	92.11	396.92	19.731	0.431	0.952	5489	349.40	773.09	19.754	0.422	0.833
1584	19.72	231.70	19.731	0.592	0.998	5189	354.05	675.72	19.754	0.491	0.963
1541	444.60	226.71	19.732	0.661	0.950	5372	181.60	725.85	19.754	0.499	0.848
3508	66.06	417.99	19.732	0.685	1.015	3404	386.80	408.52	19.754	0.624	0.983
3371	24.13	405.38	19.732	0.377	0.941	4274	250.75	504.49	19.754	0.483	0.868
2160	485.22	288.32	19.733	0.235	0.957	1567	275.71	229.08	19.754	0.591	0.986
615	351.53	112.69	19.733	-0.035	0.940	3067	96.92	375.66	19.755	0.278	0.936
2029	523.14	276.25	19.733	0.365	1.198	42	379.75	-12.05	19.755	-0.097	0.943
2912	504.35	360.63	19.735	0.600	1.023	4785	340.15	583.51	19.756	0.435	0.835
5430	104.54	753.46	19.735	0.478	0.897	3667	485.98	434.05	19.756	0.611	0.949
836	400.07	144.41	19.735	0.698	0.857	4580	125.37	545.04	19.756	0.561	0.918
2377	221.16	309.54	19.736	0.570	1.405	3502	160.42	417.30	19.756	0.607	1.006
3679	281.02	435.48	19.736	0.795	1.039	323	71.06	63.97	19.756	0.590	1.023
3190	355.51	385.78	19.736	1.493	0.858	911	224.59	154.19	19.757	0.771	0.970
1415	32.82	211.75	19.736	0.489	0.858	4946	258.91	620.70	19.758	0.464	0.947
2791	158.06	350.00	19.736	0.519	1.430	4981	319.26	628.24	19.758	0.586	0.980
3767	125.11	445.12	19.736	0.385	0.873	2609	396.75	333.22	19.758	0.320	0.965
2866	395.64	357.16	19.737	0.433	0.935	180	63.47	34.57	19.760	0.608	1.095
4941	378.90	619.91	19.737	0.341	0.885	3062	136.64	375.42	19.760	0.369	1.091

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
4720	48.71	571.33	19.760	0.663	0.980	2114	401.46	284.87	19.779	0.602	1.065
3559	249.54	423.78	19.760	0.507	0.999	492	286.70	93.37	19.779	0.016	1.113
4723	331.98	572.67	19.761	0.692	0.813	3083	46.76	377.63	19.779	0.396	1.017
3617	142.82	429.75	19.762	0.526	0.949	874	452.98	149.65	19.780	0.470	0.943
631	366.81	114.89	19.762	0.836	0.882	692	54.60	123.92	19.780	1.204	0.825
5545	268.38	798.36	19.762	2.018	0.870	4890	211.69	608.72	19.781	0.901	0.848
2028	82.93	276.03	19.763	0.475	0.987	4053	170.23	474.52	19.781	0.542	0.967
1718	180.09	245.63	19.763	-0.021	1.010	4005	198.51	469.19	19.781	0.440	0.899
1109	503.48	180.41	19.763	0.721	1.217	3524	35.09	419.35	19.782	0.581	0.938
4892	270.24	608.93	19.763	0.521	0.887	4195	170.32	493.92	19.782	0.362	0.939
2410	33.63	313.38	19.764	0.397	1.018	3265	34.82	393.95	19.782	0.136	0.950
936	223.76	157.48	19.764	0.289	1.003	1096	108.18	178.92	19.783	0.373	1.035
2398	292.53	312.41	19.764	0.573	1.002	880	535.38	150.04	19.783	0.577	0.880
5255	520.44	693.92	19.764	0.408	0.995	4885	94.56	607.37	19.783	0.391	0.977
2016	60.50	274.84	19.765	0.861	0.973	947	106.40	158.83	19.783	0.831	0.870
4046	379.16	473.43	19.765	1.054	0.747	4753	57.60	577.74	19.783	0.490	0.923
1564	257.33	228.90	19.765	0.586	0.945	1481	198.53	219.93	19.784	0.505	1.015
997	513.87	166.96	19.765	-0.022	1.087	3828	151.24	450.43	19.784	0.462	0.983
4648	297.51	556.94	19.766	0.758	0.931	5544	249.81	798.25	19.784	0.933	0.968
1249	375.67	194.51	19.766	0.480	0.822	120	166.88	19.61	19.786	0.748	0.853
4755	242.12	577.95	19.766	1.080	0.873	4267	150.48	503.32	19.788	0.544	1.050
2346	58.29	306.67	19.766	0.622	0.995	1012	258.15	168.66	19.788	0.465	1.068
3081	331.22	377.52	19.767	0.544	0.882	2820	314.13	353.13	19.788	0.567	0.958
796	51.19	139.44	19.767	0.453	0.928	3033	332.09	372.53	19.788	0.266	0.923
4119	349.65	482.08	19.767	0.475	0.900	474	187.80	91.47	19.788	0.640	1.003
5070	74.58	648.73	19.767	0.726	0.970	5250	34.04	693.14	19.789	0.791	0.930
2178	132.96	289.88	19.767	-0.473	1.033	5559	180.45	811.30	19.789	0.582	0.817
4353	448.51	512.10	19.768	0.252	0.910	2769	322.93	348.14	19.790	-0.451	0.970
82	358.69	10.32	19.768	0.873	0.777	1805	264.11	255.90	19.791	0.129	1.260
5222	438.18	683.23	19.769	0.788	0.985	133	324.07	22.95	19.791	0.509	0.828
3576	472.89	425.47	19.769	0.529	0.898	239	282.15	46.97	19.792	0.545	0.919
965	333.47	161.70	19.770	0.408	0.910	4027	225.80	471.64	19.792	0.516	0.942
4746	285.20	576.26	19.771	0.452	0.995	4536	307.02	539.41	19.793	0.519	0.986
3853	181.64	453.23	19.771	0.999	0.950	5536	212.49	795.66	19.793	0.630	0.798
1334	31.06	203.62	19.772	0.515	0.938	1624	299.44	235.61	19.794	0.648	0.923
1128	274.02	182.69	19.772	0.339	0.944	846	222.22	145.74	19.795	1.144	1.073
1698	341.10	243.34	19.772	1.110	1.073	3896	95.50	458.47	19.796	0.322	0.921
3366	436.58	404.77	19.772	0.297	0.998	1456	155.95	216.39	19.797	0.328	0.938
3239	348.27	391.15	19.773	0.510	0.941	2166	320.52	289.19	19.797	0.652	0.929
1447	339.57	215.60	19.773	0.373	1.075	1309	2.64	201.42	19.798	0.159	1.067
3570	24.14	424.71	19.773	0.595	0.970	5223	279.02	683.36	19.799	1.402	1.467
2143	129.18	286.76	19.774	0.215	1.013	2283	143.84	300.11	19.799	0.469	0.987
259	34.62	52.21	19.774	0.441	0.875	166	112.24	31.07	19.799	0.443	0.952
3824	307.67	450.21	19.774	0.612	1.013	3756	461.33	444.32	19.799	0.468	0.986
416	26.41	80.61	19.774	0.617	0.973	5215	171.76	682.26	19.801	0.591	0.888
4070	17.23	476.39	19.774	0.542	0.924	1559	378.76	228.52	19.802	0.572	0.988
4929	52.91	617.23	19.774	0.462	0.887	663	71.38	239.51	19.802	0.425	0.997
5035	272.48	640.79	19.775	0.314	0.948	5270	273.79	697.74	19.802	0.660	1.103
1082	144.36	176.97	19.775	0.359	1.005	4876	115.68	602.79	19.803	0.277	0.972
1751	532.20	250.15	19.775	0.546	0.910	1612	256.25	234.45	19.803	0.406	0.906
3959	102.68	465.13	19.775	0.477	0.961	3422	188.73	410.19	19.803	0.382	1.018
4433	192.06	526.35	19.776	1.268	1.335	5109	249.71	658.01	19.803	0.607	0.902
4779	373.81	582.21	19.776	0.576	0.877	3499	137.68	416.87	19.804	0.612	0.975
3718	481.75	440.30	19.776	0.644	0.844	5548	244.86	801.04	19.804	0.490	0.933
4949	322.44	621.69	19.777	0.662	0.860	5493	108.97	775.42	19.804	0.397	1.025
3307	271.23	398.39	19.777	0.499	0.960	3620	317.49	430.19	19.805	0.565	1.207
2023	374.46	275.29	19.777	0.717	1.090	1338	33.55	203.77	19.805	0.105	0.893
3729	348.82	441.30	19.778	0.591	0.999	698	328.63	124.93	19.805	0.482	0.917
153	359.24	27.58	19.778	0.632	0.883	2321	397.65	304.71	19.806	0.550	1.080
2005	260.04	273.47	19.778	0.320	1.053	1261	447.07	195.82	19.806	0.482	0.953

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
1638	409.01	237.05	19.806	0.413	0.953	520	325.91	98.00	19.836	0.367	0.945
1121	475.10	181.68	19.807	0.613	0.995	299	273.80	60.41	19.837	0.515	0.861
608	39.47	110.99	19.808	0.479	0.943	3448	411.18	412.06	19.837	0.671	1.005
2745	270.37	346.37	19.808	0.542	1.100	5034	398.44	640.78	19.837	0.364	1.028
4349	385.47	513.93	19.809	0.564	0.917	1972	437.22	270.26	19.837	0.512	0.845
4591	48.76	546.38	19.809	1.206	0.925	1711	101.14	244.65	19.837	1.186	1.023
825	440.47	143.61	19.809	0.658	1.008	5251	129.13	693.28	19.838	0.626	0.892
3077	342.56	376.91	19.809	0.471	0.951	18	295.50	-27.36	19.838	0.758	0.893
486	457.93	92.96	19.810	0.868	0.940	2021	155.14	275.27	19.838	0.510	0.938
4963	107.05	623.86	19.810	0.715	0.863	4665	442.38	560.63	19.838	0.465	0.980
1251	354.03	194.84	19.810	0.675	0.883	994	502.82	166.25	19.839	0.469	1.097
1643	156.02	237.75	19.811	0.164	0.977	1136	503.44	183.55	19.840	0.508	1.170
495	301.43	93.69	19.811	0.605	0.895	17	378.81	-28.12	19.840	0.406	0.930
668	310.84	120.77	19.811	0.582	1.030	2781	188.90	348.83	19.841	0.481	1.008
3947	236.53	463.97	19.812	0.617	0.985	4434	20.97	526.73	19.842	0.524	0.933
2335	85.36	306.12	19.813	0.689	0.920	4624	328.51	553.32	19.843	0.685	0.840
1361	142.26	206.00	19.813	0.593	0.850	3842	142.25	451.99	19.844	0.450	0.894
704	354.90	125.86	19.814	0.728	0.860	5367	90.57	724.54	19.844	1.372	0.938
889	349.57	151.51	19.814	0.704	0.855	1831	275.16	258.51	19.845	0.342	1.011
5431	285.04	753.57	19.814	1.286	1.350	3509	75.40	418.00	19.845	0.708	1.000
4630	196.60	554.80	19.815	0.608	0.905	4932	363.71	617.96	19.846	0.199	1.015
1634	467.28	236.87	19.815	0.674	0.978	1462	194.24	217.06	19.847	0.546	0.870
4925	436.17	616.61	19.816	0.470	0.830	708	377.56	126.18	19.848	0.620	0.878
3562	180.74	424.14	19.816	0.648	1.012	2304	377.26	302.90	19.849	0.561	0.868
2241	204.24	295.68	19.817	0.420	0.990	2900	4.18	360.08	19.850	0.654	1.240
1586	4.84	231.92	19.818	0.547	1.005	432	255.85	82.50	19.850	0.610	0.949
3886	242.74	457.14	19.818	0.435	0.952	80	412.19	10.16	19.850	1.322	0.930
371	357.29	71.90	19.819	1.321	0.915	4448	274.78	528.40	19.851	0.933	1.385
3354	499.28	403.61	19.819	0.440	0.996	2566	242.34	328.46	19.851	0.532	1.030
5378	185.14	729.73	19.820	0.516	0.870	4686	499.54	564.77	19.851	0.477	1.065
4212	265.03	496.41	19.821	0.425	0.873	46	439.15	-10.14	19.851	0.390	0.965
907	186.59	153.76	19.821	0.763	0.988	3741	129.81	442.70	19.853	0.353	0.874
3928	380.33	462.30	19.821	0.586	1.046	5179	145.08	672.81	19.854	0.397	0.945
4456	391.09	529.16	19.821	0.472	0.835	1601	52.06	233.25	19.854	0.292	0.885
2373	451.60	309.22	19.821	0.695	0.879	4393	231.68	520.35	19.855	0.411	0.957
2525	411.31	324.89	19.822	0.572	0.910	673	420.72	121.17	19.855	0.724	0.920
4880	150.90	603.83	19.823	0.226	1.377	1632	60.16	238.42	19.855	0.575	0.948
5153	260.97	667.57	19.824	0.503	0.957	1536	397.43	226.13	19.856	0.411	0.882
4357	236.97	514.80	19.825	0.615	0.908	3485	529.11	415.04	19.857	0.834	0.937
340	106.79	66.15	19.825	0.351	0.910	5124	276.12	659.92	19.857	0.865	0.903
2636	287.00	336.33	19.826	0.242	0.940	3245	318.11	391.54	19.858	0.791	1.003
2617	346.22	334.13	19.826	0.539	0.916	5123	453.94	659.90	19.858	0.499	0.918
617	303.39	112.92	19.826	0.480	1.026	3754	110.81	443.89	19.858	0.624	0.962
1833	43.51	258.74	19.827	0.500	1.170	3821	396.73	449.90	19.858	0.765	1.244
2380	179.13	309.75	19.828	0.812	1.215	3611	127.62	428.57	19.859	0.803	0.912
4543	157.10	540.81	19.828	0.923	0.910	5057	159.12	646.37	19.859	0.562	0.903
1494	269.12	221.48	19.828	0.416	1.250	3126	299.76	381.43	19.859	0.535	0.953
1592	440.14	232.34	19.831	0.483	0.930	2124	86.76	285.60	19.859	0.393	0.940
1237	365.06	193.38	19.831	0.859	0.967	886	210.18	150.99	19.860	0.204	1.135
2391	98.87	311.37	19.831	0.955	0.995	751	96.30	132.25	19.860	0.670	1.073
302	53.04	60.99	19.831	0.775	0.943	3228	138.07	389.79	19.860	0.487	1.024
4402	175.74	521.78	19.832	0.350	0.860	982	135.68	164.84	19.861	0.716	0.937
4307	33.60	508.69	19.832	0.340	1.045	1743	309.64	249.20	19.861	0.497	1.035
5581	153.20	831.12	19.832	0.540	0.925	4714	452.60	570.85	19.861	0.542	0.820
1609	499.40	234.17	19.833	0.404	1.050	2333	390.14	306.01	19.861	0.447	0.871
3872	195.98	455.26	19.833	0.283	1.048	2629	78.00	335.34	19.862	-0.056	1.006
2477	110.49	320.40	19.833	0.471	0.960	420	221.11	81.30	19.863	0.391	1.043
2596	289.78	331.94	19.834	0.580	0.954	4658	482.92	558.88	19.863	0.602	1.008
2831	278.76	353.93	19.835	0.564	0.932	5553	173.48	803.76	19.863	0.620	1.030
5359	89.36	721.50	19.835	0.550	0.977	5376	208.45	728.87	19.865	0.524	0.888

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
176	380.03	33.80	19.866	0.465	0.975	2539	457.59	326.07	19.892	0.495	0.931
5400	302.75	743.35	19.866	0.568	0.920	2761	115.91	347.50	19.893	1.100	0.948
360	121.47	69.76	19.867	0.621	0.888	3816	350.79	449.65	19.894	0.334	1.387
5056	123.61	646.21	19.867	1.103	0.950	106	134.32	17.04	19.894	0.019	1.053
4578	282.45	544.56	19.868	0.572	0.963	452	271.02	85.54	19.894	0.838	0.954
633	115.79	115.06	19.868	0.494	0.912	382	418.07	74.39	19.896	1.034	0.875
2938	226.02	363.19	19.869	0.645	1.053	1472	58.69	219.05	19.896	0.512	0.988
3074	249.67	376.04	19.869	0.447	0.992	5557	72.59	809.24	19.896	0.589	0.970
753	86.17	132.50	19.870	0.612	0.857	3490	27.85	415.80	19.896	0.522	0.938
3905	50.47	459.82	19.870	0.805	0.932	2239	154.38	295.44	19.896	0.370	1.018
2062	67.61	279.23	19.871	0.172	0.990	3700	351.97	438.17	19.896	1.350	0.936
1794	347.31	254.39	19.871	0.625	0.908	2075	447.18	280.58	19.897	0.794	0.898
1926	310.42	265.86	19.871	0.088	1.467	2214	31.54	293.29	19.897	0.773	0.943
4777	433.64	581.84	19.871	0.485	0.923	5071	344.25	648.99	19.897	0.395	1.070
2099	301.65	283.11	19.872	0.706	0.934	1573	428.98	229.28	19.898	0.416	0.915
1227	264.94	192.81	19.872	0.671	0.966	1975	378.79	270.72	19.898	0.647	1.635
1717	241.53	245.60	19.872	0.735	0.936	1276	270.29	197.51	19.898	0.529	0.987
1162	224.91	186.56	19.873	0.558	0.935	1704	60.16	244.01	19.898	0.587	0.960
2070	242.64	280.39	19.873	0.519	0.970	3103	251.47	378.89	19.900	0.844	0.996
1818	23.27	257.06	19.874	0.775	0.847	2132	429.00	286.08	19.900	0.786	0.984
3501	291.08	417.26	19.874	0.392	1.014	5155	414.28	668.38	19.900	0.627	0.868
4914	111.00	612.72	19.874	0.449	0.923	5379	205.50	729.96	19.901	1.038	0.940
3507	272.82	417.68	19.875	0.602	0.922	808	29.28	140.91	19.901	0.072	0.897
366	243.10	71.41	19.875	0.582	0.923	860	286.85	147.31	19.902	0.532	0.927
4329	308.00	511.06	19.876	0.583	0.876	2348	157.38	306.85	19.902	0.291	1.173
1678	41.48	241.19	19.876	0.669	0.930	3994	63.49	467.70	19.903	1.718	1.040
4691	413.74	565.70	19.877	0.563	0.925	4158	100.68	486.93	19.903	0.462	0.963
841	533.13	145.02	19.877	0.552	0.867	3045	398.62	373.43	19.903	0.097	0.932
737	76.80	130.09	19.878	0.778	0.910	1340	279.85	203.86	19.903	0.686	0.998
903	20.99	153.20	19.879	0.352	0.915	1442	364.07	214.99	19.903	0.596	0.960
2280	22.25	299.79	19.879	0.752	0.908	4095	536.51	479.42	19.903	0.522	0.945
1793	81.43	254.34	19.879	0.280	1.232	777	342.74	136.30	19.904	0.470	0.930
1027	332.33	170.70	19.879	0.292	1.075	5150	320.46	667.22	19.904	0.547	0.923
4853	55.57	596.65	19.879	0.316	0.983	1316	305.06	201.91	19.904	0.274	1.030
3416	59.43	409.35	19.879	0.093	0.966	5529	226.05	791.32	19.906	0.836	0.885
4924	301.59	616.49	19.880	0.467	0.965	4831	348.78	591.05	19.906	0.585	0.905
1317	164.15	202.01	19.880	0.190	0.903	1105	346.73	180.29	19.907	0.529	0.955
3971	50.35	466.31	19.881	0.391	0.918	4344	49.75	513.49	19.907	0.151	1.155
2775	330.66	348.45	19.881	0.511	1.030	2890	63.27	359.29	19.907	0.380	1.061
4807	242.69	587.08	19.881	0.527	0.879	4500	149.65	534.97	19.908	1.047	1.043
4737	370.23	575.01	19.882	0.323	0.998	2300	250.31	302.19	19.908	0.316	1.045
3809	28.19	449.16	19.883	0.648	0.977	4362	366.03	515.29	19.908	0.490	0.942
879	288.36	150.02	19.883	0.443	0.925	3409	377.69	408.93	19.909	0.737	0.906
5086	358.49	651.84	19.883	0.439	0.803	418	457.31	80.95	19.909	0.688	0.925
4486	14.48	533.24	19.886	0.707	1.033	4437	86.40	527.10	19.909	0.379	1.000
1301	195.15	200.49	19.886	0.496	0.967	3639	137.87	431.61	19.910	0.646	1.006
4299	293.85	507.73	19.886	0.312	0.941	5448	298.01	758.14	19.910	0.869	1.512
2172	445.78	289.48	19.887	0.279	0.971	2942	243.46	363.64	19.911	1.159	1.018
4190	22.12	492.63	19.887	0.575	0.999	261	138.51	57.50	19.911	0.396	0.870
546	255.34	102.02	19.887	0.287	0.908	4592	228.09	546.84	19.911	0.159	0.965
2363	14.25	308.21	19.887	0.789	0.948	3814	23.88	449.56	19.911	0.458	0.901
542	73.74	101.41	19.889	0.475	0.955	1002	174.44	167.66	19.911	0.416	0.857
830	215.81	144.14	19.890	0.872	1.035	1168	236.34	187.14	19.911	0.602	0.903
5330	506.74	713.94	19.890	0.485	1.035	1510	63.17	222.80	19.912	0.402	1.008
1774	206.55	252.95	19.891	0.624	0.950	5232	350.27	687.30	19.912	0.748	0.970
4931	172.97	617.59	19.891	0.256	1.028	5435	383.17	754.91	19.912	0.436	0.998
264	255.51	53.23	19.891	0.630	0.936	1664	405.96	239.55	19.912	0.518	0.945
554	40.47	102.85	19.892	0.430	1.003	4809	46.84	587.40	19.913	0.553	1.067
147	450.78	25.79	19.892	0.731	0.945	3048	33.18	374.02	19.913	0.512	1.077
449	122.10	85.41	19.892	0.477	0.853	3820	271.06	449.72	19.914	0.763	1.032

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
3956	491.20	464.42	19.915	0.462	0.978	4045	139.93	473.35	19.939	0.417	0.945
1847	311.56	259.79	19.915	0.038	1.138	4140	541.40	485.14	19.939	0.808	0.925
5203	288.00	678.82	19.915	0.982	1.266	1691	251.69	242.69	19.939	0.579	1.006
4230	170.98	500.01	19.915	0.578	0.960	4875	540.33	602.52	19.939	0.363	0.983
2351	30.05	307.14	19.915	0.112	0.947	4719	221.14	571.31	19.939	0.284	1.085
1427	277.71	212.95	19.918	0.633	0.971	5167	348.75	671.60	19.940	0.323	0.913
5456	28.27	761.31	19.918	1.211	0.925	5594	57.99	943.23	19.941	0.767	0.847
4181	160.64	490.74	19.918	0.565	0.981	95	251.19	14.07	19.941	0.421	0.910
3413	114.67	409.21	19.918	0.663	1.030	1524	54.70	224.87	19.941	0.187	0.970
2139	24.69	286.42	19.918	0.025	0.860	5294	41.09	704.28	19.941	0.666	0.805
5237	81.07	686.47	19.920	0.537	0.973	4676	119.97	562.80	19.941	1.600	0.943
3802	372.95	448.12	19.920	0.614	0.949	2250	291.74	296.34	19.942	0.559	0.968
1284	111.25	198.16	19.920	0.639	1.007	3122	518.51	380.71	19.942	0.544	0.977
4669	351.27	560.81	19.920	0.875	0.875	2237	319.58	295.26	19.942	0.540	1.012
5130	11.73	660.93	19.920	0.559	0.873	3263	77.87	393.67	19.942	0.523	1.001
4036	217.47	472.35	19.920	0.297	0.969	5187	162.37	675.18	19.942	0.533	0.858
2584	251.45	330.47	19.921	0.549	0.940	5007	120.93	634.21	19.944	0.415	0.865
681	84.19	122.04	19.921	0.465	0.903	3079	65.15	377.41	19.944	0.778	1.032
62	337.43	-2.12	19.922	0.416	0.983	2137	539.02	286.32	19.945	0.780	0.968
3030	357.98	372.16	19.922	0.534	0.998	2575	354.57	329.97	19.945	0.606	0.896
541	410.45	101.36	19.922	0.685	0.988	3985	90.09	467.35	19.945	0.431	0.935
4936	233.07	618.35	19.923	0.304	0.788	3102	35.88	378.83	19.946	0.238	1.071
1502	44.44	221.89	19.924	0.593	1.080	3163	232.03	383.90	19.946	0.681	1.047
1788	218.60	253.85	19.926	0.526	0.997	1543	316.98	226.82	19.946	0.618	0.933
5050	165.13	644.22	19.926	0.593	0.875	712	256.93	126.77	19.947	0.408	0.978
4443	498.17	528.15	19.926	0.367	0.962	222	137.27	42.73	19.947	0.379	0.965
3569	253.81	424.43	19.926	0.441	1.039	545	162.90	101.94	19.947	0.432	0.837
1289	530.45	198.88	19.926	0.361	0.787	2847	527.58	355.55	19.948	0.654	0.914
4868	15.84	600.96	19.927	0.752	0.960	1371	319.52	306.69	19.948	0.444	0.985
2145	239.58	287.05	19.927	0.561	1.060	3656	227.44	433.05	19.948	0.266	0.946
1160	325.19	166.30	19.928	0.644	0.805	2151	65.18	287.39	19.948	0.629	0.873
4100	115.83	479.88	19.928	0.701	0.920	3583	230.13	425.84	19.949	0.570	1.096
308	189.56	61.81	19.928	0.350	0.968	4917	349.85	614.69	19.949	0.875	1.033
274	512.29	55.24	19.929	0.363	0.880	3912	428.76	460.04	19.950	0.003	0.853
4786	173.89	583.53	19.929	0.199	0.867	1729	29.38	247.17	19.950	0.730	0.867
2065	355.92	279.76	19.930	0.673	0.990	2554	137.11	327.49	19.951	-0.284	0.823
2906	342.17	360.40	19.930	0.408	0.955	3403	331.04	408.48	19.952	0.568	0.930
4850	24.13	622.03	19.931	0.674	0.845	998	63.53	167.04	19.952	0.746	0.970
4972	370.21	625.50	19.931	0.422	0.860	5558	204.69	810.03	19.953	0.485	0.942
5433	438.80	754.35	19.931	0.548	0.960	818	275.78	142.54	19.953	0.427	1.046
2700	104.65	341.95	19.931	0.866	1.033	2782	434.09	348.87	19.953	0.492	0.960
3554	89.10	422.88	19.931	0.577	0.988	16	387.48	-28.84	19.956	0.360	1.070
791	262.65	138.34	19.932	0.471	0.967	3280	271.04	396.08	19.956	0.264	0.868
4526	504.94	538.63	19.933	0.557	0.970	788	386.69	137.87	19.957	0.686	1.040
2087	493.04	281.63	19.933	0.342	0.967	3408	443.44	408.91	19.958	0.498	0.886
4016	295.30	470.20	19.933	0.665	1.010	2701	70.62	342.06	19.958	0.128	1.010
1574	9.25	229.47	19.934	0.286	0.988	2532	418.02	325.58	19.959	1.284	0.943
2367	274.74	308.46	19.934	0.871	0.998	2973	349.57	366.66	19.959	0.342	0.931
1300	325.96	200.43	19.935	0.846	0.930	733	258.54	129.63	19.959	0.566	0.941
5161	325.12	669.10	19.935	0.834	0.978	2339	410.67	306.29	19.960	0.566	0.805
651	200.38	118.64	19.935	0.578	0.870	2202	361.25	292.39	19.960	1.056	0.914
5160	375.27	668.95	19.936	0.600	0.988	1988	355.75	272.37	19.960	0.767	0.950
629	256.62	114.54	19.936	0.619	0.973	4276	140.28	504.53	19.960	0.280	0.880
138	246.01	23.96	19.936	0.744	0.884	4315	297.57	509.61	19.960	0.519	0.931
3894	67.89	458.44	19.937	0.834	1.090	4298	38.03	507.68	19.961	0.892	0.958
693	208.24	124.26	19.937	0.432	0.960	355	114.25	68.42	19.961	0.526	0.907
5029	13.09	640.08	19.937	0.513	0.895	1137	307.01	183.71	19.961	0.498	0.896
2165	67.73	289.12	19.937	0.588	0.907	1565	193.45	228.90	19.961	0.726	0.950
3910	161.71	459.98	19.937	1.045	1.090	979	245.40	164.74	19.961	0.564	0.913
1977	143.36	270.96	19.938	0.321	0.920	1242	325.74	194.02	19.962	0.565	0.953

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
15	499.67	-29.28	19.962	0.764	0.963	591	62.08	108.80	19.988	0.509	0.907
2705	207.56	342.63	19.962	0.339	0.983	2730	91.16	344.65	19.989	0.735	1.020
4214	65.66	496.94	19.963	0.531	0.920	1061	514.80	174.88	19.989	0.493	0.970
2883	371.41	358.49	19.963	0.595	0.893	829	307.21	144.06	19.990	1.090	1.315
4180	288.08	490.66	19.963	0.452	1.002	278	224.87	55.53	19.992	0.662	0.925
2960	240.79	365.94	19.964	0.299	1.010	3192	419.44	386.41	19.993	0.739	0.951
687	377.97	123.20	19.964	0.745	0.883	787	333.62	137.87	19.994	0.418	0.988
2046	456.79	277.71	19.964	0.411	0.980	5113	452.20	658.56	19.994	0.674	0.810
2177	232.76	289.75	19.965	0.590	1.023	3358	438.01	403.99	19.995	0.486	0.838
2816	369.27	352.33	19.965	0.426	0.933	3738	421.22	442.27	19.995	0.445	0.838
5334	145.46	715.20	19.965	0.706	0.885	548	425.56	102.25	19.995	0.271	0.905
2808	172.37	351.77	19.966	0.677	1.058	3883	12.08	456.91	19.996	0.532	0.950
795	298.92	139.26	19.966	0.483	1.025	4590	492.09	546.31	19.996	0.376	0.868
1493	404.49	221.43	19.966	0.486	0.950	4863	117.26	599.94	19.996	0.821	0.933
935	138.38	157.40	19.966	0.549	1.010	1246	3.53	194.13	19.996	0.523	1.040
5395	341.42	739.37	19.967	0.532	1.238	2430	325.00	315.38	19.996	0.990	0.805
3566	38.78	424.28	19.967	0.606	0.874	801	10.73	140.06	19.997	0.458	0.813
5533	119.34	792.85	19.968	0.604	0.923	1593	116.80	232.45	19.997	0.772	0.923
4346	230.26	513.69	19.968	-0.173	0.858	5061	319.71	647.05	19.997	0.342	0.953
3382	48.10	406.42	19.969	0.808	0.983	5387	54.03	733.69	19.997	1.214	0.853
3555	82.68	423.30	19.970	0.298	0.958	1009	146.83	168.20	19.998	0.680	0.865
1296	302.65	200.13	19.970	0.483	0.975	5497	76.33	778.08	19.998	1.127	0.748
3784	383.06	446.40	19.970	0.763	1.417	2293	252.80	301.28	20.000	0.613	1.126
5349	455.50	719.33	19.971	0.597	0.880	1769	71.53	252.16	20.000	0.492	0.850
5247	331.18	692.54	19.971	0.528	0.882	2022	124.46	275.28	20.000	0.589	0.990
307	162.24	61.66	19.971	0.480	0.810	3924	316.33	461.97	20.001	0.293	1.076
2807	358.83	351.73	19.971	0.349	0.869	5288	462.20	702.43	20.001	0.458	0.860
5308	349.67	708.57	19.972	0.479	0.973	4784	48.18	583.49	20.001	0.475	0.945
4447	32.27	528.35	19.972	0.639	0.945	1605	493.79	233.73	20.001	0.748	0.925
3669	86.04	434.15	19.973	0.649	1.020	1657	420.46	238.98	20.001	0.510	0.925
411	231.29	79.74	19.973	0.923	0.928	4817	58.99	589.11	20.002	0.345	0.950
2932	245.02	362.62	19.973	0.691	1.153	847	259.48	146.14	20.002	0.502	0.893
5358	270.61	721.42	19.974	0.798	1.275	4414	96.01	523.76	20.002	1.402	1.080
5090	336.33	652.49	19.974	0.546	0.768	1789	257.12	253.88	20.003	0.897	0.983
5467	503.62	764.65	19.974	0.529	1.037	1322	266.80	202.38	20.003	0.594	1.023
2743	521.48	346.24	19.975	0.335	0.913	3019	46.33	371.16	20.004	1.316	0.998
338	118.98	65.76	19.978	0.470	0.863	1385	126.85	208.26	20.004	0.496	0.960
5298	60.65	705.56	19.978	0.567	0.822	2019	358.50	275.17	20.005	0.070	0.957
3857	266.18	453.86	19.979	0.425	0.968	4072	147.22	476.80	20.005	0.548	0.879
3976	323.92	466.97	19.979	0.603	0.934	2676	525.71	340.16	20.005	0.658	0.981
2219	198.59	293.80	19.981	0.326	0.963	3097	345.39	378.66	20.005	0.463	0.967
944	480.96	158.60	19.981	0.790	0.987	3653	29.82	432.84	20.006	0.493	0.945
4370	197.15	516.38	19.981	0.167	0.995	1939	94.95	266.99	20.006	0.241	0.965
1761	144.29	250.92	19.982	1.007	0.910	4726	53.35	573.05	20.008	0.196	0.915
4740	158.79	575.33	19.982	0.428	0.838	816	121.78	142.17	20.008	0.691	0.780
928	414.95	156.48	19.983	0.691	1.050	1952	421.21	267.88	20.008	0.419	0.943
2150	60.66	287.34	19.983	0.342	0.945	1994	478.50	273.04	20.008	0.368	0.885
3	415.34	-39.20	19.983	0.532	1.008	2811	118.02	351.85	20.008	0.270	1.010
1924	475.33	265.60	19.983	0.598	0.903	5485	398.95	770.87	20.010	0.809	0.953
2703	276.66	342.41	19.984	0.421	0.963	2547	70.34	326.75	20.011	0.516	1.037
4127	537.97	483.12	19.984	0.316	0.990	2140	273.32	286.44	20.011	0.629	1.000
1746	285.60	249.69	19.985	0.383	0.974	1314	230.37	201.81	20.011	0.979	1.000
2549	261.48	326.81	19.985	0.481	1.178	2965	231.65	366.40	20.012	0.443	1.017
3539	411.54	421.69	19.986	0.602	0.891	4071	303.93	476.62	20.013	0.497	0.949
760	382.50	133.51	19.986	0.870	0.975	4576	187.93	544.74	20.013	0.534	1.120
1247	89.51	194.20	19.987	0.753	1.023	2829	135.19	353.71	20.013	0.273	1.042
1758	156.30	250.70	19.987	0.634	1.063	1993	154.67	273.03	20.014	1.111	0.990
4795	494.85	585.05	19.987	0.348	0.988	4224	417.00	498.99	20.014	0.327	0.885
1695	322.01	243.15	19.987	0.742	0.990	484	355.48	92.41	20.014	0.338	1.053
4069	144.41	476.38	19.988	0.276	0.919	3742	252.58	442.88	20.014	0.534	0.910

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
3856	60.25	453.78	20.015	0.048	1.044	324	3.76	64.04	20.039	0.345	0.940
2	261.93	-39.98	20.017	0.844	0.853	5465	115.90	764.02	20.039	0.637	0.910
3492	210.14	416.03	20.017	0.433	0.958	3262	276.87	393.62	20.039	0.224	1.010
4240	2.96	501.11	20.017	0.817	0.885	5271	264.21	697.90	20.040	0.341	0.939
992	478.08	166.08	20.017	0.587	0.887	4018	324.13	470.57	20.041	0.665	0.840
1081	14.96	176.91	20.018	1.273	1.108	4652	145.21	557.62	20.042	0.849	0.948
4631	37.01	554.93	20.018	0.650	0.907	396	338.89	77.60	20.042	1.043	0.995
3599	13.44	427.33	20.019	0.558	0.966	2416	116.13	313.66	20.042	0.595	0.875
3217	437.51	388.74	20.019	0.893	0.907	1931	76.99	266.26	20.043	0.524	1.060
810	192.86	141.09	20.019	0.506	1.040	4907	435.37	611.75	20.044	0.330	0.907
4293	97.58	507.22	20.020	0.578	1.063	4655	429.38	558.14	20.045	0.343	0.963
3654	353.89	432.85	20.020	0.469	0.870	1676	204.98	241.13	20.046	0.521	0.968
1845	402.86	259.68	20.021	1.068	1.045	5075	9.12	649.56	20.050	0.959	0.878
3765	345.64	444.99	20.021	0.366	1.266	624	52.08	113.67	20.050	0.220	0.863
845	213.29	145.67	20.021	0.422	1.155	81	329.30	10.29	20.050	0.465	0.958
4304	326.20	508.48	20.021	0.480	0.763	4579	292.81	545.12	20.050	0.595	0.867
5204	285.31	679.27	20.022	1.145	1.513	5317	55.37	710.47	20.050	0.509	0.827
955	43.65	160.12	20.022	0.409	1.120	785	81.15	137.81	20.050	0.662	0.988
1232	311.31	193.94	20.022	0.351	0.952	2036	234.28	277.10	20.051	0.320	1.175
2171	395.98	28.45	20.023	0.502	0.992	3138	430.41	381.99	20.051	0.473	0.938
4387	168.81	518.79	20.023	0.626	0.953	1824	108.19	257.63	20.052	0.430	1.048
3687	264.63	436.69	20.023	0.559	1.138	4466	400.35	530.58	20.052	0.646	1.047
1418	491.52	212.20	20.024	0.273	0.873	5527	451.87	791.13	20.053	0.543	0.952
4457	167.58	529.34	20.024	0.520	0.970	4814	297.96	588.77	20.054	0.653	1.036
3556	115.73	423.33	20.024	0.397	1.040	4610	199.43	551.56	20.054	0.709	0.890
3308	377.62	398.44	20.025	0.156	0.918	1263	33.83	195.57	20.054	0.526	0.973
3328	10.90	400.95	20.026	0.375	1.085	2044	179.67	277.64	20.054	0.741	1.087
4556	206.48	541.74	20.026	0.528	0.935	730	201.67	129.38	20.055	0.471	0.955
5	392.32	-39.09	20.026	0.605	0.950	4994	313.62	630.95	20.056	0.939	1.040
4451	366.44	528.72	20.026	0.592	0.855	189	70.12	35.96	20.056	0.583	0.920
4202	233.03	495.19	20.026	0.643	0.930	5013	477.98	636.95	20.057	0.543	1.105
571	84.51	105.27	20.027	0.303	0.980	3998	287.53	468.24	20.058	0.225	0.970
269	260.04	53.97	20.027	0.731	0.941	1549	168.92	227.31	20.059	0.575	0.903
1066	291.30	175.27	20.028	0.508	0.919	2958	401.46	365.42	20.060	0.591	0.955
3274	215.23	395.25	20.029	0.361	0.996	5098	100.05	654.39	20.060	0.753	0.900
5457	70.41	761.49	20.029	0.654	0.830	3270	434.35	394.71	20.061	0.013	0.907
852	63.23	146.57	20.030	0.561	1.035	5319	316.27	710.57	20.061	0.342	0.825
2148	106.21	287.28	20.030	0.368	0.980	1681	180.37	241.50	20.063	0.640	1.085
663	465.73	119.96	20.031	0.889	0.963	167	320.55	31.49	20.064	0.330	0.963
1784	228.90	253.74	20.031	0.167	0.950	2519	332.48	324.39	20.064	0.387	0.989
5314	238.29	710.21	20.032	0.676	0.924	392	148.00	76.27	20.064	0.889	0.963
3633	507.02	431.00	20.032	0.112	0.941	576	198.37	105.92	20.065	0.388	0.863
4608	479.56	551.25	20.032	0.491	0.843	2625	71.65	334.88	20.066	0.404	1.020
4176	41.48	490.12	20.032	1.117	0.931	2010	191.10	274.28	20.066	0.661	0.950
5551	26.26	803.30	20.032	0.656	0.877	1218	430.90	191.58	20.067	0.516	0.965
2484	41.45	320.77	20.033	0.363	0.830	2655	272.71	537.97	20.069	0.658	0.982
3837	97.17	451.69	20.033	0.172	0.919	5350	124.35	719.35	20.069	0.794	0.805
592	248.22	108.81	20.034	0.554	0.855	898	370.46	152.47	20.069	0.369	0.983
3848	447.93	452.37	20.034	0.379	0.953	5600	24.99	846.00	20.070	0.373	0.915
1051	360.55	173.76	20.035	0.305	0.918	5274	335.05	698.61	20.070	0.498	0.888
4412	212.69	523.03	20.035	1.234	1.205	3482	367.82	414.87	20.071	0.460	1.050
1703	275.58	243.83	20.035	0.342	1.024	173	30.90	32.44	20.071	0.754	0.840
1692	149.20	243.01	20.036	0.264	0.912	4283	128.31	505.18	20.072	0.517	0.901
5024	261.22	639.80	20.036	0.703	0.840	5295	426.04	704.44	20.072	0.130	0.925
2635	304.65	336.23	20.037	-0.044	0.973	1425	187.48	212.90	20.072	0.536	1.055
3657	67.50	433.05	20.037	0.552	1.228	3783	417.89	446.39	20.072	0.579	0.788
113	76.87	19.17	20.037	0.564	0.787	3173	186.00	384.69	20.073	0.335	1.283
923	238.76	155.70	20.038	0.365	1.025	2458	285.34	318.38	20.074	0.716	1.008
4937	375.68	618.74	20.038	0.566	0.870	4407	499.97	522.46	20.074	0.263	0.963
1139	165.43	183.89	20.038	0.538	0.943	515	7.33	97.36	20.074	0.389	1.240

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
3595	542.53	426.80	20.075	0.460	0.920	5543	296.38	798.15	20.094	0.718	0.918
4294	540.75	507.34	20.075	0.828	0.830	1841	217.09	259.34	20.095	0.170	1.023
2953	77.19	365.22	20.075	0.397	1.024	5427	396.09	753.08	20.096	0.670	0.993
149	433.17	26.58	20.076	0.561	0.937	1132	529.55	182.94	20.098	0.759	0.847
4734	450.43	574.84	20.076	0.753	0.795	5386	338.01	733.68	20.098	0.648	1.033
4281	75.47	505.03	20.076	0.557	0.864	4099	152.75	479.85	20.098	0.434	0.943
4773	444.64	580.82	20.078	0.569	0.767	5361	340.63	721.69	20.098	0.714	0.915
1809	446.60	256.52	20.078	0.640	0.968	4583	242.66	545.42	20.099	0.668	0.882
482	131.13	92.29	20.078	0.941	0.800	2452	298.06	318.05	20.099	0.587	1.015
65	385.01	1.73	20.078	0.170	1.037	3598	225.45	426.93	20.100	0.860	1.038
1696	392.34	243.31	20.078	0.250	0.873	2910	348.34	360.53	20.101	0.330	0.904
3891	363.15	457.84	20.078	0.209	0.979	1642	80.53	237.70	20.101	0.453	0.925
2447	323.90	317.67	20.078	0.259	1.165	4980	442.80	627.86	20.102	0.976	0.910
4762	326.07	578.98	20.078	0.441	0.858	3384	113.08	406.88	20.102	0.287	1.205
290	309.21	58.67	20.079	0.497	1.040	2418	52.69	313.94	20.102	0.263	0.937
5244	541.93	691.63	20.079	0.577	0.878	4067	377.88	476.11	20.102	-0.051	0.770
4367	314.89	515.79	20.079	0.626	0.807	1640	486.13	237.14	20.102	0.845	0.868
587	325.36	107.91	20.080	0.333	1.060	2090	30.73	281.83	20.103	0.431	0.930
4151	326.67	485.85	20.080	0.499	0.915	464	520.30	88.55	20.103	1.327	0.848
1732	37.92	247.44	20.081	0.825	0.863	300	42.60	60.92	20.104	0.616	1.018
4174	124.68	489.99	20.081	0.700	0.979	4138	51.54	484.66	20.105	0.667	0.887
865	55.22	148.19	20.081	0.376	1.067	5105	114.15	657.17	20.105	0.686	0.930
4480	120.76	532.63	20.082	0.538	0.933	3049	544.90	374.16	20.105	0.446	1.105
1250	345.05	194.69	20.082	0.764	0.955	1262	208.24	195.82	20.106	0.449	0.903
424	496.73	81.89	20.083	0.321	0.905	4878	77.03	603.13	20.106	0.614	0.928
866	373.27	148.19	20.083	0.579	0.983	2824	356.80	353.49	20.106	0.852	0.964
2903	14.05	360.13	20.083	0.065	1.013	5267	293.28	697.10	20.107	1.443	1.148
3792	502.21	447.00	20.084	0.299	1.037	3808	187.40	448.90	20.107	1.005	1.072
195	211.41	37.15	20.085	0.617	0.975	4323	399.75	510.13	20.108	0.376	0.977
1596	514.38	232.74	20.085	1.346	0.940	702	215.08	125.24	20.108	0.542	0.965
361	109.85	435.66	20.085	0.534	1.020	5477	155.47	768.71	20.109	0.843	0.817
802	147.78	140.07	20.086	0.476	1.013	1298	497.05	200.37	20.109	0.552	0.913
3096	446.22	378.60	20.086	0.886	1.023	5494	150.44	776.16	20.109	0.316	0.953
638	537.27	115.97	20.087	0.177	0.918	4461	50.72	529.72	20.110	0.593	0.978
4911	351.67	612.04	20.087	0.340	0.943	2783	230.67	349.02	20.110	0.622	1.080
4182	304.97	490.96	20.087	0.787	1.022	4097	82.19	479.65	20.111	0.429	0.912
4255	205.31	502.30	20.087	0.603	0.925	5292	414.77	703.71	20.111	0.573	1.018
4350	340.34	513.94	20.087	0.617	1.157	580	171.76	107.07	20.113	0.381	0.960
3472	38.52	414.42	20.087	0.581	0.953	3060	209.75	375.22	20.113	0.719	1.035
471	7.69	90.08	20.087	0.669	1.018	4233	81.68	500.16	20.113	0.445	0.957
5268	307.25	697.63	20.088	0.531	0.795	1182	102.08	188.95	20.113	0.645	1.065
1003	452.10	167.73	20.089	0.417	0.940	632	320.56	114.93	20.113	0.384	0.920
1961	89.83	269.35	20.089	0.646	0.903	2864	338.10	357.09	20.114	0.665	0.985
5331	340.06	714.25	20.089	0.466	0.860	3713	119.41	439.48	20.114	0.544	0.964
279	327.84	55.75	20.090	1.297	0.890	1233	20.55	193.15	20.114	0.309	0.895
4692	341.12	565.98	20.090	0.633	0.937	196	133.97	37.29	20.116	0.404	0.985
2528	87.90	325.09	20.090	0.858	1.277	4566	201.23	543.37	20.116	0.337	0.970
4572	357.96	544.31	20.090	0.395	0.930	4335	502.72	512.26	20.118	0.445	1.163
4564	517.63	542.99	20.090	0.086	0.725	5117	513.52	659.57	20.118	0.547	0.873
237	146.78	46.41	20.090	1.003	0.955	658	131.42	119.33	20.119	0.503	0.968
3161	276.89	383.83	20.091	0.433	0.984	2603	342.17	332.51	20.120	0.480	0.960
553	282.33	102.83	20.091	0.426	0.935	5168	69.08	671.64	20.121	0.936	0.965
4003	127.59	469.03	20.092	0.512	0.904	4985	333.08	629.06	20.121	0.797	0.983
3958	427.03	464.62	20.093	0.709	0.949	1373	252.31	206.89	20.121	0.829	1.138
5419	435.25	750.54	20.093	0.984	0.913	962	467.87	160.91	20.121	0.675	0.920
5560	105.19	812.61	20.093	0.578	0.868	1165	172.73	186.79	20.121	0.316	0.887
172	298.84	31.96	20.093	0.657	0.873	2746	315.26	346.37	20.122	0.708	0.900
1438	382.25	214.85	20.093	0.447	0.900	2650	49.27	337.53	20.122	0.499	0.860
3745	192.06	443.28	20.094	0.326	1.114	1915	97.43	265.01	20.122	0.295	1.125
4620	347.15	552.74	20.094	0.721	0.923	1759	409.33	250.88	20.122	0.660	0.923

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
3643	197.31	431.90	20.122	0.468	0.964	1212	31.45	191.23	20.144	0.575	0.983
5502	207.71	778.52	20.122	0.594	0.878	4537	328.03	539.82	20.145	0.682	0.950
1047	95.78	173.39	20.123	0.664	0.923	3170	114.71	384.39	20.145	0.451	1.015
4242	523.28	501.29	20.123	0.679	0.945	4517	386.99	537.53	20.145	0.466	0.928
1706	363.22	244.18	20.123	0.770	0.900	155	148.95	28.50	20.146	0.156	0.980
748	235.48	131.44	20.123	0.352	1.020	5441	212.86	756.85	20.146	1.136	0.870
5133	498.59	661.72	20.123	1.091	1.033	4015	80.12	470.16	20.146	0.457	0.965
4910	396.42	611.81	20.123	0.297	0.983	2893	260.71	359.76	20.146	1.306	1.620
5095	240.37	652.75	20.124	0.505	0.865	2950	331.18	365.16	20.147	0.037	0.923
3775	206.18	445.78	20.124	0.313	1.060	4442	292.80	528.09	20.147	0.635	1.040
5326	51.32	712.67	20.124	0.827	0.825	5311	439.22	709.35	20.148	0.600	1.063
655	144.62	118.97	20.125	0.726	0.955	1264	231.61	196.20	20.148	0.636	0.955
4429	128.77	525.77	20.125	0.239	0.925	5221	206.38	682.99	20.149	0.588	0.893
1490	388.42	220.88	20.125	0.390	1.295	855	86.11	146.66	20.150	0.577	0.882
4842	248.60	594.45	20.125	0.441	0.81	1302	101.72	200.58	20.150	0.516	0.960
3213	280.27	388.29	20.126	-0.118	0.990	4376	416.76	517.39	20.150	0.453	0.983
19	300.19	-26.89	20.127	0.480	0.890	812	259.65	141.74	20.150	0.469	0.953
1127	404.77	182.51	20.128	1.056	0.865	5415	373.50	748.46	20.152	1.143	0.903
1683	468.96	241.90	20.128	0.379	1.010	3782	499.77	446.37	20.152	0.385	1.062
814	305.63	141.93	20.129	0.573	0.964	3722	389.90	440.51	20.153	0.530	1.053
4136	74.19	484.34	20.129	0.593	0.917	5006	276.01	634.02	20.154	0.468	0.876
4530	221.41	539.14	20.129	0.766	1.013	2268	114.63	298.33	20.154	0.725	0.978
1460	273.18	216.90	20.129	0.703	1.047	3121	54.95	380.69	20.155	0.621	0.980
5049	293.46	644.21	20.130	0.606	0.963	260	83.12	52.48	20.155	-0.202	1.255
3736	401.36	441.90	20.130	2.460	1.130	469	185.60	89.91	20.157	0.694	1.003
4995	162.95	630.99	20.131	0.316	0.880	4861	71.73	599.43	20.158	0.661	0.900
2502	32.89	322.89	20.131	0.600	0.880	4581	22.21	545.07	20.158	0.274	0.953
1149	281.37	185.12	20.132	0.015	0.948	1469	35.27	217.99	20.159	0.677	0.955
2619	245.27	334.32	20.132	0.445	1.060	3474	230.71	414.56	20.160	0.603	0.980
1414	403.67	211.50	20.133	0.714	0.800	761	329.53	133.63	20.160	0.520	0.947
5471	409.21	766.26	20.133	0.688	0.880	5026	178.45	639.87	20.160	0.319	0.850
752	15.27	132.26	20.133	0.338	0.985	5062	291.44	647.28	20.161	0.162	0.944
101	95.91	16.02	20.133	0.687	1.003	3892	354.17	458.20	20.162	0.374	1.013
5284	8.56	702.09	20.133	0.407	0.988	3670	329.61	434.27	20.162	0.719	0.977
5022	332.68	639.01	20.134	0.640	0.878	1935	471.87	266.72	20.162	1.045	0.880
2812	70.22	352.14	20.134	1.026	1.025	2572	323.28	339.12	20.162	0.606	0.875
3768	276.92	445.17	20.135	-1.000	0.977	519	383.47	97.63	20.163	0.416	0.960
5577	234.99	527.68	20.135	0.719	0.970	2536	288.14	325.96	20.163	0.739	0.955
4769	30.49	579.68	20.136	0.811	0.978	2707	358.66	342.72	20.163	0.569	0.975
4923	474.49	315.76	20.136	0.478	0.850	1004	474.18	167.74	20.164	0.194	0.963
2073	530.94	280.53	20.137	-0.259	1.450	3740	80.15	442.60	20.164	0.478	0.953
1896	359.58	264.02	20.137	-0.010	1.027	4467	294.94	530.72	20.165	0.330	1.139
461	457.33	87.84	20.137	0.770	0.970	2505	536.93	322.98	20.165	0.872	0.915
2394	188.06	312.08	20.138	0.500	1.035	1501	49.59	221.84	20.165	0.488	1.038
5397	25.37	740.75	20.138	0.601	0.877	3349	244.35	403.34	20.165	0.521	0.943
2695	291.82	341.60	20.138	0.275	0.961	4381	137.23	518.28	20.166	0.677	1.030
5574	185.89	824.24	20.138	1.463	1.008	3283	320.74	396.66	20.166	0.527	0.879
1215	66.95	191.43	20.139	1.596	1.097	2439	481.73	316.79	20.166	0.536	0.954
2849	353.36	555.89	20.139	0.970	0.950	804	39.36	140.58	20.166	1.196	0.807
3535	236.20	421.01	20.140	0.528	1.079	2456	416.99	318.31	20.167	0.497	0.926
2962	461.09	366.12	20.141	0.336	1.024	5383	382.69	731.30	20.169	0.615	1.207
5301	542.07	705.99	20.142	0.553	1.125	40	345.98	-14.52	20.169	0.679	1.035
5108	422.63	657.99	20.142	0.513	0.970	5129	232.63	660.66	20.170	0.545	0.837
376	160.14	73.06	20.142	0.735	0.967	664	137.96	120.04	20.171	0.795	0.900
4225	185.86	499.11	20.142	0.147	0.978	1622	265.13	235.18	20.171	0.630	0.923
4754	99.68	577.87	20.142	0.629	0.945	2412	502.49	313.50	20.171	0.331	1.103
5569	186.17	818.40	20.143	0.622	0.930	3184	50.22	385.23	20.172	0.676	0.983
1329	301.16	202.83	20.143	0.613	0.970	5371	304.00	725.24	20.172	0.421	0.963
21	240.50	-26.60	20.143	0.965	1.040	3206	498.58	387.62	20.173	0.182	1.026
4422	76.42	524.99	20.144	0.758	0.955	200	456.32	37.94	20.173	0.706	0.885

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
5048	331.04	643.38	20.174	0.508	0.890	3191	39.93	386.02	20.208	0.707	1.023
500	132.86	94.67	20.174	0.673	0.847	501	434.68	94.99	20.208	0.509	0.910
1457	84.58	216.44	20.175	0.819	0.960	5587	156.11	834.82	20.208	0.420	0.965
4854	278.03	597.50	20.176	0.646	1.007	5158	105.93	668.87	20.208	0.818	1.055
4837	424.48	592.53	20.176	0.376	0.858	447	529.79	85.05	20.209	0.530	0.887
5377	331.22	729.68	20.177	0.354	0.940	2487	78.75	321.47	20.209	0.629	1.015
1484	135.47	220.47	20.177	0.407	1.020	3989	337.24	467.42	20.209	0.558	0.774
775	205.98	135.95	20.178	0.676	0.950	3850	87.59	452.53	20.210	0.555	1.004
263	44.76	53.06	20.178	0.450	0.970	2411	357.26	313.45	20.210	0.635	0.961
4664	385.87	560.44	20.178	0.396	0.878	3525	328.46	419.73	20.210	1.438	0.963
3964	150.29	465.72	20.179	0.316	0.930	3515	121.15	418.45	20.211	0.431	1.008
5053	530.59	644.71	20.179	0.216	1.028	838	250.05	144.62	20.212	0.204	0.963
27	303.57	-24.33	20.180	0.895	0.893	5290	244.49	703.17	20.212	0.500	0.910
648	359.92	118.30	20.181	0.800	0.920	3534	5.74	420.78	20.212	0.594	1.110
4217	484.41	497.24	20.181	0.492	0.920	4460	353.71	529.62	20.212	0.128	0.940
3040	232.51	373.04	20.181	0.618	1.012	3249	322.09	391.92	20.213	0.693	0.935
2301	112.66	302.21	20.181	0.594	0.970	191	349.23	36.15	20.213	0.275	0.933
2874	283.39	357.75	20.181	0.689	0.981	5097	49.35	654.16	20.214	1.107	0.960
1627	497.75	236.07	20.182	0.338	0.947	4527	158.29	539.10	20.214	0.509	0.883
3369	339.22	405.28	20.182	0.307	0.930	3347	390.18	403.17	20.216	0.507	0.847
2897	339.32	359.94	20.183	0.643	1.050	4375	105.44	517.38	20.216	0.890	0.930
3911	35.79	460.02	20.183	0.731	1.042	2657	443.04	338.00	20.216	0.529	1.020
151	191.93	27.16	20.184	0.490	0.918	3209	238.50	387.86	20.216	0.862	1.191
5068	349.33	648.56	20.184	0.607	1.048	2976	294.97	366.89	20.216	0.703	1.060
5487	290.87	772.36	20.185	1.054	1.630	4710	20.18	570.09	20.217	0.971	1.005
1408	433.98	210.72	20.185	1.356	0.987	2493	291.35	322.33	20.217	0.347	0.943
394	193.61	76.86	20.185	0.482	0.985	4847	230.33	595.55	20.219	0.327	0.960
4832	429.02	591.25	20.186	0.375	0.835	4973	260.33	626.18	20.219	0.847	0.898
3522	91.09	419.11	20.186	0.569	0.972	1757	235.34	250.68	20.219	0.244	0.895
4545	259.45	540.94	20.188	0.571	0.963	5425	216.71	752.24	20.219	0.212	0.895
999	269.85	167.16	20.188	0.659	0.948	4211	340.30	496.15	20.220	0.875	0.918
4491	268.60	533.89	20.189	0.603	0.904	4584	231.10	545.50	20.220	0.755	0.955
3139	356.27	382.09	20.189	0.583	0.899	3027	449.19	371.96	20.220	0.546	0.978
331	127.85	64.93	20.191	0.494	0.865	4771	183.17	579.98	20.220	0.408	0.910
5181	20.29	674.17	20.191	0.734	1.015	4954	165.40	622.54	20.221	0.910	0.907
301	525.20	60.98	20.193	0.733	0.875	1183	400.95	189.04	20.221	0.800	0.893
742	185.92	130.91	20.194	1.191	0.857	2968	9.52	367.72	20.224	0.482	0.995
4266	308.18	503.30	20.194	0.854	0.973	2585	423.02	330.51	20.225	0.656	0.910
98	38.22	15.06	20.194	0.271	1.053	3869	138.06	455.14	20.225	0.744	0.910
422	207.01	81.51	20.195	0.194	0.895	2194	82.12	291.58	20.225	0.568	0.987
1929	89.10	266.05	20.196	0.703	0.997	1839	434.93	259.29	20.225	0.577	0.883
1648	182.94	238.06	20.197	0.684	0.940	5112	99.77	658.46	20.226	0.361	0.950
4675	381.32	562.38	20.197	0.574	0.815	771	23.88	135.32	20.226	0.256	0.928
5055	338.41	645.95	20.198	0.626	0.768	1407	504.66	210.46	20.226	0.548	0.900
3908	440.16	459.87	20.199	0.329	1.284	5165	370.02	670.69	20.226	0.438	0.950
2907	291.83	360.45	20.199	0.666	0.985	4197	137.59	494.25	20.228	0.356	0.996
4424	502.73	525.14	20.200	0.277	0.980	493	14.94	93.59	20.228	0.738	0.957
4666	246.73	560.67	20.200	0.326	0.873	1525	251.50	225.03	20.228	0.781	0.954
929	289.31	156.53	20.200	0.755	1.002	1411	63.69	211.11	20.229	0.740	0.973
3304	136.47	398.23	20.201	0.383	1.022	3705	236.08	438.73	20.229	0.407	1.016
3036	392.68	372.69	20.201	1.040	0.920	5261	363.79	696.42	20.229	1.034	0.973
5422	275.68	751.49	20.201	0.612	0.903	2267	484.08	298.15	20.230	0.515	0.992
5046	469.23	643.07	20.202	0.661	0.783	2076	524.24	280.74	20.230	-0.870	1.527
4178	296.82	490.47	20.202	0.503	0.949	3952	124.98	464.31	20.230	0.504	0.873
51	414.50	-7.88	20.203	0.334	0.858	5414	99.25	748.03	20.231	0.569	0.990
3267	21.57	394.47	20.203	0.784	1.004	1947	183.27	267.49	20.231	0.917	0.883
5531	494.28	791.56	20.203	0.303	0.837	404	342.61	78.95	20.231	0.794	0.987
5147	63.89	665.82	20.206	0.516	0.997	5351	271.72	719.41	20.232	0.741	0.998
773	111.77	135.54	20.206	0.648	1.050	2299	183.12	302.16	20.232	0.604	1.190
2216	222.74	293.48	20.207	0.462	0.885	1798	488.86	254.60	20.234	0.952	0.975

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2599	169.01	332.11	20.234	0.652	1.000	5229	392.26	686.04	20.264	0.643	1.085
2236	398.92	295.25	20.235	0.586	0.903	5027	383.08	639.94	20.265	1.531	0.925
159	43.49	28.80	20.236	0.538	1.273	1653	147.92	238.60	20.265	-0.009	0.940
3732	24.40	441.56	20.236	0.630	0.978	913	270.32	154.44	20.266	0.773	1.145
4708	289.04	569.87	20.236	0.664	0.921	393	391.18	76.57	20.267	0.616	0.967
2858	348.72	356.87	20.237	0.564	0.915	268	222.11	53.84	20.267	0.252	0.847
1859	213.78	260.88	20.237	0.732	1.005	4111	376.97	480.95	20.268	0.942	0.913
4752	199.91	577.72	20.238	0.653	0.908	11	255.82	-33.90	20.268	0.673	1.017
5076	428.43	649.67	20.238	0.840	1.135	4615	344.83	552.10	20.269	0.569	0.898
738	478.34	130.17	20.238	0.474	0.825	5040	221.38	641.67	20.269	0.437	1.010
194	463.54	37.04	20.238	0.944	0.990	5316	421.48	710.41	20.270	0.502	0.928
1089	301.20	178.17	20.238	0.221	0.897	511	196.99	96.68	20.271	0.726	0.857
3592	275.47	426.55	20.240	0.435	1.054	4738	380.29	575.04	20.272	0.342	0.860
5282	138.69	700.17	20.241	1.111	0.902	862	177.89	147.85	20.272	0.310	0.850
4404	139.86	522.03	20.241	0.450	1.000	213	465.69	40.33	20.272	1.060	0.877
4216	259.34	496.98	20.241	0.571	0.938	1727	409.31	246.63	20.273	0.483	0.940
4546	10.08	540.99	20.241	-0.732	1.220	3117	305.74	380.22	20.274	0.536	1.029
5063	403.06	617.49	20.242	0.958	0.890	5554	21.67	805.12	20.274	0.659	0.978
1148	416.02	184.90	20.242	0.541	1.023	5067	23.67	648.46	20.274	0.992	0.825
2920	454.51	361.22	20.242	-0.195	1.767	5303	180.02	706.97	20.274	1.724	0.902
3937	358.47	462.81	20.242	0.712	0.955	4205	317.43	495.51	20.275	0.318	1.018
4252	100.26	502.12	20.243	0.539	1.073	5329	290.55	713.12	20.277	0.596	0.873
858	526.95	146.91	20.243	0.783	0.905	1726	440.64	246.42	20.277	0.187	0.940
5495	41.73	777.27	20.243	0.831	0.960	3042	331.01	373.39	20.277	0.148	0.817
2649	467.95	337.52	20.243	0.573	0.896	4756	330.11	577.96	20.278	0.509	0.908
2424	237.34	314.60	20.245	0.792	1.048	4302	284.56	506.31	20.278	0.609	0.955
5564	254.89	815.21	20.245	0.465	0.965	4998	366.57	632.17	20.278	0.468	1.003
2818	76.16	352.72	20.246	1.036	0.994	736	381.14	129.84	20.281	0.556	0.927
2997	239.71	368.98	20.247	0.591	1.036	5444	85.21	757.15	20.283	0.694	0.875
3476	348.10	414.62	20.247	1.046	1.080	2627	165.76	335.07	20.283	0.729	1.055
827	183.90	143.70	20.247	0.693	1.050	5374	449.62	727.60	20.283	0.541	0.890
4903	362.84	611.05	20.247	0.445	0.815	3130	194.50	381.57	20.283	0.250	1.077
1174	272.08	188.38	20.247	0.331	0.970	1347	365.04	204.28	20.283	0.796	0.925
3207	417.71	387.80	20.247	0.883	0.897	2251	525.15	296.83	20.283	0.909	1.400
798	158.95	139.73	20.249	0.301	0.965	2297	281.88	302.02	20.284	0.729	1.043
5137	76.33	662.74	20.249	0.540	0.865	946	327.50	158.68	20.284	0.351	1.040
4188	334.12	492.51	20.251	0.538	0.713	2795	477.71	350.36	20.284	0.669	0.904
5408	144.90	746.53	20.251	0.280	0.905	285	154.92	57.11	20.285	0.721	0.975
1618	544.44	235.03	20.251	0.872	0.880	414	266.57	80.52	20.285	0.633	0.925
4417	405.75	524.47	20.251	0.735	0.975	419	57.41	81.21	20.285	0.268	0.965
3008	406.90	369.93	20.251	0.721	0.916	1170	215.33	187.60	20.286	0.944	1.007
443	509.73	84.43	20.252	0.570	1.033	4641	344.46	556.37	20.286	0.370	0.900
2213	493.48	293.22	20.252	0.728	0.966	358	261.94	68.57	20.286	0.762	1.037
4668	224.73	560.80	20.252	0.685	0.793	386	221.79	74.89	20.286	0.600	0.845
5406	485.70	745.68	20.253	1.085	0.967	3229	359.83	389.79	20.288	0.794	0.917
2413	376.64	313.52	20.254	0.568	0.970	4000	274.90	468.33	20.288	0.600	0.996
5346	5.18	718.87	20.255	0.375	0.975	5454	424.57	760.27	20.288	0.687	0.880
37	263.11	-17.42	20.255	-0.088	0.925	562	29.29	104.19	20.288	0.271	0.940
76	292.79	8.63	20.257	0.478	0.922	531	123.12	100.32	20.289	0.866	1.043
4395	13.18	520.42	20.257	0.865	0.848	266	281.32	53.37	20.290	0.506	1.023
4709	212.27	570.04	20.259	0.508	0.950	4497	96.35	534.71	20.291	0.727	1.015
5135	537.66	662.23	20.259	0.164	0.873	3840	257.14	451.95	20.292	0.597	0.969
5043	327.97	641.88	20.259	0.357	0.967	790	126.34	138.28	20.292	0.806	0.850
4741	385.92	575.53	20.259	0.817	0.913	5032	308.84	640.52	20.293	0.385	0.970
4838	240.45	592.57	20.260	0.278	0.947	5085	382.87	651.64	20.293	1.263	0.953
1156	530.18	186.17	20.260	0.375	0.907	5077	177.86	650.04	20.294	0.465	0.905
2254	361.96	297.11	20.260	0.497	0.966	5134	239.88	662.09	20.296	0.679	0.920
4372	155.62	516.63	20.261	1.569	1.057	650	229.35	118.60	20.296	0.254	0.930
5080	30.36	650.63	20.263	0.673	0.953	5440	175.90	756.42	20.297	0.611	0.895
4109	5.92	480.76	20.263	0.408	0.912	4388	317.80	518.80	20.297	0.740	0.853

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
3003	344.33	369.76	20.297	1.008	1.143	1050	539.79	173.68	20.329	0.759	1.005
3635	99.47	431.34	20.297	0.153	0.977	3323	51.99	400.54	20.330	0.154	1.040
306	100.26	61.63	20.298	0.416	0.960	1243	389.32	194.05	20.333	1.355	0.890
118	356.26	19.58	20.298	0.055	0.853	2513	404.34	323.87	20.333	0.557	0.924
1613	333.05	234.58	20.300	0.274	0.900	5128	351.31	660.58	20.334	0.457	0.877
4475	370.83	531.63	20.301	0.464	0.832	3257	471.08	392.80	20.335	0.609	0.977
1324	435.60	202.50	20.302	0.764	0.863	2117	248.00	285.18	20.335	0.643	1.038
3512	87.21	418.05	20.303	0.614	1.092	1816	148.49	256.96	20.336	0.528	1.243
4650	172.43	557.18	20.303	0.280	0.933	3733	530.51	441.61	20.336	0.529	0.877
99	402.79	15.19	20.303	0.865	0.890	3624	337.91	430.34	20.336	0.659	1.160
4751	217.75	577.27	20.304	0.695	1.027	3260	374.47	393.15	20.338	0.792	0.888
647	304.72	118.01	20.304	0.571	1.051	4220	399.35	498.09	20.338	0.674	0.863
5139	229.36	663.47	20.304	0.397	0.900	1807	111.20	256.02	20.339	0.224	0.955
5335	246.98	715.25	20.305	0.791	1.043	850	27.73	146.42	20.339	0.273	0.908
1475	122.43	219.38	20.305	0.570	0.910	1504	433.61	221.91	20.339	0.727	0.993
4760	469.93	578.65	20.305	0.666	1.035	1271	397.05	196.87	20.340	0.650	0.920
4089	55.71	478.81	20.306	0.357	0.882	4273	386.38	504.18	20.340	0.414	1.160
3730	377.31	441.35	20.306	0.483	0.935	4992	170.92	629.98	20.340	0.457	0.943
5344	210.79	718.78	20.306	0.461	1.007	528	239.42	99.74	20.341	0.795	0.881
4843	93.11	594.70	20.306	0.920	0.837	3681	257.27	435.66	20.342	0.466	1.070
5038	407.40	641.48	20.306	1.024	0.935	5214	333.12	682.19	20.343	0.762	0.930
207	382.02	39.34	20.307	0.415	0.990	2578	292.72	330.17	20.343	0.564	0.978
326	543.22	64.28	20.307	0.585	1.010	5528	343.02	791.18	20.343	0.868	1.003
4940	45.48	619.43	20.307	0.440	0.948	3652	426.29	432.72	20.344	0.843	0.983
5540	158.06	797.61	20.308	0.376	0.998	5481	177.44	770.40	20.345	0.224	0.977
3180	398.48	385.03	20.308	0.477	0.831	4141	308.84	485.14	20.346	0.539	0.914
3292	15.87	397.33	20.309	0.812	1.080	5020	425.31	638.79	20.347	0.494	1.047
4043	263.07	473.02	20.309	0.439	1.075	2467	397.78	319.54	20.347	0.633	0.845
1779	223.38	253.19	20.310	0.008	0.910	5496	427.05	777.47	20.347	0.612	0.883
2542	158.96	326.51	20.310	0.511	0.993	4483	67.31	532.80	20.348	0.372	0.945
4988	259.77	629.40	20.310	0.584	0.870	4232	303.66	500.15	20.349	0.847	0.986
4374	283.23	516.81	20.311	0.913	1.324	4172	318.49	489.78	20.350	0.502	0.975
740	445.74	130.37	20.312	0.751	0.860	4121	41.98	482.24	20.351	0.576	0.950
1786	50.08	253.78	20.313	0.341	1.100	3316	418.80	399.95	20.351	0.539	0.904
4007	428.80	469.46	20.316	0.321	0.978	5357	419.70	721.09	20.352	0.989	0.900
2220	157.92	293.86	20.317	-0.062	0.983	357	334.22	68.48	20.352	0.928	0.977
4956	62.05	622.74	20.317	0.697	0.933	202	281.67	38.42	20.352	0.653	0.898
22	416.48	-26.19	20.318	0.530	0.898	3888	331.30	457.57	20.352	0.561	0.957
4611	104.25	551.60	20.318	0.689	0.947	3893	382.08	458.25	20.353	0.348	1.400
5407	48.43	745.74	20.319	0.530	0.843	5201	53.54	678.54	20.353	0.845	0.800
1029	321.80	170.97	20.319	0.731	0.950	1375	430.44	207.32	20.353	0.578	0.927
1968	486.89	269.91	20.320	0.897	0.863	60	346.41	-3.85	20.355	1.132	1.047
4823	375.26	589.98	20.320	0.692	0.933	906	376.08	153.69	20.356	0.254	1.055
1044	128.48	173.07	20.321	0.600	0.920	2861	120.18	356.93	20.356	0.091	1.300
602	372.51	109.90	20.321	-0.327	0.943	4009	498.07	469.52	20.356	0.692	1.025
1756	137.86	250.66	20.322	-0.049	0.893	5249	260.03	693.05	20.356	0.073	0.934
639	328.53	116.00	20.322	-0.056	0.973	4913	542.41	612.67	20.357	0.986	0.967
2698	434.61	341.81	20.322	0.503	1.055	5420	482.43	750.96	20.357	0.433	1.057
5338	249.66	717.28	20.323	0.941	0.985	2291	463.31	300.91	20.358	0.894	0.818
3484	77.40	415.01	20.323	0.606	1.013	1934	509.13	286.65	20.359	0.897	1.090
656	434.38	119.21	20.324	0.432	0.938	1294	350.73	199.85	20.359	0.910	0.900
1946	425.62	267.41	20.324	0.322	0.907	79	312.61	9.43	20.360	0.196	0.930
3187	410.07	385.69	20.325	0.410	0.900	3923	54.10	461.84	20.361	0.270	0.965
4431	529.51	526.22	20.325	0.526	0.907	2919	175.48	361.20	20.361	2.034	1.140
551	226.07	102.49	20.327	0.564	0.923	3881	470.72	456.87	20.361	-0.025	1.430
2621	271.49	334.71	20.327	0.546	1.000	2340	128.50	306.38	20.363	0.499	1.140
3368	537.52	405.21	20.328	0.352	0.905	3984	387.20	467.28	20.364	1.020	1.335
4324	387.40	510.28	20.329	0.651	0.963	163	450.52	29.86	20.364	1.335	1.037
3706	403.67	438.78	20.329	0.329	0.959	824	146.35	143.59	20.365	0.377	1.075
5328	489.33	713.12	20.329	0.344	0.905	2641	498.41	336.54	20.365	0.260	1.017

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
525	18.37	98.54	20.366	0.633	0.898	3538	206.78	421.61	20.410	0.563	1.085
2122	284.21	285.48	20.367	0.843	1.058	3698	12.40	437.79	20.410	1.215	0.980
286	400.74	57.67	20.367	0.413	0.858	3580	355.81	425.65	20.411	1.040	0.928
5054	180.98	645.04	20.368	0.627	0.897	4713	240.65	570.57	20.411	0.453	0.880
109	303.56	18.66	20.370	0.429	0.977	2620	161.00	334.35	20.411	0.562	1.107
2982	281.08	367.54	20.370	0.380	0.968	453	28.87	86.20	20.412	0.895	1.003
1189	464.40	189.56	20.371	0.283	0.963	3495	32.29	416.36	20.412	0.566	0.942
1608	213.32	234.12	20.372	0.209	0.963	1048	200.50	173.42	20.413	0.248	0.910
4207	95.81	495.38	20.372	0.827	1.007	56	494.40	-5.82	20.413	0.494	0.973
1060	429.76	174.85	20.372	2.345	1.003	5016	245.41	637.42	20.414	0.693	1.227
5593	139.79	842.36	20.373	0.543	0.970	4059	473.02	475.16	20.414	0.497	1.100
1646	115.31	237.97	20.373	0.257	0.927	799	409.69	139.75	20.415	0.572	1.010
1026	133.83	170.66	20.375	0.720	0.963	5197	4.35	677.52	20.416	0.891	0.950
2719	398.07	343.85	20.375	0.467	0.871	2164	41.49	289.10	20.417	0.219	0.887
1623	204.68	235.38	20.376	0.536	1.037	28	325.40	-24.31	20.417	0.350	1.057
5220	320.55	682.83	20.376	0.793	0.928	4068	490.71	476.24	20.417	0.392	0.975
4264	243.86	503.15	20.376	0.543	0.966	2271	529.48	298.59	20.418	1.527	1.493
3453	381.50	412.46	20.377	0.367	0.958	2735	103.26	345.13	20.419	0.427	1.052
4	292.71	-39.17	20.377	0.407	1.115	4453	97.62	528.84	20.420	0.501	1.040
3804	88.18	448.36	20.379	0.605	0.970	779	19.62	136.42	20.421	0.680	0.945
1143	347.32	184.31	20.380	0.983	0.913	4106	512.56	480.43	20.422	0.514	1.030
421	15.94	81.49	20.380	1.117	1.070	1352	405.91	204.97	20.422	0.689	0.837
5579	51.56	830.22	20.381	0.837	1.007	298	421.33	60.40	20.422	1.301	1.007
4002	283.05	468.54	20.382	0.445	0.938	5576	284.86	827.47	20.422	0.690	0.867
5207	443.21	680.19	20.382	0.783	0.963	1390	298.14	208.47	20.423	0.287	0.999
550	167.27	102.44	20.382	0.275	0.873	440	179.66	84.22	20.427	0.331	0.925
973	353.81	164.06	20.383	0.503	0.873	2913	31.11	360.66	20.427	0.629	0.993
626	443.13	113.08	20.384	0.472	0.825	690	456.06	123.71	20.428	0.654	0.877
3774	320.05	445.74	20.385	0.323	0.920	5526	157.46	789.97	20.428	0.623	0.870
5146	429.65	664.80	20.385	0.815	1.010	523	219.94	98.44	20.428	0.300	0.873
1455	231.52	216.32	20.385	0.173	1.010	4263	225.19	503.08	20.429	0.563	0.903
2803	200.04	351.32	20.385	0.315	1.157	3025	490.98	371.78	20.429	0.416	0.983
4606	167.70	550.88	20.386	0.608	0.910	1780	67.97	253.26	20.429	0.112	0.963
1815	184.84	256.79	20.386	1.389	1.043	4249	230.25	501.96	20.429	0.221	0.940
5590	167.43	838.01	20.388	0.515	0.910	3418	408.20	409.64	20.430	0.212	0.945
4503	307.30	535.22	20.390	0.883	0.966	4900	290.75	610.13	20.430	0.488	0.947
369	296.59	71.53	20.390	0.720	0.866	183	154.96	34.95	20.430	0.677	0.960
4761	398.40	578.92	20.390	0.214	0.903	4765	7.65	579.11	20.431	0.630	0.983
4966	541.48	624.75	20.391	0.658	0.880	2500	370.48	322.71	20.431	0.839	0.938
219	40.31	42.30	20.391	0.801	0.845	1454	61.35	216.25	20.432	0.781	1.037
4718	314.47	571.22	20.392	0.801	1.076	436	162.49	83.57	20.432	1.003	0.777
4554	85.32	541.56	20.393	0.543	0.873	3205	495.07	387.59	20.433	0.826	1.040
4336	512.94	512.32	20.395	0.278	0.918	4855	289.74	597.80	20.435	0.326	0.910
4054	274.96	474.52	20.396	0.602	0.978	5519	186.15	786.62	20.435	1.252	0.820
2967	149.61	366.47	20.396	0.330	1.013	2235	383.25	295.24	20.438	0.354	0.913
5138	55.38	663.41	20.396	1.015	0.913	4960	140.04	623.64	20.439	1.546	0.857
423	184.32	81.83	20.396	0.714	0.850	4386	366.48	518.70	20.440	0.896	0.893
247	22.82	49.16	20.396	0.494	0.898	5340	34.09	718.30	20.440	0.505	0.970
872	504.64	149.37	20.397	0.202	1.030	4745	120.72	576.20	20.441	0.995	0.913
3672	377.61	434.63	20.397	0.369	0.904	430	347.28	82.31	20.441	0.202	0.888
5573	264.80	821.39	20.398	0.566	0.900	1397	84.89	209.17	20.441	0.784	1.180
2035	414.39	276.81	20.401	0.599	0.927	4528	538.32	539.10	20.442	0.800	0.893
2396	13.56	312.21	20.402	0.147	0.925	5426	165.05	752.72	20.444	1.088	0.970
4605	437.98	550.76	20.404	0.442	0.775	1781	324.63	253.33	20.445	1.394	1.110
5512	7.47	783.71	20.406	0.466	1.053	349	495.11	67.67	20.446	0.994	1.003
2409	499.17	313.16	20.406	0.319	1.052	1292	274.60	199.14	20.446	1.175	1.025
5595	53.87	843.53	20.406	0.298	0.960	759	308.58	132.96	20.447	0.696	0.915
5466	249.71	764.38	20.407	0.491	0.938	5198	238.73	677.54	20.447	0.535	0.851
3811	76.38	449.41	20.407	0.747	0.946	4087	519.01	478.64	20.447	0.264	1.220
1783	21.47	253.59	20.410	0.363	0.887	503	444.11	95.65	20.449	0.778	0.927

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
1765	363.79	251.42	20.451	0.421	0.950	5037	161.26	641.19	20.487	0.363	0.870
767	195.81	134.61	20.451	0.071	1.000	4871	368.22	601.58	20.488	0.992	0.827
4828	223.09	590.82	20.452	0.533	0.947	5078	465.86	650.11	20.490	0.603	0.990
1313	333.15	201.64	20.452	0.301	0.930	544	100.81	25.25	20.490	0.269	0.888
3393	533.71	407.33	20.452	0.838	1.020	458	417.51	87.40	20.491	0.427	0.985
636	110.68	115.70	20.452	0.754	0.990	126	449.76	21.06	20.495	1.530	0.927
1610	32.31	234.32	20.453	0.460	0.990	3933	350.34	462.56	20.496	0.826	1.120
4974	251.55	626.37	20.453	0.788	0.973	4149	467.15	485.77	20.500	0.217	0.820
2428	424.28	314.97	20.454	1.080	0.908	1491	423.95	221.01	20.500	0.381	0.905
58	355.44	-4.76	20.457	0.601	0.935	1348	63.99	204.51	20.500	0.352	1.015
4587	108.26	545.85	20.457	0.918	1.130	5391	479.01	736.46	20.501	0.396	0.940
770	44.21	135.28	20.458	0.565	0.920	24	340.16	-25.90	20.502	0.341	1.050
5572	39.50	821.36	20.459	1.268	0.885	4462	438.57	530.01	20.503	0.823	0.883
5126	279.05	660.09	20.459	0.918	0.922	4513	68.38	536.56	20.503	1.262	0.855
3446	104.85	411.90	20.460	0.894	1.043	4423	5.81	525.11	20.505	0.534	0.950
5468	267.06	764.88	20.460	0.474	0.810	1022	143.77	170.03	20.506	-0.362	0.990
1171	2.30	187.76	20.461	0.001	1.230	5324	161.81	711.94	20.506	0.325	0.933
4812	77.91	588.26	20.462	0.612	0.825	3100	164.27	378.77	20.506	0.552	1.225
4811	193.80	588.13	20.462	0.463	0.937	250	26.92	49.98	20.507	0.565	0.877
2877	485.16	357.93	20.462	0.757	0.995	3955	27.68	464.41	20.508	0.678	1.058
342	181.36	66.22	20.464	0.720	0.940	881	295.41	150.04	20.509	1.438	1.557
5345	86.82	718.83	20.464	0.358	1.020	4908	251.58	611.75	20.510	0.479	0.894
5208	282.06	680.44	20.464	0.615	1.572	908	423.18	153.81	20.511	1.108	1.087
4146	173.40	485.41	20.465	0.429	1.055	792	424.02	138.56	20.512	0.870	0.957
4672	165.08	561.61	20.467	0.779	0.990	2281	389.92	299.86	20.512	0.593	0.967
204	199.24	38.91	20.468	0.716	1.045	4797	480.28	585.38	20.514	0.878	0.723
4739	352.56	575.09	20.468	0.504	0.858	590	76.08	108.78	20.514	0.934	1.005
123	390.13	19.89	20.468	0.348	0.980	3174	97.84	384.71	20.517	0.695	0.942
4296	441.22	507.47	20.469	0.100	1.010	4600	31.20	549.81	20.517	0.682	0.888
1547	434.19	227.28	20.469	0.295	0.905	4781	425.08	582.82	20.517	0.917	0.853
4643	225.61	556.39	20.470	0.576	0.850	5315	358.50	710.22	20.518	0.634	0.913
3098	541.20	378.73	20.472	0.554	0.992	3954	302.71	464.38	20.518	0.872	0.978
2934	5.74	362.98	20.472	0.305	0.965	5269	247.71	697.63	20.519	0.513	0.958
175	344.84	33.11	20.473	0.420	0.917	84	478.51	10.60	20.521	1.127	0.980
335	67.02	65.55	20.473	0.142	0.967	3315	292.74	399.73	20.521	0.771	1.046
3397	10.15	407.45	20.474	0.239	0.984	610	118.62	111.17	20.522	0.306	0.910
2397	252.31	312.29	20.474	0.581	1.053	5520	10.70	788.25	20.522	0.287	1.057
4614	43.99	552.08	20.474	0.465	0.910	4717	60.77	571.21	20.523	0.412	0.837
4865	405.01	600.36	20.475	0.246	0.868	4031	331.48	472.11	20.523	0.737	0.860
4030	163.94	471.97	20.475	0.400	1.043	1193	365.21	189.76	20.525	0.325	0.843
4968	177.47	625.00	20.476	0.512	0.910	4749	422.61	577.18	20.526	0.264	0.927
5389	279.30	736.02	20.476	0.670	1.071	605	101.57	110.36	20.526	0.642	0.815
2832	375.88	353.94	20.476	0.737	0.966	4918	241.33	614.76	20.527	0.624	0.892
2431	270.63	315.42	20.476	0.547	0.996	805	200.76	140.78	20.527	1.579	0.990
582	338.42	107.30	20.476	0.286	1.003	2491	44.08	322.08	20.528	0.917	1.050
1275	494.28	197.48	20.477	0.669	0.947	1801	90.16	255.04	20.530	-0.058	1.095
3026	319.46	371.95	20.480	0.405	1.018	1498	464.47	221.64	20.532	0.896	1.060
1075	200.28	176.16	20.480	0.007	0.963	3704	277.17	438.71	20.532	0.856	1.007
4290	454.33	506.22	20.481	0.570	0.827	969	235.22	160.45	20.532	0.149	1.047
4083	460.33	478.05	20.481	0.500	0.890	4724	414.16	572.98	20.533	0.510	0.913
967	456.06	163.18	20.481	-0.030	1.033	3641	12.22	431.78	20.533	0.410	0.967
2152	338.22	287.42	20.483	0.296	0.950	4532	42.74	539.20	20.534	0.656	0.927
5115	161.42	659.11	20.483	0.670	0.920	735	339.39	129.78	20.534	0.346	1.007
1558	125.37	228.34	20.484	0.555	0.913	496	143.18	94.01	20.538	0.679	0.830
5517	402.99	785.89	20.485	1.042	0.878	5437	140.77	756.11	20.538	0.572	0.965
5535	75.82	795.62	20.485	0.460	1.008	5004	387.85	633.30	20.539	0.499	0.950
2173	531.79	269.48	20.485	0.033	1.283	5102	350.06	656.64	20.539	1.181	0.870
3627	380.42	430.53	20.486	0.939	0.905	5455	114.65	760.84	20.540	1.128	0.887
4098	165.91	479.68	20.486	0.099	1.045	4218	238.35	497.75	20.540	1.052	0.993
3600	85.40	427.38	20.486	0.611	1.053	4884	310.81	607.09	20.541	1.013	0.834

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
444	358.75	84.54	20.542	1.014	0.900	1388	479.54	208.43	20.598	0.139	0.920
4063	365.56	475.64	20.542	0.915	0.975	2681	427.49	340.63	20.598	0.816	0.905
3232	111.21	390.26	20.543	0.889	1.168	4818	61.04	589.49	20.599	-0.942	0.900
174	353.88	32.45	20.544	0.570	0.965	273	317.92	54.76	20.602	1.092	1.045
5333	299.72	714.74	20.545	0.536	0.863	678	444.59	121.61	20.602	0.168	0.927
5309	185.57	708.65	20.546	0.450	0.905	3553	98.66	422.78	20.603	0.189	1.028
4977	232.68	626.89	20.546	0.941	0.838	362	223.62	70.40	20.603	0.848	0.757
117	11.97	19.51	20.546	0.911	0.930	4260	109.35	502.69	20.604	0.375	0.988
333	324.37	65.26	20.547	0.282	0.955	5310	338.51	708.94	20.604	0.684	0.843
3863	374.08	454.21	20.548	0.526	0.915	4398	291.15	520.87	20.604	0.556	1.320
346	280.06	67.21	20.549	1.208	1.008	4898	76.64	609.96	20.604	0.467	0.923
5087	124.46	651.99	20.550	1.002	0.965	4312	286.33	509.42	20.605	1.017	0.947
4257	262.31	502.64	20.551	0.363	0.898	3720	504.83	440.40	20.605	0.474	1.040
513	340.02	98.85	20.551	0.292	0.947	780	526.73	136.73	20.606	0.252	0.880
518	525.10	97.89	20.551	0.550	0.907	3922	240.80	461.79	20.606	0.853	0.934
5082	331.07	651.30	20.552	0.489	0.810	5178	27.66	672.78	20.606	0.716	0.950
241	499.44	47.17	20.552	0.580	1.040	2415	410.16	313.57	20.609	0.332	0.960
3075	364.28	376.19	20.553	0.623	0.986	3144	72.09	382.33	20.610	0.299	0.897
4198	115.74	494.42	20.553	0.525	1.047	5143	119.30	664.16	20.610	0.919	0.875
3290	361.14	597.09	20.554	0.890	0.976	3970	393.87	466.26	20.614	-1.967	1.365
3296	20.15	397.53	20.557	-0.160	1.066	3786	380.81	446.45	20.615	0.397	1.003
4320	347.74	510.03	20.557	0.730	1.045	601	470.28	109.75	20.618	0.257	0.925
4766	439.41	579.25	20.557	0.988	0.880	399	308.03	78.03	20.619	0.805	0.938
36	321.54	-17.63	20.558	0.686	0.533	4489	440.02	533.71	20.619	0.235	0.870
365	18.62	71.35	20.558	1.070	0.978	4484	526.93	532.90	20.620	0.818	1.080
462	198.53	88.08	20.560	0.708	0.946	364	65.42	71.28	20.621	0.476	0.855
5363	308.80	722.51	20.561	1.045	1.008	3552	242.11	422.63	20.622	0.478	1.007
5122	29.97	659.81	20.561	0.613	0.840	1594	472.49	232.63	20.622	-0.054	0.958
3716	99.04	439.77	20.561	0.617	1.078	4421	62.98	524.90	20.622	0.723	0.915
4129	482.12	483.61	20.565	0.901	1.170	5596	191.63	844.53	20.624	0.770	0.870
494	72.63	93.63	20.566	1.668	0.875	214	79.35	40.87	20.626	0.677	0.968
5490	323.76	773.70	20.566	0.718	1.067	1224	418.03	192.56	20.627	0.354	0.897
512	45.43	96.80	20.566	0.758	0.930	1010	189.71	168.34	20.628	0.468	0.907
4902	458.62	610.79	20.568	0.612	1.000	143	446.57	25.14	20.629	0.454	0.957
5513	330.46	784.51	20.569	0.436	0.980	2033	528.00	276.52	20.629	0.303	1.415
4239	478.97	501.06	20.569	0.576	0.955	4667	76.99	560.75	20.630	0.332	0.933
4703	270.70	568.56	20.572	0.190	1.040	5252	333.56	693.60	20.633	0.278	0.887
3259	420.79	392.93	20.572	0.594	0.970	3391	173.33	407.15	20.633	0.307	0.946
717	186.66	127.27	20.572	0.670	0.870	600	213.06	109.60	20.634	0.112	0.873
5362	71.85	722.13	20.572	0.530	0.875	5463	446.21	763.15	20.636	0.770	1.003
3131	341.45	381.80	20.573	0.784	1.020	4670	356.80	560.97	20.637	0.665	0.807
4820	93.21	589.63	20.573	0.401	0.860	378	52.63	74.00	20.637	0.934	1.057
4916	497.24	614.58	20.573	0.766	0.733	5248	466.42	692.78	20.637	1.073	0.915
4179	271.46	490.55	20.573	0.968	1.055	594	267.39	109.03	20.637	0.347	0.918
2343	345.54	306.52	20.575	1.203	0.950	5566	82.86	816.51	20.639	0.863	0.963
1034	71.48	171.39	20.577	0.521	0.860	3376	256.81	405.97	20.640	0.650	0.931
368	353.22	71.51	20.576	0.782	0.833	895	449.89	152.14	20.641	-0.275	1.010
1303	358.23	200.66	20.579	1.050	1.038	4850	112.93	595.86	20.643	0.841	1.010
5482	140.55	770.57	20.579	1.583	0.853	198	444.24	37.39	20.643	0.299	0.960
5388	471.51	734.72	20.580	0.689	0.910	5151	49.27	667.34	20.644	0.373	0.870
4277	22.21	504.64	20.583	0.615	0.943	5409	516.42	746.54	20.644	0.600	0.895
756	131.09	132.84	20.584	0.575	1.053	3927	284.08	462.16	20.644	0.496	0.945
4764	138.58	579.09	20.584	0.292	0.947	5445	101.80	757.40	20.645	0.522	0.877
5163	240.60	669.18	20.584	0.819	0.939	2645	16.95	337.31	20.645	0.264	0.902
112	351.55	19.14	20.586	-0.071	0.915	5323	254.91	711.61	20.646	0.319	0.980
2061	188.59	279.17	20.586	0.911	1.043	4882	331.51	605.25	20.647	0.527	0.883
3642	262.61	431.83	20.588	0.140	1.194	5339	173.15	717.87	20.648	1.332	0.907
5506	97.03	417.62	20.592	0.617	1.113	5012	365.08	635.67	20.648	0.319	1.047
1471	97.11	218.88	20.598	0.595	1.275	4840	306.35	593.26	20.648	0.495	0.967
319	131.13	63.62	20.598	0.077	0.863	2658	502.74	338.00	20.650	0.347	1.210

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
4976	271.58	626.75	20.650	0.702	0.921	5312	37.71	709.48	20.724	0.400	0.873
3392	425.13	407.26	20.652	1.023	0.980	4594	150.02	546.90	20.725	0.360	0.925
5404	352.31	744.59	20.654	0.333	0.990	4810	343.43	587.61	20.725	0.417	0.913
5507	351.65	782.11	20.654	0.982	0.850	2836	496.81	354.52	20.728	1.378	0.978
4959	193.45	623.54	20.656	0.687	1.015	5081	195.67	650.82	20.728	0.692	0.863
5599	211.75	847.89	20.656	1.026	1.067	4604	367.32	550.23	20.728	0.721	0.843
1877	453.98	262.47	20.660	0.164	0.930	4428	475.42	525.59	20.730	0.813	0.857
5518	61.95	786.12	20.661	0.767	0.915	3851	496.78	452.75	20.732	0.656	0.992
2058	503.17	278.83	20.662	0.471	1.105	2060	46.37	278.99	20.732	0.101	0.883
4553	362.73	541.54	20.665	0.769	0.823	2468	438.16	319.59	20.733	0.306	0.940
67	256.22	2.45	20.665	0.340	0.882	2329	47.55	305.82	20.733	0.262	0.870
4971	289.95	625.47	20.667	0.468	0.930	472	270.66	90.41	20.734	0.511	0.960
4909	329.15	611.76	20.671	0.545	0.983	4148	461.55	485.66	20.736	0.691	0.873
3046	440.31	373.67	20.671	0.337	0.957	5074	523.14	649.48	20.738	0.481	0.927
5453	304.30	760.10	20.673	2.828	1.093	4081	433.92	477.91	20.739	1.064	0.813
3510	349.07	418.03	20.673	1.004	1.003	3132	412.60	381.67	20.740	0.109	0.955
4589	443.40	546.29	20.674	0.345	0.918	728	438.00	128.63	20.742	0.138	0.937
784	504.96	137.71	20.676	0.250	1.055	5474	393.17	767.23	20.743	0.478	0.775
2952	423.59	365.17	20.677	0.819	0.977	2909	20.37	360.49	20.744	0.352	1.073
3171	133.03	384.39	20.679	0.441	1.095	5369	66.83	724.93	20.744	0.557	0.858
57	243.61	-5.26	20.679	0.218	1.073	3475	344.96	414.59	20.744	0.528	1.000
765	149.20	133.98	20.682	-0.027	0.900	4133	123.55	483.86	20.746	0.630	0.938
451	15.30	85.48	20.682	1.017	1.093	5355	28.70	720.25	20.747	0.820	0.995
5107	340.69	657.96	20.682	0.185	0.958	316	460.29	63.24	20.749	0.491	0.843
5401	53.49	743.52	20.686	1.042	0.860	4343	496.26	513.07	20.750	0.355	0.988
662	212.98	119.92	20.686	0.731	0.967	456	291.55	86.80	20.752	0.294	0.917
2303	387.63	302.61	20.687	0.212	0.964	5360	344.99	721.52	20.752	0.443	0.965
26	242.54	-24.60	20.689	0.103	1.109	1196	359.43	190.21	20.754	1.306	0.815
747	106.43	131.34	20.689	0.546	1.087	5353	465.10	719.72	20.754	0.409	0.820
3929	353.93	462.30	20.690	0.233	1.073	3584	478.80	425.86	20.756	0.502	1.027
223	100.55	42.83	20.693	0.327	0.947	3519	432.88	418.90	20.756	0.724	1.048
4213	490.79	496.90	20.693	0.533	1.113	5159	190.65	668.91	20.758	0.350	1.067
764	543.13	133.93	20.695	0.725	0.833	5196	229.57	677.35	20.758	1.124	1.020
1378	57.27	207.60	20.695	0.308	1.087	2511	323.14	323.58	20.759	0.456	1.000
4787	154.68	583.85	20.695	1.604	0.830	3278	523.68	398.82	20.760	0.911	0.983
640	63.66	116.17	20.697	0.607	0.883	4291	82.29	506.22	20.760	0.725	0.958
3849	408.59	452.52	20.700	0.376	1.098	4021	534.60	470.87	20.760	0.602	1.235
1107	417.69	180.32	20.701	0.309	1.045	4822	463.82	589.91	20.762	-0.034	0.970
2384	370.48	310.06	20.702	0.360	1.038	5106	319.70	657.67	20.764	0.488	0.945
3208	414.94	387.85	20.702	0.453	0.970	4693	275.84	566.27	20.764	0.246	1.003
4269	479.78	503.94	20.703	0.573	0.955	401	30.41	78.33	20.765	0.737	0.920
4955	179.65	622.56	20.703	1.282	0.960	4203	399.75	495.19	20.765	0.269	0.948
1537	21.75	226.27	20.704	0.182	0.962	995	149.35	166.46	20.768	-0.016	0.963
4805	423.45	586.64	20.705	0.211	1.017	2618	129.02	334.21	20.769	0.901	1.130
3549	517.45	422.34	20.707	0.344	0.910	190	223.44	35.96	20.770	0.667	0.840
5241	381.12	689.51	20.709	0.755	1.060	793	393.92	138.73	20.770	0.495	1.025
41	410.81	-12.06	20.710	0.154	0.890	4246	318.50	501.74	20.771	-0.004	0.900
516	425.71	97.46	20.712	0.797	0.900	4130	465.27	483.65	20.771	1.138	0.815
5031	301.33	640.25	20.713	0.483	0.822	5111	189.87	658.40	20.774	0.937	0.980
3414	364.86	409.25	20.714	0.299	1.005	1200	176.39	190.49	20.778	-0.251	1.047
5464	492.23	763.81	20.715	0.729	0.960	510	354.25	96.62	20.779	0.027	1.075
5416	115.41	749.80	20.716	0.766	0.920	1483	90.10	220.39	20.781	0.643	0.860
3440	373.83	411.42	20.720	0.526	0.968	5398	519.67	741.32	20.782	0.442	0.910
2206	297.25	292.69	20.721	0.919	0.993	457	309.90	87.14	20.785	0.177	0.940
3961	480.28	465.44	20.721	0.422	1.407	4017	371.76	470.47	20.787	0.773	0.973
1956	430.11	269.00	20.722	0.662	0.850	5047	74.00	643.20	20.792	1.054	0.897
1312	476.11	201.60	20.723	0.074	0.965	4426	164.45	525.54	20.793	0.609	1.040
4001	187.97	468.37	20.723	0.373	0.920	5289	165.48	702.66	20.796	0.870	0.938
4582	394.64	545.09	20.724	1.005	0.980	267	457.88	53.65	20.797	1.524	0.975
4747	407.83	576.34	20.724	0.674	1.003	5423	469.12	752.02	20.799	0.455	0.990

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
3565	412.75	424.24	20.799	0.369	0.876	1433	293.17	214.16	20.887	0.344	1.240
5149	297.32	666.64	20.802	0.842	0.905	374	99.10	72.85	20.887	0.256	0.950
4256	410.89	502.53	20.803	0.204	0.935	4619	403.46	552.70	20.887	0.452	0.833
3885	499.99	456.95	20.806	0.488	0.996	3012	107.44	370.27	20.888	0.257	1.130
2345	340.32	306.58	20.807	0.559	1.012	220	307.58	42.37	20.889	0.417	0.9
4309	25.22	509.28	20.807	0.796	0.918	4830	245.68	590.95	20.892	0.821	0.888
71	478.76	4.58	20.808	0.067	0.923	5446	503.15	757.79	20.894	0.178	1.317
4982	182.99	628.29	20.808	-0.187	0.895	4248	393.11	501.95	20.898	0.255	0.938
5191	114.91	675.95	20.811	0.596	0.873	4229	408.51	499.72	20.898	0.000	0.867
5522	266.15	788.81	20.811	0.430	0.928	2184	471.40	290.38	20.900	0.569	0.930
5121	245.65	659.80	20.811	0.374	0.942	606	386.64	110.72	20.902	0.478	1.070
2360	519.77	307.90	20.814	0.345	0.909	3949	193.21	464.16	20.904	0.140	0.975
5272	150.37	697.99	20.816	0.078	0.863	2540	474.87	336.51	20.904	0.302	0.874
4827	88.15	590.67	20.817	0.582	0.910	2244	480.97	295.97	20.906	0.137	1.028
4939	252.97	619.08	20.817	0.524	0.885	5523	370.57	789.50	20.908	0.391	0.893
5000	95.08	632.42	20.817	0.798	0.935	5114	258.50	659.00	20.908	0.654	1.064
566	355.15	104.88	20.818	-0.819	0.980	3619	458.43	429.78	20.913	0.266	0.975
4915	202.66	614.25	20.819	2.012	0.865	5504	460.68	780.13	20.915	0.662	0.850
4834	407.77	591.37	20.819	0.843	0.957	61	362.99	-2.48	20.919	1.540	0.960
3962	37.74	465.55	20.821	0.803	0.977	2055	26.67	278.36	20.921	0.744	0.960
4776	349.33	581.79	20.822	0.452	0.977	1583	476.04	231.67	20.922	-0.829	0.960
4558	77.40	541.86	20.823	0.685	0.945	5516	497.68	785.83	20.923	1.058	0.800
4887	523.91	608.35	20.824	0.654	1.007	1668	360.98	240.16	20.924	0.253	0.920
549	211.60	102.27	20.825	0.513	0.880	3907	479.81	459.85	20.928	0.497	0.905
5186	359.52	674.99	20.828	0.878	0.805	5286	522.39	702.39	20.930	0.690	0.925
3648	246.13	432.34	20.830	0.774	1.018	3237	238.09	391.01	20.931	0.247	1.173
7684	90.43	340.82	20.834	-0.129	1.123	5413	357.35	747.48	20.931	0.470	1.013
1335	209.74	203.64	20.834	0.605	1.015	4702	244.02	568.06	20.932	0.352	0.862
69	452.48	3.12	20.835	0.504	1.030	3221	457.64	388.93	20.934	0.413	0.885
5280	261.00	699.97	20.835	0.545	0.894	3793	5.59	447.06	20.935	0.542	1.018
4826	103.76	590.67	20.839	0.559	1.113	5235	132.77	688.14	20.946	-0.003	0.990
5019	62.45	638.08	20.839	0.317	0.810	4774	537.82	580.92	20.948	0.351	0.893
4390	348.64	520.75	20.840	0.513	1.130	124	482.49	19.97	20.952	0.540	0.985
2328	433.27	362.06	20.841	0.513	0.890	598	379.88	109.39	20.953	0.127	0.833
1714	459.84	245.25	20.841	0.412	1.027	3091	533.82	378.33	20.954	0.392	1.060
3450	325.19	412.22	20.846	0.247	0.988	3438	257.73	411.32	20.960	0.614	0.968
3357	97.83	403.95	20.847	0.632	1.040	8	455.11	-36.03	20.961	0.554	0.860
4236	353.46	500.65	20.851	0.259	1.097	4531	423.70	539.15	20.963	0.494	0.930
3234	425.54	390.67	20.852	0.681	0.900	956	166.63	160.13	20.964	0.121	0.830
2403	475.87	312.89	20.856	0.377	1.098	5183	41.05	674.58	20.964	0.554	0.803
1180	211.82	188.82	20.858	0.501	1.023	5434	375.16	754.74	20.965	0.438	1.040
1800	468.94	254.85	20.859	0.156	0.903	2835	472.04	354.40	20.966	0.671	1.032
2436	533.21	316.18	20.861	0.468	0.928	4535	282.20	539.30	20.967	0.936	1.045
577	32.99	106.42	20.862	0.194	0.943	5623	434.53	639.69	20.969	0.435	0.838
4802	310.56	586.42	20.864	0.368	0.988	309	145.77	62.26	20.969	-0.465	0.960
4547	431.86	541.23	20.865	0.293	0.997	1036	50.33	171.80	20.970	0.286	0.900
5452	161.62	759.50	20.867	0.255	0.895	4663	323.48	560.05	20.972	0.858	0.830
2970	513.55	366.51	20.868	0.988	0.933	2344	62.20	306.57	20.973	0.459	0.927
2546	341.30	326.70	20.871	0.189	0.990	2994	521.54	368.51	20.973	1.971	0.855
1849	93.47	260.06	20.873	0.281	1.217	4104	361.69	480.39	20.975	0.391	0.923
5136	320.62	662.55	20.873	0.229	0.948	242	161.81	47.68	20.978	0.406	0.873
2208	66.25	292.73	20.874	0.142	0.970	352	240.45	67.86	20.979	-0.396	1.045
1267	171.76	196.38	20.874	-0.768	0.945	1239	456.92	193.54	20.979	-0.254	0.900
743	299.45	131.05	20.875	0.354	0.900	2263	401.58	297.63	20.987	0.791	0.962
4278	382.39	504.79	20.877	0.127	1.175	5575	272.81	825.49	20.988	0.331	0.880
5209	379.51	680.51	20.878	0.729	0.980	4869	528.98	601.44	20.988	0.578	0.983
2951	317.93	365.16	20.878	0.475	0.933	1509	37.76	222.63	20.989	0.144	0.983
4627	391.68	554.41	20.883	0.433	1.010	4102	436.67	480.21	20.989	0.197	0.813
5492	360.49	774.74	20.883	0.395	0.985	4930	440.67	617.55	20.993	0.402	0.960
4706	236.85	569.15	20.884	0.717	0.847	870	414.20	149.07	21.000	0.665	0.980

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
5225	528.14	683.80	21.001	0.443	0.907	2995	477.81	368.60	21.160	0.628	0.874
4153	393.92	486.29	21.001	0.056	0.815	251	52.31	50.15	21.165	1.136	1.035
3329	330.88	401.10	21.004	0.575	0.988	4384	327.45	518.68	21.166	-0.029	0.940
252	69.37	50.99	21.010	0.117	0.987	5025	346.08	639.81	21.172	0.847	0.868
643	352.62	117.87	21.012	-0.415	0.940	4681	526.96	563.51	21.173	0.902	0.915
4856	505.26	598.30	21.013	0.029	1.230	5499	496.06	772.25	21.181	0.678	0.997
2292	504.31	301.17	21.015	0.547	1.133	402	280.00	78.81	21.182	0.368	1.035
4660	534.26	559.56	21.019	0.176	0.817	4877	465.69	603.08	21.191	0.536	0.827
3568	48.72	424.41	21.019	1.170	0.953	5172	137.23	671.94	21.194	0.437	0.745
395	215.22	77.03	21.022	0.380	0.933	4819	333.96	589.56	21.204	0.467	0.950
4644	263.49	556.43	21.025	0.419	0.923	4499	362.29	534.94	21.208	1.900	0.735
5258	208.97	695.16	21.029	-0.084	0.803	5093	142.37	652.61	21.212	0.063	0.830
5083	245.17	651.40	21.034	1.203	0.970	4334	89.41	512.10	21.217	-0.104	0.880
4032	35.55	472.16	21.041	0.069	1.015	75	467.18	7.84	21.231	-0.200	1.027
4989	189.17	629.43	21.042	0.434	0.990	3897	393.33	458.49	21.240	-0.418	1.262
125	472.84	20.75	21.048	0.383	0.880	1572	447.54	229.21	21.244	-0.255	0.910
815	384.84	142.03	21.049	0.094	1.020	3157	409.72	383.56	21.254	0.304	0.927
1024	138.68	170.50	21.049	0.196	0.935	4705	411.26	569.01	21.255	-0.091	0.827
4502	77.70	535.03	21.052	0.005	0.905	2443	530.50	317.11	21.263	0.230	0.978
915	507.52	154.94	21.054	0.513	1.005	5291	75.99	703.60	21.268	0.278	1.045
197	49.40	37.32	21.057	0.296	0.945	5073	388.36	649.44	21.276	-0.136	0.918
4471	307.59	531.18	21.061	0.804	0.923	244	480.97	47.79	21.280	0.855	0.790
3128	416.70	381.56	21.072	0.741	0.897	2899	389.78	359.99	21.286	-0.293	0.877
4168	536.23	489.27	21.077	1.249	0.895	3684	452.58	435.95	21.286	0.216	0.940
4873	499.68	601.88	21.084	0.566	1.100	5175	466.31	672.29	21.297	-0.487	1.007
5515	480.87	765.78	21.084	0.527	1.020	5390	299.33	736.06	21.311	1.664	0.900
634	241.21	115.31	21.085	0.518	0.985	4268	528.86	503.53	21.324	0.057	0.950
5405	466.63	744.73	21.098	0.960	1.005	3935	342.81	462.64	21.332	-0.506	1.418
1872	188.12	262.22	21.117	0.351	0.970	5045	520.37	642.65	21.334	0.185	0.927
2200	458.49	292.33	21.125	0.613	1.085	4261	258.34	503.02	21.379	0.068	0.985
3333	443.47	401.81	21.130	0.487	0.872	313	193.70	62.93	21.384	0.617	0.930
986	318.88	165.22	21.131	0.099	0.980	559	381.69	103.67	21.411	0.362	0.850
2507	389.15	323.21	21.132	0.783	0.955	1763	392.19	250.99	21.417	-0.070	0.980
3607	468.29	428.24	21.133	0.250	0.881	1190	146.08	189.59	21.425	-0.908	1.045
4135	517.53	484.22	21.135	-0.057	1.160	3593	491.61	426.72	21.453	0.277	0.960
623	336.13	113.33	21.143	-0.477	0.942	5089	508.40	652.24	21.493	-0.153	1.160
5212	156.89	681.11	21.144	0.431	0.950	4859	181.82	598.92	21.691	-0.336	0.910
4235	149.02	500.39	21.147	-0.120	0.943	4862	192.43	599.47	21.692	-0.642	0.823
3688	336.43	436.72	21.147	-0.094	0.973	12	237.01	-32.83	22.010	-0.809	1.210
5500	96.19	778.43	21.150	0.413	0.897	666	493.00	120.34	22.126	-0.987	0.990
2661	390.76	338.72	21.154	0.287	1.060						

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
6093	262.13	693.58	12.088	0.751	2.428	4942	249.90	513.60	14.520	0.847	1.223
2692	-76.86	361.03	12.188	1.438	2.610	2572	55.33	352.88	14.527	0.722	2.421
2845	-41.66	369.59	12.198	1.374	2.580	2764	32.83	364.76	14.558	0.306	3.255
1739	47.69	290.02	12.511	1.220	2.401	3640	-66.89	416.52	14.573	0.838	1.411
1180	-48.18	235.08	12.640	1.186	1.585	3575	69.00	412.71	14.594	0.829	1.583
1452	-7.09	263.72	12.659	1.137	1.425	3447	36.24	404.92	14.595	0.079	2.006
3961	85.26	437.65	12.840	1.129	2.298	2270	53.05	331.44	14.597	0.713	1.203
2548	54.02	351.09	12.868	1.109	2.701	3625	81.83	415.40	14.624	0.831	1.736
2149	18.36	321.94	12.999	1.028	2.006	2093	8.94	316.82	14.625	0.823	1.325
275	255.87	87.83	13.050	1.067	1.315	4960	147.38	515.82	14.644	0.684	0.980
4758	45.50	496.01	13.086	1.067	2.341	3815	-25.19	427.74	14.694	0.857	1.728
2834	70.17	369.04	13.158	1.002	2.898	3491	66.04	407.32	14.732	0.792	2.156
558	-176.96	147.80	13.161	1.036	1.227	3000	40.72	379.18	14.733	0.038	4.133
3206	39.52	390.67	13.225	1.079	2.841	3003	30.49	379.29	14.752	0.429	3.948
3596	-43.03	414.01	13.251	1.037	1.923	761	119.92	178.68	14.758	0.175	1.265
4032	68.19	442.39	13.287	0.976	1.885	3028	33.13	390.75	14.763	0.176	4.009
2142	108.45	321.11	13.288	0.998	2.322	3201	-21.25	390.31	14.779	0.822	1.711
2670	-5.37	358.97	13.332	1.020	1.710	424	5.99	120.47	14.784	0.801	1.241
2614	-104.72	356.03	13.351	1.020	2.126	5664	66.45	604.24	14.787	0.817	1.092
3427	38.06	403.77	13.373	0.972	3.033	2686	181.61	360.27	14.798	0.812	1.524
4015	-102.67	441.24	13.455	0.959	1.862	3793	137.66	426.33	14.816	0.814	1.276
3584	40.98	413.00	13.468	0.975	2.373	5714	46.29	612.24	14.816	0.815	1.373
6412	61.38	842.20	13.589	0.981	1.948	3858	-109.18	430.19	14.832	0.810	1.441
2065	82.42	315.07	13.675	0.926	1.800	3061	42.90	383.27	14.845	0.632	4.156
2756	30.65	364.41	13.798	0.834	3.375	2449	51.30	344.51	14.846	0.778	1.971
4502	-127.89	476.00	13.820	0.906	1.614	2902	34.98	373.57	14.848	0.340	4.194
2994	38.81	378.97	13.833	0.855	4.099	2982	34.76	378.29	14.848	0.425	4.104
5812	8.80	631.18	13.950	0.906	1.401	2579	59.60	353.33	14.857	0.719	2.475
2185	6.01	325.29	13.954	0.898	1.429	3320	49.89	396.83	14.912	0.555	2.373
318	-141.40	97.76	13.967	0.891	1.178	2299	56.11	333.44	14.913	0.779	1.261
2940	33.91	376.01	14.034	0.695	4.173	3064	34.25	384.38	14.922	0.652	4.265
5070	23.53	526.49	14.050	0.889	1.405	4498	29.75	475.77	14.963	0.202	1.938
5797	50.23	628.40	14.065	0.893	1.383	3365	52.49	399.88	14.965	0.787	1.926
4284	142.74	460.20	14.084	0.860	1.588	5566	-97.16	588.65	14.982	0.798	1.125
3423	-9.02	403.77	14.139	0.862	1.849	5139	1.65	533.42	14.984	0.776	1.290
3722	65.71	422.00	14.148	0.874	1.998	3139	36.41	387.10	14.996	0.266	4.631
5577	36.03	590.41	14.149	0.892	1.340	3047	59.01	382.23	14.999	0.286	2.017
2772	40.13	365.43	14.153	0.440	3.504	1814	30.03	296.88	15.001	0.781	1.152
3072	36.80	383.92	14.181	0.591	4.246	2662	28.80	358.56	15.009	0.206	2.483
2986	28.36	378.43	14.186	0.502	3.943	3442	-103.16	404.48	15.017	0.774	1.276
2950	29.73	376.56	14.230	0.295	3.949	2330	46.52	335.97	15.020	0.769	1.248
1883	98.43	301.88	14.232	0.861	1.467	3641	11.88	429.18	15.023	0.110	1.681
1811	212.40	296.76	14.235	0.854	1.538	2793	36.50	366.81	15.028	0.159	4.118
4519	36.50	477.92	14.241	0.852	1.388	259	-57.99	82.99	15.045	0.489	0.940
3273	50.64	394.33	14.241	0.785	2.316	3412	-5.87	402.65	15.045	0.235	1.600
3914	32.74	434.49	14.254	0.784	1.544	2170	37.04	323.88	15.052	0.777	1.524
2382	167.35	338.91	14.261	0.751	1.185	4228	29.81	456.15	15.055	0.561	1.324
4867	-152.87	506.41	14.276	0.852	1.455	2840	43.15	366.51	15.059	0.345	3.729
2758	21.16	364.48	14.286	0.808	2.932	1595	-208.75	277.40	15.068	0.773	0.990
5958	205.03	663.54	14.288	0.771	0.930	2990	47.38	378.68	15.070	0.171	3.664
2040	26.97	313.69	14.316	0.770	1.551	3083	50.69	384.37	15.077	0.199	3.185
3971	51.60	438.32	14.335	0.858	1.778	2639	20.28	357.40	15.078	0.734	2.151
3223	40.99	391.54	14.348	1.213	2.689	2936	42.70	375.85	15.079	0.178	3.920
3036	37.45	381.33	14.396	0.141	4.146	2805	31.52	367.43	15.089	0.153	3.691
2909	-24.58	374.05	14.406	0.863	1.464	2526	126.46	349.60	15.094	0.122	1.440
3797	45.78	426.53	14.463	0.780	1.667	3582	88.37	412.82	15.095	0.121	1.525
3451	106.89	405.26	14.489	0.719	1.550	2405	88.91	340.88	15.098	0.764	1.630
2714	1.19	362.11	14.497	0.783	1.988	3105	39.95	385.83	15.106	0.436	4.460
3130	72.30	386.77	14.512	0.817	1.822	5482	62.57	576.55	15.115	0.215	1.115
2715	37.59	362.12	14.515	0.773	3.316	1989	105.06	310.24	15.118	0.755	1.160

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
2702	19.49	361.49	15.120	-0.236	2.548	2752	-8.55	364.17	15.385	0.730	1.661
4397	222.09	468.53	15.121	0.768	1.207	2880	203.19	371.85	15.387	0.755	1.079
2583	98.75	353.66	15.138	0.539	1.229	4854	139.27	505.22	15.388	0.070	1.318
2959	21.70	376.90	15.149	0.120	3.312	1209	109.90	238.13	15.397	0.761	1.043
94	174.86	41.92	15.157	0.435	0.920	2313	-22.77	334.47	15.403	0.070	1.148
2609	46.44	355.54	15.158	0.731	2.174	2259	-21.54	330.74	15.407	0.108	1.100
2919	28.05	374.84	15.164	0.744	4.125	3315	55.64	396.51	15.408	0.088	2.470
2503	8.48	347.96	15.166	0.111	1.400	3175	99.76	389.36	15.416	0.032	1.608
3182	63.67	389.59	15.177	0.139	1.878	2148	16.64	321.75	15.417	0.339	1.949
5423	-214.68	568.13	15.179	0.172	1.072	1457	48.49	264.07	15.418	0.747	1.217
3104	61.21	385.74	15.190	0.249	1.931	5943	308.97	658.71	15.421	0.069	1.060
4210	163.46	454.06	15.191	0.192	1.316	2361	224.42	337.94	15.423	0.048	1.293
2307	26.34	333.91	15.194	0.716	1.363	4792	291.39	499.88	15.424	0.443	1.354
2153	88.15	322.14	15.199	0.767	1.207	2370	38.06	338.21	15.426	0.727	1.583
1504	126.48	269.03	15.199	0.172	1.773	1812	303.08	296.78	15.427	0.741	1.198
3260	24.93	393.46	15.200	0.154	2.954	4414	79.45	469.44	15.427	0.737	1.031
3208	31.74	390.80	15.200	0.514	3.711	1702	-185.41	286.39	15.430	0.020	0.920
2207	177.32	326.56	15.202	0.114	1.043	2809	0.89	367.70	15.434	0.068	1.960
1754	-40.91	291.57	15.203	0.794	1.598	3257	51.88	393.30	15.436	0.087	2.280
4887	216.27	507.80	15.216	0.787	1.246	1753	-92.44	291.43	15.446	0.756	0.963
4550	-31.76	481.22	15.228	0.159	1.221	3786	-129.11	425.86	15.447	0.746	1.249
2216	62.90	327.25	15.230	0.722	1.591	1393	7.46	256.86	15.449	0.050	1.133
6300	154.37	779.10	15.239	0.757	1.138	2309	67.49	333.98	15.451	0.015	1.349
3218	28.88	391.28	15.249	0.623	3.689	2898	112.20	372.97	15.456	0.074	1.642
2195	1.57	325.91	15.249	0.757	1.364	3076	45.97	384.11	15.457	0.114	3.793
3774	57.28	425.24	15.254	0.772	2.018	3055	25.19	382.71	15.457	0.447	3.866
1557	213.72	274.55	15.256	0.769	0.993	5160	-121.52	536.33	15.461	0.031	1.135
3372	68.82	400.75	15.258	0.093	2.343	2706	18.54	361.78	15.464	0.150	2.098
2604	291.99	355.17	15.261	0.560	1.358	3153	62.98	387.65	15.465	0.486	1.785
3006	-4.95	379.50	15.265	0.127	1.604	2984	51.13	378.33	15.467	0.301	3.260
4540	14.28	480.48	15.277	0.762	1.449	5684	30.51	606.77	15.474	0.056	1.041
2763	50.22	364.72	15.287	0.098	2.583	2773	47.09	365.60	15.482	0.044	2.727
2762	126.35	364.68	15.294	0.579	1.344	3822	49.51	428.08	15.483	0.091	2.228
5565	-94.61	586.62	15.303	0.118	1.072	4885	168.00	507.69	15.483	0.040	1.343
2944	40.35	376.28	15.304	0.316	4.001	5960	262.49	664.12	15.486	0.027	0.975
6290	80.05	772.13	15.308	0.159	1.120	3069	21.68	383.62	15.488	0.588	3.314
3249	37.23	392.88	15.309	0.113	3.031	56	214.73	25.79	15.494	0.002	1.053
966	181.24	207.75	15.310	0.103	1.085	4204	-1.26	453.63	15.498	0.076	1.333
3891	-50.26	432.60	15.312	0.779	1.161	3306	42.86	396.17	15.500	0.752	2.601
3737	-82.63	423.04	15.318	0.752	1.199	3389	297.53	401.30	15.506	0.726	1.061
2459	53.81	345.07	15.318	0.205	2.531	4295	53.99	461.11	15.508	0.051	1.414
1437	102.03	261.86	15.322	0.709	1.050	4605	-53.88	485.06	15.509	0.750	1.099
3970	158.76	438.21	15.322	0.442	1.090	4855	23.20	505.31	15.525	0.740	1.369
451	-18.21	128.81	15.325	0.124	1.125	5499	254.10	579.08	15.527	0.762	1.113
3159	65.93	388.06	15.331	0.067	1.796	1804	37.06	296.43	15.533	0.031	1.290
3919	-71.19	434.95	15.336	0.106	1.413	2656	196.52	358.39	15.534	0.031	1.779
2391	43.55	339.64	15.337	0.732	1.326	2618	2.38	356.19	15.535	0.035	1.693
3332	7.02	397.48	15.338	0.780	1.886	140	116.01	53.74	15.537	0.032	1.143
5727	203.01	614.48	15.340	0.053	0.843	2624	78.79	360.06	15.539	0.688	1.518
2431	26.97	343.08	15.342	0.729	1.571	3270	9.46	394.20	15.551	0.689	2.044
4070	-138.08	444.65	15.350	0.806	1.135	4966	133.31	518.28	15.552	0.000	0.918
1297	60.62	246.67	15.351	0.083	1.155	2718	-43.14	362.21	15.552	-0.003	1.786
3506	24.30	408.20	15.352	0.099	1.753	1431	40.43	261.45	15.559	0.733	1.169
3400	62.75	401.90	15.357	0.151	1.940	989	5.97	211.27	15.561	0.747	0.905
6233	29.18	748.70	15.365	0.099	1.130	4750	3.05	495.46	15.562	0.728	1.224
2935	19.82	375.80	15.369	0.116	3.007	3046	-0.32	382.13	15.562	0.048	1.508
2154	185.24	322.21	15.375	0.716	1.020	2738	8.69	363.42	15.565	0.713	2.041
3225	115.09	391.60	15.375	0.105	1.279	4335	300.86	464.50	15.567	0.037	1.176
2588	117.68	353.83	15.379	0.187	1.228	2281	-14.80	332.29	15.567	0.027	1.125
1413	32.45	259.74	15.384	0.735	1.278	3889	48.53	432.45	15.574	0.073	2.547

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
5195	201.03	540.24	15.574	0.046	0.968	248	-95.91	80.58	15.740	0.727	1.055
4557	-4.11	481.36	15.575	0.037	1.194	1525	12.34	270.72	15.741	-0.001	1.265
3008	44.54	379.69	15.584	0.513	3.764	3677	-16.90	418.88	15.741	0.023	1.306
4542	8.24	480.72	15.589	0.031	1.491	2491	24.24	347.33	15.742	-0.131	1.604
5429	-7.88	593.81	15.596	0.011	1.008	3862	62.29	430.35	15.747	0.683	1.815
3601	93.13	414.18	15.599	0.033	1.480	3810	44.06	427.57	15.749	1.017	1.611
5205	-4.15	541.34	15.602	0.751	1.085	4932	95.47	512.32	15.759	0.711	1.015
5435	129.16	573.26	15.605	0.031	1.345	3295	47.46	393.99	15.760	0.711	2.517
885	-172.86	197.21	15.607	0.024	0.880	2719	-105.96	362.21	15.760	0.000	1.501
3608	68.62	414.60	15.614	0.023	1.463	4518	34.96	477.88	15.764	0.066	1.357
1471	159.32	265.78	15.615	0.024	1.230	2525	130.99	349.28	15.765	0.738	1.357
3861	5.60	412.19	15.616	0.096	1.642	5436	103.72	569.71	15.771	-0.010	0.970
1506	-146.31	269.07	15.620	0.023	1.077	2922	48.19	374.96	15.773	0.541	3.624
5613	109.29	596.28	15.620	0.739	1.025	2808	-172.28	367.62	15.774	-0.022	1.248
5461	-149.94	574.38	15.622	0.750	0.920	3713	38.36	421.59	15.778	0.733	1.463
4602	-65.68	484.86	15.624	-0.004	1.095	418	18.53	119.78	15.779	0.704	1.063
2360	80.60	337.14	15.627	0.009	1.330	232	129.01	77.12	15.781	-0.001	0.982
526	-78.32	142.44	15.627	0.027	0.960	6268	-67.20	572.85	15.785	0.010	0.956
2028	74.98	312.84	15.628	0.031	1.418	2988	56.52	378.50	15.791	0.061	2.319
5177	217.18	538.39	15.633	0.007	1.055	5742	175.99	618.09	15.791	0.761	1.115
2413	41.57	341.30	15.634	0.723	1.430	3842	68.67	429.16	15.791	0.003	1.956
5967	-105.77	665.69	15.635	0.779	0.988	5045	3.17	523.99	15.806	-0.013	1.221
2211	60.91	326.92	15.636	0.015	1.475	3450	-41.21	405.16	15.802	0.705	1.569
2261	60.96	330.85	15.638	0.780	1.388	4975	72.15	517.23	15.803	1.056	1.085
1984	-173.44	309.76	15.642	0.709	1.095	5198	245.01	540.82	15.803	0.732	0.947
3325	-48.48	397.11	15.644	0.009	1.285	1351	-204.73	252.32	15.804	0.736	0.980
3004	25.03	379.38	15.645	0.587	3.865	5724	34.28	614.27	15.805	0.719	0.950
719	96.53	172.84	15.656	0.721	1.200	4426	67.66	470.53	15.822	-0.026	1.314
5249	41.13	516.04	15.657	0.802	1.040	3473	159.92	406.48	15.829	-0.008	1.063
372	239.14	110.82	15.660	0.006	0.980	570	260.21	149.37	15.833	-0.039	1.133
3567	61.14	412.48	15.663	0.751	1.989	1092	43.73	224.22	15.840	-0.016	1.341
3456	32.32	405.69	15.665	0.615	3.099	4405	112.41	469.12	15.742	0.700	1.025
6208	-205.07	735.74	15.665	0.759	0.860	5093	112.77	639.13	15.850	0.680	0.975
893	41.54	198.38	15.668	0.010	1.095	2765	-69.78	361.65	15.853	0.811	1.948
7	-97.69	0.79	15.669	0.720	0.928	3868	21.14	431.07	15.854	0.002	1.376
1587	15.26	276.78	15.673	0.747	1.114	2220	-86.38	327.79	15.858	-0.022	0.918
2444	114.69	343.86	15.682	0.742	1.295	3217	-223.79	391.25	15.860	-0.006	1.028
4873	-61.73	506.87	15.686	0.020	1.177	2716	34.33	362.12	15.861	0.362	3.261
3155	30.63	387.80	15.688	0.480	3.958	2720	45.64	362.24	15.865	0.544	2.775
4611	68.03	477.43	15.689	0.006	1.541	1146	200.85	229.41	15.867	-0.029	0.960
3634	20.51	415.96	15.692	0.714	1.473	3065	29.13	383.47	15.871	0.646	4.219
4590	65.14	483.85	15.695	0.006	1.181	577	120.80	149.92	15.877	0.705	0.880
2892	31.52	372.33	15.696	0.443	4.871	2653	-103.87	358.15	15.877	2.035	1.690
2920	-123.54	374.86	15.696	0.017	1.080	2658	-26.52	368.45	15.878	-0.051	1.247
4798	216.22	500.39	15.699	0.005	1.246	2506	-53.06	348.06	15.880	-0.004	1.236
1383	-13.86	255.95	15.700	0.680	1.092	6362	77.29	815.68	15.897	-0.039	1.208
2594	-79.71	354.49	15.705	-0.024	0.848	6057	-221.58	685.63	15.897	-0.010	1.040
4989	140.78	520.22	15.707	-0.008	0.848	5077	44.11	527.90	15.908	0.710	1.075
2287	-39.26	332.61	15.709	0.727	0.930	3759	40.33	424.11	15.911	0.012	1.481
4994	153.37	519.24	15.712	-0.001	0.910	1734	34.21	289.20	15.912	0.683	1.236
1792	-124.14	295.41	15.712	-0.012	1.317	4212	102.04	454.12	15.917	0.718	0.949
2819	83.14	368.22	15.714	0.071	1.301	2868	-203.02	370.32	15.919	0.718	1.478
3291	13.25	395.06	15.716	0.730	2.444	5235	-15.40	545.17	15.920	-0.010	0.965
3452	53.00	405.28	15.717	-0.053	1.683	2843	139.67	369.55	15.920	0.731	1.121
1724	69.21	288.64	15.720	0.000	1.159	5135	-213.21	833.10	15.920	0.003	1.103
3432	213.23	403.86	15.722	0.750	1.060	5129	43.91	386.75	15.923	0.467	4.084
1986	-34.08	310.51	15.726	0.703	1.045	2487	277.63	347.64	15.926	0.690	1.050
4207	232.90	453.79	15.727	0.732	1.345	2649	-178.80	429.52	15.931	-0.031	1.200
3756	144.39	424.05	15.736	0.723	1.226	1879	220.34	301.68	15.931	0.707	1.040
117	183.06	46.81	15.740	0.712	0.943	654	264.19	161.95	15.935	-0.062	0.875

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
3147	19.21	387.35	15.941	0.636	2.871	3109	48.42	386.02	16.235	0.371	3.350
319	72.83	97.92	15.943	-0.036	0.910	1248	100.22	241.75	16.239	0.725	0.993
2812	15.74	367.94	15.943	-0.064	2.646	3040	55.47	381.66	16.246	0.361	2.362
2556	61.21	351.83	15.955	0.643	2.218	2613	33.02	356.00	16.253	0.510	2.912
2479	25.61	346.63	15.968	1.101	1.489	4507	120.05	476.87	16.260	0.668	0.985
2791	26.00	366.66	15.971	0.454	5.751	4838	184.45	504.03	16.267	0.695	0.949
3108	-12.72	386.01	15.978	0.675	1.349	3133	-5.96	386.87	16.269	0.686	1.158
2221	4.13	327.96	15.993	0.721	1.396	963	243.33	207.28	16.275	0.692	0.918
3746	49.06	423.37	15.996	-0.068	1.682	2924	89.20	375.06	16.277	0.638	1.816
3883	36.44	432.04	15.998	0.693	1.424	148	232.28	55.55	16.290	0.682	1.003
3779	221.17	425.61	16.005	-0.038	1.132	1953	-166.65	307.84	16.290	0.643	1.060
1011	-41.97	213.47	16.010	0.714	0.890	3262	33.10	393.55	16.292	0.415	3.491
2306	-54.51	333.87	16.024	0.666	1.085	3183	61.24	389.64	16.308	0.504	1.992
3772	-99.00	425.13	16.024	-0.055	0.985	2377	-38.68	338.69	16.317	0.754	1.160
2895	0.71	372.75	16.028	0.629	2.019	931	200.59	203.24	16.330	0.663	1.018
134	-109.07	51.11	16.030	-0.039	0.945	5263	158.14	548.07	16.335	0.689	0.870
1145	-214.55	229.39	16.032	0.694	0.948	2886	106.05	372.08	16.339	0.654	1.525
4100	261.63	446.80	16.041	0.691	1.305	950	176.71	205.69	16.342	0.671	1.085
3856	1.19	430.16	16.046	-0.045	1.501	2917	15.62	374.60	16.352	0.641	2.322
2314	234.25	334.57	16.057	-0.058	1.155	6094	196.65	693.82	16.354	0.703	0.848
5657	158.40	603.14	16.059	0.671	0.860	2380	48.25	338.81	16.355	0.636	1.361
271	-66.73	86.70	16.070	0.700	0.960	3252	44.12	393.06	16.359	0.423	2.774
3276	61.24	394.41	16.070	0.542	2.789	2725	-35.67	362.58	16.363	0.533	1.390
3002	50.37	379.28	16.071	1.058	3.185	1029	218.45	215.82	16.365	0.669	0.933
5525	92.44	583.19	16.075	0.705	0.908	1239	250.57	241.06	16.371	0.660	0.938
3828	94.49	428.69	16.084	0.696	1.219	2245	114.06	329.56	16.375	0.702	1.148
5111	114.06	530.61	16.093	0.752	1.005	2079	247.02	315.74	16.385	0.658	1.025
2859	-44.38	370.38	16.096	3.121	2.453	3330	33.00	397.24	16.386	0.388	3.233
4137	96.40	449.29	16.101	0.690	0.986	2201	53.20	326.30	16.390	0.668	1.289
353	76.06	107.11	16.103	-0.047	1.085	3282	130.82	394.68	16.390	0.696	1.121
4248	53.77	457.02	16.108	0.685	1.258	3374	25.29	400.56	16.392	0.614	2.156
2903	41.97	373.57	16.109	0.016	4.022	3870	255.39	431.27	16.393	0.682	0.984
6264	85.86	761.98	16.125	0.720	0.942	1470	116.22	265.67	16.394	0.663	1.045
3402	13.05	401.94	16.127	0.636	1.954	2682	35.80	359.81	16.396	0.625	3.158
3605	96.91	414.45	16.129	0.667	1.381	3037	53.75	381.42	16.398	0.485	2.665
3790	77.28	426.22	16.131	0.700	1.464	2002	-159.61	310.70	16.416	0.617	0.943
4313	-88.98	462.07	16.133	0.707	1.059	2874	12.54	371.40	16.417	0.197	1.891
3099	52.85	385.39	16.143	0.226	3.008	2635	-72.75	357.28	16.420	0.915	2.178
4979	267.35	517.65	16.145	0.736	1.148	1810	142.11	286.74	16.423	0.629	1.150
3679	60.96	18.96	16.152	0.719	1.917	2701	-4.13	361.42	16.423	1.337	1.940
3615	49.14	414.98	16.154	0.686	1.687	5356	47.37	859.91	16.425	0.658	1.301
1610	-133.09	278.74	16.160	0.671	0.900	4096	72.74	440.47	16.427	0.640	1.686
1423	-130.42	260.97	16.170	0.717	1.048	2836	18.25	368.57	16.437	0.353	2.808
2862	39.64	370.50	16.171	0.438	3.984	3293	30.25	395.24	16.440	0.475	3.529
2797	81.59	367.11	16.173	0.617	1.356	2282	89.50	332.35	16.440	0.528	1.211
5706	-42.84	610.67	16.174	0.714	0.890	1931	11.37	306.07	16.441	0.706	1.233
4274	-87.28	459.13	16.174	0.678	1.058	5412	18.25	565.94	16.452	0.666	0.960
3166	54.03	388.61	16.179	0.681	3.054	3422	4.13	463.23	16.454	0.476	2.066
2664	40.20	358.65	16.179	0.527	3.341	4331	103.60	404.13	16.466	0.652	0.985
899	154.92	198.90	16.181	0.680	1.023	1014	-222.44	212.91	16.475	0.680	1.043
4520	-42.82	478.00	16.183	0.658	1.071	2782	43.98	306.39	16.479	0.388	3.218
2681	57.96	359.75	16.185	0.426	3.100	2078	31.24	315.62	16.482	0.351	1.920
203	56.17	70.91	16.195	0.691	0.946	1886	114.72	302.00	16.488	0.667	0.993
2951	51.91	376.56	16.195	0.349	3.329	2665	25.02	358.67	16.489	0.612	2.334
2932	55.61	375.60	16.195	0.605	2.445	2606	100.84	355.28	16.499	0.598	1.520
3925	82.96	435.20	16.213	0.693	2.116	4974	5.53	517.03	16.519	0.677	1.060
2914	13.06	374.37	16.220	0.672	2.108	3384	31.84	400.98	16.534	0.537	3.088
2276	49.86	332.01	16.225	0.711	1.227	6036	26.30	682.47	16.535	0.675	1.176
280	-10.78	88.80	16.228	0.689	0.998	3163	16.43	388.50	16.538	0.510	2.791
2755	97.54	364.27	16.239	0.681	1.861	3303	40.26	396.08	16.547	0.382	2.684

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
2703	83.89	361.51	16.549	0.650	1.666	126	-41.45	48.87	16.799	0.669	1.055
3444	51.41	404.69	16.555	0.779	1.842	1082	226.44	223.51	16.800	0.647	1.067
2371	7.15	338.30	16.558	0.108	1.421	1342	151.80	251.68	16.802	0.655	0.983
3476	35.82	406.59	16.560	0.636	2.452	3664	46.15	417.74	16.807	0.651	2.160
1002	46.96	212.42	16.572	0.769	1.011	3034	18.26	381.26	16.807	0.576	3.300
939	-117.38	204.34	16.579	0.634	1.008	4786	57.10	499.16	16.817	0.658	1.109
5512	-91.83	581.29	16.588	0.639	0.905	3642	13.89	416.64	16.820	0.624	1.726
1851	119.60	299.37	16.589	0.616	0.870	2789	54.39	366.55	16.822	0.249	2.944
4981	-69.94	517.71	16.593	0.690	0.913	5851	-40.54	637.50	16.824	0.664	1.023
5326	182.74	555.68	16.599	0.675	0.825	1135	12.05	228.73	16.836	0.682	0.992
2709	60.07	361.87	16.602	0.291	2.795	3021	174.54	380.34	16.847	0.603	1.039
3735	128.43	422.97	16.611	0.707	1.210	2855	50.90	370.14	16.849	0.327	3.170
2316	70.19	334.74	16.612	1.403	1.283	3050	0.98	382.46	16.852	0.968	1.563
2956	82.67	376.78	16.618	0.649	2.009	3123	22.16	386.55	16.859	0.366	3.274
2726	42.35	362.62	16.637	0.416	3.285	2946	17.77	376.33	16.866	0.114	2.845
2866	20.73	370.79	16.642	0.419	3.339	2729	13.96	362.76	16.869	0.460	3.144
2509	29.55	348.49	16.645	0.750	1.898	888	-95.15	197.33	16.870	0.624	1.013
2438	37.61	343.38	16.647	0.584	1.999	185	111.54	65.52	16.874	0.679	0.967
4063	-102.48	444.25	16.652	2.353	1.572	1948	93.54	307.46	16.882	0.653	1.143
3943	202.22	436.60	16.657	0.645	1.070	3357	-181.21	399.39	16.882	0.638	0.964
3056	-52.06	382.84	16.657	0.655	0.978	5158	17.64	536.24	16.882	0.670	1.079
3850	38.20	429.53	16.658	0.637	1.358	2100	-9.98	317.23	16.886	0.654	0.995
2683	52.07	358.64	16.658	0.379	3.897	554	179.20	147.03	16.887	0.673	0.840
5984	139.84	669.86	16.662	0.702	0.933	4148	17.91	450.01	16.892	0.614	1.113
1815	39.43	296.97	16.670	0.647	1.299	3492	59.70	407.34	16.898	0.537	1.781
3761	0.63	424.27	16.671	0.613	1.413	1436	13.75	261.83	16.898	0.687	0.991
4157	-134.02	450.73	16.672	0.642	1.119	2671	66.24	359.01	16.900	0.429	2.507
3176	49.90	389.43	16.675	0.442	3.358	3299	58.98	395.70	16.919	0.384	2.509
3314	35.91	396.49	16.676	0.442	3.129	1314	-14.76	248.04	16.924	0.647	0.942
3162	25.83	388.41	16.677	0.434	3.875	2638	13.22	357.34	16.926	0.382	2.086
2394	19.95	340.05	16.678	0.628	1.249	2596	24.52	354.51	16.932	0.578	2.078
2566	-2.66	352.35	16.678	0.675	1.921	5346	-14.21	558.51	16.942	0.603	0.813
2089	52.21	316.36	16.683	0.107	1.180	2539	24.59	350.51	16.942	0.040	2.058
4165	-88.75	451.31	16.693	0.640	1.103	1933	101.80	306.35	16.950	0.637	1.160
2690	-26.42	360.57	16.695	0.559	1.271	826	-82.19	189.03	16.960	0.589	0.895
1106	-10.58	225.73	16.701	0.635	0.975	3360	45.07	399.62	16.968	0.533	2.266
2873	67.50	371.27	16.704	0.929	3.081	2364	29.99	338.03	16.972	0.647	1.339
3632	138.58	415.93	16.705	0.651	1.028	1441	-146.08	262.25	16.977	0.651	0.988
455	-39.06	129.47	16.705	0.664	0.940	2921	137.98	374.94	16.983	0.650	1.000
3178	65.13	389.49	16.711	1.072	1.523	991	32.08	211.55	16.984	0.632	0.861
2601	61.30	354.96	16.716	0.539	2.323	3704	-18.57	421.09	16.989	0.542	1.295
2631	44.47	357.11	16.716	0.643	2.241	2570	37.34	352.54	16.996	0.628	2.630
2250	-38.23	330.23	16.719	0.621	0.983	2116	-86.67	318.69	17.001	0.660	0.890
2816	171.56	368.11	16.719	0.661	1.018	2796	-8.65	367.09	17.001	0.902	1.692
2721	113.21	362.96	16.722	0.671	1.312	4599	2.37	477.13	17.007	0.550	1.688
2721	148.68	509.98	16.724	0.877	0.984	1005	-214.37	212.95	17.008	0.627	0.910
4216	244.56	454.87	16.728	0.652	0.904	1531	-23.06	271.28	17.008	0.660	1.225
4066	81.52	444.37	16.743	0.681	1.753	3802	89.37	426.86	17.009	0.634	1.498
5891	47.50	646.45	16.747	0.639	1.169	3649	87.89	416.95	17.011	0.634	1.447
5666	159.82	604.80	16.748	0.660	0.877	3025	234.60	380.50	17.012	0.639	0.995
1523	-33.86	270.60	16.751	0.583	1.115	2815	20.47	368.02	17.013	0.812	2.908
1650	-194.80	282.05	16.752	0.817	1.013	5778	-53.86	625.69	17.016	0.706	0.790
5637	-169.09	600.53	16.758	0.646	1.025	2243	49.84	329.55	17.018	0.427	1.289
4209	1.49	454.04	16.759	0.738	1.272	2368	-208.47	338.16	17.023	0.674	1.010
3295	91.78	395.38	16.764	0.640	1.124	3396	-17.35	401.57	17.027	0.579	1.315
4473	96.95	473.50	16.776	0.662	0.996	5576	57.63	590.02	17.041	0.717	0.946
3127	77.20	386.69	16.782	0.610	1.213	2883	54.15	371.91	17.046	0.674	2.984
3280	167.59	394.64	16.785	0.618	0.888	617	135.00	155.81	17.047	0.650	0.943
1873	-131.96	300.90	16.788	0.618	0.912	2728	-0.46	362.72	17.049	0.311	1.661
2746	-73.89	363.94	16.798	2.786	1.980	3760	-96.49	424.20	17.051	0.666	0.989

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
3785	2.04	425.83	17.053	0.534	1.500	4534	-127.89	479.75	17.242	1.781	1.215
3754	18.26	423.90	17.059	0.280	1.577	2411	283.87	341.18	17.283	0.593	1.040
2575	31.97	353.07	17.061	0.629	2.499	3407	50.36	402.19	17.253	0.120	1.903
3517	49.57	408.78	17.063	0.443	1.746	1711	6.51	287.41	17.255	0.412	1.003
3097	17.35	385.16	17.064	0.381	2.997	2518	111.99	348.52	17.257	0.547	1.475
2876	46.32	371.53	17.066	0.365	3.403	2610	28.01	355.57	17.261	0.901	2.347
1359	157.02	252.90	17.073	0.603	0.947	1552	76.19	273.70	17.263	1.599	0.920
3240	17.56	392.42	17.079	0.460	2.954	3682	-8.67	419.36	17.264	0.742	1.411
95	234.53	41.92	17.082	0.649	1.035	580	150.25	150.64	17.264	1.492	1.105
2158	65.99	322.73	17.083	0.610	1.525	1406	-110.64	258.48	17.264	0.653	1.000
3169	-2.55	388.92	17.084	0.515	1.194	3020	-49.59	380.15	17.264	0.656	1.048
3366	41.46	399.89	17.086	0.430	2.452	1271	-64.08	244.07	17.265	0.644	0.958
3622	60.77	415.34	17.087	0.494	2.190	6351	-212.97	809.08	17.266	0.684	0.920
2225	9.40	328.05	17.089	0.654	1.366	3187	72.44	389.76	17.268	1.071	1.953
1412	-9.76	259.61	17.094	0.722	1.478	4319	147.00	462.42	17.269	0.702	1.511
3614	35.10	414.95	17.094	0.596	2.028	3026	10.28	380.85	17.269	0.564	2.036
2906	10.32	373.86	17.096	0.546	1.889	2912	-19.03	374.08	17.272	0.584	1.340
2933	91.81	375.65	17.097	0.468	1.910	3498	17.39	407.70	17.274	0.589	1.568
2337	195.64	336.44	17.100	0.612	0.957	3334	17.00	397.68	17.278	0.347	2.736
5656	-120.08	603.08	17.107	0.634	1.023	1835	-70.00	298.56	17.279	0.634	0.928
4178	-188.58	451.82	17.109	0.638	0.958	3030	92.26	380.99	17.281	0.709	1.553
1159	-60.10	231.72	17.111	0.639	1.033	2827	48.31	368.60	17.282	0.385	2.676
3636	32.77	416.14	17.111	0.532	1.792	2458	33.37	345.01	17.283	0.393	2.043
3417	4.16	402.95	17.116	0.268	1.903	4681	-239.07	490.68	17.286	0.655	1.026
2839	77.00	369.38	17.118	0.775	1.746	3817	-32.19	427.79	17.286	0.538	1.491
2109	-74.27	317.89	17.123	0.858	1.063	889	-30.20	197.46	17.286	0.739	0.945
2494	104.27	347.36	17.126	0.654	1.150	2333	122.48	336.19	17.295	0.634	1.010
4304	-56.66	461.57	17.134	0.625	0.990	3510	36.62	408.29	17.297	0.195	3.810
2477	20.85	346.56	17.134	0.421	1.348	3497	28.17	407.68	17.297	0.272	2.554
2908	59.95	374.04	17.137	0.330	3.480	2268	-24.84	331.34	17.304	0.681	1.155
4453	141.02	472.32	17.141	0.629	0.975	1805	211.84	278.45	17.304	0.655	1.010
875	-12.40	196.29	17.143	0.589	0.942	1137	-16.68	228.83	17.306	0.652	0.885
5014	-203.57	521.42	17.152	0.656	1.118	4130	-84.37	448.78	17.308	0.694	1.055
3317	-32.85	396.62	17.154	0.443	1.229	3454	-29.45	405.66	17.313	0.691	1.341
1875	66.38	301.07	17.164	0.613	1.119	4643	-71.96	487.53	17.320	0.628	0.938
2750	-42.78	364.14	17.165	0.535	1.796	2255	77.80	330.49	17.320	0.581	1.220
1374	36.92	254.79	17.168	0.566	1.071	3987	-128.90	439.39	17.323	0.599	0.945
4690	157.55	491.23	17.175	0.546	0.994	2292	43.93	333.14	17.324	0.477	1.624
1817	126.18	297.06	17.176	0.479	1.102	2108	93.09	317.82	17.326	0.544	1.148
150	-60.19	56.05	17.177	0.800	0.848	3950	55.14	436.97	17.329	0.628	1.518
3544	58.20	410.78	17.181	0.545	1.867	4623	-115.87	485.94	17.331	0.667	0.963
833	270.73	189.87	17.183	0.650	0.815	3140	-207.04	387.10	17.331	0.612	0.895
3942	25.61	436.58	17.183	0.592	1.435	1942	-39.31	307.21	17.332	0.301	1.095
2595	118.48	354.50	17.186	-0.025	1.225	3045	15.03	381.99	17.334	0.328	2.946
1923	35.41	305.04	17.186	0.630	1.050	4973	-27.47	516.86	17.336	0.624	0.950
1755	53.06	291.68	17.188	0.492	1.843	2117	47.43	318.71	17.337	0.917	1.219
2574	45.68	353.01	17.195	0.366	2.079	860	-112.79	192.38	17.346	0.662	0.882
4512	16.24	477.48	17.198	0.668	1.189	2694	9.46	360.85	17.352	0.393	2.155
4826	56.73	503.05	17.199	0.540	1.166	3532	40.51	409.99	17.352	0.263	2.721
2247	31.15	329.80	17.201	0.709	1.386	1937	184.29	306.87	17.355	0.604	0.970
3895	77.04	433.12	17.202	0.547	1.468	2422	32.70	342.14	17.357	0.415	1.942
2647	-78.51	357.84	17.202	1.039	2.046	2395	34.10	349.05	17.362	0.475	1.778
2414	-6.86	341.39	17.204	0.317	1.345	2294	71.27	333.28	17.362	-0.066	1.253
2586	-15.32	353.76	17.205	0.551	1.305	3689	39.29	419.67	17.363	0.623	1.667
1427	68.89	261.17	17.207	0.577	1.016	3562	51.14	412.23	17.366	0.381	1.569
5291	111.33	551.78	17.211	0.647	1.063	4087	85.95	445.69	17.371	0.641	1.777
796	-111.40	184.06	17.226	0.632	0.845	4749	-142.36	495.37	17.372	0.633	0.988
908	111.59	199.88	17.230	0.610	1.002	1955	175.66	308.16	17.372	0.580	0.995
2849	-32.46	369.76	17.240	0.470	1.404	3224	66.07	391.58	17.373	0.805	2.142
4260	-149.21	457.93	17.242	0.617	1.011	4071	34.79	444.73	17.374	0.500	1.307

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
1377	65.88	255.30	17.377	0.638	1.029	975	-213.91	209.23	17.505	0.583	0.940
909	190.97	199.23	17.385	0.569	1.053	3957	34.56	437.39	17.506	1.369	1.743
3090	63.53	384.74	17.386	0.039	1.911	1899	50.55	303.10	17.507	0.525	1.245
3869	25.76	431.16	17.386	0.572	1.476	3066	8.67	383.47	17.514	0.740	1.997
2993	79.68	378.88	17.389	0.333	2.138	2813	97.75	367.97	17.514	0.409	1.604
3531	2.72	409.97	17.393	1.138	0.890	2863	-15.66	370.60	17.516	0.645	1.263
1618	-111.84	279.18	17.396	0.590	0.810	3333	1.22	397.67	17.519	0.334	1.731
2835	162.26	369.05	17.398	0.504	0.906	3367	72.93	400.12	17.526	0.469	2.006
3180	105.36	389.58	17.398	0.645	1.463	4239	75.99	456.52	17.526	0.631	1.020
2473	-199.71	346.12	17.400	0.645	1.063	5378	34.70	562.16	17.526	0.636	0.850
2360	-154.76	337.85	17.400	0.551	0.858	1368	-143.58	253.95	17.530	0.627	1.048
3196	-16.35	390.17	17.401	0.016	1.336	3524	30.33	409.52	17.537	0.344	2.462
5741	-40.76	618.01	17.401	0.663	1.043	2830	-31.63	368.78	17.537	1.322	1.473
5038	121.31	523.26	17.403	0.503	1.055	2576	-61.75	353.20	17.544	0.340	1.039
2291	119.08	333.10	17.404	0.626	0.945	3254	-25.50	393.08	17.546	0.574	1.181
1468	47.06	406.27	17.405	0.301	1.811	3038	68.03	381.56	17.550	0.632	2.141
2123	69.76	319.34	17.406	0.488	1.514	2599	17.56	354.77	17.550	0.410	1.957
5814	292.51	631.43	17.408	0.632	0.913	1235	98.55	240.81	17.550	0.487	0.983
3832	65.21	428.82	17.408	0.460	2.051	3393	-51.48	401.44	17.552	0.235	1.349
3318	24.02	396.76	17.411	0.433	2.446	1466	288.56	265.32	17.555	0.641	0.798
1950	106.87	307.50	17.414	0.648	1.078	3521	46.16	406.30	17.556	0.398	1.848
3379	48.58	400.73	17.416	0.336	2.013	3875	43.20	431.56	17.557	0.789	1.654
2655	63.62	358.25	17.418	0.422	2.444	3120	219.59	386.45	17.557	0.655	0.869
4404	63.77	469.03	17.420	0.602	1.330	2399	45.47	340.46	17.559	0.358	1.364
3138	157.40	387.05	17.425	0.614	1.011	3983	-20.52	438.92	17.559	0.618	0.968
3391	71.51	401.40	17.425	1.100	1.933	3388	-52.49	401.26	17.560	0.791	1.457
3279	-119.77	394.55	17.426	0.585	0.953	1417	14.21	260.03	17.561	0.721	0.985
3953	36.46	437.13	17.426	0.249	1.426	2889	-115.82	372.16	17.561	0.164	0.945
838	64.59	192.13	17.426	0.626	0.951	2676	-157.33	359.27	17.562	0.536	0.891
312	155.50	96.30	17.426	0.607	0.960	3569	-42.27	412.54	17.567	-0.078	1.647
2173	32.64	323.93	17.428	0.497	1.686	3453	50.02	405.36	17.570	-0.209	1.821
2801	-44.09	367.22	17.430	1.552	1.805	2095	11.99	317.03	17.572	0.452	1.386
4727	3.12	494.08	17.435	1.389	1.320	3292	-136.10	395.18	17.576	0.609	1.029
2910	-26.02	374.05	17.436	-0.122	1.520	2553	28.94	351.55	17.577	0.300	1.892
696	-210.70	166.19	17.441	0.641	0.780	3271	68.84	394.25	17.581	0.286	1.944
3387	16.83	401.26	17.448	0.566	2.872	3609	16.95	414.61	17.581	-0.045	2.150
2884	-1.98	371.93	17.449	0.470	1.930	5754	-25.59	619.81	17.590	0.643	0.960
2182	58.19	324.96	17.452	0.456	1.723	1979	135.16	309.30	17.592	0.653	1.005
4832	74.24	503.57	17.454	0.580	1.038	6079	260.28	690.83	17.592	0.244	2.415
3067	83.03	383.52	17.455	0.659	1.270	4029	78.94	442.25	17.593	0.584	1.645
2090	59.11	316.44	17.459	0.609	1.404	4198	17.55	453.26	17.594	0.511	1.064
3624	-26.37	415.39	17.460	0.644	1.338	1371	-102.83	254.42	17.596	0.618	0.870
2193	110.46	325.88	17.461	0.467	2.045	2175	13.44	324.02	17.596	0.482	1.584
2744	-40.65	363.79	17.465	0.857	1.975	5895	291.07	646.72	17.596	0.610	1.098
3226	57.96	391.71	17.466	0.312	2.778	5040	26.26	523.39	17.596	0.602	1.291
2428	26.12	342.80	17.468	0.454	1.594	5073	-66.90	527.39	17.603	0.530	0.823
3469	44.33	406.31	17.472	0.418	1.977	2051	-13.76	314.24	17.605	0.765	0.993
3805	133.01	427.21	17.476	0.094	1.230	2740	5.94	363.59	17.606	0.387	2.048
3906	26.03	433.99	17.479	0.477	1.424	2085	46.63	316.00	17.609	0.292	1.250
2781	-93.46	366.25	17.479	0.625	0.988	3651	19.31	417.04	17.614	0.481	2.244
1803	189.85	296.30	17.481	0.644	0.935	2514	79.16	348.41	17.614	0.770	1.554
5403	-26.22	565.20	17.485	0.605	0.898	2335	15.55	336.42	17.614	0.549	1.359
5587	-77.65	592.02	17.488	0.658	0.750	3386	-1.10	401.17	17.616	0.643	1.356
3656	39.49	417.18	17.490	1.287	2.474	574	127.72	149.67	17.617	0.568	1.058
4121	-107.25	448.20	17.490	0.274	1.135	3675	22.70	418.67	17.621	0.456	1.923
3437	72.40	404.17	17.494	0.427	1.743	805	110.37	185.32	17.628	0.626	1.105
3210	21.24	390.85	17.494	0.455	2.928	2633	17.72	357.20	17.629	0.545	2.390
6047	-25.71	684.68	17.498	0.537	0.715	550	57.14	146.32	17.631	0.582	0.850
3368	22.17	400.16	17.502	0.320	2.124	5017	300.99	521.62	17.631	0.095	1.093
4276	17.12	459.42	17.504	0.630	1.076	3658	-37.20	417.19	17.631	0.560	1.548

ID	X	Y	V	B-V	$\bar{\kappa}$	ID	X	Y	V	B-V	$\bar{\kappa}$
6090	257.61	693.12	17.631	0.582	2.823	2062	-21.54	314.88	17.717	0.479	0.988
3576	-8.99	412.72	17.632	0.587	1.370	6498	40.54	578.97	17.717	0.617	0.886
3530	102.75	409.79	17.632	0.408	1.265	882	-114.42	196.93	17.718	0.624	0.875
333	-147.88	100.89	17.632	0.549	0.983	2094	17.54	316.84	17.721	0.989	1.740
5914	-85.38	650.20	17.636	0.629	1.070	2236	-60.76	329.18	17.726	0.510	0.870
5852	98.92	637.52	17.636	0.590	0.820	2520	4.18	348.60	17.726	0.358	1.582
3728	-163.60	422.37	17.639	0.597	1.000	1474	31.22	266.29	17.726	0.690	1.101
2190	-15.39	325.80	17.640	0.567	1.280	4415	-108.01	469.52	17.728	0.543	0.934
6068	261.39	698.50	17.643	1.405	2.587	2339	11.02	336.49	17.728	0.450	1.276
1541	89.53	272.83	17.643	0.513	0.913	4903	82.23	510.19	17.731	0.642	0.907
3191	13.02	390.02	17.647	0.511	2.587	2838	-29.20	375.98	17.733	0.283	1.443
4783	-31.50	498.97	17.647	0.624	0.928	2558	69.30	351.90	17.733	0.567	1.472
3693	65.11	419.85	17.647	0.103	1.855	2365	41.48	338.05	17.737	0.427	1.376
5057	86.54	525.43	17.651	0.801	0.905	1856	-71.97	299.62	17.738	0.638	0.923
3124	-26.28	386.59	17.653	0.808	1.182	5259	42.15	547.27	17.741	0.633	1.034
3342	120.02	398.28	17.654	0.809	1.093	2769	85.06	365.15	17.743	0.410	1.345
4636	54.77	487.21	17.654	0.626	1.061	2111	1.69	318.02	17.745	0.663	1.266
3115	0.25	386.36	17.656	0.673	1.621	2242	-13.85	329.43	17.749	0.473	1.126
3861	83.62	450.24	17.659	0.491	1.996	5256	263.04	546.75	17.749	0.688	1.165
2412	-24.04	341.25	17.659	0.512	1.072	2091	-118.06	316.51	17.751	0.387	0.920
2867	75.69	370.83	17.662	0.394	1.710	2026	47.07	312.81	17.751	0.397	1.239
2996	69.39	379.02	17.662	-0.070	2.102	3860	-114.88	430.21	17.756	0.616	1.154
1838	73.98	298.85	17.666	0.603	1.023	3990	13.71	439.47	17.757	0.522	1.170
1708	135.44	287.01	17.666	0.621	0.952	4470	162.02	473.28	17.758	0.660	0.986
2435	36.05	343.18	17.668	0.289	1.868	3516	54.20	408.69	17.758	0.270	1.685
3423	20.18	403.24	17.668	0.412	1.853	4639	48.53	487.31	17.761	0.491	1.066
1476	70.27	246.42	17.671	0.675	0.965	3908	63.25	434.07	17.762	0.394	1.752
3637	26.81	416.17	17.671	0.439	1.625	4116	80.54	447.84	17.762	0.580	1.834
2402	69.13	340.57	17.672	0.490	1.246	4236	51.80	456.45	17.763	0.640	1.203
3752	47.41	423.72	17.674	0.252	1.677	2176	46.11	324.14	17.763	0.506	1.278
4301	187.04	461.45	17.674	0.695	0.941	5811	138.83	630.81	17.764	0.583	0.908
61	124.57	26.60	17.679	0.695	1.015	2685	74.47	360.08	17.764	0.457	1.434
3512	2.34	408.36	17.679	-0.088	1.696	4297	86.68	461.16	17.768	0.412	1.226
2680	-23.23	359.73	17.679	0.389	1.399	720	-135.50	173.11	17.768	0.619	0.955
4028	49.99	442.20	17.682	0.495	1.682	1970	73.62	300.74	17.770	0.769	1.233
4199	-75.23	453.40	17.682	0.654	0.961	2252	-27.99	371.61	17.771	0.753	1.465
4024	150.84	441.86	17.683	0.604	0.956	2879	57.51	330.38	17.775	0.539	1.286
3107	184.10	386.00	17.685	0.624	0.905	2197	121.15	325.96	17.781	0.553	1.040
3552	1.95	411.26	17.686	0.607	1.572	3731	22.78	422.54	17.781	0.571	1.683
2487	37.89	347.02	17.686	0.739	2.256	3898	258.58	433.44	17.785	0.542	1.096
2206	180.80	326.53	17.689	0.698	1.145	5886	137.06	645.96	17.788	0.717	0.980
3643	77.14	416.64	17.690	0.561	1.315	2209	82.11	326.90	17.789	0.516	1.220
2244	-44.91	329.55	17.690	0.634	0.910	4858	104.54	505.58	17.789	0.630	0.965
3033	253.98	381.15	17.691	0.634	1.110	1750	160.27	291.19	17.794	0.485	0.877
3988	-37.38	439.42	17.692	0.649	1.059	6418	22.10	846.06	17.796	0.497	1.016
3559	-57.63	411.98	17.697	0.619	0.989	2960	2.39	378.13	17.797	0.601	1.451
1721	42.05	288.50	17.698	1.539	1.903	54	-88.38	23.24	17.798	0.627	0.887
2871	-66.16	371.08	17.701	0.467	0.983	2582	39.82	353.48	17.798	0.523	2.844
3192	-118.57	390.03	17.702	0.524	1.003	2851	-17.82	369.90	17.798	0.526	1.265
3838	-25.83	429.00	17.705	-0.450	1.655	3982	19.53	438.88	17.799	0.548	1.287
2246	-79.47	329.76	17.706	0.557	0.983	3742	117.93	423.34	17.800	0.542	1.168
6023	123.56	679.45	17.710	0.888	0.975	3547	24.02	411.01	17.802	0.340	1.115
3421	-22.95	403.15	17.710	0.572	1.320	3397	130.37	401.68	17.807	0.574	1.061
1055	40.28	219.04	17.711	0.456	0.996	2602	97.24	355.04	17.809	0.207	1.295
3680	31.38	418.87	17.712	0.464	1.617	3289	83.81	394.99	17.810	0.586	1.116
3001	88.80	379.19	17.712	0.562	1.611	4781	-232.30	498.85	17.811	0.633	0.889
1188	-67.68	235.49	17.713	0.710	0.900	4601	141.05	484.80	17.811	0.628	0.870
2976	116.83	377.76	17.714	0.100	1.223	4067	-42.47	444.40	17.812	0.559	0.964
5194	-127.71	540.19	17.715	0.635	0.957	3540	88.45	410.54	17.815	0.718	1.735
3708	216.62	421.49	17.717	0.456	1.073	3551	33.39	411.10	17.816	0.480	2.512

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
1455	-18.86	263.96	17.817	0.635	1.118	2970	3.77	377.47	17.906	0.160	1.679
4086	-10.34	445.65	17.817	0.580	0.911	4135	87.28	449.09	17.907	0.662	1.516
1892	34.05	302.33	17.818	0.399	1.145	2775	92.31	365.74	17.908	0.692	1.734
4139	122.14	449.40	17.819	0.537	1.436	2274	6.94	331.97	17.912	0.398	1.415
1786	40.28	294.68	17.820	1.109	1.625	3535	15.49	410.19	17.915	0.378	1.494
2869	6.27	370.64	17.821	0.386	1.775	1218	59.24	239.13	17.916	0.433	0.966
2468	-81.68	347.05	17.823	0.373	1.022	2660	15.38	358.52	17.917	0.969	2.462
2196	15.84	328.93	17.823	0.377	1.741	4085	116.05	445.62	17.919	0.395	0.894
2649	-69.50	357.93	17.824	0.884	1.910	3991	-23.96	439.52	17.920	0.601	0.914
4307	-1.16	461.76	17.825	0.657	1.069	2907	80.50	373.91	17.922	0.379	2.104
3411	59.85	402.44	17.825	0.137	1.851	2347	68.12	337.00	17.922	0.630	1.166
2171	-111.08	323.90	17.826	0.611	0.928	1966	-87.38	300.61	17.922	0.450	0.898
3867	163.94	430.79	17.826	0.597	0.941	3687	-14.19	419.57	17.924	0.418	1.294
5470	-175.54	575.59	17.827	0.568	1.087	3348	123.52	398.66	17.925	0.337	1.126
4120	164.47	448.11	17.830	0.414	1.108	3628	247.73	415.56	17.925	0.580	0.917
4351	126.93	465.54	17.831	0.546	0.858	3385	160.96	401.15	17.927	0.546	1.033
1680	52.19	285.15	17.831	1.945	1.610	2358	156.99	337.81	17.928	0.511	1.003
2741	78.80	363.72	17.832	0.473	1.451	4291	51.88	460.96	17.928	0.577	1.417
1507	183.90	269.14	17.833	0.315	0.870	3948	75.87	429.51	17.929	0.553	1.456
1991	183.42	310.29	17.833	0.485	0.925	1684	-11.88	285.40	17.929	0.543	0.935
2039	96.10	313.64	17.834	0.275	1.035	4392	53.35	528.25	17.937	0.195	0.845
3730	273.79	422.48	17.834	0.552	0.924	3425	57.60	403.65	17.938	0.320	1.789
5944	-6.89	541.32	17.836	0.614	0.970	177	55.05	62.54	17.941	0.663	0.763
2381	-108.30	338.81	17.838	0.532	0.940	3329	77.78	397.22	17.942	0.439	1.691
2194	184.30	325.88	17.839	0.761	1.010	2334	189.40	336.40	17.942	0.426	0.848
1735	65.58	288.64	17.842	-0.090	1.173	4235	25.54	457.25	17.943	0.399	1.362
1360	-92.65	253.07	17.842	0.554	1.907	2960	8.43	376.93	17.943	0.615	1.786
3245	3.48	392.60	17.843	0.554	1.907	3460	112.53	405.96	17.949	0.592	1.217
19	-2.97	9.09	17.844	0.543	0.900	2512	-1.15	348.33	17.951	0.272	1.386
1850	25.00	289.33	17.845	0.591	1.339	2580	-134.94	353.38	17.952	0.275	0.981
2152	284.17	322.04	17.846	0.514	0.945	4667	-30.28	489.66	17.953	0.499	1.309
1372	-32.42	254.65	17.852	0.555	0.945	2636	-10.53	357.29	17.953	0.561	1.500
2352	-52.62	337.26	17.854	0.412	0.980	1480	111.35	267.06	17.954	0.517	1.033
2105	-153.83	317.58	17.856	0.616	0.928	3583	-47.67	483.18	17.956	0.680	1.773
2358	55.25	399.41	17.857	0.388	2.028	5763	-81.48	621.73	17.957	0.608	1.120
5032	-34.10	522.95	17.863	0.504	1.510	5206	139.57	541.38	17.957	0.514	1.218
3764	-168.20	424.58	17.865	0.575	0.969	1917	43.31	304.45	17.958	0.398	1.740
2229	25.91	328.24	17.868	0.366	1.541	5787	118.59	627.59	17.958	0.606	0.933
3362	-5.39	399.77	17.869	0.919	1.452	4541	36.89	480.52	17.959	0.714	1.274
2384	23.86	339.21	17.872	0.422	1.505	5303	191.54	553.01	17.959	0.597	0.920
2696	72.54	361.03	17.874	0.457	1.491	4564	227.03	481.96	17.959	0.527	1.025
6366	-47.69	818.33	17.875	0.591	0.845	2799	100.68	367.19	17.960	0.436	1.069
5804	173.18	630.07	17.876	0.557	0.873	2673	-28.79	359.17	17.961	0.326	1.089
602	-19.30	153.92	17.878	0.606	0.868	1576	-134.47	276.01	17.962	0.444	0.902
5201	203.16	541.08	17.878	0.474	0.900	3526	-60.85	409.66	17.963	0.379	0.973
1275	71.99	244.67	17.880	0.572	0.947	2023	192.75	312.47	17.963	0.578	0.975
5197	-27.13	540.58	17.882	0.579	0.868	1376	72.42	255.10	17.965	0.375	0.785
1015	126.41	213.61	17.884	0.458	1.102	1175	61.25	234.15	17.965	0.611	0.901
2075	49.48	315.61	17.887	0.572	1.228	4264	-33.09	458.42	17.965	0.521	0.954
2546	22.07	350.79	17.887	0.317	1.557	1844	-34.51	299.11	17.968	0.572	0.978
3834	144.77	428.91	17.888	0.612	1.105	4050	-28.05	443.42	17.969	0.663	0.959
4132	-63.29	448.79	17.888	0.542	0.938	6046	114.90	684.08	17.969	0.617	0.945
1636	11.09	302.09	17.891	0.561	1.305	4644	78.62	487.56	17.970	0.455	0.983
2137	76.59	320.55	17.892	0.501	1.165	5764	243.40	622.40	17.971	0.559	1.015
2958	176.58	376.84	17.896	0.466	0.983	3070	-2.44	383.67	17.972	0.316	1.339
2997	-2.05	379.03	17.901	0.252	1.393	4232	17.60	456.40	17.973	0.552	1.084
2401	-2.05	340.53	17.906	0.433	1.268	2972	11.54	377.55	17.974	0.737	2.640

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2415	50.43	341.65	17.975	0.312	1.813	737	-78.57	175.36	18.027	0.650	0.923
4894	18.29	508.80	17.975	0.371	1.104	3394	163.57	401.48	18.028	0.334	1.054
2550	162.13	351.35	17.976	0.413	0.891	5271	89.42	548.63	18.028	0.586	1.087
749	29.63	176.80	17.978	0.541	0.925	537	-42.94	144.37	18.028	0.441	1.215
1111	94.79	226.33	17.979	0.667	0.783	4466	12.44	473.05	18.029	0.387	1.142
3172	-49.44	389.09	17.980	0.570	1.001	2165	-89.72	323.34	18.029	0.573	0.863
3984	-5.64	439.08	17.980	0.142	0.950	2436	-18.22	343.27	18.030	0.565	1.155
3236	71.33	392.14	17.981	0.541	1.937	2464	-128.27	345.30	18.030	0.324	0.817
3727	57.87	422.35	17.981	0.613	1.989	2272	-30.49	331.85	18.031	0.531	1.055
3586	3.35	413.11	17.982	0.207	1.525	2761	-34.26	364.64	18.031	2.195	1.710
1890	216.76	8	17.982	0.454	1.175	5388	-46.63	563.28	18.031	0.397	0.928
1710	41.81	287.15	17.982	1.027	1.943	5367	63.81	560.78	18.032	0.501	0.989
4775	228.26	498.08	17.983	0.577	0.963	4795	-61.15	500.14	18.032	0.590	0.939
3319	110.45	396.81	17.984	0.361	1.194	1089	-141.46	223.97	18.033	0.498	0.980
3749	7.93	423.54	17.986	0.569	1.589	4103	31.95	447.04	18.034	0.528	1.098
5611	76.34	595.95	17.987	0.294	0.945	4559	-179.41	481.68	18.035	0.445	0.925
1418	157.67	260.39	17.989	0.526	1.003	1765	43.68	292.97	18.036	0.767	1.761
4043	155.75	443.03	17.990	0.564	1.031	2513	16.03	348.39	18.036	0.474	1.370
648	85.93	160.91	17.991	0.422	0.888	2145	-192.25	321.38	18.038	0.461	0.855
2469	74.59	345.55	17.993	0.387	1.733	2535	101.82	350.20	18.038	0.434	1.216
1075	-43.05	222.06	17.993	0.575	1.023	4175	-54.46	451.65	18.039	0.591	0.949
3659	3.40	417.31	17.996	0.325	1.776	2342	206.52	336.75	18.040	0.394	0.970
2478	48.14	346.59	17.997	0.615	2.010	1035	-134.19	216.33	18.041	0.433	1.295
1660	16.72	283.27	17.998	0.299	0.954	2249	10.34	339.53	18.041	0.598	1.319
3058	8.06	382.89	18.000	0.310	1.495	1862	-30.66	300.50	18.041	0.523	0.960
5719	4.95	612.87	18.000	0.599	0.881	3554	-46.53	411.59	18.041	0.564	1.048
5039	64.71	523.27	18.002	0.530	0.868	4950	34.18	514.63	18.044	0.573	0.940
2260	95.05	330.74	18.002	0.755	1.180	3579	26.03	412.75	18.045	0.703	1.741
3597	15.41	414.01	18.004	0.485	1.624	3591	108.45	413.74	18.045	0.427	1.315
3928	145.88	435.29	18.004	0.518	0.978	904	136.79	199.47	18.045	0.510	0.985
1465	-13.23	265.24	18.004	0.474	1.315	4363	237.44	466.44	18.046	0.565	0.985
2301	51.09	333.65	18.004	1.198	1.550	4572	160.72	482.56	18.046	0.600	1.088
4242	14.59	456.68	18.005	0.544	1.046	4182	-108.51	451.88	18.047	0.482	0.991
2134	51.67	320.26	18.005	0.481	1.248	1868	-102.45	300.71	18.047	0.502	0.956
2087	33.61	316.04	18.007	0.194	1.560	1561	-185.45	274.80	18.049	0.484	0.986
3999	24.57	440.06	18.008	0.383	1.361	482	-171.44	134.19	18.049	0.504	0.984
3548	-36.96	411.01	18.010	0.608	1.569	2041	5.55	313.76	18.050	0.502	1.200
6056	253.35	685.61	18.015	0.487	1.655	1975	85.57	309.17	18.054	0.490	1.208
3281	96.36	394.64	18.017	0.422	1.065	4261	63.01	458.13	18.054	0.470	1.031
3792	61.29	426.28	18.017	0.341	2.003	3907	70.95	434.02	18.055	0.507	1.206
5395	12.10	564.65	18.018	0.644	0.938	1259	78.00	242.72	18.055	0.503	0.977
3101	82.38	385.44	18.018	0.415	1.256	1928	72.67	305.73	18.055	0.512	1.213
186	265.60	65.57	18.018	0.552	0.995	5152	-20.78	535.35	18.055	0.555	0.940
2968	76.40	377.36	18.019	0.599	2.014	5021	284.56	521.83	18.056	0.500	0.985
3494	81.09	407.40	18.020	0.395	1.256	3482	13.89	407.13	18.059	1.057	1.350
1529	61.34	271.04	18.020	0.429	0.968	2691	220.12	360.60	18.060	0.541	0.916
3981	228.96	438.85	18.022	0.365	0.909	2366	22.15	338.10	18.061	0.157	1.298
1528	40.53	270.91	18.022	0.616	0.966	5716	-143.91	612.46	18.061	0.506	1.023
4481	47.15	473.90	18.022	0.620	1.083	2852	8.78	369.93	18.062	0.237	2.048
3741	-20.92	423.19	18.022	0.153	1.235	3681	177.45	419.06	18.063	0.483	0.988
5551	129.52	586.92	18.022	0.538	1.008	6221	56.44	741.85	18.063	0.608	0.963
3202	-9.06	390.34	18.023	0.351	1.202	6097	154.67	695.24	18.063	0.437	0.918
103	175.14	44.15	18.023	1.877	0.887	2426	-8.82	342.72	18.064	0.549	1.217
1941	-37.77	307.18	18.023	0.589	1.090	4625	-94.86	486.35	18.068	0.586	1.013
3507	85.92	408.21	18.024	0.463	1.199	3600	106.92	414.13	18.069	0.846	1.126
2496	-74.43	347.58	18.025	0.452	1.090	2517	18.09	348.51	18.070	0.082	1.706
3788	-2.40	425.96	18.025	0.540	1.361	2657	-55.92	358.41	18.072	0.597	1.175
1761	23.22	292.38	18.026	0.720	1.224	2407	-12.96	341.04	18.073	0.542	1.125
4362	-20.45	466.39	18.026	0.235	1.016	3673	52.71	418.54	18.074	0.401	1.873
3801	41.95	426.84	18.027	0.307	1.673	2593	-185.19	354.28	18.077	0.501	0.946

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2962	171.31	376.98	18.079	0.424	1.111	3940	-176.43	436.29	18.131	0.558	0.973
2708	-67.55	361.85	18.081	0.330	1.616	1054	141.31	218.85	18.131	0.525	0.833
3413	140.74	402.70	18.082	0.474	0.929	4776	-3.52	498.29	18.131	0.609	1.036
1461	131.20	264.22	18.082	0.482	1.207	4574	19.86	482.65	18.133	0.369	1.069
3232	1.07	391.99	18.083	0.714	1.216	1749	255.75	291.17	18.134	0.477	0.837
1118	-47.99	227.02	18.084	0.595	1.123	3594	30.41	413.82	18.134	0.460	2.356
788	-180.41	183.13	18.085	0.225	0.853	5081	38.00	528.26	18.134	0.478	1.006
1971	-49.09	308.82	18.086	0.480	0.900	818	-156.56	187.97	18.135	0.583	0.748
2392	-43.40	339.70	18.087	0.529	1.060	4119	69.62	448.10	18.136	0.537	1.577
3316	72.91	396.52	18.087	0.494	2.009	4741	-112.97	495.02	18.137	0.474	1.036
2406	-115.94	340.92	18.087	0.520	0.903	938	137.23	204.23	18.137	0.549	0.877
5252	-107.31	546.51	18.088	0.545	0.950	4569	-177.45	482.36	18.138	0.504	0.923
3854	28.42	430.10	18.091	0.655	1.589	4699	-84.70	491.91	18.138	0.488	1.003
3403	65.78	402.00	18.091	0.470	2.844	1051	-69.69	218.21	18.139	0.502	0.933
5749	49.20	618.85	18.091	1.701	1.033	2367	146.01	338.10	18.139	0.332	1.097
2780	-30.02	366.15	18.092	0.804	1.334	3574	-11.85	412.70	18.140	0.476	1.278
866	86.29	195.15	18.094	0.396	1.010	5083	24.31	528.50	18.141	-0.004	1.093
4669	-126.12	489.83	18.094	0.508	0.991	3504	-61.14	407.92	18.141	0.492	0.974
2617	4.76	356.15	18.097	0.409	1.592	581	1.76	150.85	18.142	0.565	0.956
3203	88.17	390.35	18.098	0.610	1.118	724	178.92	173.86	18.143	0.506	0.960
1228	294.68	240.01	18.098	0.542	1.025	440	32.76	125.35	18.144	0.499	0.941
1278	44.44	244.85	18.098	0.583	1.000	3645	64.56	416.79	18.144	0.175	1.781
4920	244.12	511.31	18.098	0.507	0.990	5013	0.32	589.91	18.144	0.518	0.810
2035	97.83	313.26	18.099	1.085	1.050	5207	9.72	541.57	18.145	0.425	1.036
2118	87.48	318.73	18.099	0.565	1.442	5312	53.32	553.94	18.145	0.491	0.959
4007	108.24	440.70	18.100	0.614	0.989	4506	-14.02	476.36	18.145	0.333	0.893
5472	14.04	576.01	18.100	0.466	0.910	1615	-54.18	278.99	18.145	0.525	0.910
1210	132.91	238.23	18.100	0.521	0.928	3044	75.95	381.91	18.146	0.584	1.827
4159	-107.51	450.77	18.101	0.582	1.020	1247	-89.83	241.68	18.148	0.500	1.020
1392	-180.22	256.69	18.101	0.577	0.850	4804	256.83	500.80	18.148	0.473	0.960
3775	-19.77	425.37	18.103	0.499	1.343	3346	-84.86	398.51	18.149	0.363	0.921
1671	-93.27	284.67	18.105	0.616	0.883	4579	62.28	482.88	18.149	0.511	1.124
3340	-0.83	398.05	18.105	0.557	1.213	4622	-102.05	485.92	18.151	0.539	1.014
3635	-182.18	415.99	18.107	0.564	0.855	5433	171.09	569.61	18.151	0.456	1.320
2564	14.88	352.26	18.108	0.262	1.845	2106	199.07	317.63	18.151	0.450	1.043
2461	64.21	345.18	18.111	0.335	1.593	2450	22.23	344.56	18.152	0.586	1.410
5090	-14.55	528.97	18.111	0.500	0.893	5529	-128.47	583.94	18.154	0.535	0.877
5793	58.16	628.11	18.111	0.569	1.181	3508	0.57	408.27	18.154	0.270	1.612
3275	-100.87	394.36	18.113	0.535	0.989	2543	43.17	350.65	18.155	0.372	2.640
156	-59.46	57.26	18.114	1.144	0.797	2267	-19.21	331.29	18.155	0.332	1.095
6009	100.82	675.33	18.114	0.500	0.910	2386	85.08	339.42	18.156	0.462	1.353
6078	63.07	690.49	18.115	0.463	0.903	6152	44.74	714.41	18.156	0.431	0.953
3341	20.03	398.22	18.115	0.147	3.128	2460	106.28	345.17	18.157	0.443	1.082
2534	67.64	350.16	18.116	0.140	1.581	3753	32.46	423.78	18.158	0.603	1.586
2343	1.23	336.90	18.116	0.753	1.440	4489	-19.94	474.59	18.159	0.389	0.944
576	-106.06	149.89	18.116	0.408	0.830	2795	-30.96	367.06	18.159	-0.049	1.352
1526	98.06	270.81	18.116	0.384	1.075	395	192.40	115.48	18.160	0.501	0.913
3136	-107.13	386.99	18.123	0.525	0.892	3952	-96.51	437.03	18.160	0.495	1.149
7875	96.95	371.47	18.123	0.329	1.468	1073	-53.46	221.76	18.161	0.550	1.033
3725	30.01	422.27	18.124	0.419	1.580	1177	-37.18	276.09	18.162	0.405	0.958
2178	132.41	324.27	18.125	0.534	1.122	2872	-47.48	371.16	18.162	2.568	2.540
4030	-108.08	442.37	18.126	0.524	1.379	18	190.86	8.99	18.164	0.451	0.840
2082	102.17	315.87	18.127	0.298	1.090	3670	138.23	418.22	18.165	0.421	1.053
3905	-17.37	433.89	18.127	0.398	0.908	4184	-44.78	451.97	18.165	0.408	1.009
2952	183.19	376.56	18.127	0.516	0.951	3112	-82.68	386.21	18.166	0.356	1.065
1943	4.07	307.22	18.127	0.498	1.295	2305	17.06	333.73	18.167	0.259	1.493
2505	-15.15	348.01	18.127	0.500	1.147	4563	-136.00	481.93	18.168	0.418	1.166
2981	118.24	378.27	18.128	0.767	1.330	5339	178.21	557.50	18.169	0.502	0.810
6228	234.99	745.95	18.130	0.509	0.873	1781	53.44	294.24	18.169	1.835	1.787
6113	262.21	700.60	18.130	1.640	2.583	124	-134.41	48.63	18.170	0.462	0.953

<i>ID</i>	<i>X</i>	<i>Y</i>	<i>V</i>	<i>B - V</i>	$\bar{\chi}$	<i>ID</i>	<i>X</i>	<i>Y</i>	<i>V</i>	<i>B - V</i>	$\bar{\chi}$
4277	-123.44	459.48	18.173	0.491	0.891	2989	-53.16	378.62	18.224	0.566	1.075
5803	72.65	629.99	18.173	0.472	1.076	3042	-18.71	381.79	18.226	0.547	1.204
2817	158.27	368.11	18.174	0.409	0.912	3653	68.26	417.09	18.226	-0.167	1.650
1769	141.50	293.29	18.174	0.437	1.125	3438	79.33	404.24	18.226	0.467	1.293
192	-47.68	66.47	18.175	0.458	1.077	3992	-6.92	439.56	18.227	0.494	0.951
2554	-79.18	351.71	18.175	0.591	1.345	71	157.07	30.88	18.227	0.496	0.877
1510	-155.97	269.33	18.175	0.530	0.893	3745	-86.08	423.36	18.228	1.062	1.105
3188	11.40	389.88	18.177	0.081	2.502	3829	-147.97	428.71	18.229	0.466	0.910
4168	97.51	451.42	18.177	0.521	1.000	3701	82.09	420.58	18.229	0.614	1.395
2217	-73.11	321.32	18.177	0.474	1.125	4900	-158.45	510.02	18.230	0.537	1.080
3461	19.37	405.97	18.178	0.460	2.181	5246	289.23	545.86	18.230	0.510	0.945
2125	37.25	319.43	18.179	0.391	1.464	4604	-39.23	484.95	18.231	0.539	1.044
4073	-1.97	444.89	18.180	0.451	1.173	6109	266.87	699.25	18.231	2.348	1.935
1952	34.10	307.73	18.183	0.600	1.148	3131	-3.32	386.77	18.231	-0.050	1.180
3550	21.00	411.06	18.183	0.494	1.712	2507	-240.12	348.11	18.232	0.534	0.842
3151	-15.21	387.59	18.183	0.371	1.380	2275	81.57	332.02	18.232	0.598	1.250
1827	-52.59	297.89	18.184	0.602	0.942	3886	-47.98	432.27	18.233	0.425	1.111
1999	-36.82	310.54	18.184	0.484	1.010	5478	-34.34	576.20	18.234	0.797	0.873
3766	37.20	424.89	18.185	0.458	1.309	5699	306.95	608.49	18.234	0.455	1.018
3520	13.49	409.08	18.185	0.467	1.620	5674	85.74	605.85	18.234	0.583	0.768
4573	-10.81	482.59	18.186	0.477	1.009	4206	-96.41	453.72	18.235	0.558	1.005
3845	-146.41	429.36	18.187	0.780	0.941	2733	181.89	363.28	18.236	0.397	1.473
332	-15.05	100.87	18.188	0.431	1.025	1658	-195.97	282.96	18.236	0.587	1.047
5561	66.61	588.09	18.189	0.494	0.858	1400	234.29	257.93	18.238	0.383	1.010
1947	19.01	307.40	18.189	0.636	1.109	1951	122.72	307.63	18.238	0.509	0.845
2934	196.72	375.78	18.190	0.547	0.968	2632	-63.10	357.13	18.240	0.365	1.085
5868	-85.28	641.73	18.192	0.469	1.108	3467	9.41	406.26	18.242	0.528	1.674
2654	105.20	358.22	18.193	0.658	1.224	2296	159.52	333.36	18.242	0.420	0.952
176	18.35	62.33	18.193	0.617	0.950	1114	107.32	226.55	18.244	0.521	0.923
47.8	173.76	493.07	18.194	0.433	0.920	1334	-145.54	251.32	18.245	0.415	1.077
3068	117.44	383.60	18.195	0.273	1.121	3871	10.05	431.32	18.247	0.605	1.814
4154	-90.69	450.54	18.195	0.756	0.979	2443	58.81	343.84	18.248	0.282	2.246
2482	131.15	346.85	18.196	0.636	0.978	3963	148.83	437.68	18.248	0.449	0.946
806	-89.09	185.36	18.197	0.481	0.935	3082	-7.47	384.34	18.250	0.489	1.352
293	127.42	91.68	18.197	0.436	0.955	4633	5.37	487.02	18.252	0.454	1.089
4715	38.79	492.94	18.197	1.839	1.388	803	-143.97	185.11	18.252	0.460	0.930
3429	87.63	403.77	18.198	0.505	1.236	1527	-126.37	270.90	18.254	0.472	0.875
5641	26.80	600.77	18.202	0.384	0.939	3571	17.91	412.58	18.255	0.496	1.872
6183	278.13	724.64	18.204	0.548	0.923	2139	92.82	320.68	18.255	0.562	1.160
3692	75.83	419.79	18.205	0.449	1.322	5110	-9.72	530.60	18.256	0.518	0.938
2359	-39.91	337.82	18.208	0.572	0.960	1926	157.69	305.71	18.257	0.463	0.920
5798	-171.04	629.24	18.209	0.563	0.905	4379	-186.45	467.28	18.258	0.478	0.988
4143	101.63	449.52	18.210	0.444	0.986	3390	-100.17	401.38	18.258	0.477	1.155
2404	25.78	340.73	18.210	0.093	1.335	960	22.91	207.01	18.258	0.457	0.946
2344	-6.17	336.95	18.211	0.373	1.420	2044	-135.84	314.05	18.259	0.511	0.808
6100	179.23	696.32	18.212	0.459	0.830	2233	-66.26	328.89	18.260	0.557	0.810
5526	67.58	583.21	18.213	0.500	0.826	4728	59.23	494.28	18.260	0.442	1.003
4954	145.99	514.96	18.215	0.499	0.980	5528	41.63	583.41	18.260	0.444	0.899
217	115.72	73.15	18.216	0.493	0.988	1927	68.47	305.72	18.260	0.400	1.152
3913	-0.70	434.43	18.216	0.485	1.236	2059	44.14	314.62	18.262	0.288	1.320
1619	96.42	279.18	18.216	0.321	0.925	2624	-38.49	356.65	18.263	0.445	1.148
3121	-8.39	386.47	18.216	0.392	1.301	1871	-90.08	300.81	18.264	0.498	0.880
1616	-104.44	279.10	18.217	0.530	0.810	1061	102.65	220.37	18.264	0.474	1.053
659	-6.67	162.19	18.218	0.532	0.860	34	203.09	16.94	18.264	0.448	0.887
4514	-34.76	477.78	18.218	0.437	1.056	1240	74.65	241.20	18.265	0.549	0.910
800	-102.96	184.60	18.219	0.466	0.830	1043	-144.67	217.20	18.266	0.336	0.967
1548	-52.41	273.41	18.221	0.204	0.868	596	-107.14	153.27	18.266	0.494	0.813
2547	-85.73	350.85	18.223	0.377	1.113	3322	-23.77	396.86	18.267	0.485	1.208
4022	-80.41	441.75	18.223	0.393	1.053	624	82.42	156.84	18.267	0.428	0.900
1394	84.29	256.98	18.223	0.342	0.827	4647	-76.64	487.70	18.268	0.469	0.911

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
3301	68.28	395.84	18.268	-0.191	1.005	4977	105.65	517.55	18.306	0.420	0.910
3015	96.15	379.90	18.268	0.553	1.388	2329	-51.74	335.89	18.306	1.264	0.993
5284	-230.96	550.02	18.270	0.520	0.875	2081	131.14	315.82	18.306	0.069	0.952
2448	-28.01	344.44	18.270	0.562	1.243	1915	-85.04	304.28	18.307	0.383	0.918
2080	-51.28	315.80	18.270	0.330	0.915	5118	100.11	531.23	18.308	0.379	0.880
1920	-149.20	304.67	18.271	0.261	0.888	4700	33.23	492.00	18.308	0.369	1.067
646	-148.79	160.18	18.271	0.439	0.928	3683	168.24	410.37	18.310	0.409	0.934
4316	29.68	462.11	18.272	0.494	1.261	3733	121.26	422.75	18.311	0.508	1.138
4720	-116.41	493.22	18.272	0.381	0.949	3378	159.04	400.71	18.311	0.266	0.948
2256	40.01	330.58	18.272	0.520	1.660	2439	12.76	343.67	18.311	0.485	1.414
118	46.66	47.20	18.272	0.515	1.035	292	28.85	91.43	18.312	0.399	0.898
3986	174.89	439.34	18.274	0.422	1.019	1882	109.78	301.82	18.312	0.345	0.950
3335	-92.00	397.84	18.274	0.403	0.946	2942	-88.01	369.54	18.313	0.256	1.014
3654	108.83	417.10	18.275	0.392	1.090	4456	-18.90	472.49	18.314	0.380	0.894
1199	-84.35	237.09	18.277	0.320	0.888	6294	-29.82	76.33	18.314	0.581	0.990
3617	110.28	415.04	18.278	0.654	1.109	3671	48.67	418.29	18.317	0.229	2.200
111	11.37	45.91	18.278	0.472	0.869	3711	3.51	421.55	18.317	1.381	1.614
2010	17.33	311.17	18.279	0.588	1.245	288	231.72	91.22	18.317	0.436	0.973
1881	-32.73	301.78	18.279	0.123	0.990	5133	97.47	532.90	18.319	0.494	0.538
3053	2.70	382.63	18.279	-0.217	1.660	1053	-163.42	218.54	18.319	0.482	0.890
4866	276.47	506.28	18.279	0.438	0.877	5223	-53.21	544.02	18.319	0.618	0.845
3285	125.11	394.81	18.279	0.398	1.071	5100	95.40	529.73	18.321	0.434	0.915
4330	90.26	464.06	18.280	0.367	1.195	4568	23.93	482.34	18.321	0.441	1.107
2620	244.42	356.38	18.281	0.599	1.084	1544	36.15	273.12	18.322	0.390	1.028
3009	-36.67	379.71	18.281	0.614	1.329	744	-17.30	176.08	18.324	0.556	0.950
2885	150.81	372.00	18.283	0.135	1.478	1748	4.51	291.13	18.325	0.385	0.978
5451	147.11	572.17	18.283	0.407	0.780	4961	-234.89	515.90	18.325	0.437	0.935
891	-126.06	198.15	18.283	0.528	0.888	592	91.03	152.98	18.326	0.196	0.845
1939	-28.16	306.94	18.283	0.256	0.853	2561	0.56	351.99	18.326	0.178	1.767
4340	39.93	464.85	18.283	0.461	1.050	6341	-236.70	803.52	18.328	0.545	1.048
812	-188.19	186.76	18.285	0.495	0.963	3996	41.62	439.81	18.328	0.550	1.084
68	235.47	30.18	18.285	0.390	1.000	1512	114.54	269.47	18.329	0.507	0.983
4292	-142.44	461.00	18.286	0.446	0.964	2723	-33.56	362.40	18.329	-0.362	1.097
4457	143.49	472.50	18.286	0.450	0.915	1728	37.10	288.71	18.330	0.501	1.239
5737	103.06	616.64	18.286	2.201	0.900	3243	68.26	392.52	18.330	-0.398	1.342
2269	25.26	331.41	18.287	0.542	1.389	2640	-18.00	357.40	18.332	0.556	1.155
5108	12.92	530.28	18.287	0.266	0.929	3878	115.92	431.69	18.332	0.514	1.079
1072	182.12	221.63	18.287	0.359	0.808	2295	-179.34	333.29	18.332	0.417	0.925
2034	87.39	313.23	18.287	0.717	1.418	5861	-49.19	640.36	18.333	0.548	1.035
1707	12.82	286.95	18.288	0.369	1.019	4108	-71.90	447.29	18.334	0.429	0.915
1666	27.86	284.01	18.289	0.535	1.105	1806	-27.37	296.63	18.334	0.415	1.433
2807	10.46	367.56	18.289	0.155	2.267	2179	-73.66	324.42	18.334	0.655	1.005
79	-163.58	35.88	18.289	0.669	1.013	2135	138.05	320.47	18.335	0.364	1.005
5049	-129.15	524.24	18.290	0.377	0.957	2527	-66.07	349.65	18.335	0.518	1.575
3757	138.42	424.08	18.291	1.310	1.030	3529	115.92	409.71	18.336	0.456	1.075
5847	25.92	636.88	18.291	0.443	0.909	5651	-54.55	602.48	18.336	0.485	0.985
2001	33.04	310.67	18.291	0.438	1.275	4145	-49.63	449.72	18.336	0.417	1.101
4258	186.00	457.75	18.292	0.482	0.895	2983	107.85	378.31	18.336	0.547	1.332
2442	-99.52	343.81	18.292	0.496	0.985	5328	233.45	556.03	18.337	0.412	0.925
1996	29.73	310.48	18.292	0.570	1.434	1727	27.37	288.66	18.337	0.338	1.045
2086	5.78	316.03	18.293	-0.169	1.304	5904	-69.34	649.04	18.337	0.440	0.802
2699	-47.86	361.09	18.296	0.501	1.524	5064	26.76	525.91	18.338	0.544	1.361
1752	162.01	291.30	18.297	0.537	0.880	4805	229.07	501.18	18.338	0.529	0.960
1597	114.15	277.65	18.298	1.669	0.977	3343	-118.40	398.28	18.338	0.381	0.975
1740	98.98	290.06	18.298	0.392	0.913	2571	220.02	352.59	18.339	0.414	0.933
4126	72.77	448.53	18.301	0.850	1.514	4065	-78.78	444.47	18.340	0.420	0.981
4388	-150.07	467.86	18.301	0.514	0.975	1450	-113.40	263.42	18.340	0.480	0.990
3644	162.00	416.72	18.303	0.510	0.904	836	-142.51	190.00	18.341	0.447	1.013
2000	-21.23	310.66	18.303	0.399	0.977	3350	174.97	398.81	18.341	0.464	0.945
3305	137.68	553.32	18.304	0.415	0.850	3434	-80.05	403.95	18.341	0.453	0.918

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
3736	245.47	423.01	18.342	0.381	0.909	597	-146.64	153.30	18.371	0.424	0.940
4992	86.56	518.90	18.343	0.327	1.025	3620	-23.44	415.15	18.372	0.350	1.597
3220	53.11	391.34	18.343	0.276	1.197	3668	-46.45	417.89	18.373	0.539	1.416
2765	110.36	364.87	18.343	0.558	1.441	1120	-228.02	227.17	18.373	0.422	0.875
3230	-12.34	391.82	18.344	0.320	1.286	3336	-51.20	397.78	18.373	0.427	1.306
1086	61.23	223.84	18.344	0.387	0.971	2743	-21.22	363.73	18.374	0.380	1.234
4913	-97.53	510.83	18.345	0.442	0.882	1689	13.31	285.66	18.375	0.553	1.110
481	199.03	134.16	18.345	0.231	0.805	5748	100.77	618.76	18.375	0.506	0.965
2589	84.38	353.95	18.345	0.370	1.870	4077	39.17	445.19	18.375	0.473	1.084
3723	256.61	422.02	18.346	0.475	0.869	2905	-85.05	373.72	18.375	0.469	0.975
1249	288.00	241.78	18.346	0.456	0.745	2911	-11.63	374.07	18.376	0.385	2.041
4902	203.05	510.14	18.347	0.478	0.788	2854	-63.96	370.11	18.376	0.335	0.986
6102	-149.60	696.59	18.347	0.427	0.800	3164	80.38	388.50	18.376	0.489	1.209
4105	65.15	447.12	18.347	0.819	1.893	3910	106.53	434.19	18.379	0.439	1.007
1415	-3.19	259.78	18.349	0.697	1.572	3821	104.48	428.04	18.380	0.486	0.964
3031	71.37	381.10	18.350	0.205	2.440	4751	109.08	495.61	18.380	0.419	1.010
2462	110.87	345.20	18.350	0.533	1.210	2619	-8.13	355.36	18.381	0.271	1.591
2126	23.65	319.47	18.351	0.891	2.119	5258	-16.71	546.97	18.381	0.427	1.087
5822	-91.94	632.70	18.352	0.496	0.865	1910	158.35	303.95	18.381	0.288	0.993
3570	216.95	412.55	18.352	0.382	1.025	2052	-60.21	314.24	18.382	0.391	0.948
1499	-167.29	268.76	18.352	0.380	1.008	4631	8.35	486.98	18.383	0.443	1.076
2283	-65.02	332.42	18.353	0.614	0.853	4624	128.14	486.24	18.383	0.434	0.999
6075	269.19	689.57	18.353	1.172	2.215	933	217.67	203.44	18.387	0.453	0.910
1940	47.14	307.09	18.354	0.449	1.423	2410	131.33	341.17	18.387	0.319	1.018
6114	257.09	700.75	18.354	2.118	1.270	3738	-16.52	423.04	18.387	0.340	1.167
5771	171.23	625.13	18.356	0.470	0.893	385	278.59	113.49	18.387	0.426	1.017
3577	130.67	412.72	18.356	0.497	1.096	968	72.00	207.85	18.387	0.368	0.957
112	19.69	45.98	18.356	0.421	0.963	2323	-79.29	335.17	18.388	0.234	0.945
2155	157.85	322.32	18.357	0.527	0.850	26	-229.83	12.72	18.388	0.632	1.008
3352	12.95	399.11	18.357	0.515	2.778	4049	43.61	443.19	18.388	0.466	1.104
563	-28.09	148.45	18.358	0.436	1.008	4582	-111.57	483.17	18.388	0.491	0.983
4006	-44.81	440.63	18.360	0.379	1.001	3227	130.88	391.77	18.389	0.476	1.065
3308	78.63	396.29	18.361	0.438	1.477	4256	-130.27	457.60	18.389	0.447	0.941
5694	-1.64	608.21	18.361	0.370	0.870	2675	212.03	359.19	18.390	0.421	0.979
6156	85.49	715.84	18.362	0.506	0.875	1661	18.55	283.32	18.392	0.696	0.971
1335	-7.00	251.35	18.362	0.485	0.900	3852	30.72	430.00	18.393	0.438	1.618
5875	103.68	644.15	18.363	0.482	0.920	3493	-26.18	407.36	18.393	0.432	1.221
2923	106.65	375.04	18.363	0.460	1.485	2724	139.53	362.50	18.393	0.445	1.028
1008	124.05	713.30	18.363	0.505	0.950	3406	162.55	402.05	18.394	-0.004	1.116
1783	-185.76	294.30	18.363	0.376	0.988	1357	-107.43	252.71	18.394	0.454	0.947
3255	288.71	393.09	18.363	0.409	1.869	4048	9.82	443.15	18.394	0.474	1.149
6266	221.04	763.19	18.364	0.429	1.015	756	285.42	178.20	18.394	0.425	0.798
1227	171.25	239.99	18.365	0.376	0.923	6225	283.44	743.69	18.395	0.453	0.885
1302	-17.19	247.30	18.365	0.333	0.938	4851	49.93	505.15	18.395	0.223	1.182
5031	-131.16	522.93	18.365	0.418	0.945	2432	-3.35	343.14	18.395	0.528	1.268
3309	-14.41	396.30	18.365	0.521	1.321	4446	205.78	471.87	18.397	0.458	1.030
4874	42.37	577.03	18.365	0.348	1.028	4025	93.48	442.11	18.398	0.675	1.163
1640	-95.68	281.28	18.365	0.495	0.840	5800	-35.83	629.45	18.398	0.434	1.015
1809	173.52	296.68	18.366	0.464	0.965	1142	-123.43	229.19	18.399	0.376	1.018
4057	23.34	413.70	18.366	0.583	1.217	5227	1.78	544.38	18.400	0.451	0.980
3219	-180.16	391.32	18.366	0.537	0.835	1599	51.85	277.85	18.401	0.597	1.134
257	-12.91	82.47	18.367	0.590	0.953	4367	7.28	466.57	18.402	0.384	1.114
4036	-76.69	442.59	18.368	0.266	0.970	5220	-164.49	543.80	18.403	0.421	0.890
4611	57.20	485.42	18.368	0.294	1.094	5116	-0.59	531.17	18.403	0.385	1.190
4696	149.97	490.88	18.368	0.315	0.980	445	-32.29	127.49	18.404	0.545	0.900
1891	36.60	302.32	18.369	0.927	1.141	5900	2.54	648.29	18.405	0.564	0.872
4035	302.56	442.58	18.370	0.475	1.033	168	-93.70	61.05	18.405	0.492	0.968
4033	35.78	442.40	18.370	0.461	1.493	5998	2.57	673.81	18.406	0.593	0.944
3351	117.52	399.02	18.371	0.505	1.137	3791	20.06	426.22	18.406	0.440	1.643
6391	-165.90	830.06	18.371	0.456	0.953	6236	205.64	750.01	18.406	0.365	0.978

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
777	7.25	181.54	18.408	0.381	1.053	1502	182.91	268.99	18.444	0.774	0.870
1521	-7.71	270.34	18.409	0.485	0.888	944	-154.61	205.20	18.444	0.473	0.830
4033	-136.51	445.59	18.410	-0.221	1.088	3715	-34.40	421.70	18.444	1.327	1.208
3335	8.00	428.96	18.410	0.387	1.638	2345	53.45	336.98	18.444	0.493	1.315
3945	181.69	436.70	18.412	0.334	0.929	2644	156.91	357.57	18.446	0.504	0.964
2536	-5.18	350.44	18.413	0.569	1.795	1983	-187.42	309.73	18.447	0.417	0.890
5836	173.63	634.85	18.414	0.474	0.888	3844	228.27	429.32	18.448	0.475	0.998
4627	60.01	486.51	18.414	0.327	1.080	3563	-5.44	412.27	18.448	0.603	1.457
2510	69.99	348.25	18.415	0.492	2.090	5129	46.02	532.44	18.448	0.422	1.140
5627	51.51	598.07	18.415	0.421	0.983	2499	-20.87	347.75	18.450	0.379	1.168
4989	132.82	518.67	18.415	0.838	0.920	1839	-138.08	298.87	18.450	0.943	0.825
4364	136.79	466.48	18.415	0.554	1.023	4437	-31.99	471.39	18.450	0.606	0.891
4155	-3.89	450.54	18.416	0.650	1.258	3287	118.28	394.90	18.451	0.352	1.253
4986	164.60	518.53	18.416	0.461	0.915	697	212.80	168.28	18.451	0.425	0.878
4138	153.93	449.38	18.418	0.344	0.985	1108	112.20	226.07	18.451	0.485	0.950
5708	55.51	610.86	18.418	0.483	1.023	3897	-88.00	433.37	18.451	0.424	0.963
2446	169.87	344.17	18.418	0.707	1.037	2616	-6.47	356.12	18.453	0.324	1.651
1766	-206.32	293.06	18.419	0.395	0.893	6172	-5.08	720.66	18.454	0.368	0.873
4916	-182.46	510.97	18.419	0.509	1.037	2766	184.57	364.90	18.454	0.868	1.249
2133	-11.24	320.21	18.419	0.639	0.945	3511	99.73	408.35	18.455	0.523	1.213
5261	-63.36	547.91	18.420	0.432	0.913	1976	144.63	309.19	18.455	0.578	1.170
2868	232.20	370.88	18.420	0.434	0.913	129	173.76	50.50	18.456	0.402	1.050
3359	-164.80	399.56	18.420	0.457	0.941	1168	-69.80	232.73	18.456	0.760	0.928
11	-92.83	4.27	18.421	0.500	0.928	2398	95.69	340.34	18.457	0.433	1.158
1346	251.69	251.82	18.422	0.401	0.940	2232	-28.84	328.84	18.458	0.298	1.067
1287	131.61	245.67	18.422	0.394	0.850	5500	170.43	579.11	18.458	0.400	1.028
4233	49.07	456.40	18.422	0.539	1.185	1895	-23.21	302.87	18.458	0.340	0.940
910	178.56	200.30	18.423	0.351	0.800	5489	231.40	577.81	18.459	0.433	0.993
892	-67.78	198.36	18.423	0.411	0.978	700	8.93	169.33	18.459	0.435	0.944
4483	119.07	474.20	18.423	0.474	1.010	4337	303.04	464.77	18.460	0.028	0.990
2074	155.81	315.51	18.425	0.327	0.895	4451	-131.52	472.12	18.461	0.470	1.188
5835	-179.73	634.80	18.425	0.363	0.893	4635	-19.56	487.06	18.461	0.728	0.905
2150	60.01	321.94	18.426	0.563	1.965	1409	-14.58	259.07	18.462	1.741	1.197
3370	299.35	400.24	18.427	1.186	0.956	1681	-55.50	285.23	18.462	0.568	0.895
1997	44.57	310.49	18.428	0.343	1.524	3349	-33.57	398.75	18.463	0.830	1.249
2021	108.76	312.37	18.429	0.684	1.215	6077	254.28	690.16	18.463	0.833	2.328
3256	201.85	393.10	18.429	0.412	0.951	3726	85.23	422.28	18.463	0.641	1.396
2659	138.59	358.51	18.430	0.470	0.969	4420	45.15	469.98	18.463	0.415	1.130
4708	150.19	492.65	18.431	0.983	0.964	4249	140.25	457.07	18.465	0.437	1.484
736	37.20	175.35	18.431	0.465	0.914	2722	-112.72	362.31	18.465	0.681	1.178
2445	78.98	344.16	18.431	0.284	1.415	2515	-10.78	348.49	18.466	-0.082	1.137
3740	-101.60	423.14	18.432	0.476	0.934	693	55.62	167.31	18.467	0.416	0.921
5987	108.11	671.41	18.434	0.394	0.958	2253	75.89	330.39	18.467	0.499	1.353
337	-61.08	101.85	18.434	0.501	0.835	4241	33.90	456.63	18.467	0.338	1.194
1637	24.52	281.22	18.435	0.447	1.109	3769	187.52	425.05	18.467	0.320	0.959
4438	-21.00	471.52	18.435	0.526	0.945	5389	208.55	563.47	18.468	0.392	0.858
3142	-63.65	387.15	18.436	0.338	1.115	2630	-124.30	357.07	18.468	0.429	0.949
2237	14.80	329.18	18.436	1.078	1.763	73	125.27	31.81	18.469	0.484	1.018
4536	58.51	479.78	18.436	0.464	1.034	1405	183.47	258.16	18.469	0.458	0.895
4018	297.62	441.50	18.437	0.395	0.988	5850	-68.69	637.49	18.470	0.506	0.900
2948	-36.01	376.50	18.438	0.706	1.811	831	-10.08	189.55	18.471	0.672	0.920
4366	104.54	466.55	18.439	0.555	0.980	64	215.79	28.25	18.471	0.891	0.973
5675	214.34	605.93	18.439	0.439	0.858	5341	-206.51	557.75	18.472	0.449	0.860
5097	55.01	529.66	18.439	0.494	0.924	4515	140.73	477.79	18.472	0.418	0.974
4133	30.82	448.80	18.439	0.503	1.132	4616	47.89	485.51	18.473	0.843	1.063
3294	105.36	395.34	18.440	0.365	1.148	848	-225.77	192.28	18.473	0.438	1.000
1269	84.26	243.78	18.441	0.463	0.940	4933	106.67	512.37	18.473	0.385	0.998
6095	269.81	694.04	18.441	1.730	2.110	1553	90.18	274.00	18.474	0.667	1.030
1793	146.72	295.43	18.441	0.342	1.015	5933	-228.55	665.49	18.475	0.352	0.945
5170	-45.53	527.22	18.442	0.478	1.048	2748	-238.28	364.00	18.476	0.403	1.245

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
4823	-62.91	502.68	18.476	0.360	0.990	4110	194.48	447.36	18.507	0.401	0.891
2383	-15.64	339.12	18.476	0.558	1.268	223	204.56	74.34	18.507	0.485	0.855
1444	90.20	262.68	18.476	0.402	1.013	3702	-36.11	420.84	18.508	0.121	1.366
3980	80.21	438.83	18.477	0.825	1.740	237	115.33	78.06	18.509	0.354	0.870
3813	106.38	427.69	18.479	0.436	0.967	1959	125.75	303.28	18.510	0.379	0.917
2508	-78.24	348.17	18.480	0.733	1.207	3448	103.64	404.98	18.511	0.454	1.316
2227	215.25	328.11	18.480	0.390	0.767	677	-66.01	165.01	18.511	0.328	0.875
3062	203.04	383.27	18.480	0.504	0.903	1581	115.33	276.28	18.512	-0.264	0.925
1945	36.51	307.37	18.481	0.780	1.089	1918	2.00	304.47	18.513	0.385	1.267
3233	94.98	392.01	18.481	0.579	1.192	2557	-44.21	351.85	18.513	0.408	1.096
1298	51.03	246.71	18.482	0.409	0.909	4856	-5.04	505.46	18.516	0.497	1.072
2965	72.55	377.21	18.482	0.663	2.243	3485	72.89	407.19	18.516	0.570	1.712
5359	-130.99	560.31	18.482	0.308	0.808	4214	210.28	454.17	18.517	0.391	0.936
1195	-18.64	236.34	18.484	0.313	0.968	987	-232.03	210.96	18.518	0.461	0.893
254	-14.24	81.39	18.484	0.122	0.950	579	224.33	150.52	18.518	0.453	0.942
3154	-27.46	387.79	18.484	0.295	1.189	5527	-2.16	583.23	18.519	0.390	0.828
408	65.84	118.25	18.485	0.453	0.918	3665	73.33	417.74	18.519	0.472	1.378
2146	120.16	321.49	18.485	0.489	1.232	687	-151.89	166.13	18.521	0.440	0.963
4526	85.53	478.71	18.486	0.390	0.995	1901	75.11	303.38	18.521	0.912	1.195
5354	29.89	559.73	18.487	0.416	0.896	2713	119.61	362.10	18.522	0.478	1.189
1652	47.68	282.25	18.488	0.985	1.620	3714	117.24	421.67	18.522	0.334	1.173
471	-12.86	132.23	18.489	0.229	1.023	2770	-27.06	365.36	18.522	0.489	1.206
4395	78.91	468.27	18.489	0.210	0.988	4371	-134.60	466.87	18.523	0.432	0.995
4202	157.40	453.45	18.489	0.375	1.076	2629	117.30	357.05	18.523	0.007	1.226
206	84.77	71.02	18.491	0.503	0.953	4170	-82.15	451.45	18.524	0.517	1.013
3509	96.83	408.28	18.491	0.296	1.186	4298	20.81	461.22	18.524	0.425	1.036
5243	14.21	545.64	18.491	0.447	0.996	5317	152.88	554.58	18.525	0.370	0.918
1562	54.56	274.84	18.492	0.413	1.115	4521	122.65	478.06	18.525	0.401	0.983
2249	-110.84	329.93	18.492	0.412	0.910	1777	-6.35	294.04	18.526	0.419	1.165
2607	-61.61	355.40	18.492	0.816	1.042	2214	87.18	327.19	18.526	0.582	1.090
4208	-33.87	454.03	18.492	0.443	1.040	3198	121.56	390.18	18.526	0.478	1.087
4510	-55.37	477.31	18.493	0.437	1.016	3103	-47.17	385.55	18.529	0.439	1.034
240	-81.93	78.73	18.493	0.416	0.818	4200	109.69	453.40	18.530	0.444	0.945
2454	-11.89	344.78	18.493	0.451	1.100	5132	-18.14	532.88	18.530	0.338	0.880
2304	237.49	333.70	18.493	0.428	0.933	1079	180.36	223.10	18.533	0.618	0.775
4573	253.80	466.99	18.493	0.353	1.099	3157	114.78	387.85	18.534	0.282	1.389
1473	47.36	265.90	18.494	0.205	1.106	2189	124.98	325.70	18.535	0.504	1.023
4193	54.18	453.01	18.494	0.446	1.204	4240	100.14	456.52	18.535	0.413	0.975
4011	-142.30	440.90	18.495	0.439	0.873	3339	125.76	398.00	18.536	0.354	1.153
362	-81.46	109.04	18.495	0.341	0.945	3947	45.81	436.77	18.536	0.343	1.603
4247	96.31	457.00	18.496	0.538	0.950	881	37.25	196.84	18.537	0.398	1.116
2804	178.44	367.40	18.496	0.541	0.984	496	-85.56	137.63	18.538	0.301	1.035
1272	18.59	244.12	18.496	0.448	0.885	398	74.42	116.50	18.539	0.662	0.810
2824	87.75	368.50	18.497	0.538	1.334	2019	-62.56	312.28	18.539	0.429	0.918
3054	151.11	382.63	18.497	0.410	1.055	2418	72.97	341.93	18.539	0.402	1.550
399	73.44	116.81	18.498	1.033	0.895	3480	77.57	407.00	18.540	0.885	1.192
1932	-22.07	306.29	18.499	0.552	0.925	1798	-166.03	295.82	18.540	0.305	0.855
4246	72.51	450.98	18.500	0.506	1.060	5921	63.36	651.24	18.541	0.460	0.974
5553	150.96	587.08	18.501	0.361	0.947	1704	69.06	286.49	18.541	0.754	1.160
4976	64.64	517.37	18.502	0.410	0.934	3587	-14.65	413.13	18.541	0.471	1.168
3804	25.64	427.19	18.504	0.827	1.443	1977	165.06	309.26	18.542	0.383	0.978
1463	67.38	264.43	18.504	0.405	0.949	3237	80.24	392.18	18.542	0.471	1.180
1401	-17.27	257.99	18.505	0.343	1.055	2114	-19.69	386.34	18.542	0.466	1.429
187	-119.63	65.59	18.505	0.629	1.058	3441	-3.10	404.34	18.542	0.233	1.437
1944	74.01	307.33	18.505	-0.567	1.155	5345	-233.04	398.41	18.543	0.413	0.944
4278	66.14	459.70	18.505	0.473	1.044	5311	-202.45	553.90	18.543	0.464	0.798
1807	76.60	296.64	18.505	0.740	1.073	439	40.76	125.34	18.543	0.457	0.956
4665	76.60	489.37	18.505	0.382	1.038	2998	-99.48	379.04	18.544	0.435	0.970
2856	-171.49	370.29	18.506	-0.074	1.635	1799	47.27	295.94	18.545	1.008	1.863
1903	195.63	303.49	18.506	0.495	1.092	2033	158.36	313.21	18.545	0.453	0.903

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
2760	-104.81	364.54	18.545	0.327	1.238	1262	124.51	243.13	18.581	0.678	0.905
1986	-211.86	309.95	18.545	0.506	0.965	5368	-13.29	560.93	18.582	0.571	0.870
3364	76.48	399.87	18.545	0.542	1.553	4226	66.24	456.04	18.583	0.484	1.077
3789	-48.22	426.20	18.546	0.486	1.126	1907	113.23	303.75	18.583	0.468	1.013
3593	-59.50	413.78	18.546	0.562	1.050	3762	110.82	424.49	18.583	0.419	0.951
5815	296.75	631.56	18.546	0.438	0.970	4767	79.41	496.89	18.583	0.536	0.960
4626	251.22	486.36	18.547	0.379	1.056	4875	-176.13	507.11	18.583	0.300	0.872
4140	178.78	449.40	18.547	0.450	0.946	694	181.58	167.40	18.585	0.512	0.860
2529	-125.96	349.79	18.547	0.545	0.834	2463	6.80	345.23	18.585	0.581	1.743
1990	-24.97	310.25	18.548	0.270	0.858	3212	83.20	391.02	18.585	0.471	1.168
3902	-109.83	433.66	18.548	0.795	1.263	2036	-48.99	313.34	18.586	0.542	0.882
5225	-25.53	544.26	18.549	0.230	0.858	625	105.77	156.96	18.587	0.486	1.120
5728	69.59	614.59	18.549	0.267	0.940	1123	-0.80	227.56	18.587	0.471	0.912
2013	19.26	311.63	18.551	0.266	1.281	2130	157.47	319.74	18.587	0.346	0.743
3630	160.08	415.80	18.552	0.277	0.890	2037	147.05	313.57	18.589	0.409	0.975
3799	98.74	426.71	18.553	0.352	1.127	4084	-189.47	445.61	18.589	0.486	0.966
1656	34.97	282.70	18.553	0.518	1.099	4076	4.12	445.09	18.590	0.504	1.049
5006	58.26	520.83	18.553	0.395	0.814	4819	72.75	502.41	18.590	0.423	1.010
1173	-6.05	233.94	18.553	0.543	1.025	3283	112.17	394.71	18.590	0.459	1.336
2987	-73.47	378.45	18.553	0.279	1.123	2114	32.72	318.41	18.591	0.167	1.710
4637	-110.46	487.29	18.553	0.498	1.011	3057	123.17	382.84	18.591	0.214	1.191
1147	-49.03	229.42	18.554	0.569	1.325	3724	138.85	422.19	18.591	0.211	1.240
2578	119.91	353.23	18.555	1.430	1.750	2551	243.51	351.36	18.591	0.474	1.098
458	-136.44	129.69	18.556	0.480	0.945	5119	271.06	531.31	18.592	0.495	0.823
1747	137.24	290.96	18.556	0.376	0.933	2651	-79.88	358.09	18.592	-0.319	1.780
2864	102.63	370.73	18.557	0.550	1.670	4348	84.31	465.32	18.592	0.441	1.126
4045	83.03	443.06	18.558	0.330	2.200	3798	125.31	426.56	18.592	0.432	1.089
5605	43.40	594.97	18.559	0.432	0.970	3261	171.00	393.49	18.594	0.442	0.933
5598	115.87	594.39	18.560	0.468	0.900	4169	-37.75	451.42	18.594	0.368	0.925
2088	-81.20	316.17	18.561	0.358	1.228	3719	-40.59	421.78	18.595	0.689	1.257
1336	52.84	251.42	18.562	0.454	0.965	2311	22.96	334.35	18.595	0.528	1.803
3410	116.52	402.36	18.563	0.347	1.083	308	132.90	94.92	18.596	0.319	0.765
4094	26.32	446.36	18.563	0.468	1.109	5832	47.62	634.55	18.596	0.550	1.199
4759	241.71	496.09	18.563	0.311	0.909	4079	14.64	445.26	18.596	0.450	1.080
1132	48.59	228.43	18.564	0.399	0.978	1714	138.21	287.69	18.597	0.553	0.960
1607	-32.75	278.46	18.565	0.565	0.963	2798	124.31	367.17	18.597	0.303	1.304
757	63.41	178.46	18.565	0.522	0.883	3519	-41.71	409.00	18.597	0.481	2.107
1687	289.58	285.56	18.566	0.452	0.863	2161	51.71	323.08	18.597	0.340	1.203
2803	126.86	367.31	18.566	0.323	1.210	246	-159.82	80.22	18.598	0.281	0.905
6278	15.63	767.78	18.568	0.367	0.908	3430	143.34	403.77	18.598	0.407	0.931
667	179.13	163.51	18.570	0.368	0.930	1657	-39.79	282.82	18.599	0.461	1.043
5473	282.81	576.11	18.570	2.070	0.913	2424	-45.89	342.40	18.599	0.434	1.020
2538	71.50	350.49	18.570	0.002	1.480	2532	-76.53	350.01	18.599	0.955	1.193
1306	181.82	247.50	18.570	0.394	0.905	3997	130.92	439.90	18.599	0.378	0.976
907	59.99	199.68	18.571	0.777	0.901	1655	82.67	282.68	18.600	0.124	1.298
4163	-60.26	451.04	18.572	0.408	0.894	5025	-134.80	522.41	18.600	0.585	0.965
3052	110.95	382.56	18.573	0.452	1.132	913	58.30	200.79	18.600	0.179	0.901
4921	20.37	511.43	18.573	0.568	1.165	2369	-68.32	338.20	18.600	0.524	0.923
3539	-43.47	410.47	18.573	0.528	1.487	3007	-156.67	379.50	18.604	0.421	0.911
3238	85.92	392.23	18.574	0.311	1.115	3161	139.40	388.38	18.605	0.501	0.956
1644	134.60	281.56	18.574	0.427	0.967	5174	231.77	537.76	18.605	0.356	0.917
1191	289.12	235.84	18.574	0.379	0.970	3399	-18.25	401.83	18.605	0.116	1.340
5460	40.03	574.16	18.575	0.592	0.869	918	22.65	201.76	18.606	0.660	0.952
3573	-136.37	412.62	18.578	0.476	1.079	1367	-16.94	283.85	18.607	0.509	0.883
2992	231.67	378.82	18.578	0.497	1.035	3528	153.94	409.67	18.608	0.458	1.003
4092	-40.63	446.23	18.579	0.320	0.964	3652	123.33	417.05	18.609	0.477	1.086
1846	107.22	299.20	18.580	0.273	1.055	775	65.30	87.34	18.610	0.336	0.865
3189	-82.93	389.94	18.580	0.372	1.065	711	80.95	171.72	18.610	0.527	0.757
4004	-9.39	440.45	18.580	0.601	0.924	1084	50.55	223.66	18.611	0.442	0.964
3811	9.69	427.62	18.580	0.115	1.633	5424	116.02	568.20	18.611	0.463	0.903

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
4001	126.90	440.14	18.612	0.427	0.988	2545	-73.40	350.76	18.646	0.681	1.139
5089	-125.56	646.52	18.613	0.495	0.817	3837	-61.81	428.98	18.649	0.402	1.031
5393	299.59	564.28	18.613	0.377	0.810	6164	109.70	717.88	18.650	0.266	1.065
6206	-94.16	734.68	18.614	0.420	0.873	6169	243.61	719.32	18.650	0.531	1.003
2890	-201.51	372.22	18.615	1.193	1.567	5911	-29.77	649.95	18.651	0.473	0.965
4062	58.25	444.20	18.615	0.530	1.364	4281	68.43	459.90	18.651	0.560	1.081
3505	-15.36	407.93	18.615	0.753	1.245	274	60.84	87.02	18.651	0.418	0.990
4334	61.17	464.42	18.616	0.482	1.151	2850	-196.75	369.79	18.651	0.501	0.945
2387	64.33	339.46	18.616	0.485	1.172	6123	170.49	704.19	18.651	0.354	0.812
5532	144.96	584.11	18.618	0.582	0.925	1252	-42.18	241.99	18.651	0.456	1.153
3827	-119.21	428.55	18.619	0.581	1.051	4945	-46.32	513.94	18.651	0.433	0.938
1919	25.46	304.60	18.620	0.457	1.375	3606	54.92	414.45	18.652	0.404	2.212
780	-4.98	182.90	18.620	0.332	0.995	4189	28.46	452.33	18.652	0.462	1.063
4652	-82.59	488.58	18.621	0.365	0.993	2163	71.27	323.17	18.652	0.445	1.243
1938	-25.07	306.87	18.621	0.467	0.890	4988	38.09	518.62	18.653	0.142	0.850
196	16.98	67.93	18.622	0.499	0.914	5849	89.02	637.12	18.653	0.498	0.950
3239	303.88	392.29	18.623	0.168	0.871	5730	-51.27	614.92	18.653	0.416	0.863
289	154.68	91.28	18.623	0.419	0.998	5027	-84.58	522.63	18.653	0.432	0.865
962	37.79	207.26	18.623	0.343	0.824	5678	-94.16	606.15	18.653	0.395	0.940
1353	-46.53	252.53	18.624	0.726	0.865	2375	-27.09	338.65	18.654	0.634	1.155
3455	121.26	405.64	18.625	0.415	1.131	4948	7.98	514.39	18.656	0.525	1.101
6181	-236.60	723.88	18.626	0.487	1.065	3901	38.24	433.59	18.657	0.285	1.631
2071	133.28	315.42	18.626	0.391	0.943	2012	66.23	311.33	18.658	0.395	1.395
4370	165.94	466.86	18.627	0.226	1.045	1324	136.46	249.41	18.658	0.512	0.908
3954	-70.41	437.22	18.627	0.895	1.190	1612	-8.66	278.77	18.658	0.544	0.913
6092	48.34	693.40	18.629	0.218	0.996	4721	286.04	493.38	18.658	0.384	0.928
4021	202.10	441.72	18.629	0.432	0.908	2877	190.45	371.57	18.659	0.419	0.848
5774	153.25	625.20	18.629	0.705	0.785	650	31.21	161.28	18.660	0.886	0.987
1236	118.51	240.84	18.630	0.686	0.813	1606	65.95	278.45	18.660	0.581	0.966
3932	-23.90	435.85	18.630	0.388	0.883	2447	-57.34	344.38	18.661	0.726	1.170
2828	-68.05	368.61	18.630	0.642	1.284	1454	77.53	263.92	18.661	0.426	0.868
3277	199.37	394.44	18.630	0.547	0.986	2502	86.95	347.94	18.661	0.252	1.323
6008	85.43	675.16	18.631	0.391	0.842	4595	-48.25	484.28	18.661	0.527	1.070
1290	70.49	246.09	18.631	0.225	0.920	4487	106.57	474.45	18.662	0.376	0.984
5515	205.01	581.68	18.631	0.487	0.813	1157	170.30	231.37	18.663	0.500	0.830
1310	-1.19	247.55	18.632	0.492	0.930	2847	-101.07	369.72	18.663	0.453	0.822
3663	151.83	417.59	18.633	0.367	0.978	2204	70.56	326.47	18.664	0.313	1.503
901	174.06	199.03	18.634	0.399	0.810	4267	122.14	458.70	18.665	0.473	0.911
3184	85.54	389.66	18.634	0.389	1.187	4591	-18.71	483.93	18.666	0.613	0.887
2937	-55.56	375.83	18.634	0.370	1.016	2915	202.97	374.45	18.666	0.387	1.170
5079	-205.09	528.17	18.635	0.541	0.923	4814	48.33	501.78	18.667	0.972	1.603
1070	-80.77	221.34	18.639	0.351	0.788	2492	272.33	347.34	18.668	0.395	0.925
3158	144.61	387.97	18.639	0.418	1.060	3909	250.05	434.16	18.668	0.350	1.121
752	-237.39	177.41	18.640	0.358	0.895	1517	-38.61	269.96	18.668	0.276	1.283
6297	240.63	777.67	18.640	0.413	0.863	1026	32.68	215.17	18.669	0.403	0.802
462	108.75	130.53	18.640	0.427	0.842	1196	-38.27	236.72	18.671	1.074	1.170
4724	-48.51	493.72	18.642	0.232	0.914	1119	206.05	227.08	18.671	0.355	1.023
1651	11.40	282.24	18.642	0.431	1.004	5732	-91.48	615.38	18.672	0.546	0.863
6030	73.04	681.76	18.642	0.406	0.848	4649	130.53	488.15	18.672	0.426	0.964
4688	-12.00	491.11	18.643	0.376	0.980	5817	-87.10	531.75	18.673	0.316	0.882
606	-189.52	154.38	18.643	0.360	0.898	897	65.32	198.76	18.673	0.431	0.969
4192	51.79	452.68	18.643	0.863	1.238	3583	-85.94	412.88	18.674	0.430	0.945
5216	-34.13	543.59	18.643	0.741	1.130	3627	125.05	415.42	18.674	0.374	1.116
5022	59.57	522.04	18.644	0.873	0.813	158	64.37	57.70	18.675	0.443	0.861
1898	134.10	303.02	18.644	0.457	0.853	2829	-175.08	368.68	18.675	0.472	1.051
6043	-22.86	683.80	18.644	0.424	0.760	1356	-32.97	252.68	18.675	0.542	0.978
2156	-8.20	323.37	18.645	0.582	1.033	4230	-9.44	456.26	18.676	0.445	1.170
264	-55.72	84.77	18.645	1.497	0.850	5829	-118.25	634.30	18.676	0.629	1.028
6104	146.10	697.55	18.646	0.436	0.773	1558	-82.70	274.69	18.676	0.632	0.868
845	60.37	191.49	18.646	0.463	0.915	1446	292.43	262.92	18.676	0.467	0.888

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
1853	-98.89	299.43	18.677	0.425	0.870	5056	81.29	525.25	18.712	0.231	1.030
4463	51.51	472.83	18.677	0.515	1.104	4615	207.32	485.50	18.712	0.300	0.964
3398	-213.71	101.71	18.677	0.517	0.880	774	49.98	180.88	18.712	0.267	0.915
3851	136.11	429.91	18.677	0.441	1.186	4610	-124.69	485.32	18.713	0.496	1.031
3918	137.81	434.73	18.678	0.337	1.020	4349	-29.74	465.44	18.714	0.366	0.921
5571	-28.69	589.31	18.678	0.428	0.823	4733	-22.00	494.64	18.714	0.515	0.978
1870	49.30	300.78	18.678	0.194	1.288	3259	297.17	393.39	18.714	0.358	0.818
1064	105.47	220.49	18.678	0.580	1.063	5589	57.40	592.57	18.715	0.402	0.920
5448	-15.41	571.81	18.679	0.488	0.733	4964	-25.11	516.16	18.715	0.612	0.957
990	120.73	211.36	18.680	0.377	0.893	1683	50.31	285.36	18.716	1.738	1.773
63	292.53	28.05	18.681	0.355	0.913	1746	-51.89	290.94	18.717	0.542	0.913
4034	-6.89	442.56	18.682	0.675	0.961	4472	38.82	473.38	18.717	1.399	1.097
2456	-62.68	344.87	18.682	0.454	1.290	2177	92.44	324.22	18.718	0.249	1.387
2484	138.04	346.94	18.683	0.485	0.952	6222	183.94	742.40	18.718	0.466	0.993
3545	-202.70	410.81	18.683	0.536	0.884	4532	-48.19	479.71	18.718	0.339	0.970
5688	247.07	603.18	18.684	0.470	1.165	5156	53.26	536.07	18.718	0.275	0.851
2943	-135.18	376.24	18.685	0.430	1.027	5094	-12.27	529.24	18.718	0.340	0.907
410	-99.18	118.37	18.685	0.590	0.930	3921	-103.43	434.97	18.719	0.565	1.501
704	-190.95	170.80	18.685	0.481	0.935	5002	183.77	520.52	18.720	0.441	1.013
1887	30.68	302.22	18.687	0.717	1.199	2078	-132.21	315.73	18.720	0.185	0.822
323	-41.61	98.46	18.687	0.524	0.877	2666	-33.10	358.70	18.720	0.791	1.303
943	251.84	205.06	18.687	0.390	0.860	2423	164.99	342.23	18.720	0.548	1.207
5681	-21.77	606.36	18.688	0.449	0.990	3946	-25.53	436.71	18.722	0.510	0.940
2288	-43.85	332.80	18.688	0.082	0.908	3934	4.61	435.96	18.722	0.415	1.491
4134	13.77	448.96	18.689	0.296	1.077	4041	15.33	442.93	18.723	0.640	1.070
2024	170.86	312.59	18.689	0.489	0.978	5582	96.82	590.96	18.724	0.354	0.943
3204	6.82	390.40	18.689	0.419	2.196	3887	-234.30	432.28	18.725	0.522	0.898
1451	138.69	263.66	18.689	0.358	1.118	1719	-41.50	288.32	18.725	0.535	1.293
2678	-108.62	359.36	18.689	0.365	1.603	1183	-62.07	235.14	18.726	0.342	0.903
1579	66.45	276.24	18.689	0.142	0.962	5490	-28.78	577.93	18.726	0.461	0.933
809	266.41	185.67	18.690	0.426	0.833	1429	143.44	261.35	18.727	0.361	0.955
4811	6.33	501.51	18.690	0.505	1.039	2378	70.22	338.69	18.727	0.055	1.417
4484	116.72	474.20	18.690	0.422	0.987	6160	183.02	717.16	18.727	0.398	0.830
1430	-31.57	261.36	18.690	0.375	1.035	5128	281.60	532.35	18.728	0.400	0.820
1946	-31.31	307.38	18.693	0.724	0.902	3017	-110.09	380.02	18.729	0.440	0.968
3197	-126.34	390.17	18.693	0.310	0.908	1642	-10.44	281.49	18.729	0.246	0.968
334	-44.74	101.44	18.694	0.387	0.850	3660	96.28	417.46	18.730	0.828	1.440
5130	-107.06	532.53	18.694	0.467	0.915	1056	27.93	219.64	18.730	0.480	0.948
5036	169.28	523.02	18.694	0.360	0.995	912	46.61	200.39	18.731	0.803	1.018
5034	-39.36	523.00	18.695	0.421	0.895	3781	-81.71	425.70	18.731	1.325	1.045
5143	-12.13	534.30	18.697	0.288	0.923	1826	124.46	297.66	18.731	0.278	1.030
1184	234.30	235.25	18.697	0.319	0.942	4777	-87.05	498.32	18.731	0.360	0.994
3899	-106.31	433.44	18.699	0.400	1.327	753	78.11	177.80	18.732	0.399	0.838
2141	-101.65	320.83	18.699	0.449	0.988	1117	-209.64	226.94	18.733	0.384	0.945
1127	-45.72	227.78	18.700	0.845	1.293	252	70.25	81.08	18.733	0.368	0.940
3621	298.34	415.27	18.700	0.325	0.885	5348	270.53	558.62	18.734	0.409	1.048
1443	-55.42	262.46	18.700	0.606	0.885	3116	129.26	386.38	18.734	0.729	1.109
1705	55.27	286.64	18.702	0.582	1.651	3135	89.61	386.97	18.734	0.323	1.295
3489	136.12	407.24	18.702	0.436	1.005	4585	-128.21	483.36	18.734	0.865	1.157
2677	-113.91	359.29	18.703	0.303	1.154	651	149.72	161.38	18.735	0.373	1.033
1677	89.19	284.95	18.704	0.671	0.903	6001	-181.29	674.07	18.736	0.435	0.908
3433	154.39	403.89	18.704	0.467	1.018	1861	-66.02	300.44	18.736	0.430	0.905
2562	-119.59	352.18	18.705	0.574	0.845	6347	115.06	805.49	18.736	0.441	1.035
1731	130.59	288.82	18.709	0.449	0.980	2310	97.28	334.07	18.737	0.692	1.127
4096	-50.11	446.48	18.709	0.551	1.099	5299	-66.94	552.75	18.738	0.312	1.103
1225	116.66	239.96	18.710	0.133	0.778	825	-183.54	188.82	18.738	0.409	0.898
4074	283.60	444.97	18.710	1.364	0.814	4120	127.17	451.84	18.739	0.398	0.988
3488	-99.56	407.23	18.710	0.358	1.186	3174	110.80	389.32	18.739	0.432	1.175
1555	66.93	274.28	18.711	0.361	0.853	1294	175.39	246.43	18.740	0.387	0.880
4149	-225.65	450.01	18.711	0.405	1.030	2088	89.87	315.26	18.740	0.559	1.630

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
338	-173.21	102.03	18.741	0.319	0.838	1589	38.89	275.82	18.771	0.434	0.969
3383	-149.51	400.90	18.741	0.440	0.918	4386	-19.51	467.79	18.773	0.141	0.955
2949	-95.36	376.55	18.742	0.398	0.939	6039	-25.36	632.77	18.774	1.435	0.690
3808	4.09	427.48	18.742	0.417	1.864	4668	29.46	489.82	18.775	0.418	1.051
170	17.25	61.67	18.743	0.283	0.923	4951	111.96	514.71	18.776	0.456	0.963
1688	-8.85	285.64	18.743	0.416	0.958	2451	92.26	344.56	18.777	0.296	1.265
2357	77.87	337.75	18.744	0.849	1.258	1554	64.22	274.24	18.779	0.532	0.866
6309	-184.92	782.96	18.745	0.425	0.923	4937	73.57	512.83	18.779	0.370	0.955
3706	86.14	420.17	18.745	0.381	1.600	2429	81.54	342.82	18.780	0.624	1.070
2279	108.19	332.26	18.745	0.568	1.160	4587	-20.82	483.40	18.780	0.269	0.882
5082	58.48	528.46	18.747	0.403	0.868	4332	21.56	464.18	18.780	0.481	1.060
3475	15.21	406.54	18.747	-0.145	2.245	1432	171.78	261.49	18.782	0.373	0.893
1301	99.31	246.92	18.748	0.351	1.003	1758	150.05	292.19	18.782	0.717	0.950
4117	15.34	447.84	18.748	0.520	1.119	4243	164.11	456.09	18.782	-0.315	1.028
2240	11.46	329.34	18.748	0.462	1.373	3312	136.99	396.42	18.782	0.458	0.951
1515	-1.00	269.34	18.748	1.293	1.137	1980	-201.13	309.32	18.782	0.353	1.020
86	120.31	7.67	18.748	0.401	0.965	3581	-112.87	412.79	18.783	0.492	0.974
566	-128.30	482.20	18.749	0.611	1.130	4926	122.61	511.87	18.784	0.321	0.950
4955	202.61	515.08	18.750	0.373	0.780	1547	-208.78	273.35	18.784	0.832	0.953
3920	-19.12	134.95	18.751	0.200	0.939	1467	6.44	265.49	18.784	0.401	0.973
3278	81.82	394.46	18.751	0.663	1.200	1888	127.09	302.25	18.784	1.251	0.987
3706	-46.68	421.16	18.751	1.282	1.267	874	11.54	196.22	18.785	0.377	0.963
340	199.48	103.10	18.751	0.487	0.988	768	-133.41	179.77	18.786	0.336	0.970
2802	160.57	367.25	18.752	0.510	0.920	6116	-70.38	701.37	18.786	0.495	0.840
4136	129.40	449.27	18.752	0.432	0.965	1350	117.57	252.27	18.786	0.330	0.980
81	-34.17	36.78	18.753	0.440	1.105	4053	91.95	443.51	18.787	0.915	1.207
2794	-161.99	366.94	18.753	0.309	0.903	4589	-171.80	483.80	18.787	-0.212	0.883
5894	208.61	645.66	18.753	2.643	0.977	5296	-162.59	552.41	18.788	0.269	0.915
572	32.30	149.51	18.754	0.456	0.939	3092	124.77	384.82	18.789	0.677	1.179
1580	185.31	276.27	18.754	0.313	0.885	5524	37.51	583.12	18.789	0.462	1.010
4031	-154.15	442.38	18.754	0.453	0.858	5723	102.15	614.15	18.789	0.593	0.993
3836	-123.04	428.96	18.755	1.648	1.200	4848	129.17	505.06	18.789	0.446	1.070
5975	226.53	667.32	18.756	0.421	0.942	1155	89.89	231.04	18.790	0.561	1.067
1042	80.78	217.18	18.756	0.537	1.183	4662	119.73	489.18	18.790	0.287	0.871
2143	45.23	321.20	18.756	0.214	1.191	1380	250.23	255.54	18.790	0.486	0.910
5794	249.28	628.11	18.757	0.360	0.860	605	-156.88	154.31	18.790	0.346	0.885
178	19.29	62.63	18.757	0.633	0.924	2419	101.95	341.93	18.792	0.450	1.197
1864	-59.85	300.55	18.757	0.596	0.955	5381	260.19	562.74	18.792	0.463	0.780
740	199.53	175.64	18.757	0.346	0.938	3710	17.10	421.53	18.792	0.552	1.715
3338	98.47	397.83	18.758	0.494	1.053	349	-81.35	105.67	18.792	0.887	0.945
4305	291.27	461.64	18.758	0.447	1.072	3449	76.32	405.09	18.792	0.506	1.564
5880	297.10	645.15	18.759	0.298	0.927	3598	237.39	414.02	18.793	0.469	0.933
1854	44.72	299.52	18.759	0.476	1.435	895	143.49	198.40	18.793	0.284	0.810
1283	255.59	245.38	18.760	0.544	0.825	1094	-48.86	224.35	18.793	0.770	1.265
4679	109.11	490.52	18.762	0.426	0.973	371	-184.90	110.41	18.794	0.439	1.015
3111	-104.40	386.15	18.762	0.429	0.890	3373	260.02	400.52	18.795	0.330	1.051
3098	118.66	385.33	18.762	0.501	1.167	3495	-33.50	407.46	18.797	0.555	1.268
4423	162.71	470.32	18.763	0.430	0.993	6027	-147.07	681.31	18.798	0.406	0.855
2102	-36.92	317.35	18.764	0.464	0.935	2942	174.61	376.17	18.798	0.184	1.027
4433	147.18	470.98	18.764	0.425	0.927	1678	7.74	284.95	18.800	0.532	1.334
1266	-44.82	243.33	18.765	0.455	1.185	1840	-5.07	298.90	18.800	0.360	1.107
3966	267.91	437.96	18.766	0.288	1.110	2954	187.55	376.59	18.801	0.519	0.885
2070	-47.40	315.41	18.766	0.658	0.855	4471	70.98	470.36	18.801	0.516	1.514
6089	158.76	692.81	18.767	0.598	0.873	5908	46.54	649.80	18.802	0.449	1.108
2373	133.77	338.51	18.767	0.432	0.978	2050	-92.40	314.17	18.802	0.357	1.003
4504	-97.17	476.26	18.768	0.544	1.050	2157	-78.71	322.64	18.803	0.326	1.103
2501	226.37	347.91	18.768	0.303	0.918	3929	-50.35	435.71	18.803	0.468	1.067
3697	240.01	420.10	18.768	0.421	1.010	492	41.74	136.86	18.804	0.480	0.904
4513	-36.88	477.49	18.769	0.303	1.029	1762	148.60	257.41	18.804	0.093	0.960
2672	-86.53	359.14	18.770	1.243	1.030	4752	279.50	493.61	18.805	0.353	0.953

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
4782	-45.47	498.94	18.806	0.462	0.955	5269	-74.88	548.46	18.836	0.467	0.953
4682	203.67	490.68	18.806	0.382	1.046	914	134.63	201.29	18.836	0.279	0.900
728	227.38	174.24	18.807	0.290	0.938	5492	133.11	578.37	18.836	0.459	0.898
4125	50.66	448.54	18.807	0.353	1.153	7319	36.60	334.89	18.836	0.388	1.421
1426	306.97	261.10	18.808	0.486	0.863	4619	115.92	485.67	18.836	0.457	0.906
6085	74.96	692.29	18.809	0.292	0.875	5173	56.46	537.59	18.836	0.481	0.836
6307	136.27	781.72	18.811	0.326	0.873	4220	8.86	455.62	18.837	0.507	1.132
6284	-45.94	770.88	18.811	0.486	0.770	343	-105.31	103.72	18.838	0.453	1.028
2751	172.97	364.14	18.811	0.313	1.063	2590	174.29	353.95	18.838	0.915	0.960
970	35.08	208.22	18.812	0.418	0.860	2565	-204.74	352.31	18.839	0.453	1.026
2712	-52.20	362.07	18.812	0.649	1.200	3258	-73.90	393.32	18.839	0.536	0.883
3825	110.40	428.27	18.812	0.516	0.996	305	-90.17	94.29	18.840	0.340	0.890
172	116.15	61.74	18.814	0.756	0.827	4358	55.98	466.13	18.840	0.416	1.440
4898	85.44	509.86	18.814	0.532	1.008	2786	184.07	366.41	18.841	0.781	1.240
2622	223.03	356.61	18.814	0.481	0.913	358	-15.87	108.18	18.841	0.620	0.900
3960	-22.43	437.48	18.814	1.001	0.914	2753	-92.14	364.24	18.841	0.394	0.958
2471	-182.35	346.04	18.815	1.952	1.060	2286	74.75	332.65	18.841	0.200	1.205
4493	127.00	474.84	18.815	0.431	0.895	3716	106.21	421.71	18.841	0.543	1.008
1069	39.87	221.31	18.815	0.669	0.984	6191	-117.84	728.40	18.842	0.460	0.855
2568	-231.31	352.50	18.816	0.405	1.071	2555	155.97	351.73	18.843	0.250	0.950
3290	-122.65	395.00	18.816	1.646	1.295	4314	-11.77	462.08	18.844	0.402	1.077
5965	-34.43	665.53	18.816	0.451	0.980	3143	140.12	387.20	18.844	1.735	1.087
477	14.16	133.45	18.816	0.356	0.933	4044	214.37	443.05	18.844	0.341	0.881
4687	-233.08	491.07	18.817	0.481	0.964	3767	151.43	424.93	18.845	0.393	1.020
4368	107.20	416.61	18.817	0.762	1.088	2901	-155.81	373.36	18.846	0.148	0.989
5362	86.29	560.62	18.818	1.590	0.755	2899	-52.73	373.01	18.846	0.636	1.161
657	121.69	162.09	18.819	0.475	0.930	4078	-75.33	445.20	18.847	0.456	0.966
1214	-41.13	238.93	18.819	0.979	1.183	3536	-62.00	410.25	18.848	0.586	1.019
1326	-117.75	249.64	18.819	0.408	0.963	1732	62.80	288.83	18.848	0.483	1.100
2061	-107.81	314.84	18.820	0.489	0.853	5029	122.51	522.85	18.848	1.700	0.890
3976	63.80	438.70	18.821	0.475	1.841	2200	236.28	326.27	18.848	0.363	0.923
5543	-4.73	586.08	18.821	0.665	0.873	2823	110.00	368.49	18.848	0.321	1.593
630	47.84	157.38	18.822	0.440	0.909	1245	-31.04	241.47	18.849	0.473	0.873
3989	-35.49	439.45	18.822	0.449	1.071	4953	136.10	514.95	18.849	0.409	0.885
1354	-22.71	252.53	18.823	0.531	0.930	403	45.53	116.98	18.850	0.333	0.844
1202	-4.56	237.37	18.823	0.500	0.957	2144	262.98	321.23	18.850	0.510	0.947
1805	2.07	296.49	18.825	0.629	1.081	5830	98.12	634.39	18.850	0.726	0.833
4923	79.61	511.65	18.825	0.487	0.890	3149	-38.02	387.44	18.850	0.519	1.401
448	249.14	127.98	18.825	0.313	1.082	2844	-157.17	369.55	18.851	0.386	1.021
5268	-38.02	548.41	18.825	0.368	1.073	4131	-37.10	448.78	18.851	0.317	0.929
3931	-28.12	435.84	18.825	0.398	0.993	3589	-17.37	413.47	18.851	0.403	1.146
5053	-51.41	524.86	18.825	0.325	0.825	5544	121.03	586.14	18.851	0.386	0.995
2372	-21.04	338.31	18.826	0.391	1.188	3958	-151.08	437.44	18.851	0.407	0.929
1193	104.62	236.03	18.826	0.355	0.960	3874	-142.93	431.55	18.851	0.584	0.916
2573	157.99	353.00	18.826	0.391	0.943	2569	128.42	352.51	18.851	-0.151	1.583
4593	57.08	484.20	18.826	0.238	0.995	3812	-157.18	427.68	18.852	0.320	0.947
5535	314.75	584.76	18.827	0.422	1.043	1855	-9.17	299.57	18.852	0.535	1.123
3011	-33.57	379.83	18.828	0.597	1.238	5295	-143.47	552.33	18.852	0.939	0.725
4762	63.19	496.36	18.828	0.310	1.005	3134	-80.04	386.94	18.853	0.524	1.013
5603	5.68	594.84	18.829	0.444	1.100	1543	264.34	273.06	18.853	0.514	0.783
3780	256.71	425.61	18.829	0.407	0.860	2057	-10.42	314.55	18.854	0.043	0.995
556	91.05	147.24	18.829	0.522	0.858	3125	-31.08	386.64	18.854	0.450	1.137
3525	-19.95	409.54	18.830	0.400	1.302	4090	110.20	446.05	18.854	0.160	0.980
4326	-63.41	463.35	18.830	0.388	0.956	4475	150.00	473.60	18.855	0.451	0.924
479	256.14	134.71	18.832	0.216	0.903	1234	-123.55	240.46	18.855	0.331	0.805
2818	116.99	368.18	18.833	0.016	1.153	4054	-144.58	443.61	18.855	0.428	0.877
5496	233.69	578.74	18.834	0.523	0.833	4882	157.34	507.45	18.855	0.545	0.943
4785	-105.17	499.12	18.834	0.525	0.895	3424	82.01	403.59	18.855	0.348	1.370
594	92.67	153.12	18.835	0.482	0.860	3344	143.58	398.32	18.856	0.303	0.966
2528	135.72	349.72	18.836	0.329	1.282	5026	141.87	522.51	18.856	0.341	0.810

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
4476	80.95	473.61	18.856	0.520	0.976	5405	246.66	565.34	18.882	0.431	0.855
6159	-130.51	716.90	18.857	0.327	0.955	739	-77.58	175.57	18.882	0.669	0.895
4434	48.96	471.10	18.857	0.332	1.075	3253	-222.33	393.07	18.883	-0.048	1.213
5735	21.56	615.88	18.857	0.449	0.999	5237	262.74	544.97	18.883	0.239	1.340
2396	-66.99	340.23	18.857	0.679	0.965	6161	152.29	719.19	18.884	1.385	0.960
1105	102.89	225.40	18.859	0.331	0.965	4188	108.99	452.29	18.884	0.649	0.865
1251	-150.82	241.94	18.859	0.373	0.910	4402	109.97	468.92	18.884	0.279	1.109
300	261.00	93.26	18.859	1.664	1.303	2203	97.10	326.45	18.885	0.296	1.228
1623	86.81	279.54	18.859	0.523	1.060	1068	290.94	221.17	18.885	1.523	0.928
2480	210.26	346.63	18.860	0.629	0.905	3490	231.56	407.24	18.886	0.374	0.883
3034	115.24	383.43	18.860	0.582	1.167	1076	6.81	222.68	18.886	0.367	0.970
3302	142.17	395.87	18.860	0.463	0.940	1216	-141.82	239.02	18.886	0.550	0.877
4698	178.01	491.87	18.860	0.486	0.873	3110	271.50	386.05	18.886	0.525	0.891
1824	100.68	297.50	18.860	0.634	1.265	1634	56.48	280.96	18.886	0.584	1.123
1801	232.42	296.21	18.860	0.455	0.905	3122	101.75	386.48	18.887	0.375	1.447
36	-5.60	17.04	18.860	0.383	0.860	775	47.61	180.96	18.887	0.545	0.505
5599	27.98	594.46	18.861	0.418	1.008	4670	-147.22	489.96	18.887	0.384	0.937
6394	-229.93	831.55	18.861	0.515	0.920	4156	72.07	450.68	18.888	0.543	1.395
3751	73.93	423.60	18.861	0.433	1.488	3612	-232.18	414.78	18.888	0.432	0.873
5484	64.63	576.62	18.861	0.837	1.030	1469	120.67	265.60	18.888	0.353	1.228
1847	133.22	299.20	18.861	0.400	0.873	1100	-90.84	224.76	18.888	0.385	0.958
443	-6.90	126.76	18.862	0.495	0.940	1093	137.64	224.32	18.889	0.523	0.925
3564	136.83	412.34	18.863	0.370	1.038	6171	-184.01	720.17	18.890	0.344	0.880
1974	78.60	309.15	18.864	0.416	1.123	998	9.05	212.18	18.890	0.354	0.978
2953	128.15	376.58	18.864	0.428	1.087	1382	161.14	255.85	18.890	0.481	0.933
4939	-76.73	513.03	18.866	0.552	0.963	465	128.34	131.13	18.890	0.401	0.863
5590	-95.38	592.79	18.866	0.463	1.080	3566	184.86	412.40	18.891	0.443	0.850
765	-203.68	179.22	18.867	0.430	0.870	5107	-54.80	530.13	18.892	0.429	0.850
779	115.80	182.08	18.867	0.108	1.037	5469	281.81	575.41	18.892	0.896	0.753
282	-79.97	89.17	18.869	0.462	0.863	3118	4.05	386.41	18.892	0.354	1.627
4449	-17.46	471.94	18.869	0.508	0.898	4309	98.94	461.94	18.892	0.387	1.076
3941	-47.20	436.43	18.869	0.345	1.056	4651	-23.35	488.40	18.892	0.295	0.886
538	39.50	144.70	18.869	0.440	0.832	647	222.69	160.37	18.892	0.531	0.848
4152	99.50	450.37	18.869	0.459	1.050	277	272.17	87.98	18.892	0.443	0.898
4271	-38.69	458.98	18.869	0.458	0.984	5394	-121.37	564.34	18.892	0.471	0.953
1978	-131.13	309.27	18.869	0.564	0.855	4648	90.11	488.02	18.892	0.308	0.965
3228	-107.95	391.80	18.869	0.356	0.953	3896	91.00	433.24	18.893	0.842	1.723
2969	-44.08	377.38	18.870	1.998	1.466	202	138.43	70.76	18.893	0.542	0.820
2710	124.17	361.95	18.870	0.426	1.360	4528	115.49	478.89	18.894	0.521	0.887
4378	87.04	467.23	18.870	0.484	1.111	3560	-64.00	412.10	18.894	0.522	1.099
6403	115.63	836.53	18.872	0.601	0.865	5316	128.62	554.32	18.894	0.325	0.893
4835	173.50	503.69	18.872	0.428	0.946	1468	-183.15	265.58	18.894	0.474	0.878
283	-84.68	89.35	18.872	0.431	0.833	2669	-221.27	358.81	18.894	0.378	0.959
2584	225.70	353.71	18.872	0.406	0.926	242	69.56	79.30	18.894	0.125	1.364
1169	-56.41	232.82	18.873	0.713	1.145	1258	16.76	242.58	18.895	0.530	0.891
2463	-112.47	345.51	18.873	0.477	0.870	2287	183.25	332.67	18.895	0.276	0.928
4290	312.66	460.92	18.873	0.467	1.061	2215	45.60	327.24	18.896	0.430	1.435
2441	134.18	343.76	18.873	0.233	0.913	1633	163.78	280.91	18.897	0.240	0.908
2212	-24.50	327.08	18.875	0.185	1.090	4852	63.51	505.19	18.897	0.439	1.053
4747	-148.14	495.29	18.875	1.965	0.893	1522	67.45	270.37	18.897	0.303	0.942
3416	109.14	402.92	18.876	0.181	1.400	1060	91.03	220.16	18.897	0.277	0.822
4925	-89.31	511.85	18.876	0.261	1.035	5504	47.59	379.71	18.898	0.408	0.888
4123	28.43	446.51	18.877	0.438	1.130	5639	17.46	600.54	18.898	0.611	0.865
2181	-187.60	324.94	18.879	0.233	0.830	2961	138.68	376.94	18.898	-0.161	1.018
529	-66.73	142.89	18.879	0.747	0.903	149	126.60	56.02	18.899	0.232	0.960
4102	27.99	447.03	18.879	0.430	1.118	1139	2.41	228.90	18.899	0.407	1.199
3474	166.17	406.48	18.881	0.361	0.966	2806	-87.88	367.54	18.899	0.290	0.972
1482	-15.90	267.16	18.881	0.574	1.143	1534	19.12	271.64	18.899	0.453	1.191
1559	-8.22	274.70	18.881	0.360	0.963	1647	159.95	281.75	18.901	0.285	0.983
5410	79.09	565.73	18.882	0.432	0.813	844	-11.71	191.46	18.901	0.622	0.835

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
5105	273.19	530.06	18.901	0.597	0.835	4944	-152.27	513.82	18.928	0.568	0.900
1770	99.88	293.31	18.902	0.283	1.003	896	116.70	198.44	18.928	0.522	0.897
1009	-38.66	213.32	18.902	0.375	0.920	5761	-11.52	621.34	18.928	0.549	0.935
3128	-125.88	386.74	18.904	0.540	0.934	5355	-128.59	559.88	18.929	0.462	0.808
2336	182.04	336.43	18.905	0.274	0.905	2408	61.65	341.04	18.930	0.215	1.598
4064	108.83	444.28	18.905	0.348	0.948	4632	-64.47	487.01	18.931	0.071	0.876
807	28.89	185.53	18.906	0.497	0.829	3824	-97.90	428.21	18.931	0.532	0.957
5417	13.82	566.94	18.906	0.466	0.879	5554	-38.29	587.37	18.932	0.449	0.820
5519	99.28	582.67	18.907	0.453	0.780	1187	193.69	235.44	18.933	0.393	0.945
3800	162.63	426.72	18.907	0.334	1.010	4713	14.58	492.91	18.934	0.481	0.964
3863	55.64	430.44	18.907	0.521	1.850	5890	192.02	646.33	18.934	0.477	1.025
5957	38.50	662.37	18.908	0.471	0.929	645	-29.78	160.16	18.935	0.680	0.905
2925	130.99	375.05	18.909	0.312	0.989	4160	260.31	450.86	18.935	0.587	1.128
1586	-13.02	276.70	18.909	0.969	1.093	5873	53.80	644.11	18.935	0.420	0.893
3514	128.46	408.60	18.909	0.310	1.132	516	47.34	141.33	18.935	0.323	0.843
2162	189.28	323.14	18.909	0.284	0.923	2971	-64.95	377.53	18.936	0.429	1.061
4467	77.55	473.08	18.910	0.498	1.038	4927	69.28	511.94	18.936	0.498	1.064
2457	172.28	344.96	18.910	0.940	0.953	4545	-65.72	480.99	18.936	0.582	1.054
1221	72.63	239.55	18.911	0.209	0.922	1808	132.97	296.65	18.937	0.408	0.900
784	-70.06	182.79	18.911	0.365	0.905	1329	-30.04	250.36	18.938	0.704	0.973
3776	189.38	425.48	18.912	0.245	0.858	1617	-4.37	279.14	18.938	0.465	1.008
1775	28.40	293.98	18.912	0.428	1.180	1487	53.97	267.79	18.938	0.433	1.117
4218	-22.40	455.38	18.912	0.522	0.915	2069	158.01	315.35	18.938	0.506	0.873
5475	-10.17	576.16	18.913	-0.058	0.875	839	2.71	190.45	18.938	0.518	0.991
2519	153.48	348.55	18.913	0.307	0.963	1500	73.11	268.48	18.939	0.367	0.975
4229	-193.86	456.18	18.913	0.348	0.844	5144	-44	534.31	18.939	0.518	0.865
3458	215.02	405.81	18.914	0.826	0.997	1828	-47.13	298.00	18.940	0.254	0.908
5652	49.80	602.62	18.914	0.355	0.935	3106	-53.59	385.91	18.940	0.663	1.034
6201	131.41	733.24	18.914	0.372	0.975	3356	141.25	399.36	18.941	0.530	0.937
1363	202.77	253.45	18.915	0.293	0.938	5279	-25.50	549.48	18.942	0.354	1.003
4987	30.64	518.61	18.916	0.221	1.003	2264	145.89	331.14	18.943	0.404	1.003
1779	21.67	294.08	18.917	0.062	1.240	2222	103.70	327.96	18.943	0.477	1.435
4177	75.75	451.79	18.918	0.512	1.093	4565	217.37	482.08	18.943	0.491	0.926
2784	117.37	366.40	18.918	0.507	1.097	2218	151.82	327.48	18.945	0.305	0.897
3353	-89.60	399.18	18.919	0.293	0.969	4714	288.60	492.91	18.946	1.316	0.803
3796	-232.79	426.46	18.919	0.510	0.930	2882	9.78	371.90	18.946	0.751	2.120
5792	158.46	628.01	18.920	0.386	0.850	4039	54.61	442.82	18.946	0.635	1.513
5322	60.93	554.88	18.920	0.327	0.993	4930	209.74	512.18	18.947	0.443	1.065
4461	289.42	472.81	18.921	0.371	0.943	531	-170.47	143.06	18.948	0.944	0.825
4478	-45.62	473.70	18.921	0.379	0.963	559	-8.90	147.82	18.948	0.435	0.888
1212	42.97	238.43	18.921	0.134	0.966	6210	272.76	736.18	18.949	0.463	1.030
5879	134.72	644.69	18.921	0.369	1.065	1566	79.19	275.38	18.950	0.227	0.920
3247	301.97	392.68	18.921	0.873	0.802	5342	91.91	557.86	18.950	0.605	0.800
718	-215.67	172.83	18.923	0.478	0.795	327	-7.71	99.94	18.950	0.433	0.788
5846	178.92	636.81	18.923	0.603	0.968	423	53.63	120.41	18.952	0.317	0.896
1659	40.47	283.12	18.923	0.473	1.386	489	-75.31	136.08	18.952	0.531	0.928
1352	229.37	252.40	18.925	0.381	0.948	4754	-79.73	495.84	18.952	0.431	0.928
3866	-12.11	430.77	18.924	0.195	1.182	3126	-196.36	386.67	18.953	0.451	0.988
160	-6.93	58.11	18.924	0.351	0.803	60	-187.47	26.50	18.953	0.452	0.973
4736	82.97	494.72	18.924	0.351	0.943	710	-31.38	171.71	18.954	0.450	0.878
3847	118.94	423.48	18.924	0.421	1.060	2119	180.58	318.98	18.954	0.263	1.005
2303	-46.13	333.68	18.925	0.388	0.923	2228	-33.42	328.11	18.957	0.684	1.077
3955	-10.64	437.25	18.925	0.363	0.910	4533	-172.64	479.73	18.957	0.340	0.881
1717	93.06	287.82	18.925	1.054	0.930	321	106.97	98.23	18.958	0.568	0.898
644	-173.39	160.10	18.926	0.477	0.873	1622	-49.76	279.43	18.958	0.432	0.888
5618	-61.10	597.03	18.926	0.501	0.760	4817	-97.69	501.97	18.958	0.705	0.858
3551	-18.49	410.30	18.926	0.850	0.973	4421	93.05	470.02	18.960	0.259	0.938
4429	82.16	470.68	18.927	0.161	0.996	4972	89.76	516.72	18.960	0.580	0.990
4344	-198.43	464.96	18.927	0.426	0.921	6119	-125.62	702.09	18.961	0.605	0.945
2930	-156.76	375.54	18.928	0.159	0.960	2346	-150.39	336.98	18.961	0.646	0.865

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
1833	161.40	298.44	18.961	0.452	0.993	1956	-176.43	308.20	18.990	0.396	1.033
174	25.20	62.17	18.962	0.605	0.824	3965	227.29	437.84	18.990	0.642	0.824
1422	21.91	260.95	18.962	0.254	1.006	6292	0.17	775.53	18.990	0.347	0.793
2164	25.12	322.20	18.963	0.700	2.264	2704	262.37	361.64	18.990	0.559	0.884
478	197.59	133.78	18.963	0.386	0.790	3820	100.51	428.01	18.990	0.875	1.092
4756	-50.35	495.94	18.964	0.445	0.890	2027	-29.70	312.82	18.990	0.122	0.858
4965	23.81	516.17	18.964	0.562	1.075	3207	189.31	390.69	18.991	1.011	0.955
4694	122.60	491.61	18.965	0.561	0.891	3246	-89.66	392.63	18.991	0.227	0.935
3376	192.61	400.63	18.965	0.563	0.909	3855	114.50	430.10	18.991	0.507	1.194
4354	-43.23	465.85	18.965	0.432	1.015	4279	100.18	459.74	18.992	0.509	0.930
5753	50.38	619.73	18.965	0.421	1.022	2537	289.16	350.44	18.992	0.531	1.165
2315	-226.57	334.63	18.967	0.456	0.890	4244	103.05	456.79	18.993	0.372	0.976
4010	60.29	440.86	18.967	0.884	1.382	2363	118.21	337.99	18.993	0.345	0.903
5518	224.97	582.35	18.967	0.523	0.825	1564	-120.19	274.96	18.995	0.483	0.908
3650	-127.87	417.00	18.967	0.523	0.925	1204	196.32	237.54	18.995	0.283	0.860
1820	165.05	297.23	18.968	0.507	0.843	5386	47.65	563.09	18.995	1.047	1.106
5557	72.95	587.55	18.968	0.489	0.845	4172	289.43	451.56	18.997	0.517	0.916
5169	4.13	537.17	18.968	0.464	1.376	632	33.99	158.09	18.999	0.483	0.895
1925	23.97	305.34	18.968	0.362	1.830	1842	46.83	299.03	18.999	0.401	1.537
4924	38.13	511.77	18.969	0.415	0.891	3956	137.55	437.34	19.000	0.505	0.976
4190	-81.48	452.39	18.969	0.867	1.290	5517	183.63	582.14	19.001	0.528	0.853
769	279.18	178.78	18.970	0.291	0.830	375	52.61	111.29	19.001	0.371	0.811
4522	182.31	478.11	18.970	0.294	0.901	193	-94.27	67.51	19.001	0.558	1.023
4571	26.98	482.53	18.972	0.421	1.137	3748	229.80	423.53	19.001	0.302	0.879
3010	-22.23	379.82	18.972	0.491	1.347	2841	-177.42	369.53	19.002	0.697	1.067
4014	300.74	441.03	18.973	0.612	0.943	2388	-132.44	339.47	19.002	0.631	0.920
4928	126.39	512.08	18.976	0.529	1.048	1074	-67.50	221.96	19.002	0.508	0.960
4701	36.61	492.06	18.978	0.458	1.164	4112	231.71	447.43	19.002	0.371	0.925
4012	-185.53	440.98	18.979	0.339	0.930	278	167.00	88.5	19.003	0.497	0.833
2234	-89.02	328.92	18.979	0.597	0.897	4998	72.54	519.91	19.003	0.791	1.130
6026	122.87	681.16	18.979	-0.053	0.928	379	54.61	112.35	19.004	0.711	0.814
1620	-27.84	279.38	18.980	0.542	0.890	4888	179.88	508.07	19.004	0.279	0.981
1900	-217.04	303.22	18.980	0.799	0.783	5302	-79.94	552.98	19.006	0.448	1.010
4480	136.71	473.81	18.980	0.443	1.040	3022	-30.51	380.39	19.006	0.421	1.228
1857	-202.24	299.69	18.980	0.185	0.903	854	134.35	193.70	19.006	0.447	0.948
1355	257.54	252.57	18.981	0.544	1.048	671	127.17	164.21	19.006	0.399	0.780
3631	-183.69	415.88	18.982	0.644	0.905	165	155.15	60.25	19.007	0.499	0.835
3743	-76.12	423.28	18.983	0.408	1.035	4219	111.00	455.55	19.007	0.633	0.893
3543	-100.05	410.77	18.983	0.645	1.194	1863	-55.03	300.53	19.008	0.280	0.940
5839	63.50	635.08	18.983	0.443	0.959	2779	-70.53	366.01	19.008	1.002	2.247
2493	127.96	347.34	18.984	1.640	1.060	1524	51.13	270.70	19.008	0.294	0.925
1421	188.57	260.85	18.984	0.597	0.880	3244	127.57	392.57	19.008	0.489	1.096
3361	202.68	399.63	18.985	0.345	0.898	3075	-83.52	384.10	19.008	0.532	1.025
2832	-78.04	368.93	18.985	1.244	1.720	4377	-76.87	467.16	19.008	0.334	0.930
542	58.31	145.11	18.986	1.449	0.906	636	-181.80	159.24	19.008	0.766	0.900
4993	38.28	518.91	18.987	0.748	0.910	354	81.77	177.48	19.008	0.781	0.852
3629	220.67	415.58	18.987	0.415	1.059	6217	-214.34	740.21	19.008	0.405	1.030
1133	307.62	228.48	18.987	0.277	1.053	5638	71.81	600.53	19.008	0.740	0.960
5273	-169.64	548.67	18.988	0.250	0.918	1362	49.93	253.20	19.009	0.423	0.885
4101	237.51	446.97	18.988	0.378	0.979	1583	-49.3	276.31	19.009	0.522	0.890
2318	225.25	334.82	18.988	0.652	1.018	4748	-146.91	495.34	19.009	0.713	0.977
5745	139.01	618.26	18.988	0.488	0.815	528	-28.04	142.83	19.011	0.480	0.933
1829	69.65	298.04	18.989	0.604	0.968	653	277.56	161.41	19.011	1.220	0.793
2567	187.79	352.45	18.989	0.672	0.967	2258	154.07	330.70	19.011	0.435	0.920
3242	240.90	392.47	18.989	0.477	0.956	4807	15.35	501.25	19.012	0.414	0.968
4584	82.51	483.26	18.989	0.544	1.023	1098	202.30	224.53	19.012	0.524	0.995
917	105.44	201.49	18.989	0.070	0.898	107	176.37	45.01	19.012	0.609	1.000
392	-97.37	115.09	18.990	0.216	0.978	2978	-21.27	377.80	19.013	0.570	1.270
4337	-167.43	467.83	18.990	0.290	0.925	3093	165.82	384.97	19.013	0.113	0.957
3088	128.80	384.60	18.990	0.821	1.172	5450	-13.13	572.02	19.013	0.639	0.880

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
714	86.08	172.05	19.013	0.650	0.803	2668	-36.4	358.74	19.036	0.755	1.360
3515	-143.57	408.66	19.014	0.384	0.983	561	95.71	148.41	19.036	0.347	0.843
3518	-167.82	408.90	19.014	0.254	0.953	3080	-32.14	384.20	19.037	0.567	1.177
2420	107.69	341.99	19.014	0.508	1.138	804	-42.79	185.22	19.038	0.756	1.060
3873	149.57	431.49	19.014	0.486	1.014	3840	-5.93	479.14	19.041	0.582	1.110
1496	210.39	268.52	19.015	0.588	0.950	449	202.32	128.19	19.041	0.310	0.845
350	-36.65	105.82	19.015	0.518	1.045	469	-34.67	131.63	19.041	0.381	0.978
590	119.57	152.40	19.015	0.486	0.855	4723	-57.66	493.66	19.042	0.582	0.955
3695	218.34	419.92	19.015	0.316	1.077	4680	-79.66	490.57	19.042	0.502	0.928
4113	23.19	447.48	19.015	0.458	1.283	2351	93.94	337.21	19.042	0.637	1.168
5175	120.12	538.11	19.015	0.337	0.945	5579	-80.09	590.70	19.043	0.508	0.790
4440	61.93	471.57	19.015	0.414	1.206	2516	-69.36	348.48	19.043	0.828	1.038
5200	150.72	541.03	19.017	0.331	0.908	190	62.72	65.71	19.044	0.578	0.846
4051	279.65	443.43	19.018	0.443	0.876	10	-95.87	3.24	19.044	0.752	0.965
1703	-46.37	286.41	19.018	0.473	1.110	5973	89.42	666.97	19.044	0.351	0.843
2549	228.04	351.14	19.018	0.381	0.890	6175	-72.94	721.24	19.045	0.344	1.015
3074	186.36	384.09	19.019	0.621	0.924	4660	102.84	489.10	19.045	0.410	0.914
5051	148.04	524.55	19.019	0.452	0.955	6216	87.44	740.07	19.045	1.368	0.975
4745	-95.87	495.22	19.020	0.484	1.069	5030	-175.57	522.85	19.045	0.532	0.838
1563	149.78	274.84	19.020	0.506	0.988	4956	153.28	515.37	19.046	0.605	0.895
1878	154.66	301.67	19.020	0.466	0.935	2465	-131.14	345.38	19.046	0.300	0.863
1629	-22.71	280.42	19.021	0.184	0.945	1020	-189.13	214.58	19.047	0.835	0.815
5820	81.51	632.05	19.021	0.580	1.088	1735	201.76	389.30	19.047	0.448	0.863
1120	-177.75	228.00	19.022	0.535	0.977	3709	275.38	421.52	19.048	0.693	0.862
1300	1.52	246.79	19.022	0.545	0.921	5041	-41.25	523.46	19.048	0.444	0.825
979	-6.73	210.41	19.022	0.387	0.948	2927	-132.68	375.21	19.049	0.572	0.980
521	51.15	142.02	19.023	0.486	0.863	789	212.93	183.19	19.050	0.540	0.913
1085	111.88	223.80	19.023	0.401	0.950	6166	121.85	719.11	19.051	0.460	1.093
3795	-159.98	426.45	19.023	0.546	0.989	4300	-40.60	461.44	19.051	0.463	0.994
5869	-176.20	641.91	19.023	0.566	0.967	934	295.82	203.44	19.051	0.383	0.865
4176	33.34	451.79	19.024	0.281	1.004	112	-176.73	71.58	19.053	0.366	0.913
4499	87.38	475.77	19.024	0.595	1.003	5117	72.57	530.65	19.053	0.327	0.923
2083	114.36	315.88	19.024	0.608	1.268	5367	199.03	526.13	19.053	0.523	0.947
2904	212.39	373.71	19.024	0.357	0.919	30	-27.22	15.34	19.053	0.301	0.978
3375	-118.23	400.59	19.024	0.504	0.860	5283	235.82	549.90	19.054	0.547	0.918
748	-109.21	176.35	19.026	0.276	0.883	1152	21.57	230.16	19.054	0.544	1.021
1930	-66.37	305.89	19.026	0.104	0.860	116	202.01	46.69	19.055	0.318	0.898
1170	-71.74	233.01	19.027	1.020	0.980	3864	134.41	430.57	19.055	0.658	1.296
1633	-130.72	281.08	19.027	0.341	0.942	799	-82.31	184.58	19.055	0.665	0.845
1893	-46.61	302.37	19.028	0.599	0.890	2113	-203.00	318.32	19.055	0.430	0.938
65	138.63	29.01	19.028	0.611	0.895	1207	96.46	237.96	19.055	0.585	0.960
4543	53.27	480.90	19.029	0.380	0.981	2191	219.90	325.84	19.056	0.315	0.833
4444	-117.47	471.73	19.029	0.577	0.928	1911	-115.28	303.95	19.056	0.525	0.913
2084	-130.05	315.95	19.029	1.463	0.838	6170	-55.91	719.90	19.056	0.595	0.895
2524	99.00	349.11	19.030	0.480	1.177	1032	153.33	216.23	19.056	0.463	0.907
3048	-120.23	382.19	19.030	0.606	0.843	1867	269.87	300.68	19.056	0.455	0.762
2324	204.08	335.36	19.031	0.363	0.935	568	64.42	149.25	19.057	0.307	0.859
5150	132.60	534.96	19.031	0.441	0.903	1518	26.00	269.99	19.057	0.544	1.076
2101	-53.46	317.25	19.031	0.312	0.868	3985	117.04	439.24	19.057	0.178	1.114
5936	-72.41	655.65	19.032	0.440	0.930	1588	11.51	276.93	19.058	0.283	1.105
2254	87.81	330.41	19.032	0.417	1.077	3951	-134.43	436.97	19.058	0.376	1.109
2096	-120.52	317.03	19.032	0.509	0.908	2183	-35.39	325.06	19.058	0.360	1.090
2977	-208.24	377.77	19.032	0.436	0.860	1226	-7.13	239.96	19.058	0.479	1.020
2174	-44.55	323.94	19.034	0.360	1.013	3959	67.15	437.48	19.058	-0.239	2.060
1572	-54.72	275.76	19.034	-0.092	0.860	234	156.58	77.78	19.058	0.570	1.115
2385	175.72	339.38	19.035	0.587	0.905	5506	-41.46	580.35	19.059	0.288	0.817
1845	288.56	299.13	19.035	0.425	0.918	1909	-67.54	303.88	19.059	0.804	0.840
1148	-56.06	229.42	19.035	0.309	1.070	1001	-3.99	212.41	19.059	0.777	0.963
3298	-11.12	395.68	19.035	0.036	1.280	400	237.60	116.87	19.059	0.281	0.845
1665	-53.96	283.95	19.036	0.567	0.957	1494	195.66	268.14	19.061	0.438	0.795

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
6055	-20.71	685.57	19.061	0.548	0.858	4810	-29.74	501.42	19.088	0.601	0.957
3078	-121.77	384.17	19.062	0.582	0.915	1151	-134.48	229.85	19.088	0.361	0.968
781	-141.53	182.56	19.064	0.599	0.870	1570	91.94	275.65	19.089	0.474	0.875
3190	-105.49	389.96	19.066	0.529	0.931	5377	-53.93	561.84	19.089	0.254	0.697
2587	-92.11	353.78	19.066	0.572	0.931	611	-172.19	154.99	19.089	1.393	0.903
1280	63.41	245.29	19.066	-0.113	1.187	2379	62.70	330.80	19.089	-0.201	1.283
1396	-60.87	257.18	19.066	0.638	0.950	1055	-14.55	220.64	19.089	0.599	0.983
5285	-87.28	550.21	19.067	0.425	1.092	108	87.40	45.11	19.089	0.398	0.885
1921	76.97	304.96	19.068	-0.095	1.250	4345	-55.72	464.97	19.090	0.485	1.019
2452	94.38	344.58	19.068	0.333	1.323	517	33.11	141.35	19.090	0.386	0.907
4403	164.37	468.97	19.068	1.311	1.207	2627	148.31	356.91	19.090	0.568	0.985
4412	94.79	469.36	19.069	0.482	1.036	2687	-230.84	360.34	19.090	0.731	0.980
4707	97.49	492.52	19.069	0.439	0.964	3809	222.35	427.48	19.090	0.345	1.177
5663	-52.16	603.92	19.069	0.253	0.948	2066	-34.62	315.09	19.091	0.444	0.983
2230	-58.63	328.40	19.069	0.877	0.887	6363	288.33	816.42	19.092	0.563	0.860
3647	-125.76	416.85	19.069	2.354	0.947	1630	88.52	280.66	19.092	0.845	0.993
3380	-71.59	400.77	19.070	0.440	0.976	1957	-66.97	308.24	19.092	0.865	0.833
70	237.28	30.57	19.070	2.369	0.903	5278	159.08	549.22	19.092	0.652	1.060
965	133.56	207.73	19.071	0.341	0.873	4675	-2.09	490.25	19.092	1.413	0.970
1330	4.94	250.53	19.071	0.513	0.909	6063	-131.85	687.20	19.093	0.268	0.840
1083	-111.13	223.56	19.071	1.097	0.918	6425	194.19	850.51	19.093	0.505	0.983
4837	28.23	503.80	19.071	0.388	1.096	3879	161.28	431.81	19.093	0.292	0.941
2355	-30.08	337.53	19.072	0.300	1.222	1825	-17.29	297.62	19.094	0.318	1.135
5736	-181.48	616.44	19.072	0.483	1.063	6144	141.25	710.88	19.094	0.478	0.905
4638	-39.91	487.29	19.072	0.757	0.980	5138	119.53	533.38	19.094	0.483	0.865
4983	-7.95	518.10	19.073	0.253	0.970	1293	180.89	246.34	19.095	0.399	0.880
6177	35.14	722.19	19.073	0.462	0.954	7501	-43.34	579.45	19.095	0.696	0.800
1296	56.45	246.61	19.073	0.275	1.046	6321	148.99	790.95	19.096	0.544	0.967
1935	84.87	306.51	19.074	0.324	1.307	1284	-47.54	245.55	19.096	0.363	1.083
1478	125.30	266.79	19.074	0.492	1.647	524	275.25	142.25	19.097	0.319	0.793
2014	57.37	311.65	19.074	0.579	1.408	3165	-51.84	388.60	19.097	0.300	1.004
6	-160.40	-0.23	19.074	0.400	1.070	2916	217.59	374.58	19.097	0.414	0.944
179	-36.85	63.47	19.074	0.424	0.865	1425	8.61	261.09	19.097	0.777	1.064
5371	109.77	561.52	19.075	0.497	1.007	1982	-96.29	309.52	19.097	0.473	1.005
4286	104.43	460.32	19.075	0.379	1.064	29	-185.26	15.08	19.098	0.345	0.805
1571	-1.64	275.75	19.075	0.469	0.985	6396	191.47	832.26	19.098	0.489	0.913
2231	174.74	328.82	19.075	0.486	1.082	4799	184.55	500.50	19.098	0.375	0.974
733	162.45	174.90	19.075	0.409	0.910	1589	-201.65	276.93	19.098	0.719	0.940
2147	84.98	321.57	19.076	0.462	1.370	2322	-43.60	335.09	19.098	1.615	0.765
4107	-30.23	447.27	19.076	0.345	0.929	4265	211.79	458.52	19.098	0.408	0.956
5953	41.96	661.83	19.076	0.446	0.909	3534	212.53	410.11	19.099	0.297	1.020
1190	-40.71	235.68	19.077	0.774	1.215	820	-110.04	188.30	19.099	0.377	0.900
1963	306.40	308.42	19.077	0.577	0.878	475	19.62	133.08	19.100	0.354	0.929
5281	173.63	549.53	19.078	0.562	0.943	2846	-75.69	369.59	19.100	1.244	2.010
1676	92.99	284.91	19.078	0.401	0.907	5166	30.74	536.95	19.101	0.422	1.097
5214	66.29	542.93	19.078	0.485	0.844	2592	138.38	354.13	19.101	0.410	1.025
2327	75.53	335.78	19.078	0.415	1.383	3073	97.89	384.05	19.102	0.216	1.530
4042	145.94	443.01	19.080	0.417	0.901	4217	-111.85	455.09	19.102	0.416	0.874
4384	-87.28	467.52	19.080	0.603	0.990	344	9.17	104.42	19.102	0.578	0.940
5366	81.35	560.72	19.080	0.661	0.980	5548	-60.76	586.58	19.102	0.272	0.838
4425	22.81	470.49	19.080	0.402	1.166	4468	-9.85	473.17	19.102	0.575	0.990
1509	-88.18	269.32	19.082	0.789	0.977	1690	26.70	285.76	19.103	0.303	1.040
1965	-159.00	308.58	19.082	-0.048	0.990	5163	309.93	536.79	19.103	0.354	0.915
104	-57.24	44.46	19.083	0.557	0.803	2857	210.76	370.29	19.103	0.583	0.951
2967	-175.88	377.31	19.083	0.284	0.859	4865	-209.74	506.10	19.103	0.648	0.917
3876	-12.50	431.56	19.086	-0.075	1.010	92	82.07	41.18	19.104	0.412	0.840
2975	-71.07	377.74	19.086	0.531	1.018	3546	-1.40	410.90	19.104	0.199	1.832
6408	-71.11	841.07	19.086	0.609	0.985	1038	1.79	216.56	19.105	0.477	1.093
5293	299.97	552.11	19.087	0.311	0.905	1347	37.06	252.08	19.105	0.250	1.028
4666	138.03	489.58	19.087	0.464	0.892	4380	38.64	467.33	19.105	0.660	1.145

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
3807	-103.07	427.28	19.106	0.333	1.002	1503	254.45	269.01	19.130	0.481	0.778
5308	158.66	553.84	19.107	0.493	0.953	552	-167.39	146.72	19.131	0.601	0.843
6219	89.68	740.35	19.107	-0.062	0.965	3588	235.46	413.17	19.131	1.652	0.875
4003	-66.92	440.40	19.107	0.414	0.976	4122	36.98	448.22	19.131	0.756	1.251
5141	20.76	534.01	19.107	0.293	1.059	2500	-104.45	347.75	19.132	0.593	1.098
4969	54.77	516.43	19.108	0.408	0.913	1034	42.33	216.30	19.132	0.004	0.974
1584	195.50	276.33	19.108	0.713	0.847	4597	176.56	484.36	19.132	0.477	0.824
6244	-229.34	752.07	19.108	0.590	0.853	5541	24.62	585.72	19.133	0.606	0.866
4398	-122.96	468.65	19.108	1.273	1.050	2612	-144.53	355.77	19.133	0.317	0.868
2314	153.67	368.00	19.108	0.359	1.083	832	158.01	189.61	19.133	0.216	0.838
2560	-121.79	351.95	19.109	0.243	0.868	5864	191.63	441.13	19.133	0.412	0.750
1220	-134.20	239.43	19.109	0.547	0.815	4697	135.23	401.78	19.134	0.294	0.938
6258	159.58	758.02	19.110	0.358	0.958	3211	213.41	390.89	19.135	0.538	0.906
4194	181.68	453.10	19.110	0.452	0.886	4653	-20.57	488.64	19.135	0.298	0.864
2474	-117.54	346.19	19.111	0.542	0.870	4317	-116.51	462.22	19.136	0.503	0.857
2015	-100.72	311.76	19.112	1.022	0.935	2955	-77.48	376.64	19.136	0.472	1.166
1134	-52.66	228.63	19.112	1.390	1.275	3177	-59.68	389.48	19.136	0.348	1.033
4704	162.54	492.34	19.113	0.376	0.944	1966	-143.82	308.60	19.136	0.076	0.828
631	-54.65	157.85	19.113	0.664	0.910	921	-178.26	201.95	19.136	0.480	0.910
3979	10.08	438.78	19.114	0.405	1.520	1924	120.91	305.21	19.138	0.548	0.908
3264	-34.28	393.76	19.114	0.536	1.480	2042	278.76	313.80	19.139	0.636	0.913
1590	84.74	276.97	19.114	0.318	0.992	4324	113.99	463.19	19.139	0.565	1.054
1638	117.82	281.22	19.114	0.436	0.883	760	-149.25	178.67	19.139	0.591	0.955
5168	233.70	537.10	19.114	0.763	0.873	2689	-194.30	360.54	19.139	0.506	1.000
4336	97.37	464.58	19.114	0.554	1.026	4020	-11.21	441.59	19.140	0.392	0.954
2032	286.93	313.12	19.114	0.568	0.875	3194	-154.29	390.15	19.140	0.410	0.930
4744	256.59	495.14	19.115	0.313	0.979	5329	11.50	556.10	19.141	0.581	0.849
2991	-121.08	378.79	19.115	0.557	0.882	2273	-237.47	331.83	19.141	0.514	0.833
1874	91.72	300.95	19.115	1.066	1.048	5219	30.38	543.73	19.142	0.264	0.982
3420	-67.75	403.12	19.117	0.316	0.966	4813	-117.03	501.61	19.142	0.302	0.933
5425	-69.60	568.35	19.117	0.372	0.920	3602	143.74	414.24	19.143	0.562	1.383
4834	-106.49	503.64	19.117	0.569	0.963	6406	54.31	838.70	19.143	0.419	1.117
2810	253.39	367.78	19.118	0.403	0.949	1796	78.28	295.58	19.143	0.033	0.927
5718	22.94	612.85	19.119	0.642	0.946	110	162.63	45.77	19.143	0.366	0.915
5162	-217.83	538.76	19.119	0.446	0.810	5925	113.63	651.95	19.144	0.147	1.072
4234	90.04	456.42	19.121	0.225	1.007	3823	-41.88	428.15	19.144	0.900	1.030
5264	78.20	548.09	19.122	0.093	0.863	2585	155.51	353.73	19.144	0.553	1.030
4109	253.14	447.35	19.123	0.367	0.968	3830	171.82	431.83	19.144	0.404	0.940
4893	218.07	508.39	19.123	0.435	0.920	136	79.79	51.64	19.144	0.509	1.035
2881	234.86	371.90	19.123	0.303	0.905	952	173.86	205.87	19.145	0.540	0.985
5103	-50.81	29.98	19.123	0.445	0.950	2894	136.12	372.72	19.145	0.406	1.092
2112	63.93	318.04	19.124	0.686	1.455	5480	-141.96	576.44	19.145	0.548	0.795
3248	189.46	392.81	19.124	0.280	0.895	4735	-46.07	494.71	19.145	0.558	0.921
1349	-110.36	252.26	19.124	0.578	0.913	3556	114.44	411.82	19.146	0.817	1.205
5292	67.87	551.96	19.125	0.432	0.944	411	112.57	118.58	19.147	0.442	0.750
815	23.15	187.11	19.125	0.564	0.991	2427	-187.54	342.76	19.147	0.332	0.942
4503	96.07	476.07	19.125	0.567	1.005	4069	7.31	444.51	19.148	0.437	1.248
4185	-182.38	452.17	19.125	0.409	0.876	3633	135.67	415.95	19.148	0.506	1.118
5421	-133.82	567.82	19.126	0.348	1.023	5224	31.67	544.18	19.148	0.038	0.919
2611	105.64	355.69	19.126	0.637	1.542	145	-127.55	54.22	19.149	0.450	0.868
5042	41.04	523.56	19.126	0.372	0.957	4016	-49.63	441.35	19.149	0.472	1.106
5447	-193.18	571.39	19.126	0.454	0.965	5488	82.64	577.45	19.150	0.766	0.855
1115	238.35	226.89	19.127	0.515	0.908	6132	99.33	708.31	19.150	0.505	0.915
4059	-93.62	443.76	19.128	0.382	0.977	115	-22.81	46.48	19.150	0.617	0.960
6174	193.57	721.02	19.128	0.706	0.830	3310	-142.57	396.32	19.150	0.481	0.895
877	259.89	196.55	19.128	0.319	0.845	6334	-32.36	800.87	19.150	0.264	1.015
2734	161.28	363.30	19.129	0.356	0.879	119	233.10	47.30	19.151	0.469	1.020
1153	74.31	230.36	19.130	0.369	0.873	4764	225.78	496.45	19.151	0.466	0.970
1165	-39.88	232.26	19.130	0.987	1.230	5510	-137.62	581.14	19.151	0.419	0.920
1025	41.39	215.04	19.130	0.427	0.937	1653	0.45	282.50	19.151	0.550	1.015

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
4607	-59.01	485.12	19.151	0.331	1.075	3185	-142.96	389.70	19.177	0.545	0.921
3323	185.71	396.91	19.152	0.387	0.881	5614	-25.22	596.43	19.177	0.514	0.860
713	26.65	172.01	19.153	0.409	0.876	2625	109.06	356.81	19.178	0.447	1.301
1788	186.99	294.77	19.153	0.440	1.035	5680	-8.09	806.33	19.178	0.478	1.012
583	-137.44	150.89	19.153	0.597	0.780	4450	-138.97	472.08	19.179	0.599	0.858
4055	-72.03	443.64	19.154	0.693	0.898	4347	179.70	465.31	19.179	0.529	0.908
1744	-13.02	290.35	19.154	0.511	0.953	5946	263.31	659.45	19.179	0.481	1.000
44	-116.13	19.23	19.155	0.365	0.878	226	10.04	76.21	19.180	0.465	0.898
2409	-54.90	341.10	19.156	0.397	1.043	1385	152.65	256.05	19.181	0.137	1.087
5950	68.92	661.14	19.156	0.335	0.965	2325	-153.36	335.54	19.181	0.468	0.805
2265	-100.52	331.22	19.156	0.427	1.003	723	102.61	173.75	19.181	0.304	0.833
5604	96.36	594.89	19.157	0.432	0.892	1865	22.90	300.60	19.181	0.411	1.432
1723	-80.45	288.60	19.157	0.359	0.908	5413	141.34	565.98	19.182	0.350	0.940
3607	274.51	414.47	19.158	0.218	0.921	139	-145.62	53.38	19.182	0.363	0.898
4659	140.59	489.07	19.158	0.430	0.900	2226	-42.57	328.08	19.182	0.237	1.000
1186	-105.72	235.36	19.158	0.335	0.788	5919	-26.83	651.10	19.183	0.399	1.008
3541	228.02	410.55	19.158	0.380	0.910	6349	-205.27	807.53	19.184	0.618	0.890
3734	241.09	422.90	19.159	0.458	0.990	239	145.91	78.45	19.184	0.496	0.888
4663	11.54	489.23	19.159	0.407	1.141	5866	165.92	641.36	19.184	0.413	0.875
5074	-75.62	527.55	19.159	0.644	0.913	928	90.23	202.62	19.185	0.507	0.863
5327	-20.46	555.70	19.160	0.356	0.902	1532	-79.78	271.59	19.185	0.662	0.882
3648	-96.33	416.91	19.160	0.405	0.991	4537	172.10	480.09	19.185	0.267	0.884
3662	165.80	417.55	19.160	0.440	0.900	2559	-210.39	351.93	19.186	0.491	0.975
545	181.69	145.78	19.161	1.382	0.870	4850	221.15	505.10	19.186	0.442	1.028
4957	-176.17	515.60	19.161	0.621	0.888	1331	64.07	251.00	19.187	0.241	1.063
3522	-120.28	409.38	19.162	0.543	0.965	364	-157.50	109.21	19.187	0.032	0.923
5231	-155.21	544.89	19.162	1.628	0.900	4897	226.07	509.31	19.187	0.464	0.953
5930	234.18	653.94	19.162	0.627	0.970	4796	62.62	500.17	19.188	0.470	0.954
698	14.63	168.44	19.163	0.524	0.959	4287	173.52	460.50	19.188	0.390	0.871
374	97.60	111.10	19.163	0.307	0.938	505	-67.84	140.41	19.188	0.166	0.890
5508	211.75	580.56	19.163	0.337	0.953	4778	53.70	498.58	19.188	0.516	1.162
1439	-149.29	262.18	19.163	0.317	0.930	2645	213.89	357.61	19.188	0.295	0.912
1088	-78.36	223.87	19.164	0.344	0.777	4831	68.57	503.48	19.188	0.585	0.985
6248	-211.12	753.35	19.165	0.672	0.905	5274	292.01	548.79	19.189	0.405	0.968
4162	42.93	450.88	19.166	0.487	1.189	3638	199.96	416.20	19.189	0.396	0.876
1712	15.58	287.53	19.166	0.576	1.002	5586	47.73	591.98	19.190	0.529	0.923
219	-54.78	73.76	19.167	0.800	0.793	207	-43.85	71.08	19.190	0.441	0.905
4849	-82.93	505.09	19.167	0.351	0.815	4883	-33.56	507.57	19.190	0.467	0.934
3819	247.76	427.92	19.167	0.428	0.949	3145	-112.21	387.25	19.190	0.578	0.886
84	-27.57	37.45	19.168	0.351	0.947	2661	-14.49	358.72	19.192	0.872	1.470
4787	28.26	499.45	19.169	0.595	1.105	3750	-64.65	423.55	19.192	0.577	1.063
4845	54.54	504.59	19.169	1.015	1.210	2223	196.97	328.04	19.193	0.177	0.780
2338	-122.12	336.45	19.169	0.166	0.855	5003	-145.16	520.54	19.194	0.404	0.823
1241	151.97	241.22	19.170	0.658	0.940	3603	74.95	414.28	19.194	0.659	1.307
1282	74.33	245.36	19.170	0.175	0.943	3023	-16.45	380.42	19.195	0.229	1.337
5722	130.83	613.81	19.170	0.744	0.833	1694	-78.13	286.08	19.195	0.357	0.848
1037	240.47	216.47	19.171	0.477	0.848	488	113.00	135.53	19.195	0.300	0.895
932	-10.27	203.37	19.171	0.643	0.905	3035	-117.07	381.32	19.195	0.719	0.854
5865	-63.77	641.35	19.172	0.617	0.970	4712	6.07	492.85	19.196	0.548	1.164
2697	-95.06	360.91	19.173	0.350	0.963	956	6.39	206.70	19.196	0.310	0.938
4310	-136.21	461.96	19.173	0.481	0.971	2679	-112.20	359.46	19.196	0.349	1.320
4442	-120.87	471.66	19.173	1.202	1.045	1546	133.12	273.24	19.196	0.275	0.900
1030	-0.88	215.96	19.174	0.816	0.983	6346	107.27	805.26	19.197	0.453	0.870
1501	58.77	268.97	19.174	0.477	1.019	4685	37.50	490.80	19.197	0.654	1.248
2198	245.50	325.97	19.174	0.354	0.968	1375	58.48	254.92	19.197	0.270	1.038
4323	121.59	462.92	19.175	0.569	0.904	3787	240.27	425.94	19.198	0.327	0.944
5877	197.02	644.58	19.175	0.452	0.843	3229	142.04	391.81	19.198	0.339	0.938
5069	-0.37	526.42	19.176	0.598	1.207	4469	18.25	473.17	19.198	0.467	1.119
1398	104.56	257.26	19.177	0.513	1.103	13	-185.65	6.08	19.199	0.545	0.900
2929	-106.36	375.47	19.177	0.382	0.885	3300	172.65	395.78	19.199	0.262	1.011

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
4128	-172.73	448.65	19.199	0.533	0.838	972	118.51	208.41	19.221	0.425	0.980
5672	152.00	605.63	19.199	0.485	0.913	5255	7.78	546.64	19.222	0.313	1.026
3885	-178.29	432.08	19.199	-0.638	1.115	1033	-25.82	216.27	19.222	0.314	0.890
4918	-74.57	511.29	19.199	0.556	0.895	1312	-85.10	247.58	19.223	0.751	0.860
906	3.54	199.63	19.200	0.459	0.926	2963	-50.50	377.12	19.223	0.570	1.121
1896	-57.23	302.88	19.200	0.304	0.935	1635	-14.91	281.06	19.223	0.331	1.025
2011	115.26	311.31	19.200	0.440	1.100	5099	284.06	529.70	19.224	0.431	0.855
6414	-190.17	844.46	19.200	0.455	1.020	286	-16.60	90.13	19.225	0.310	0.920
59	25.22	26.28	19.201	0.548	0.841	6155	36.27	715.33	19.225	0.330	0.978
5516	104.36	581.98	19.202	0.538	0.953	6125	-20.95	704.34	19.225	0.528	0.905
955	40.61	206.57	19.202	0.308	0.844	6323	-55.90	793.09	19.226	0.951	0.795
702	46.82	170.15	19.202	0.527	0.954	1219	81.17	239.16	19.226	0.434	0.942
2531	-100.43	349.98	19.202	0.903	1.337	6059	266.26	685.77	19.227	0.917	1.850
5667	87.43	604.85	19.203	0.061	0.730	216	130.32	72.85	19.227	0.401	0.938
2600	174.03	354.89	19.205	0.587	0.933	1048	-192.14	218.01	19.227	0.487	0.890
322	-34.53	98.41	19.205	0.575	0.897	1904	127.91	303.54	19.227	0.050	0.980
3274	-39.14	394.35	19.206	0.267	1.244	1121	-144.45	227.36	19.227	0.124	1.100
2048	-207.89	314.16	19.207	0.305	0.953	2280	150.42	332.26	19.227	0.465	0.933
3712	-62.24	421.57	19.207	0.222	1.227	3466	181.83	406.19	19.227	0.235	0.983
3013	202.18	379.85	19.207	0.407	1.041	6190	13.60	728.02	19.228	0.457	0.990
3060	172.04	383.14	19.209	0.364	1.028	497	296.30	137.99	19.228	0.384	0.988
5443	33.07	570.80	19.209	0.425	1.056	1256	59.30	242.33	19.228	0.484	0.980
3937	122.70	436.06	19.209	0.524	1.183	2957	-59.94	376.79	19.228	0.689	0.973
1136	-41.77	228.74	19.210	0.841	1.290	5343	-16.12	558.23	19.228	1.131	0.840
1822	-80.27	297.35	19.210	0.457	0.918	1264	-50.00	243.16	19.229	1.252	1.183
4603	-16.29	484.86	19.210	0.645	0.904	3418	118.18	403.04	19.229	0.779	1.020
5968	41.80	665.83	19.211	0.295	0.921	2695	-96.62	360.87	19.229	0.110	0.930
2124	99.19	319.34	19.211	0.454	1.060	3686	103.94	419.52	19.230	0.515	0.927
2707	168.54	361.79	19.211	0.676	0.951	3717	187.69	421.72	19.230	0.417	0.925
1150	55.69	229.46	19.212	0.446	0.925	4608	216.64	485.25	19.230	0.551	0.975
2025	-78.10	312.60	19.212	0.741	0.975	3694	108.11	419.91	19.231	0.402	1.123
4320	-202.57	462.70	19.213	0.436	0.986	6422	-25.32	849.48	19.231	0.369	0.943
1143	40.59	229.21	19.213	0.460	1.040	2732	-101.75	363.01	19.232	0.724	1.322
1837	-77.69	298.74	19.214	0.313	0.945	3661	102.15	417.52	19.232	0.438	1.145
4443	39.10	471.70	19.215	0.402	1.072	880	-143.33	196.77	19.232	0.416	0.940
4943	-68.10	513.62	19.215	0.683	0.945	660	192.72	162.89	19.233	0.447	0.855
4548	226.36	481.15	19.215	-0.382	0.893	2563	-98.29	352.20	19.233	0.995	1.187
2168	-164.19	323.64	19.215	0.288	0.823	4075	197.39	445.06	19.233	0.510	0.870
2017	-83.15	312.00	19.216	-0.038	1.020	856	163.31	193.82	19.233	0.441	1.015
4203	-57.92	453.52	19.216	0.119	1.023	2104	-139.34	317.46	19.234	0.982	0.820
53	-51.25	23.23	19.216	0.303	0.945	4505	-156.59	476.30	19.235	0.319	0.933
2542	152.70	350.55	19.216	0.400	0.960	1897	17.58	303.01	19.235	0.512	1.186
4895	184.61	508.90	19.216	0.656	1.132	4959	-43.90	515.72	19.235	0.613	0.918
2020	-64.82	312.36	19.216	0.388	0.938	6017	-123.05	678.07	19.236	0.461	0.793
5610	-118.74	595.58	19.216	0.236	0.898	6302	-173.52	779.89	19.236	0.703	0.960
1934	281.57	306.38	19.217	0.489	0.975	520	209.15	141.66	19.236	0.521	1.015
5349	109.34	558.75	19.217	0.866	0.948	14	-86.23	7.12	19.236	0.469	0.900
6141	-195.81	710.39	19.218	0.390	0.873	4539	220.62	480.43	19.236	0.343	0.990
1059	93.23	220.02	19.218	0.615	0.847	4730	240.27	494.41	19.237	0.930	0.892
1596	59.84	277.42	19.218	0.376	1.200	4598	51.88	484.47	19.238	0.542	1.018
4150	35.12	450.02	19.218	0.476	1.136	1099	-219.43	224.77	19.238	0.838	0.915
6407	70.23	839.10	19.219	1.428	1.010	894	109.41	198.38	19.238	0.377	0.973
1090	191.55	224.12	19.219	0.323	1.003	2737	-98.63	363.33	19.239	0.789	1.105
3538	163.43	410.39	19.219	0.413	0.995	436	-27.85	124.72	19.240	0.508	0.838
4164	-99.36	451.19	19.219	0.412	0.949	4739	117.13	494.84	19.240	0.354	0.876
2523	108.09	349.01	19.219	0.623	1.140	4114	-151.25	447.66	19.241	0.405	0.923
3215	276.91	391.13	19.219	0.814	1.122	1327	235.30	249.67	19.241	0.235	1.005
2376	-119.89	338.65	19.220	0.780	0.935	1985	8.53	309.81	19.241	0.550	1.433
4262	251.06	458.30	19.220	0.349	0.904	5297	207.60	552.49	19.241	0.735	0.820
4038	-127.31	442.70	19.220	0.411	0.983	4915	90.42	510.96	19.242	0.220	1.043

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
834	-3.99	189.89	19.242	0.454	0.870	1208	9.28	238.12	19.269	0.287	0.961
1848	277.97	299.28	19.242	0.411	0.968	4613	-97.82	485.44	19.269	0.424	1.006
1830	115.52	298.04	19.243	0.637	0.970	5538	22.67	585.13	19.270	0.612	0.949
4620	138.79	485.77	19.243	0.692	0.887	3923	-98.74	435.05	19.271	0.831	1.235
3684	-3.65	419.44	19.244	0.701	1.543	1260	-55.97	242.77	19.272	0.843	0.963
1023	45.94	214.97	19.245	0.355	1.026	1908	-127.00	303.87	19.273	0.352	0.958
4161	-29.95	450.87	19.245	0.498	0.954	4971	11.12	516.58	19.275	0.303	1.014
1189	17.84	235.57	19.246	0.306	0.938	5147	-1.90	534.53	19.276	1.545	1.167
2317	93.72	334.74	19.246	0.550	1.325	2800	-55.70	367.20	19.276	0.506	1.086
4435	-27.99	471.10	19.248	0.432	0.946	4008	253.86	440.82	19.276	0.249	1.001
4211	-85.28	454.09	19.249	0.642	1.050	2476	-47.94	346.35	19.277	0.629	1.230
4784	65.74	499.01	19.250	0.645	0.978	1192	43.39	235.91	19.277	0.321	0.866
3032	-25.42	381.13	19.250	0.655	1.540	5357	97.09	560.06	19.277	0.496	0.877
1387	98.46	256.30	19.250	0.446	1.003	4183	148.19	451.88	19.279	0.223	1.096
4929	87.54	512.16	19.250	0.674	1.028	1834	-75.00	298.54	19.279	1.010	0.905
1578	250.29	276.11	19.251	0.321	0.915	267	54.40	85.99	19.279	0.412	0.889
3024	235.89	380.42	19.251	1.518	1.040	5253	2.82	546.51	19.280	0.449	0.897
2300	-89.87	333.49	19.252	0.785	0.885	3213	-182.05	391.09	19.282	0.361	0.805
1545	197.71	273.16	19.253	1.168	0.853	6081	169.12	691.52	19.282	0.363	0.957
1171	117.49	233.71	19.253	0.510	0.870	3782	-137.78	425.70	19.282	0.544	0.840
5597	40.30	594.35	19.254	0.434	0.967	1742	103.11	290.16	19.282	0.257	0.903
1013	18.30	213.68	19.254	0.401	0.900	6146	44.96	711.45	19.283	0.444	0.901
4407	105.19	469.20	19.254	0.169	1.009	5906	132.84	649.37	19.283	0.574	1.105
2788	-83.45	366.46	19.255	1.015	1.474	1018	22.44	214.28	19.283	0.693	0.894
4061	97.55	444.14	19.255	0.774	1.063	2747	131.53	363.94	19.283	0.545	1.176
5221	37.07	544.01	19.255	0.377	0.977	2621	128.80	356.58	19.283	0.446	1.232
463	-46.56	131.04	19.255	0.851	1.000	3720	-43.72	421.82	19.285	0.915	1.350
3487	-105.23	407.22	19.256	0.395	1.219	674	-193.85	164.72	19.285	0.345	0.885
675	-106.76	164.86	19.256	0.569	0.808	2332	-204.02	336.13	19.286	0.482	0.950
6314	102.39	784.72	19.256	0.841	0.903	4308	216.92	461.77	19.287	0.232	0.881
1536	165.76	271.91	19.257	0.353	0.988	5001	-41.44	520.46	19.287	0.818	0.917
5286	-210.79	550.49	19.257	0.372	0.928	1772	135.89	293.34	19.288	0.589	0.917
1462	101.89	264.35	19.257	-0.270	1.107	4365	-105.11	466.51	19.288	0.482	0.935
1574	124.74	275.95	19.257	0.522	0.960	4824	-106.49	502.80	19.288	0.483	0.890
3568	153.06	412.50	19.258	0.427	0.989	4789	-20.57	499.67	19.289	0.597	0.990
3355	-68.78	399.33	19.258	0.266	0.983	940	-3.03	204.62	19.289	0.643	0.943
523	-181.81	142.21	19.258	1.424	0.933	4949	97.42	514.41	19.289	0.880	0.978
4141	239.36	449.40	19.258	0.454	1.021	4684	125.72	490.74	19.289	0.367	1.084
4773	23.79	497.71	19.258	0.358	1.003	1645	66.75	281.60	19.290	0.133	1.087
3214	174.06	391.12	19.259	0.584	0.939	1160	221.44	231.72	19.290	0.281	0.865
5061	141.58	525.65	19.259	0.546	0.867	5427	-59.02	568.61	19.290	0.555	0.848
2038	-55.17	313.60	19.259	0.167	0.900	672	70.14	164.33	19.290	0.388	0.952
4860	-119.24	505.70	19.259	0.381	0.965	4346	-62.07	464.99	19.290	0.481	0.946
3872	214.19	431.38	19.260	0.253	0.921	4343	2.00	464.95	19.291	0.634	1.069
2056	22.56	314.50	19.261	0.858	1.915	425	-235.62	121.42	19.292	0.473	0.923
803	103.43	199.20	19.261	0.751	0.897	787	20.74	183.10	19.292	0.634	0.976
5044	-18.49	523.78	19.261	0.407	0.900	1162	-100.16	231.83	19.293	0.438	0.953
3328	-66.24	397.16	19.262	0.442	0.999	6038	28.41	682.71	19.293	2.864	1.305
509	178.84	140.90	19.262	0.519	0.873	4991	-59.54	518.72	19.293	0.210	0.788
5898	155.75	647.48	19.263	0.257	1.038	1593	42.43	277.11	19.293	0.493	0.980
3331	-30.10	397.26	19.263	0.635	1.590	3674	98.91	418.65	19.293	0.234	1.402
4283	-76.11	460.01	19.264	0.161	0.986	3327	-8.34	397.15	19.294	0.930	1.760
2591	183.79	354.09	19.264	0.464	1.076	6064	-208.77	687.92	19.294	0.655	0.952
5401	-144.01	565.09	19.264	0.546	0.790	4614	-24.85	485.48	19.295	0.401	0.911
4427	-29.84	470.62	19.265	0.315	0.865	4558	156.87	481.36	19.296	0.533	0.997
3186	187.29	389.72	19.265	0.226	0.901	3613	207.61	414.89	19.296	-0.095	1.085
5834	218.14	634.78	19.266	0.466	1.053	2825	-128.66	368.50	19.297	0.596	0.899
5643	35.21	600.91	19.266	0.377	0.941	4341	133.11	464.85	19.297	0.397	1.016
336	-198.68	101.83	19.268	0.673	1.040	4732	-5.47	494.60	19.297	0.485	1.060
722	82.36	173.35	19.268	0.156	0.835	1621	110.49	279.39	19.298	0.277	0.935

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
6255	66.78	756.93	19.298	0.367	0.964	4409	-85.00	469.31	19.326	0.935	0.916
2180	239.46	324.75	19.298	0.407	0.952	2356	253.99	337.64	19.328	0.371	0.978
1697	-61.22	286.20	19.299	0.486	0.983	4222	248.21	455.64	19.328	0.288	0.983
3626	117.95	415.41	19.299	0.738	1.061	5662	24.25	603.89	19.328	0.276	0.910
5442	167.66	570.68	19.299	0.074	1.030	2900	-69.22	373.07	19.329	0.623	1.071
5272	106.47	548.63	19.300	0.541	0.888	3623	-58.24	415.35	19.330	0.881	1.035
6215	-52.37	739.62	19.301	0.486	0.937	4299	-120.81	461.37	19.330	0.506	0.877
1776	87.54	294.00	19.302	0.414	0.910	6276	130.24	767.48	19.330	1.902	0.873
3533	-49.41	410.07	19.302	0.402	1.847	2284	147.41	332.49	19.331	-0.128	1.000
1289	40.07	245.82	19.302	0.496	0.976	911	96.23	200.37	19.332	0.672	0.877
1323	-140.45	249.17	19.302	0.333	0.923	6066	49.55	668.20	19.333	0.528	0.919
1311	158.09	247.55	19.303	0.423	0.913	3235	291.74	392.12	19.333	0.367	0.913
587	299.41	152.19	19.303	0.368	1.008	209	-58.28	71.27	19.333	0.656	0.880
1759	-89.40	292.24	19.304	0.718	0.985	1540	196.45	272.76	19.333	0.079	1.020
2007	68.92	311.05	19.304	0.699	1.213	5547	86.80	586.53	19.334	0.367	0.955
5434	5.61	569.65	19.304	0.363	0.920	3557	-231.24	411.88	19.334	0.380	0.889
3667	-134.10	417.77	19.304	0.506	0.984	5369	87.83	560.93	19.334	0.802	0.930
2440	170.98	343.75	19.304	-0.930	1.010	3585	-160.59	413.04	19.334	0.433	0.900
4599	-57.90	484.68	19.305	0.270	0.920	1490	-98.98	267.95	19.335	0.269	1.010
5700	61.04	608.86	19.306	0.376	0.916	4847	-7.84	505.04	19.336	0.728	1.035
2047	-3.16	314.12	19.306	1.059	0.973	4254	-186.57	457.24	19.336	0.387	0.875
6218	-53.33	740.21	19.307	1.044	1.025	1080	-98.98	223.14	19.336	0.496	0.883
5619	-192.85	597.06	19.307	0.639	0.808	1600	31.98	277.86	19.337	0.830	0.979
593	221.87	153.07	19.309	0.402	0.870	1764	116.80	292.58	19.338	0.347	0.948
5545	-193.74	586.23	19.309	0.266	1.088	3081	-209.94	384.22	19.338	0.322	0.908
2202	163.13	326.42	19.310	0.298	0.955	2417	274.46	341.88	19.338	0.328	0.860
858	-4.70	194.29	19.311	0.858	0.960	2045	250.89	314.05	19.340	0.603	0.855
5511	152.19	581.27	19.311	0.702	0.970	5881	-53.35	645.15	19.340	0.418	1.005
4905	132.90	510.20	19.311	0.486	1.093	1004	-90.02	212.77	19.341	0.618	0.918
5938	147.84	657.11	19.311	0.075	0.843	2098	192.54	317.08	19.341	0.661	0.857
4562	-182.68	481.79	19.312	0.317	0.877	6007	-172.47	675.11	19.341	0.871	0.988
1378	120.46	255.47	19.313	0.694	0.863	6265	185.82	762.03	19.342	1.165	0.620
3152	-133.35	387.64	19.313	0.603	0.941	281	47.64	89.01	19.342	0.502	0.866
4996	33.25	519.59	19.313	0.572	0.913	688	154.90	166.19	19.343	0.680	0.798
2860	141.78	370.38	19.313	0.562	1.015	1632	137.75	280.79	19.344	0.625	0.945
2790	114.58	366.57	19.313	0.482	1.301	4111	176.11	447.38	19.345	0.394	0.951
205	169.26	70.95	19.313	0.541	0.933	1489	38.07	267.82	19.345	1.046	0.910
4411	-66.45	469.35	19.315	0.531	0.999	1215	-56.88	239.07	19.345	0.569	0.980
3768	-39.86	425.00	19.316	0.256	1.170	6237	33.52	750.01	19.346	0.525	0.963
1696	97.37	286.14	19.316	0.371	0.990	500	-154.72	138.90	19.346	0.277	0.837
3580	211.06	412.77	19.316	0.457	1.100	1411	55.42	259.42	19.346	0.363	0.966
297	-238.37	92.73	19.317	1.575	1.010	1213	251.64	238.81	19.346	0.523	1.010
953	-235.44	206.06	19.317	0.587	0.973	985	-97.19	210.90	19.346	0.341	0.958
5007	94.05	521.07	19.318	0.451	0.980	1379	-167.05	255.53	19.347	0.555	0.845
1519	-57.39	270.28	19.318	0.876	1.013	3503	198.93	407.85	19.347	0.462	0.934
1325	69.30	249.59	19.318	0.224	1.003	256	258.93	82.17	19.347	1.294	1.340
6178	219.05	722.00	19.318	0.543	0.828	1797	60.49	295.69	19.348	0.684	1.288
1508	49.18	269.25	19.319	0.733	1.205	5298	162.53	552.65	19.348	0.648	0.930
5609	74.00	595.56	19.320	0.897	0.830	4419	25.68	469.94	19.349	0.442	1.146
5505	-206.39	580.05	19.320	0.413	0.953	1488	242.30	267.82	19.349	0.487	0.905
47	79.28	20.37	19.320	0.413	0.745	5843	57.33	636.13	19.350	0.726	0.986
4142	203.19	449.49	19.321	0.609	0.884	5	-206.88	-1.33	19.350	0.854	0.937
3049	164.56	382.44	19.323	0.176	0.918	1533	30.28	271.62	19.350	0.137	1.098
4746	85.46	495.27	19.323	0.523	0.970	171	233.39	61.67	19.350	0.409	0.958
3553	165.50	411.32	19.323	0.306	0.942	947	-107.20	205.40	19.351	0.359	0.923
3463	-37.40	406.10	19.323	0.297	1.456	243	-183.95	79.59	19.351	0.283	0.923
5985	273.91	670.20	19.324	0.651	0.913	4447	153.23	471.88	19.351	0.635	0.943
5646	115.22	601.47	19.325	0.169	0.850	5186	-12.20	539.14	19.352	0.493	0.965
4862	182.43	505.90	19.325	0.598	0.942	1841	87.75	296.99	19.353	0.383	0.927
5415	-16.13	566.60	19.326	0.774	0.880	5244	-175.29	545.81	19.353	0.324	1.013

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
6296	-161.25	777.13	19.353	0.609	1.015	121	13.81	47.85	19.379	0.713	0.846
2544	143.75	350.65	19.354	0.770	1.258	5392	152.83	563.89	19.380	0.506	0.950
5961	151.69	664.86	19.355	0.319	0.890	1337	-56.93	251.44	19.380	0.512	1.003
2425	186.67	342.40	19.355	0.592	0.895	1662	256.87	283.47	19.381	0.917	1.130
5697	87.22	608.35	19.355	0.702	0.830	97	58.19	42.32	19.381	0.415	0.978
1419	117.10	260.58	19.356	0.468	1.018	4527	-10.75	478.87	19.382	0.581	1.080
4127	-95.15	448.61	19.356	1.107	1.041	635	-120.04	158.68	19.382	0.641	0.858
4734	-66.29	494.68	19.356	0.716	0.880	189	207.01	65.60	19.383	0.580	0.853
1877	-215.77	301.13	19.357	0.152	0.793	3005	133.09	379.38	19.383	0.543	1.039
1040	44.82	216.94	19.358	-0.418	1.110	380	-38.33	112.35	19.384	0.889	0.930
1646	-90.48	281.74	19.358	0.670	0.913	5238	-22.75	545.46	19.384	1.419	0.940
6204	-124.42	734.43	19.358	0.383	0.948	9	-157.11	2.27	19.384	0.529	0.853
958	237.96	206.92	19.358	0.513	0.830	1010	148.60	213.46	19.384	0.428	0.957
1340	186.93	251.66	19.358	0.431	0.875	5096	192.18	529.34	19.385	0.448	1.055
6261	131.40	760.21	19.358	0.528	0.970	5687	-30.12	606.88	19.385	0.565	0.843
792	72.45	183.78	19.360	0.472	0.943	6249	280.13	753.73	19.385	0.275	0.895
868	209.12	195.56	19.360	0.226	0.915	6195	221.68	730.62	19.386	0.980	0.923
1000	49.60	212.37	19.360	0.479	0.960	5790	91.65	627.79	19.386	0.901	0.828
3974	-118.27	438.80	19.360	0.617	0.961	3915	160.48	434.59	19.386	0.746	0.986
5085	41.50	528.71	19.362	0.808	1.072	1544	110.80	251.69	19.386	1.001	0.973
5970	116.28	666.56	19.362	0.402	0.980	4454	-97.86	472.33	19.386	0.515	1.031
5871	176.72	643.15	19.363	0.679	0.855	1140	16.77	229.09	19.387	0.396	1.073
4245	-56.19	456.91	19.363	0.405	0.975	2598	152.17	354.74	19.387	0.451	0.963
3718	-145.38	421.76	19.363	0.645	0.995	1452	-25.73	263.90	19.388	0.489	1.090
1464	-59.75	264.94	19.363	0.675	0.860	2008	-193.39	311.06	19.388	0.458	0.850
6285	185.25	771.07	19.364	0.279	0.883	6254	9.39	756.62	19.389	0.452	1.034
2354	128.58	337.38	19.365	0.276	0.978	5167	-129.08	536.99	19.389	0.353	0.990
487	-9.81	135.03	19.365	1.433	0.945	1643	-33.61	281.51	19.390	0.182	1.025
3095	-49.96	385.11	19.365	0.455	1.123	4554	168.86	481.30	19.390	1.152	0.904
2552	96.27	351.49	19.366	-0.191	1.188	3881	-74.74	432.01	19.390	0.419	1.171
1802	85.08	296.29	19.367	0.614	0.917	4946	258.12	514.20	19.391	0.877	0.860
225	48.00	75.69	19.368	0.374	0.914	595	-38.49	153.19	19.392	0.625	1.015
5016	12.93	521.50	19.368	0.378	1.014	2063	136.75	314.94	19.392	0.093	1.020
5560	-110.04	588.02	19.369	0.434	1.082	4552	106.01	481.28	19.392	0.427	0.964
4890	-157.11	508.12	19.369	0.035	1.290	5709	27.37	611.43	19.392	0.233	1.255
4158	8.65	450.73	19.369	0.366	1.203	2627	-158.55	356.85	19.393	0.677	0.832
4935	281.66	512.50	19.369	0.440	0.907	1733	88.65	289.00	19.394	0.857	0.957
4581	-152.79	483.03	19.369	0.354	1.020	4400	-26.63	468.77	19.394	0.183	0.914
1339	279.17	251.58	19.369	0.287	0.933	1968	-81.06	308.65	19.394	0.436	0.935
6239	-17.77	751.10	19.370	0.778	0.798	1800	217.34	296.02	19.394	1.285	1.150
2822	289.68	368.28	19.370	0.523	0.917	2122	-42.04	319.21	19.396	1.054	0.945
3964	107.79	437.70	19.370	0.615	0.971	1843	39.91	299.05	19.396	0.107	0.965
5071	92.85	526.95	19.371	0.420	0.913	3071	-91.01	383.84	19.396	0.603	1.101
3251	-109.54	393.04	19.372	0.655	1.035	2067	129.47	315.13	19.396	-0.076	1.050
5841	-238.45	635.52	19.372	0.319	1.083	2878	-148.03	371.59	19.396	0.539	0.973
262	252.55	84.13	19.372	0.803	1.530	3666	-101.22	417.76	19.397	0.690	0.945
4352	-31.89	465.65	19.372	1.816	0.960	5087	-105.46	528.85	19.397	0.343	0.928
2308	102.47	333.91	19.373	0.579	1.043	5265	36.11	548.22	19.398	0.265	0.988
3478	300.12	406.64	19.374	0.397	1.017	6034	-209.20	682.44	19.398	0.721	0.910
17	52.46	8.98	19.375	0.555	0.981	301	-4.26	93.71	19.398	0.990	0.933
1343	-155.94	251.68	19.375	0.460	0.933	6151	159.87	714.07	19.399	0.799	1.038
4853	96.70	505.19	19.375	0.432	1.010	4962	-54.97	517.97	19.399	1.107	0.920
4706	-81.94	510.36	19.377	0.457	0.838	5318	-209.64	554.62	19.399	0.410	0.795
3321	309.93	396.84	19.377	0.461	0.890	384	-123.37	113.29	19.399	0.287	0.893
2641	185.66	357.42	19.377	0.537	1.226	3377	168.15	400.67	19.400	0.454	1.011
5791	40.50	627.86	19.377	0.537	0.997	6426	-193.93	850.91	19.400	0.504	1.088
5997	261.57	673.42	19.378	0.547	0.865	3604	187.14	414.36	19.400	0.344	0.955
5578	-44.91	590.45	19.379	0.441	0.930	1964	191.49	308.49	19.400	0.566	0.983
3170	169.71	388.94	19.379	0.505	0.973	5125	230.72	531.89	19.401	0.761	0.993
2172	149.27	323.91	19.379	0.669	0.865	6224	54.75	743.03	19.401	0.261	0.907

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
4252	-217.63	457.20	19.401	0.612	0.896	2853	258.55	369.94	19.425	0.407	0.828
1936	214.54	306.55	19.401	0.803	0.957	6126	87.98	704.77	19.425	0.298	0.448
1718	91.94	288.08	19.402	0.823	0.955	2213	117.53	327.09	19.425	0.499	1.063
2470	122.19	345.60	19.402	0.396	1.307	4677	230.14	490.33	19.426	0.465	0.963
5270	-44.30	548.55	19.402	1.306	0.853	4394	147.90	468.22	19.426	0.526	0.992
4019	-61.41	441.53	19.402	0.248	0.954	273	-18.27	86.84	19.426	0.503	0.945
1958	-153.54	308.26	19.402	1.049	0.843	494	121.37	137.10	19.427	0.235	0.883
5631	303.01	598.71	19.402	0.513	0.855	4488	-13.21	474.49	19.427	0.145	0.928
5692	-184.18	608.08	19.403	0.273	0.843	5633	67.66	608.10	19.428	0.481	1.051
1649	-223.07	282.00	19.405	0.261	1.000	4223	-72.75	455.65	19.428	0.323	0.973
642	-79.28	159.77	19.405	0.481	0.995	1831	148.31	298.06	19.428	0.608	1.067
2092	288.17	316.62	19.405	0.629	0.963	1894	261.85	302.40	19.429	0.756	0.950
5794	-88.99	426.39	19.405	0.550	1.086	4408	-2.63	469.29	19.429	0.406	0.981
5592	158.84	592.97	19.406	0.843	0.938	1103	49.87	225.12	19.429	0.600	0.825
4253	157.67	457.22	19.406	0.612	1.139	452	-3.52	128.85	19.430	0.492	1.005
4612	73.11	485.42	19.406	0.532	0.936	522	-75.43	142.05	19.430	0.642	0.953
3171	-95.93	389.01	19.406	0.715	1.040	208	58.62	71.18	19.430	0.513	0.938
4424	-147.62	470.40	19.407	0.675	0.963	613	60.18	155.08	19.430	0.401	0.959
5628	81.65	598.31	19.407	0.438	0.883	1981	22.29	309.50	19.431	0.833	1.440
261	263.61	84.09	19.408	0.634	1.168	5896	38.54	646.98	19.432	0.419	0.830
4093	250.58	446.29	19.409	0.597	0.921	4272	114.64	459.03	19.432	0.505	0.953
6325	-57.32	794.05	19.409	0.223	0.890	6348	-189.24	805.84	19.432	0.415	1.067
1197	-16.39	236.73	19.410	0.548	1.000	4576	-12.86	482.68	19.432	0.236	0.930
132	182.11	50.82	19.410	0.820	0.955	77	-97.17	35.69	19.434	0.276	0.913
4628	-162.03	486.78	19.410	0.293	0.919	361	-212.31	108.43	19.434	0.431	0.735
4967	92.90	516.29	19.410	1.160	1.023	1253	-39.53	242.02	19.434	1.204	1.197
3457	115.64	405.71	19.410	0.739	1.183	2156	223.58	322.51	19.434	0.443	0.913
3324	-47.25	396.93	19.411	-1.425	1.120	1876	-27.48	301.08	19.435	0.136	0.968
616	-65.55	155.67	19.411	0.638	0.923	4251	92.07	457.19	19.435	1.030	0.954
929	-220.50	203.12	19.411	0.357	0.915	4275	94.84	459.26	19.435	0.367	1.056
27	-176.52	12.83	19.411	0.480	0.973	1737	240.62	289.69	19.435	0.999	1.268
6377	202.15	823.30	19.412	0.525	0.943	668	2.59	163.68	19.435	0.786	0.908
5211	141.84	542.63	19.412	0.545	1.033	5324	-157.71	555.44	19.436	0.323	0.827
5734	-77.54	615.76	19.413	0.621	0.938	1993	-123.38	310.38	19.436	1.008	0.793
6096	81.77	695.03	19.413	0.251	0.910	3816	177.26	427.74	19.436	0.776	0.873
1071	96.01	221.47	19.413	0.497	0.808	2778	-18.82	365.98	19.436	1.036	1.560
5845	225.52	636.70	19.414	0.360	0.725	5962	141.52	665.27	19.436	0.402	0.995
6253	85.34	755.41	19.414	0.673	0.870	5777	86.10	625.51	19.437	1.426	0.987
4235	80.10	456.43	19.414	0.532	1.011	4922	66.86	511.43	19.439	0.409	1.028
1962	243.65	308.37	19.415	0.832	0.858	6044	-168.60	683.93	19.440	0.514	0.960
2022	224.30	312.46	19.416	0.456	0.953	1397	17.23	257.24	19.441	0.238	0.935
1530	-49.41	271.22	19.416	-0.299	1.023	4303	-133.03	461.52	19.441	0.186	0.986
4828	147.46	503.26	19.417	0.221	1.163	3179	-147.51	389.51	19.441	0.450	0.925
1179	-32.40	234.69	19.418	0.315	0.990	6423	207.41	849.52	19.441	0.451	0.795
5228	135.52	544.38	19.418	0.586	0.930	560	-146.55	147.86	19.442	0.558	0.930
2608	133.83	355.45	19.418	0.474	1.288	1790	-1.57	294.84	19.442	0.142	1.163
3305	-64.06	396.15	19.419	0.589	0.964	147	-35.09	54.89	19.442	0.648	0.920
4322	-80.40	462.91	19.419	0.559	0.851	3922	112.89	434.98	19.444	0.652	1.159
971	-39.28	208.29	19.420	0.507	0.958	6051	213.27	685.16	19.444	1.063	0.933
5649	14.82	602.27	19.420	0.406	0.897	4270	81.21	458.96	19.444	0.325	1.039
4555	-41.40	481.31	19.420	0.589	1.126	5351	-95.52	558.95	19.444	0.437	0.898
1265	63.85	243.20	19.421	0.502	1.043	4551	85.52	481.25	19.445	0.985	0.980
5192	63.33	540.03	19.421	0.455	0.860	2754	-89.05	364.26	19.445	0.684	0.983
5842	38.89	600.88	19.422	0.327	0.968	3137	273.33	387.02	19.445	0.686	1.016
4453	227.11	472.17	19.422	0.913	0.920	1348	200.39	252.14	19.445	0.675	0.867
5929	284.92	653.58	19.422	0.518	0.887	530	-5.26	143.06	19.446	0.131	0.985
4575	-6.23	482.65	19.423	-0.434	1.068	5068	-28.21	526.24	19.447	0.593	0.963
4806	-13.95	501.21	19.423	0.591	0.895	5383	-181.30	562.75	19.447	0.572	0.795
2966	-92.14	377.28	19.424	0.687	0.959	4910	-15.12	510.65	19.447	0.724	0.118
1424	161.54	261.07	19.425	1.077	0.888	5157	248.07	536.09	19.447	0.472	0.985

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
1305	-27.42	247.46	19.448	0.338	0.968	2262	206.36	330.86	19.472	0.310	0.913
5827	-10.97	633.35	19.449	0.540	0.925	1081	200.56	223.28	19.473	0.532	0.940
4486	62.89	474.43	19.449	0.618	1.247	5701	-28.44	609.28	19.473	1.039	0.910
5122	-156.76	531.70	19.449	0.458	0.835	4339	4.38	464.84	19.474	0.068	0.875
427	-11.35	121.63	19.450	0.881	0.850	2416	-110.64	341.85	19.474	0.926	0.912
5591	45.25	592.88	19.451	0.886	0.898	5698	96.24	608.40	19.475	0.530	1.013
5558	138.10	587.66	19.451	0.880	0.853	2073	121.15	315.45	19.475	0.651	0.930
3100	170.19	385.39	19.451	0.953	1.092	2964	-128.10	377.20	19.475	0.538	1.022
4771	-42.29	497.49	19.451	0.417	1.058	5239	116.46	545.50	19.477	0.429	0.933
5622	140.57	597.49	19.452	0.479	0.815	852	16.35	192.95	19.477	0.431	0.983
4525	-234.25	478.68	19.452	0.337	0.824	1125	-22.17	227.68	19.477	0.390	0.960
4360	147.55	466.24	19.452	0.270	0.800	4588	-75.57	483.70	19.477	0.346	0.880
3949	-36.69	436.94	19.453	0.343	1.029	2695	-74.95	379.00	19.478	0.550	1.017
977	-145.25	209.39	19.453	0.443	0.845	4609	99.20	485.27	19.478	0.328	0.981
3148	221.21	387.38	19.454	0.705	0.854	3696	-155.22	419.99	19.478	0.575	0.921
1131	-232.37	228.20	19.454	0.397	0.873	6421	235.06	849.08	19.478	0.684	0.960
5161	69.01	536.37	19.454	0.456	0.910	2127	-196.38	319.47	19.479	0.267	0.868
5035	-68.63	523.00	19.455	0.167	0.805	2637	-88.05	357.33	19.479	0.369	1.214
1228	72.39	250.14	19.455	0.341	0.858	1672	216.81	284.67	19.479	0.512	0.988
954	131.07	206.22	19.455	0.233	0.850	5696	37.36	608.35	19.479	0.368	1.003
5673	-1.17	605.63	19.455	0.218	0.873	5172	-56.00	537.49	19.480	0.809	0.975
6257	47.61	757.97	19.456	0.606	0.828	2097	151.40	317.03	19.481	0.224	0.985
2489	83.85	347.11	19.456	0.334	1.433	5924	-161.14	651.66	19.481	0.766	0.955
1639	-25.31	281.23	19.457	0.477	0.880	988	213.47	217.14	19.481	0.350	0.908
4213	222.07	454.15	19.457	0.245	1.003	2328	-59.02	335.79	19.482	0.614	1.158
4869	-51.98	506.69	19.457	1.198	0.840	1852	83.92	299.41	19.483	0.347	1.020
1267	-7.19	243.35	19.458	1.358	0.950	2302	-128.18	333.66	19.483	0.701	0.790
5676	-37.27	606.04	19.458	1.216	0.935	2400	220.76	340.48	19.483	0.325	1.138
5365	249.63	560.65	19.459	0.672	0.803	5976	32.18	667.51	19.483	0.520	0.906
1332	-73.26	251.11	19.460	1.055	0.920	5823	88.63	632.75	19.484	0.526	0.998
6330	304.54	796.77	19.460	0.226	0.943	926	46.24	202.36	19.484	-0.190	1.071
1773	91.53	293.38	19.460	0.526	0.913	2421	161.27	342.02	19.485	0.920	1.145
1292	31.25	246.23	19.461	0.514	0.956	3900	-196.60	433.51	19.485	0.651	0.835
314	112.92	96.77	19.461	0.449	0.810	3496	-55.97	407.48	19.485	0.676	0.961
525	58.85	167.50	19.461	0.748	0.939	5376	-210.48	561.76	19.486	0.092	0.725
5602	-6.34	594.83	19.462	1.145	0.897	5848	-1.05	636.95	19.487	0.885	0.920
813	-9.50	187.02	19.462	0.238	0.892	6073	-2.86	689.39	19.487	0.896	0.930
6049	187.91	684.77	19.463	0.316	0.910	2006	235.47	310.95	19.488	0.412	0.953
1206	232.43	237.89	19.463	0.541	0.935	4672	42.52	490.08	19.488	1.767	1.535
1203	-90.67	337.42	19.463	0.344	0.968	3619	168.70	415.06	19.489	0.627	0.997
4460	132.87	472.62	19.464	0.616	0.968	6006	234.42	674.92	19.490	0.528	0.920
4181	24.00	451.86	19.465	0.469	1.341	1575	48.10	275.95	19.490	0.584	1.104
5050	-43.11	524.52	19.467	1.631	0.783	5180	-115.46	538.65	19.490	0.432	0.990
1231	67.43	240.35	19.467	0.584	0.980	1237	-35.27	240.84	19.490	0.165	0.910
2390	-157.85	339.61	19.467	0.378	0.890	6107	157.55	698.78	19.490	0.621	0.903
2208	206.29	326.62	19.468	0.411	0.900	4410	-159.22	469.33	19.491	0.363	0.873
2349	301.84	337.09	19.468	0.341	0.900	3472	211.35	406.39	19.491	0.282	1.085
2696	-142.48	360.88	19.469	0.517	0.893	1388	76.56	256.38	19.491	0.596	0.840
3481	-195.34	407.10	19.469	0.700	0.946	1166	-192.96	232.56	19.491	0.481	0.873
3222	-53.37	391.51	19.469	0.361	1.198	433	55.45	123.63	19.491	0.585	0.906
513	296.55	141.10	19.469	0.509	0.950	4375	33.13	467.10	19.492	0.633	1.198
1667	-132.83	284.28	19.469	1.030	0.895	5179	106.63	538.57	19.492	0.339	0.887
512	-119.05	141.07	19.470	0.591	0.775	4546	285.31	481.02	19.492	0.613	0.861
5552	-2.96	587.02	19.470	0.061	0.790	4829	191.97	503.27	19.493	0.384	0.865
5620	-147.58	597.09	19.471	0.456	0.833	5300	-122.64	552.81	19.493	0.506	0.990
3831	311.65	428.78	19.471	0.463	0.968	4820	-221.93	502.57	19.494	0.620	0.872
1448	84.86	263.01	19.471	0.186	1.058	4630	-14.39	486.93	19.494	0.298	0.937
1299	263.46	246.76	19.471	0.597	0.880	2009	-128.79	311.15	19.494	0.864	0.863
309	-206.94	94.92	19.472	0.660	0.777	830	-168.48	109.28	19.494	0.516	0.930
4876	-77.99	507.11	19.472	0.617	0.840	2540	250.54	350.52	19.494	0.419	1.131

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
3739	155.96	423.09	19.495	0.394	1.007	699	-30.81	168.76	19.517	0.736	0.873
1641	255.93	281.47	19.495	0.632	0.890	4879	197.41	507.16	19.518	1.187	0.803
5705	186.64	610.43	19.496	0.400	0.840	5818	294.84	631.89	19.518	0.582	0.910
6214	131.45	738.06	19.496	0.403	1.057	4318	304.46	462.40	19.519	0.396	1.068
691	-57.39	167.17	19.496	0.565	0.795	4841	-70.28	504.07	19.519	0.619	0.940
1410	66.19	259.17	19.496	0.259	1.102	5555	8.63	587.39	19.520	0.602	0.854
3672	198.25	418.48	19.497	0.667	0.837	5374	84.31	561.61	19.520	1.250	0.930
3470	195.87	406.31	19.497	0.277	0.937	2393	303.25	339.84	19.520	0.571	0.898
1161	139.69	231.82	19.497	0.449	0.892	1438	143.86	261.86	19.521	0.679	1.037
3785	307.25	424.78	19.498	0.665	0.893	584	109.69	151.30	19.521	0.351	0.900
5289	-11.46	551.17	19.498	0.430	0.925	4393	-90.47	468.17	19.521	0.669	1.036
3763	305.07	424.49	19.498	0.397	0.916	1263	229.83	243.15	19.522	0.337	0.913
6069	-133.58	688.69	19.498	0.645	0.813	3019	212.44	380.11	19.522	0.233	1.089
4338	-59.95	464.81	19.498	0.653	0.980	5181	-119.84	538.72	19.522	0.730	1.073
1270	142.01	244.04	19.498	1.165	0.860	1551	-68.67	273.57	19.522	0.909	0.850
6212	-156.14	736.93	19.499	0.345	0.820	2931	190.59	375.55	19.523	0.286	0.914
525	55.72	142.30	19.500	0.288	0.904	1091	-34.73	224.18	19.524	0.115	0.838
85	-50.68	37.63	19.500	0.739	1.007	4791	144.12	499.84	19.524	0.503	1.011
1321	223.09	249.13	19.501	0.481	0.953	48.3	222.98	504.37	19.524	1.138	0.925
5540	-207.03	585.39	19.501	0.442	0.940	1177	201.74	234.25	19.525	0.854	0.970
2238	237.51	329.19	19.501	0.418	0.893	2140	162.24	320.73	19.525	0.326	0.818
2831	190.36	368.88	19.502	0.304	0.841	5503	286.41	579.60	19.526	0.203	0.947
2785	-185.21	366.40	19.502	0.495	0.920	2683	243.31	359.93	19.526	0.611	1.016
1726	154.18	288.64	19.502	0.457	0.803	1673	-87.00	284.72	19.526	0.644	0.855
4695	-27.78	451.76	19.502	0.870	1.218	6435	-88.30	854.43	19.527	0.343	0.953
6129	33.40	706.00	19.503	0.494	0.962	1096	-1.97	224.39	19.527	0.454	0.868
421	-36.59	120.03	19.503	0.402	0.888	1124	165.62	227.67	19.527	0.901	0.973
4413	27.27	469.38	19.504	0.312	1.150	5923	85.59	651.58	19.527	0.390	0.963
6250	202.35	755.10	19.504	0.845	0.973	2029	135.66	312.99	19.528	0.393	0.957
4273	-24.64	459.04	19.504	0.651	0.839	5828	2.74	634.26	19.528	1.680	0.873
2107	183.66	317.77	19.504	0.386	1.043	6143	-15.25	710.76	19.529	0.776	0.822
849	165.69	192.37	19.504	0.017	0.942	142	280.20	53.90	19.529	0.401	0.998
1869	-190.22	300.75	19.504	0.988	0.940	5857	209.08	639.17	19.529	0.424	0.855
1693	104.09	286.02	19.504	0.320	0.963	4872	-133.88	506.78	19.530	1.101	0.915
2652	262.04	358.11	19.505	0.748	0.897	4703	-99.55	492.30	19.530	0.827	1.116
35	207.04	17.00	19.505	0.404	0.777	3839	-65.78	429.00	19.531	0.560	0.952
2031	101.92	313.11	19.505	0.645	1.078	55	224.24	24.10	19.532	0.385	0.748
4342	47.97	464.93	19.505	0.367	1.195	1774	-33.13	293.62	19.532	0.390	0.938
3392	133.65	401.42	19.506	0.509	0.986	1058	63.96	219.92	19.533	0.409	0.924
1402	-101.10	258.10	19.506	0.697	0.902	5521	203.35	582.80	19.533	-0.065	0.787
4549	-121.14	481.16	19.506	0.304	1.178	6295	-12.75	777.12	19.533	0.934	0.873
816	115.72	187.35	19.506	0.240	0.935	5456	145.24	573.37	19.533	1.107	0.760
4650	-45.45	488.15	19.508	0.656	1.001	2643	146.29	357.50	19.534	0.240	1.000
453	295.21	128.95	19.508	0.543	0.985	4174	291.11	451.61	19.535	0.402	0.808
5344	145.74	558.33	19.508	0.666	0.893	1493	6.75	268.09	19.535	0.046	1.007
1625	-85.26	279.67	19.509	0.597	0.908	3843	178.31	429.20	19.535	0.302	0.910
238	254.45	78.20	19.509	0.746	0.943	1675	-205.14	284.78	19.536	1.459	0.898
2224	195.20	328.04	19.509	0.527	0.690	495	-127.92	137.56	19.536	0.184	0.813
5951	32.59	661.73	19.510	0.559	0.909	6127	-120.99	704.94	19.536	0.175	0.850
1816	225.81	297.00	19.512	0.491	0.903	4978	-147.98	517.58	19.536	0.110	0.863
2865	253.18	370.76	19.512	0.459	0.948	4082	-159.18	445.57	19.537	0.676	0.965
1987	199.15	310.04	19.513	0.321	0.858	222	-89.97	74.33	19.537	0.789	0.923
3499	130.93	407.72	19.514	0.505	1.101	1316	-12.37	248.63	19.537	0.904	0.950
4296	-61.88	461.14	19.515	0.971	0.998	5086	80.45	528.75	19.537	0.610	1.030
1459	221.29	264.11	19.515	0.722	1.055	1520	206.29	270.32	19.538	0.380	0.945
3877	-98.29	431.57	19.515	1.298	1.095	1485	-142.31	267.63	19.538	0.303	0.933
5391	-117.36	563.79	19.516	0.262	0.958	6084	-91.52	692.19	19.539	1.147	0.373
5986	-212.53	671.22	19.516	0.882	0.900	6037	155.71	682.62	19.540	0.426	0.867
535	132.11	143.89	19.516	0.709	0.860	503	-172.80	139.87	19.540	0.970	0.950
2926	199.97	375.06	19.517	0.424	1.046	434	-2.55	124.18	19.540	0.404	0.983

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
5301	-198.22	552.86	19.540	0.577	0.787	5241	21.88	545.56	19.561	0.321	0.921
3646	300.43	416.84	19.540	0.570	0.854	6333	53.30	800.38	19.562	0.381	0.882
3144	-76.43	387.24	19.541	0.448	0.957	5208	-9.86	541.71	19.562	0.196	0.965
1778	-150.40	294.05	19.541	0.727	0.930	2128	259.52	319.49	19.562	0.105	1.040
357	-116.69	107.85	19.541	0.521	0.930	6185	276.15	725.44	19.562	-0.123	0.970
4629	175.71	486.87	19.542	0.199	0.866	4780	13.76	498.80	19.563	0.317	0.988
1027	63.75	215.37	19.542	0.344	0.908	5581	-60.22	590.94	19.563	0.739	1.125
6306	47.84	781.58	19.542	0.485	0.949	5760	136.42	621.33	19.564	0.479	0.748
6234	180.31	748.88	19.542	0.368	0.743	2941	-197.29	376.04	19.564	0.694	1.005
1460	200.54	264.13	19.542	0.761	0.798	1341	224.84	251.67	19.564	0.759	0.853
4891	62.09	508.20	19.543	0.617	1.083	1818	121.27	297.07	19.564	0.845	1.000
4717	291.82	493.06	19.543	0.277	0.913	3678	-77.04	418.90	19.564	0.881	0.953
3216	-232.58	391.13	19.543	0.612	0.974	194	286.25	67.71	19.564	0.317	0.870
4215	207.12	454.85	19.543	0.548	1.090	5913	-51.29	650.12	19.565	0.660	0.893
5922	121.84	651.36	19.543	0.618	1.077	3917	281.89	434.72	19.565	0.632	0.979
1217	-75.45	239.12	19.543	0.219	0.853	359	216.59	108.19	19.565	0.308	0.760
1456	25.75	264.01	19.544	0.510	0.995	5650	113.08	602.46	19.565	0.699	0.857
5114	-189.35	530.97	19.544	0.235	0.938	766	66.72	179.35	19.565	0.321	0.913
4689	105.52	491.19	19.545	0.616	1.027	4432	168.88	470.87	19.566	0.383	0.972
5018	-209.70	521.62	19.546	0.604	0.900	4325	-225.21	463.34	19.566	0.367	0.949
2521	-144.75	348.60	19.546	0.191	0.930	4026	-19.17	442.11	19.566	0.774	1.035
1319	-161.70	249.00	19.546	0.012	0.880	5024	15.78	522.22	19.566	0.449	1.039
598	-80.80	153.33	19.546	0.775	0.965	5756	-55.96	620.64	19.567	0.834	0.785
1110	80.23	226.16	19.546	0.481	0.805	1066	-32.81	220.72	19.567	0.690	0.850
4985	28.57	518.18	19.548	1.552	1.015	4501	180.88	475.97	19.567	0.730	0.900
915	-39.19	201.32	19.549	0.308	0.883	814	130.35	187.07	19.568	0.266	0.842
5159	-17.46	536.28	19.550	1.705	0.882	1322	-63.65	249.16	19.568	0.287	0.890
3888	128.94	432.40	19.550	0.496	1.006	5594	-7.83	593.92	19.568	0.675	0.945
5855	9.74	638.94	19.550	1.092	1.060	4863	-14.19	505.94	19.568	0.595	0.826
1836	104.62	298.73	19.550	-0.051	1.207	1613	-213.37	278.77	19.568	1.239	0.983
5905	216.28	649.30	19.551	0.349	0.915	4770	-56.54	497.36	19.568	0.290	0.989
2131	-187.94	319.82	19.551	0.213	0.850	557	-210.40	147.69	19.569	0.630	0.846
37	131.67	17.34	19.551	0.485	0.843	2504	297.64	347.98	19.569	0.151	0.955
1730	-94.66	288.79	19.552	1.186	0.970	195	39.73	67.82	19.569	0.716	0.860
1729	147.85	288.75	19.552	0.374	1.037	1745	9.30	290.76	19.570	0.527	0.999
4794	288.08	500.08	19.552	0.616	1.138	3933	-34.55	435.89	19.570	0.459	1.055
5121	-20.35	531.55	19.552	0.777	0.893	4171	152.17	451.49	19.570	0.892	1.028
3565	199.76	412.36	19.553	0.546	0.873	519	204.71	141.62	19.570	0.462	0.968
1722	-217.17	288.57	19.554	0.172	0.843	6076	89.52	690.04	19.570	0.624	0.990
4596	203.46	484.34	19.554	1.497	0.941	5407	2.43	565.42	19.570	0.560	0.897
1176	-78.67	234.18	19.554	0.767	0.930	2767	134.47	364.98	19.571	0.677	1.026
5974	231.78	667.21	19.554	0.624	0.877	1609	57.79	278.72	19.573	0.060	0.865
1320	-89.84	249.03	19.554	0.186	0.957	4538	167.72	480.14	19.573	0.413	0.942
2004	173.85	310.89	19.554	0.611	1.048	4422	-129.20	470.21	19.573	0.864	1.099
6316	198.15	785.46	19.555	0.353	0.928	5903	305.30	648.53	19.574	0.758	1.097
685	170.66	165.99	19.555	0.775	0.883	5321	185.61	554.78	19.574	0.748	0.853
4173	184.30	451.60	19.556	0.335	0.947	5994	126.17	673.25	19.574	0.400	1.010
658	82.88	162.18	19.556	0.577	0.880	5523	-187.90	583.08	19.575	0.618	0.893
2887	-218.90	372.13	19.557	0.488	0.924	125	-81.79	48.85	19.575	0.820	0.950
5964	113.42	665.49	19.557	0.566	0.940	6431	131.99	853.29	19.575	0.262	0.962
12	308.26	5.88	19.557	0.332	0.910	2192	154.03	325.85	19.576	1.284	0.723
4815	241.00	501.92	19.558	0.381	0.880	5089	-119.57	528.89	19.576	0.362	0.980
5260	287.12	547.59	19.558	0.463	0.853	3086	159.15	384.49	19.576	0.596	1.051
2184	168.21	325.12	19.560	0.305	0.985	5596	-76.21	594.33	19.576	0.580	0.807
936	-150.47	204.06	19.560	0.616	0.808	1172	175.65	233.88	19.576	0.730	0.860
2151	126.19	322.00	19.560	0.497	1.090	4289	-114.29	460.84	19.576	0.582	0.903
4578	113.91	482.82	19.560	0.851	0.940	96	187.50	41.99	19.576	0.431	0.960
3729	280.43	422.43	19.560	0.515	0.951	6140	2.84	710.29	19.577	0.677	1.023
4567	182.64	482.24	19.561	0.596	0.928	2138	-174.51	320.62	19.577	0.385	1.002
3777	-104.93	425.50	19.561	0.974	1.043	5012	-60.82	521.20	19.577	0.433	0.957

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
48	184.93	20.60	19.577	0.618	0.893	6404	67.25	837.41	19.596	1.363	1.120
547	264.47	145.95	19.577	1.143	0.913	543	105.60	145.50	19.596	0.743	0.783
884	-176.68	197.74	19.577	0.410	0.890	2321	-230.52	335.05	19.596	0.884	0.903
504	-223.18	140.08	19.577	1.151	0.980	405	88.01	492.42	19.597	0.596	0.991
4710	253.83	492.78	19.579	0.497	0.870	317	66.17	97.30	19.598	1.327	0.946
872	23.13	196.04	19.579	0.527	0.901	5533	69.22	584.27	19.599	1.029	0.813
1568	174.39	275.46	19.580	0.524	0.890	6103	-13.19	696.93	19.599	0.939	0.943
3012	137.06	379.83	19.580	0.408	1.013	4017	-87.18	441.35	19.600	0.379	0.933
6429	293.52	851.71	19.580	0.444	0.920	5345	118.66	558.40	19.600	0.511	0.883
4808	18.43	501.26	19.580	0.240	0.955	2290	239.87	333.09	19.600	1.013	0.920
4696	-76.78	491.76	19.580	0.715	0.983	5215	271.95	542.98	19.600	0.478	1.060
3205	-37.46	390.57	19.580	0.202	1.021	4580	261.15	482.94	19.600	0.571	0.897
1670	-109.36	284.44	19.581	0.389	0.985	5398	105.02	564.73	19.600	0.304	0.920
2298	144.13	333.38	19.581	0.699	1.003	15	-0.40	8.41	19.600	0.525	0.956
824	-49.71	188.75	19.581	0.846	0.748	4311	-154.22	461.96	19.601	0.479	0.974
6380	291.46	824.00	19.581	0.781	0.908	352	31.83	106.89	19.602	0.457	0.971
4790	167.09	499.69	19.582	0.583	1.020	3721	314.19	421.87	19.602	0.471	0.973
1679	-115.70	285.06	19.582	0.282	1.047	5781	-3.03	626.38	19.602	0.776	0.860
1229	84.02	240.19	19.582	0.233	0.903	763	214.88	179.15	19.603	0.651	0.887
2239	-107.51	329.24	19.582	0.532	0.973	4197	-172.10	453.19	19.603	0.701	0.837
5808	-57.00	630.60	19.583	0.427	0.983	3978	165.37	438.77	19.603	0.684	0.946
6182	-109.41	724.31	19.583	0.514	0.920	3297	241.30	395.60	19.603	0.289	0.934
1130	-191.28	228.08	19.583	1.122	0.933	4474	-8.22	473.57	19.604	0.221	1.007
1782	-163.77	294.25	19.584	0.862	0.865	5935	-178.70	655.00	19.604	0.522	0.913
2486	158.56	347.01	19.584	0.732	0.978	3948	-41.28	436.91	19.604	0.490	1.058
5937	34.00	656.91	19.585	0.407	0.946	4809	-48.63	501.38	19.604	0.562	0.997
3381	-134.94	400.84	19.585	0.382	1.013	161	232.95	58.24	19.604	1.071	0.983
643	-219.76	160.00	19.585	0.595	0.890	5332	133.00	556.58	19.605	0.546	0.887
3016	205.82	380.01	19.585	0.548	1.013	414	-5.61	119.34	19.605	0.385	0.925
5785	-41.47	626.96	19.585	0.463	0.853	846	143.51	191.60	19.605	0.598	0.963
6227	23.22	745.84	19.586	0.718	0.844	4529	-218.39	479.04	19.606	0.539	0.940
437	-217.28	125.14	19.586	0.575	0.848	1685	-52.24	285.41	19.606	0.705	1.060
5729	126.14	614.73	19.586	0.747	0.882	5717	193.55	612.61	19.607	0.214	0.700
1281	258.22	245.30	19.586	0.781	0.845	5373	-76.95	561.55	19.607	0.659	0.850
5379	-84.95	562.19	19.587	0.559	0.850	4167	142.83	451.36	19.608	0.578	1.133
5653	-35.71	602.70	19.587	0.472	0.968	649	276.33	160.91	19.608	-0.207	0.800
4621	256.46	485.77	19.587	0.316	0.958	2331	231.30	336.04	19.609	0.365	1.073
3443	-113.28	404.57	19.587	0.988	0.839	5385	248.58	562.87	19.609	0.811	0.793
5247	-8.46	545.88	19.588	0.421	0.930	601	187.52	153.84	19.609	0.775	0.830
2897	-96.18	372.93	19.588	0.617	0.983	6251	147.22	755.11	19.609	0.700	0.955
6331	159.99	798.40	19.588	0.342	0.955	1771	126.48	293.31	19.610	0.597	0.953
383	49.20	112.92	19.589	0.301	0.851	3916	149.59	434.64	19.611	0.931	1.037
3041	-187.45	381.70	19.589	0.514	0.942	3221	-74.37	391.38	19.611	0.829	0.900
2199	-51.24	326.06	19.589	0.451	0.993	1686	309.72	285.55	19.611	0.651	0.900
4459	238.77	472.55	19.590	0.732	0.866	5020	261.68	521.67	19.611	0.784	0.893
4000	287.09	440.11	19.590	0.721	0.860	5213	55.78	542.90	19.611	0.142	0.910
6153	243.49	714.74	19.590	0.673	0.910	3181	136.55	389.58	19.611	1.202	1.063
1128	94.78	227.82	19.590	-0.576	0.790	4896	-22.16	509.24	19.612	0.568	0.950
6301	114.69	779.57	19.591	1.321	0.900	42	103.50	19.18	19.612	0.445	0.815
74	181.94	32.08	19.591	0.483	1.003	4634	-17.76	487.05	19.613	-0.268	0.823
5743	-49.92	618.23	19.591	0.496	0.920	2861	226.82	370.39	19.613	0.425	0.867
229	-119.51	76.59	19.591	0.695	1.095	511	-184.66	141.04	19.613	1.705	0.940
6424	275.05	849.58	19.592	2.229	0.958	1513	-31.39	269.72	19.613	0.425	1.043
235	177.29	77.97	19.594	0.786	0.905	701	-166.82	169.63	19.614	0.439	0.838
3464	119.17	406.13	19.594	0.210	1.255	959	30.76	206.94	19.614	0.601	0.871
3059	166.99	383.00	19.595	0.767	0.964	2739	-199.84	363.51	19.614	0.908	0.935
260	-101.53	83.02	19.595	0.394	0.952	1913	-100.20	304.17	19.614	0.682	0.923
420	8.28	119.86	19.595	0.200	0.995	1338	-171.56	251.57	19.614	0.537	0.857
5671	137.66	605.55	19.596	1.300	0.968	6200	-110.18	32.98	19.614	0.223	0.960
4495	-62.11	475.41	19.596	0.515	1.080	3938	-58.27	436.06	19.616	0.679	0.936

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
377	163.87	111.78	19.616	0.575	0.800	5481	84.97	576.47	19.639	0.842	0.822
2979	-199.82	377.95	19.616	0.535	0.984	4179	187.58	451.83	19.639	0.520	0.950
6283	24.31	770.42	19.618	1.010	0.796	1163	33.90	232.00	19.640	0.503	0.971
5127	-81.90	532.32	19.618	0.434	0.908	2768	-148.42	365.04	19.640	0.620	0.957
5468	124.35	575.39	19.618	0.569	1.138	585	157.85	151.34	19.640	0.749	0.857
6371	-33.37	819.12	19.618	0.807	0.882	1261	241.83	243.00	19.641	0.458	0.873
6135	87.06	709.17	19.619	0.726	0.825	6326	11.37	794.23	19.641	0.348	0.913
6005	243.05	674.57	19.619	0.233	0.950	152	43.55	56.16	19.642	0.305	0.969
4221	183.05	455.63	19.619	0.529	0.932	4288	-126.93	460.57	19.643	-0.054	0.946
967	-14.65	207.75	19.619	0.437	0.960	4833	204.13	503.59	19.643	0.430	0.950
793	102.16	183.84	19.620	1.495	0.900	5853	-66.68	637.88	19.643	0.391	0.950
5583	-223.06	591.36	19.621	0.846	0.850	470	217.42	132.19	19.643	0.483	0.820
1318	156.25	248.97	19.622	0.478	0.993	5380	149.81	562.52	19.644	0.770	1.103
2403	157.46	340.59	19.623	1.230	1.017	3744	-110.47	423.31	19.644	0.675	1.016
2326	-131.33	335.64	19.624	0.495	0.963	4523	51.77	478.38	19.644	0.663	1.017
4570	74.68	482.42	19.624	0.393	1.030	6369	4.92	818.76	19.644	0.522	0.978
406	-149.16	117.49	19.624	0.846	0.800	4104	-27.61	447.11	19.645	0.284	0.925
790	97.01	183.22	19.624	0.236	0.825	367	-154.83	109.59	19.646	0.633	0.890
4530	-49.08	479.12	19.624	-0.740	1.105	387	114.79	113.97	19.646	0.512	0.807
5669	-160.34	605.31	19.625	0.675	0.880	2121	237.92	319.18	19.646	0.904	1.087
5446	-227.73	571.37	19.625	0.614	0.783	2293	137.71	333.15	19.646	0.234	1.053
4315	-69.65	462.10	19.625	0.716	0.962	3426	-122.75	403.72	19.646	0.408	0.921
6338	12.65	802.42	19.626	0.788	0.935	5282	-233.45	549.80	19.647	0.919	0.830
1369	-87.50	254.30	19.626	0.427	1.072	1591	245.78	277.02	19.647	0.516	0.878
767	104.92	179.46	19.626	0.673	0.915	508	-122.26	140.72	19.647	0.954	0.748
4911	257.63	510.73	19.626	0.848	0.860	287	237.83	90.38	19.648	0.380	0.920
1715	-1.94	287.79	19.628	0.881	1.278	4153	-190.49	450.37	19.649	0.370	0.925
4263	169.96	458.36	19.628	0.418	1.049	4531	174.40	479.63	19.649	1.280	0.860
3592	204.49	413.77	19.628	0.398	0.933	3091	-155.71	384.74	19.649	0.595	0.893
3096	241.75	385.12	19.628	0.529	0.796	5453	-54.43	572.40	19.649	0.360	1.153
6245	-1.54	752.19	19.629	0.170	0.825	4464	-173.28	472.84	19.649	0.516	1.000
5010	-170.28	521.17	19.629	0.467	0.882	1832	67.58	298.11	19.649	0.128	1.103
275	149.41	366.67	19.629	0.668	1.064	2711	174.98	361.96	19.649	0.446	1.058
5399	10.31	564.76	19.630	0.111	0.905	4871	159.56	506.73	19.649	0.748	0.882
5159	124.80	525.49	19.630	0.432	0.925	502	122.11	139.35	19.650	1.255	0.753
258	-218.54	82.81	19.630	0.782	0.960	6065	-26.19	687.93	19.650	0.408	0.785
391	-164.50	114.98	19.630	0.430	0.905	5019	62.57	521.64	19.651	0.244	0.865
3141	296.13	387.13	19.631	0.599	0.821	5430	20.40	568.87	19.651	0.140	0.876
727	-133.65	174.22	19.631	0.205	0.967	4535	54.79	479.75	19.652	0.636	0.997
4396	3.83	468.34	19.631	0.399	1.151	5725	235.75	614.32	19.653	0.461	0.882
5915	167.14	650.21	19.632	0.438	0.970	402	169.41	116.90	19.653	0.661	0.988
5254	-54.52	546.52	19.632	0.287	0.890	5556	-183.56	587.41	19.653	0.764	0.870
773	-94.98	180.74	19.633	0.488	0.790	6393	-14.20	831.48	19.654	0.471	0.970
1787	296.59	294.75	19.633	0.240	0.968	5824	100.76	632.77	19.654	0.775	0.798
6031	230.98	681.93	19.634	0.311	0.935	480	-5.75	134.10	19.654	0.369	1.018
1516	173.69	269.86	19.634	0.544	0.943	339	-194.60	102.06	19.654	0.651	0.918
1420	92.23	260.63	19.634	0.355	1.030	5382	29.74	562.74	19.655	0.565	0.863
4052	198.64	443.45	19.634	0.530	0.934	5011	-103.95	521.20	19.655	0.253	0.858
1449	-81.72	263.09	19.634	1.017	0.838	5894	17.79	646.60	19.655	0.338	0.910
980	65.11	210.52	19.635	0.653	0.980	3286	194.84	394.88	19.656	0.643	0.998
4892	-9.92	508.32	19.635	0.567	0.965	432	-154.56	123.31	19.656	1.646	0.873
2072	291.56	315.44	19.636	1.686	1.105	6134	-116.21	708.73	19.656	0.812	0.838
4462	93.08	472.82	19.636	0.747	0.951	290	264.39	91.36	19.657	1.358	1.320
1813	103.20	296.80	19.637	0.259	1.157	5209	-98.95	542.17	19.657	0.769	0.808
2891	-103.76	372.30	19.638	0.677	0.914	726	-34.51	173.91	19.657	0.315	0.833
1223	-54.00	239.84	19.638	0.416	1.115	676	84.73	164.90	19.658	0.223	0.905
3993	-58.76	439.72	19.638	0.364	0.956	2160	-158.37	323.03	19.658	0.677	0.705
1736	262.24	289.35	19.639	0.500	0.890	447	-143.71	127.67	19.658	0.443	0.892
5058	53.45	525.48	19.639	0.310	0.909	5584	152.65	591.88	19.658	0.580	1.048
1626	184.19	279.77	19.639	0.363	0.888	946	-168.28	205.35	19.659	0.340	0.972

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
4880	47.32	507.36	19.659	0.537	1.270	467	187.54	131.25	19.683	0.313	0.883
3431	-110.02	403.77	19.660	0.336	1.023	1483	170.33	267.16	19.684	0.776	0.913
6260	148.51	758.57	19.660	0.302	0.980	920	-82.61	201.33	19.684	0.634	1.010
6378	102.87	823.34	19.660	0.426	0.960	4056	-134.75	443.68	19.684	1.008	0.944
5476	27.38	576.16	19.660	0.371	0.861	251	9.73	81.06	19.684	0.496	0.896
705	-151.55	170.86	19.661	0.362	0.928	608	139.52	154.61	19.684	0.497	0.908
3288	-90.89	394.92	19.661	0.358	0.983	5607	141.94	595.23	19.685	0.636	0.850
1047	73.55	217.79	19.661	0.375	0.932	3616	-55.48	414.99	19.685	0.311	0.949
969	-183.11	207.92	19.662	0.927	0.835	1307	-100.81	247.51	19.685	0.123	0.928
5438	-126.57	270.05	19.662	0.644	0.875	690	-72.80	166.63	19.685	0.660	0.883
5593	172.37	593.18	19.663	0.291	0.910	4009	-207.05	440.82	19.686	0.347	1.008
4391	117.85	468.00	19.663	0.643	1.058	211	11.85	71.55	19.686	0.318	0.926
1472	173.25	265.86	19.663	0.747	0.947	5574	285.43	589.75	19.687	0.318	0.905
1713	-155.47	287.64	19.664	0.703	0.887	898	-3.60	198.76	19.687	0.922	0.930
5483	-124.24	576.66	19.664	0.382	0.975	4372	-56.30	466.97	19.688	0.931	0.956
1050	67.56	218.20	19.664	0.494	0.998	4406	-242.82	469.13	19.688	0.654	1.056
6142	153.37	710.59	19.664	0.584	0.817	5892	171.94	646.53	19.688	0.065	0.845
1912	229.08	304.09	19.664	0.560	0.782	1194	4.71	236.15	19.688	0.248	0.933
5995	77.85	673.33	19.665	1.233	0.970	6010	103.15	675.43	19.690	0.340	0.863
2475	-195.39	346.32	19.665	0.555	1.000	4884	-50.30	507.63	19.690	0.436	0.825
5251	240.21	546.46	19.666	1.669	0.970	1819	219.67	297.09	19.690	0.369	1.227
1682	126.63	285.31	19.666	0.782	1.013	847	298.43	191.92	19.691	0.521	0.892
679	51.33	165.38	19.667	0.215	0.938	2120	189.42	319.00	19.691	0.467	0.913
6405	62.17	837.97	19.668	1.021	1.492	4013	-112.93	441.02	19.691	0.822	1.119
2985	-179.89	378.37	19.668	0.759	0.850	5048	-47.16	524.20	19.692	0.630	0.790
5323	12.68	555.21	19.669	1.245	0.980	298	214.12	93.03	19.692	0.651	0.783
4046	-167.73	443.13	19.670	0.468	0.954	4494	271.96	475.33	19.692	0.483	0.869
1479	-78.73	266.91	19.670	0.918	0.857	6149	-77.29	713.20	19.692	0.409	0.858
3972	-230.38	438.32	19.671	0.383	1.003	2188	139.67	325.61	19.693	0.400	1.047
231	-235.40	77.06	19.671	0.718	0.835	1428	35.54	261.23	19.693	0.451	1.310
2312	156.42	334.44	19.671	0.889	0.963	5232	-50.18	544.90	19.693	0.398	0.850
4359	-127.66	466.17	19.671	0.339	0.966	3337	190.60	397.78	19.694	0.454	0.851
1057	156.76	219.76	19.672	0.437	0.873	4931	-118.84	512.21	19.694	1.056	0.730
5801	-75.00	629.82	19.672	1.062	0.863	80	276.52	35.95	19.694	0.371	0.935
4430	154.47	470.78	19.672	0.350	0.934	996	54.36	211.86	19.694	0.230	1.008
2266	166.82	331.23	19.674	0.544	1.130	4224	59.08	455.78	19.695	0.523	1.265
204	260.48	70.94	19.675	0.570	0.817	5137	-78.28	533.37	19.695	0.390	0.983
218	-11.40	73.74	19.675	0.279	1.000	138	-204.44	52.95	19.695	0.584	0.913
5546	47.90	586.38	19.675	0.657	0.848	388	-4.24	114.56	19.695	0.398	0.938
6329	-49.07	796.12	19.676	0.848	0.887	1381	-186.77	255.65	19.696	1.020	0.878
5608	-64.45	535.48	19.676	0.597	0.808	3833	-171.39	428.85	19.696	0.725	1.100
4702	-1.32	492.21	19.676	0.848	1.187	1556	178.22	274.30	19.697	0.394	1.040
665	15.45	163.28	19.678	0.595	0.831	329	-52.15	100.07	19.697	0.691	0.978
2030	-130.46	313.04	19.679	-0.106	0.820	3199	-43.41	390.25	19.697	0.123	1.563
1390	217.08	256.64	19.679	0.376	0.870	6163	-151.91	717.65	19.697	1.070	0.910
1795	82.62	295.57	19.680	0.038	0.950	5222	-12.62	544.01	19.697	0.166	0.988
1954	269.38	307.84	19.680	1.750	0.893	795	-136.20	184.03	19.697	0.798	0.853
236	233.16	77.98	19.680	0.452	0.933	603	-16.17	154.06	19.698	0.343	0.870
486	-176.72	134.84	19.680	1.408	0.993	3471	-89.63	406.31	19.698	0.496	0.982
5178	42.65	538.46	19.680	0.466	1.014	5612	91.68	596.01	19.700	1.344	0.870
3859	-117.16	430.20	19.681	0.595	1.183	2132	143.36	320.02	19.701	0.502	1.097
5419	-156.12	567.32	19.681	0.456	0.823	4840	153.85	504.06	19.702	0.586	1.053
3770	-220.78	425.06	19.681	0.393	0.938	1592	-108.50	277.04	19.702	2.628	0.927
5703	40.13	609.84	19.681	0.943	0.894	3209	218.17	390.80	19.702	0.411	0.829
4058	111.47	443.73	19.682	0.338	0.985	25	223.48	12.06	19.702	0.224	0.845
6143	43.21	712.68	19.682	0.800	0.952	3814	-190.62	427.73	19.703	0.564	0.860
4722	119.93	493.42	19.683	0.795	0.903	6336	-57.90	800.98	19.703	0.713	0.858
4081	-211.39	445.31	19.683	0.495	0.933	2049	-164.57	314.16	19.703	0.142	0.933
5819	44.02	632.01	19.683	1.417	0.996	1224	-173.43	239.91	19.704	0.772	0.868
6277	209.76	767.60	19.683	0.474	0.850	4861	278.19	505.79	19.704	0.668	0.785

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
5257	-73.04	546.75	19.704	0.393	0.950	3669	206.14	417.92	19.723	0.472	1.000
2648	212.56	369.75	19.704	0.313	0.964	5932	198.59	654.66	19.723	0.237	1.050
4435	110.61	474.34	19.704	0.275	1.096	986	-190.78	210.95	19.723	0.374	0.980
5713	273.66	612.23	19.705	0.901	0.908	21	-56.28	10.09	19.724	0.819	0.933
5467	-39.39	575.21	19.705	0.885	0.855	1109	117.27	226.10	19.724	0.381	0.948
6053	-11.73	685.35	19.705	0.250	0.923	3806	-215.33	427.21	19.725	0.735	0.990
1445	19.51	262.78	19.705	0.877	1.000	2918	257.99	374.65	19.725	0.440	0.860
83	132.34	37.29	19.705	0.882	0.853	4962	-144.41	515.98	19.725	0.567	0.825
5400	314.04	564.79	19.706	0.148	0.988	466	137.32	131.17	19.725	0.306	0.980
70	-42.05	171.50	19.706	0.755	0.942	6317	-155.62	787.53	19.726	0.745	1.020
3462	-86.50	406.03	19.707	0.393	0.941	5637	76.21	598.83	19.727	0.610	0.923
3939	-199.95	436.10	19.708	0.383	0.880	4779	180.30	498.78	19.729	0.616	1.038
4516	-88.38	477.79	19.708	0.335	0.871	5784	1.28	626.86	19.729	0.528	0.883
555	-185.46	147.13	19.708	0.938	1.057	5420	-9.48	567.58	19.729	0.507	0.993
664	202.95	163.14	19.708	0.965	0.935	2397	-222.71	340.26	19.729	1.162	0.887
518	290.36	141.60	19.709	0.376	0.890	5978	76.28	667.87	19.729	0.799	0.920
5340	137.05	557.51	19.709	0.546	0.833	569	-215.12	149.33	19.730	0.616	0.890
330	73.43	100.27	19.709	0.147	0.915	673	-108.54	164.55	19.731	0.688	0.760
5530	-84.43	583.94	19.710	0.356	0.810	2896	243.07	372.88	19.731	0.771	0.961
2774	-202.65	365.63	19.710	0.765	0.898	5165	20.29	536.91	19.732	0.695	1.030
6409	57.50	841.23	19.710	1.965	1.483	566	0.17	148.93	19.732	0.466	0.946
4151	-160.84	450.19	19.710	0.564	0.929	4664	-64.84	489.31	19.733	0.681	1.068
1537	72.82	271.93	19.710	0.658	1.017	5095	132.16	529.24	19.733	0.491	0.803
476	23.68	133.21	19.710	0.374	0.899	6121	198.95	702.52	19.733	0.679	0.853
5826	177.12	633.05	19.711	0.655	0.870	4517	73.65	477.83	19.733	0.409	1.180
3269	154.38	394.14	19.711	0.481	1.020	6041	238.13	683.55	19.733	0.810	0.813
459	-169.79	129.86	19.711	0.714	0.813	1007	-73.63	213.22	19.734	0.941	0.900
6287	209.93	771.72	19.712	0.796	0.865	159	150.27	57.87	19.734	0.681	0.937
5115	-47.48	531.03	19.712	0.336	0.840	1995	232.88	310.47	19.734	1.081	0.907
4706	-38.94	492.43	19.712	0.516	0.957	5330	248.76	556.16	19.735	0.659	0.807
5187	90.09	539.21	19.712	0.280	0.845	1743	-205.23	290.21	19.735	0.584	0.960
3027	264.73	380.57	19.713	0.667	0.868	2297	176.55	333.36	19.736	0.202	1.010
2541	-147.38	350.54	19.713	0.217	0.902	1663	157.05	283.67	19.736	0.573	0.893
6280	-104.87	769.25	19.713	0.380	0.822	2490	-224.47	347.12	19.737	0.729	0.858
307	208.36	94.73	19.713	0.449	0.823	864	14.34	194.82	19.737	0.200	0.922
5276	-191.17	548.86	19.714	0.678	0.858	5806	1.74	630.46	19.738	1.029	0.905
6088	306.80	692.79	19.714	0.369	0.800	331	254.45	100.38	19.740	0.890	0.885
2129	205.68	319.59	19.714	0.312	0.863	6335	95.35	800.92	19.740	0.406	0.813
105	191.28	44.61	19.715	0.495	0.908	2745	157.94	363.81	19.740	0.776	0.890
393	27.02	115.17	19.715	0.496	0.866	758	268.87	178.49	19.740	0.444	0.850
2289	227.43	333.07	19.715	0.832	1.023	296	-185.85	92.62	19.740	0.633	0.988
4857	149.79	505.52	19.715	0.930	0.873	3267	121.58	393.90	19.741	0.664	1.293
5601	195.05	594.65	19.715	0.382	0.890	905	76.70	199.55	19.741	0.583	0.873
2054	-180.57	314.46	19.715	0.530	0.882	4389	75.67	467.91	19.741	0.612	1.058
6433	258.78	854.34	19.716	0.909	0.830	6207	-186.70	735.17	19.742	0.491	0.793
811	205.77	186.58	19.716	1.061	0.830	5633	33.85	598.83	19.742	0.821	0.998
964	115.44	207.39	19.716	0.473	1.033	591	-184.83	152.53	19.742	0.964	0.890
2999	-212.80	379.06	19.716	0.310	0.833	5485	137.90	576.87	19.742	0.381	0.877
2167	173.10	343.63	19.716	0.457	1.148	1276	176.06	244.71	19.742	0.549	0.955
4448	313.33	471.92	19.717	0.441	1.068	5146	-200.21	534.45	19.742	0.855	0.755
1205	180.29	237.79	19.717	0.857	0.927	628	-189.62	157.27	19.742	0.767	0.825
2374	208.76	338.62	19.717	1.529	0.907	396	-65.67	115.59	19.743	0.708	0.915
310	64.99	95.63	19.717	0.487	0.914	2320	-86.54	334.89	19.743	0.709	0.883
2	-197.17	-2.54	19.718	1.078	0.923	6198	85.20	732.44	19.744	0.702	0.880
360	174.52	108.36	19.718	0.372	0.875	5721	137.13	613.76	19.744	0.457	0.773
370	105.47	109.79	19.718	0.705	0.947	3051	212.82	382.46	19.744	0.740	0.832
2783	-142.06	366.39	19.718	0.583	0.876	4671	97.38	490.04	19.745	0.824	0.974
5033	102.38	522.99	19.720	0.468	1.030	162	264.45	58.75	19.745	0.049	1.003
5406	-75.44	565.34	19.722	0.867	0.910	1373	127.30	254.66	19.745	0.514	0.930
4907	-106.46	510.38	19.722	0.107	0.800	6340	5.01	803.50	19.745	0.337	0.951

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
5966	-18.19	665.56	19.746	0.862	0.867	6354	-173.04	811.31	19.772	0.676	0.960
2472	-135.03	346.08	19.746	0.297	0.843	5755	52.16	620.43	19.772	0.958	1.038
2433	-147.78	343.17	19.748	0.882	0.915	3853	224.41	430.01	19.772	1.260	0.984
1365	132.84	253.67	19.748	0.289	0.863	3501	259.54	407.76	19.772	-0.022	0.824
1246	237.11	241.58	19.748	0.537	0.975	4772	19.93	497.49	19.772	0.363	1.061
5955	145.49	661.94	19.748	1.606	1.023	2939	-218.81	376.00	19.773	0.357	0.835
1492	-234.41	268.04	19.749	0.991	0.963	3865	141.35	430.63	19.773	1.095	1.334
3935	-174.30	435.96	19.749	0.283	1.013	5514	-109.43	581.60	19.774	0.625	0.727
4269	132.12	458.80	19.749	0.423	0.911	1389	78.76	256.55	19.774	0.268	0.790
5769	84.57	624.60	19.750	0.154	1.003	3119	304.28	386.42	19.775	0.308	0.919
1780	-105.83	294.21	19.750	0.275	0.993	5783	132.26	626.73	19.775	0.758	0.857
4802	-78.56	500.65	19.751	0.448	0.904	2836	-111.91	369.21	19.776	0.554	1.018
101	2.79	43.92	19.751	0.648	0.851	2466	251.86	345.41	19.777	0.335	0.927
4766	-60.40	496.74	19.751	0.474	0.885	2581	-241.25	353.47	19.777	1.177	0.784
5408	167.97	565.54	19.751	0.239	1.313	5358	-91.32	560.30	19.777	1.013	0.925
6058	283.11	685.74	19.753	0.785	0.820	4065	-148.27	444.33	19.777	0.464	0.943
6242	-3.22	751.95	19.754	0.243	0.803	6122	-137.61	704.18	19.777	0.279	0.950
4088	160.05	445.99	19.754	0.473	0.963	6230	-22.57	747.63	19.778	0.396	0.825
6024	180.59	680.21	19.754	0.519	0.763	2648	142.82	357.85	19.778	0.515	1.053
957	-188.14	206.91	19.754	0.522	0.843	41	-17.24	18.54	19.778	0.720	0.928
544	-107.37	145.64	19.755	0.611	0.837	4640	80.71	487.32	19.779	0.162	1.064
5314	143.54	554.05	19.755	0.302	0.850	627	-153.13	157.23	19.779	0.739	0.847
4312	-73.79	461.96	19.755	0.759	1.086	835	254.71	189.96	19.780	0.549	0.813
5411	150.87	565.76	19.755	0.169	1.028	199	189.89	70.20	19.780	1.252	1.128
4592	268.33	484.01	19.757	0.763	0.903	1614	-82.46	278.97	19.780	0.551	0.925
1181	83.21	235.08	19.757	0.701	0.950	1078	-117.14	223.00	19.780	0.644	0.923
3758	194.09	424.10	19.757	0.265	0.904	5294	98.38	552.25	19.780	0.463	0.845
3783	-74.32	425.73	19.758	0.457	1.005	5350	-210.09	558.93	19.781	0.514	1.005
1308	35.56	247.51	19.759	0.289	1.060	1624	170.22	279.61	19.781	0.206	0.777
304	255.32	94.26	19.759	0.144	1.220	4912	-133.68	510.78	19.781	0.551	0.940
348	85.13	105.01	19.759	1.675	0.885	3382	-141.13	400.86	19.781	0.712	0.934
2623	226.49	356.61	19.760	0.270	0.968	348	-139.14	105.52	19.782	0.178	0.950
1973	296.68	309.02	19.760	0.287	0.837	1905	-152.41	303.64	19.782	0.757	0.768
5149	139.78	534.88	19.760	0.212	0.970	871	-88.93	195.99	19.783	0.635	0.880
684	-133.30	165.96	19.761	0.576	0.800	6197	-56.73	731.57	19.783	0.404	0.860
2362	177.45	337.94	19.762	0.839	1.010	589	-169.78	152.38	19.784	0.878	1.050
1313	177.72	247.63	19.762	0.578	0.970	5288	209.30	551.03	19.784	0.686	0.895
5782	-110.75	626.68	19.762	0.859	0.923	682	252.36	165.73	19.785	0.364	0.848
5909	-133.17	649.93	19.763	0.344	0.887	3307	-157.75	396.27	19.785	0.494	0.891
1019	25.02	214.49	19.763	0.578	0.900	76	80.33	32.27	19.785	0.491	0.930
75	215.43	32.10	19.764	0.581	0.970	5731	278.39	615.31	19.787	0.704	0.793
4089	-24.03	446.04	19.764	0.314	0.963	5063	-148.32	525.70	19.788	0.638	0.973
4691	-193.04	491.25	19.765	0.353	0.937	3195	292.56	390.16	19.788	0.552	0.792
163	3.56	58.88	19.766	0.794	0.935	1760	-83.34	292.37	19.788	0.278	0.920
5109	234.84	530.40	19.766	0.188	0.900	4980	-56.87	517.68	19.789	0.253	0.897
747	43.58	176.26	19.766	0.726	0.865	4418	-6.05	469.74	19.789	0.137	1.001
776	102.65	181.46	19.766	0.429	0.877	154	-150.80	56.52	19.789	0.075	0.928
6389	-77.70	829.26	19.767	0.426	0.935	5522	309.77	582.88	19.789	0.495	0.928
493	-165.58	137.03	19.767	0.648	0.865	1902	-159.15	303.47	19.789	0.878	0.820
4237	-220.69	456.45	19.767	0.883	0.943	78	-87.46	35.85	19.790	0.668	1.090
5497	21.07	578.86	19.768	0.502	0.913	5028	-157.84	522.72	19.790	0.779	0.915
6110	18.54	700.19	19.769	0.513	0.931	1560	-108.78	274.72	19.791	-0.111	0.843
6045	34.79	684.01	19.770	0.372	0.946	1447	-189.99	262.93	19.792	0.746	1.007
6115	-147.96	701.24	19.770	0.537	0.837	473	135.13	132.69	19.793	1.059	0.887
1929	-236.08	305.76	19.770	0.293	0.920	3146	195.40	387.32	19.793	0.967	0.838
6356	217.14	811.56	19.771	0.466	0.815	2650	269.37	358.04	19.793	0.249	0.926
4678	91.64	490.37	19.771	0.891	0.995	5702	-44.88	609.38	19.793	0.254	0.985
2186	-94.26	325.46	19.771	0.239	1.023	637	30.51	159.24	19.793	-0.661	0.858
870	-76.77	195.77	19.771	0.633	0.915	6382	-197.49	824.28	19.794	0.902	1.010
1604	287.68	278.18	19.772	0.564	0.753	1906	-96.88	303.72	19.795	0.082	0.940

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
2833	120.12	368.95	19.795	0.582	1.143	1242	192.71	241.28	19.820	0.401	0.803
4661	38.93	489.17	19.795	1.077	1.273	3241	-209.71	392.46	19.821	0.349	0.907
137	299.63	52.34	19.795	0.313	0.990	4225	-155.23	455.82	19.821	0.537	0.897
829	231.03	189.22	19.796	0.741	0.980	4709	144.00	492.76	19.821	0.395	0.902
1631	-74.99	280.73	19.796	0.781	0.840	46	142.73	19.47	19.821	0.966	0.840
417	87.27	119.54	19.796	0.372	0.923	335	-58.16	101.78	19.822	0.349	0.890
4757	87.43	495.96	19.796	0.868	0.975	5810	-45.49	630.72	19.822	1.339	1.013
3234	220.18	392.06	19.797	0.534	0.843	1317	-44.41	248.68	19.822	0.177	0.893
6136	-21.65	709.42	19.797	0.834	0.855	123	174.47	48.27	19.822	0.564	1.055
1542	303.78	272.90	19.797	0.451	0.963	2481	287.47	346.81	19.823	1.448	0.905
442	35.12	125.99	19.798	0.868	0.858	233	-45.64	77.62	19.823	0.723	0.790
153	83.42	56.30	19.798	0.527	0.780	2210	-149.34	326.91	19.824	0.498	0.927
6161	-41.97	717.35	19.799	0.389	0.955	1200	162.61	237.29	19.824	0.727	0.838
3483	146.30	407.13	19.799	0.861	1.037	2348	-47.30	337.04	19.824	1.664	0.890
614	-69.12	155.24	19.800	0.595	0.830	131	-34.23	50.73	19.825	0.350	0.877
1358	43.87	252.75	19.801	0.611	0.890	6080	150.85	690.84	19.825	0.872	0.980
6180	116.22	722.67	19.801	0.648	0.780	1045	128.45	217.55	19.825	0.723	0.797
4726	-32.54	493.94	19.801	-0.007	1.323	4080	189.01	445.30	19.825	0.555	0.871
924	-142.12	202.23	19.803	0.729	0.868	951	-49.05	205.75	19.826	0.474	0.903
151	62.60	56.09	19.803	0.450	0.878	1285	21.90	245.57	19.826	0.648	0.885
1967	196.14	308.63	19.803	1.062	0.870	347	256.41	105.36	19.826	0.592	1.028
315	115.15	97.01	19.804	0.583	0.823	2064	-44.55	315.01	19.827	0.227	0.963
4124	114.02	448.52	19.804	0.780	0.945	5140	232.29	533.43	19.827	0.924	1.065
731	220.71	174.40	19.805	0.335	0.810	4401	227.27	468.78	19.827	0.892	0.844
245	104.67	80.12	19.805	2.007	0.930	5145	-58.64	534.45	19.827	0.310	0.892
1628	181.84	280.11	19.805	0.436	0.887	623	37.36	156.78	19.827	0.443	0.939
6428	63.31	851.33	19.805	0.618	0.864	1603	261.86	278.14	19.828	0.722	0.845
5679	170.60	606.16	19.806	0.422	0.863	4023	141.53	441.85	19.828	0.671	0.956
4740	41.53	494.91	19.806	0.479	2.315	5507	-78.90	580.36	19.829	1.102	0.958
3296	-104.55	395.49	19.806	0.319	0.924	2353	90.90	337.30	19.829	0.310	1.280
1087	121.67	223.86	19.806	0.531	0.880	4097	126.97	446.50	19.829	0.258	0.971
5682	39.10	606.40	19.806	0.110	0.886	656	55.38	162.01	19.830	0.263	0.954
861	-126.01	194.51	19.807	0.203	0.913	4195	-68.12	453.13	19.831	0.756	0.939
2060	-31.41	314.75	19.807	-0.060	0.893	6211	185.25	736.87	19.831	0.853	1.010
6194	212.72	729.68	19.808	1.685	0.850	1286	-79.36	245.64	19.831	0.821	0.820
5458	-67.76	573.84	19.808	0.864	1.060	6434	278.06	854.34	19.832	2.109	0.937
4129	280.24	448.66	19.808	0.323	0.869	5744	-199.82	618.25	19.833	0.864	0.998
949	53.53	205.64	19.808	0.684	0.811	6345	-10.48	805.22	19.833	0.604	0.905
5076	-173.09	527.66	19.808	0.990	0.898	1113	52.96	226.52	19.833	0.964	0.950
5151	182.44	535.08	19.809	0.468	0.873	1112	-112.11	226.47	19.835	0.091	0.785
3502	297.71	407.84	19.810	0.659	0.998	6432	-35.16	854.09	19.835	1.127	1.000
3436	-92.62	404.00	19.810	0.587	0.872	5046	158.41	524.03	19.836	0.723	0.960
6262	91.68	761.32	19.812	0.549	0.880	40	135.71	18.21	19.836	1.368	0.960
1154	53.63	230.53	19.812	0.537	0.880	4909	153.34	510.59	19.837	1.503	0.945
5487	-149.60	577.31	19.813	0.534	0.785	5462	46.14	574.54	19.837	0.548	0.797
6413	97.82	843.16	19.814	0.570	0.953	263	79.47	84.40	19.838	0.568	0.853
4842	-176.74	504.18	19.814	0.689	0.863	819	72.35	188.06	19.838	0.367	0.892
1594	69.25	277.11	19.814	0.629	0.883	5043	131.16	523.58	19.838	0.677	0.860
4797	-84.34	500.24	19.814	0.720	0.903	2973	180.91	377.55	19.838	1.083	1.188
6359	18.93	812.22	19.815	0.351	0.960	5907	-211.34	849.73	19.839	0.663	0.882
6147	-92.95	712.58	19.815	0.628	0.880	6220	-172.03	741.38	19.839	0.726	1.017
2003	257.80	310.87	19.815	0.302	0.790	976	-65.61	209.25	19.839	0.524	0.890
4917	111.45	511.05	19.815	0.462	0.948	6411	52.95	841.73	19.839	1.247	1.133
4731	138.83	494.51	19.815	0.333	0.928	16	-121.32	8.97	19.840	0.536	1.017
1475	76.08	266.38	19.816	0.030	0.917	4482	-182.22	474.14	19.841	0.407	0.888
415	-189.70	119.44	19.817	0.979	0.918	3830	-227.34	428.72	19.841	0.356	0.966
6343	91.70	804.59	19.818	0.325	0.988	4294	168.02	451.08	19.842	0.391	1.028
4350	-209.13	465.45	19.819	0.932	0.897	1961	-89.77	308.32	19.843	0.551	1.115
485	186.91	134.76	19.819	1.166	0.925	533	91.58	143.79	19.843	0.194	0.770
1706	213.12	286.94	19.820	0.850	0.947	8	46.17	1.53	19.843	0.590	0.825

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
4836	236.16	503.73	19.843	0.365	0.966	878	100.18	196.60	19.871	0.053	0.957
4692	24.66	491.45	19.843	0.662	1.035	879	-23.02	196.67	19.871	0.311	0.810
4382	-94.08	467.47	19.844	-0.055	0.995	4586	222.43	483.37	19.871	0.611	1.017
2136	-141.90	320.49	19.844	0.144	0.825	984	-19.24	210.86	19.871	0.746	0.945
6162	-201.19	717.58	19.845	0.753	0.953	4821	91.44	502.57	19.871	0.443	1.145
5307	-10.73	553.70	19.845	0.462	0.863	3459	278.17	405.93	19.872	0.684	0.951
4761	203.94	496.32	19.845	0.623	0.866	6108	-63.82	699.22	19.872	1.088	0.910
1738	221.05	289.89	19.846	0.577	0.905	5072	7.49	527.09	19.872	0.186	1.338
4577	297.26	482.69	19.847	0.412	0.845	1497	290.86	268.67	19.872	1.443	0.810
265	232.06	85.57	19.847	0.814	0.743	3610	264.98	414.69	19.872	0.585	0.966
501	-168.68	139.20	19.847	0.288	0.970	4490	-133.21	474.65	19.872	0.494	1.270
356	275.13	107.75	19.848	0.447	0.962	1211	19.48	238.41	19.873	1.149	0.900
604	157.07	154.23	19.849	0.282	0.860	6083	50.44	691.66	19.873	0.749	1.005
1860	158.89	300.34	19.849	0.652	0.920	5567	-88.46	588.68	19.874	0.421	0.870
663	79.33	163.03	19.850	0.682	0.930	5711	71.86	611.77	19.874	1.037	0.835
6320	-118.85	789.91	19.850	0.640	0.973	6120	301.91	702.42	19.874	0.441	0.890
3063	-68.43	383.27	19.851	0.216	1.055	6376	282.74	823.25	19.875	1.017	0.817
540	54.31	144.85	19.851	0.765	0.955	53.5	-44.42	561.63	19.875	0.486	0.942
1949	129.33	307.48	19.851	0.139	0.955	5670	27.40	605.55	19.876	0.491	1.087
5363	77.79	560.62	19.851	1.114	1.020	1046	18.79	217.62	19.876	0.194	0.948
1309	-53.53	247.53	19.852	1.131	0.970	1823	112.73	297.46	19.876	0.725	1.213
4146	-146.68	449.83	19.852	0.276	0.870	5977	25.47	667.85	19.877	0.418	0.811
5333	54.05	556.72	19.852	0.475	0.878	429	267.31	122.15	19.877	1.476	0.830
978	82.44	209.76	19.854	0.084	0.895	3826	233.33	428.33	19.877	0.361	0.933
1884	174.49	301.97	19.855	1.069	0.847	4618	296.80	485.64	19.878	0.864	0.936
869	-167.34	195.69	19.855	0.322	0.840	725	-9.68	173.90	19.878	0.571	0.840
3132	224.04	386.77	19.856	0.681	0.900	5422	89.77	568.12	19.878	0.718	0.765
3655	-190.42	417.12	19.856	0.564	0.969	6238	98.64	750.41	19.879	0.937	0.743
6067	-113.95	688.40	19.857	1.042	0.940	6112	-39.39	700.59	19.880	0.511	0.945
6315	-230.90	785.27	19.858	0.582	0.910	5310	-142.31	553.88	19.880	0.033	0.747
5319	180.06	554.67	19.858	0.370	0.863	3755	-189.21	423.93	19.880	0.726	0.863
3371	285.04	400.44	19.858	0.657	0.933	3732	-139.63	422.74	19.880	0.712	0.877
3639	116.14	416.27	19.858	0.233	1.122	5474	42.05	576.14	19.881	0.358	0.905
450	66.13	128.76	19.859	0.830	0.896	201	296.19	70.55	19.881	0.329	0.920
4205	-63.35	453.70	19.860	1.250	0.907	1255	139.85	242.29	19.882	0.350	0.788
6003	30.94	674.17	19.860	1.004	0.898	3699	135.04	420.14	19.882	0.523	1.082
5123	172.50	531.70	19.861	0.405	0.650	431	-110.33	122.25	19.882	1.943	0.935
5495	12.78	578.72	19.861	0.625	0.955	5573	180.22	589.58	19.882	0.754	0.947
5860	-212.67	640.09	19.862	1.151	0.913	109	82.59	45.76	19.882	0.550	0.830
6192	23.83	729.14	19.862	0.307	0.920	5805	-95.69	630.22	19.882	0.522	1.175
6223	-97.15	742.58	19.862	0.822	1.047	39	-161.17	17.80	19.882	0.757	0.948
5015	-82.72	521.47	19.863	0.284	0.897	3778	272.87	425.59	19.882	0.737	0.813
454	61.24	129.31	19.865	0.046	0.916	6252	-116.39	755.32	19.883	0.513	0.978
3977	-140.40	438.72	19.865	0.124	0.880	1049	179.57	218.18	19.884	0.221	0.765
6374	-148.61	822.50	19.865	0.657	0.860	857	215.29	194.11	19.884	0.387	0.885
2947	-143.07	376.44	19.866	0.493	0.953	5648	-207.82	601.89	19.884	0.488	0.853
181	92.12	64.18	19.867	0.891	0.930	2205	-151.56	326.49	19.885	0.277	0.853
5647	169.38	601.78	19.868	0.367	0.853	6071	61.68	689.08	19.885	2.608	0.827
1408	204.43	258.90	19.868	0.324	0.893	5396	-103.99	564.67	19.885	0.395	0.733
681	-224.33	165.59	19.868	0.550	0.990	5435	246.13	569.67	19.885	1.593	0.873
5912	159.35	650.09	19.868	0.279	0.905	342	160.87	103.69	19.886	0.625	0.973
5683	225.51	606.59	19.868	1.282	0.928	6011	47.74	675.54	19.887	0.813	0.917
6299	246.52	779.05	19.868	0.623	0.910	1889	90.47	302.27	19.888	0.032	0.995
5750	-130.94	619.03	19.869	0.383	0.963	3326	301.16	397.11	19.888	0.532	0.922
1505	233.20	269.03	19.870	0.664	0.803	5230	24.19	544.84	19.889	0.793	0.808
1767	-64.33	293.23	19.870	0.187	0.920	6293	131.11	776.24	19.889	0.774	0.833
2913	-115.08	374.17	19.870	-0.299	0.857	244	262.03	79.85	19.889	0.299	1.133
1601	191.93	277.91	19.870	0.416	0.820	1277	122.21	244.76	19.890	0.197	0.923
5882	-68.13	645.47	19.870	1.203	0.907	2717	-177.12	362.14	19.890	1.043	0.948
4654	-189.83	488.80	19.870	0.563	0.910	3930	-62.37	435.82	19.891	0.718	1.035

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
1535	117.85	271.79	19.892	0.327	0.917	2058	-142.44	314.58	19.917	0.614	0.783
1067	28.43	220.98	19.892	0.223	0.930	708	-179.06	171.12	19.917	0.074	0.930
782	265.73	182.59	19.892	0.428	0.733	3707	263.17	421.17	19.917	0.611	0.991
4968	138.58	516.22	19.893	0.387	0.850	6388	-9.63	827.72	19.918	1.263	0.853
5226	-92.38	544.31	19.894	1.374	0.843	2597	283.07	354.59	19.918	0.309	0.937
5789	152.56	627.68	19.894	0.362	0.790	6420	149.76	848.94	19.919	0.879	1.013
5134	56.28	532.99	19.894	0.277	0.865	272	-73.04	86.79	19.919	0.747	0.945
925	240.01	202.30	19.895	0.771	0.787	5361	116.74	560.53	19.919	0.450	0.898
610	74.04	154.97	19.896	0.715	0.900	2495	169.45	347.49	19.919	1.019	0.920
5562	138.34	588.15	19.896	0.710	0.965	2820	145.95	368.22	19.919	0.621	1.290
6101	-172.10	696.40	19.896	0.521	0.823	3944	176.66	436.63	19.920	0.576	0.970
2646	257.96	357.62	19.896	0.715	0.848	6327	203.75	795.95	19.920	0.616	0.803
1608	-215.35	278.68	19.897	0.028	0.887	382	66.45	112.84	19.920	0.584	0.990
666	270.07	163.33	19.897	0.928	0.898	5176	52.17	538.23	19.920	0.380	0.840
1988	-109.68	310.12	19.897	0.715	0.895	5120	-45.02	531.38	19.922	0.948	0.885
3304	-86.65	396.09	19.898	0.646	1.010	6271	192.21	764.38	19.924	0.512	0.917
6355	69.99	811.54	19.899	0.487	0.913	5402	21.70	565.13	19.924	0.993	0.983
5008	54.35	521.14	19.899	0.558	1.050	4147	247.10	449.92	19.924	0.458	0.888
821	262.44	188.33	19.899	0.479	0.800	4479	-160.38	473.80	19.924	0.306	0.939
860	50.12	194.50	19.900	0.397	0.844	2043	-122.40	313.95	19.925	0.039	0.850
5236	-130.66	545.29	19.900	0.305	0.827	734	277.73	175.00	19.925	0.233	0.827
2483	291.05	346.85	19.900	0.636	0.985	3272	-238.11	394.29	19.925	0.922	0.896
5237	-75.99	545.42	19.901	0.329	0.987	3167	276.52	388.67	19.925	-0.056	0.999
712	-73.46	171.94	19.901	0.002	0.895	5640	187.05	600.55	19.925	0.909	0.923
5162	108.58	536.75	19.901	1.122	0.810	5217	-156.61	543.62	19.926	0.851	0.687
5796	147.74	628.39	19.902	0.946	0.930	2628	230.51	356.93	19.927	0.653	0.900
945	35.91	205.22	19.902	0.397	0.885	6154	92.03	715.17	19.927	0.764	1.003
3926	238.40	435.20	19.903	0.619	0.884	1916	249.53	304.41	19.930	0.496	1.031
5155	-26.67	535.92	19.903	1.227	0.850	5883	-189.47	645.50	19.930	0.306	0.958
1097	32.12	224.40	19.903	0.224	0.943	369	-219.94	109.78	19.930	0.201	0.908
5821	-31.47	632.21	19.903	0.605	0.875	1174	-195.05	233.96	19.931	0.456	0.923
5644	166.30	601.12	19.904	0.336	0.920	1386	-175.69	256.23	19.931	0.646	0.830
923	-111.06	202.17	19.904	0.447	0.883	5457	0.58	573.58	19.931	1.103	0.942
4369	-164.92	466.70	19.905	0.585	0.898	4361	-126.20	466.35	19.932	0.070	1.035
4266	-202.83	458.59	19.905	0.458	0.896	3572	158.22	412.60	19.932	0.295	0.853
3690	201.48	419.72	19.905	0.644	0.886	341	170.34	103.63	19.933	0.408	0.990
183	11.51	64.30	19.906	0.903	0.997	5715	249.03	612.34	19.933	0.657	0.887
3924	166.07	435.09	19.906	0.314	1.120	4385	-74.84	467.55	19.933	0.319	0.910
6370	-138.24	819.02	19.906	0.613	0.860	5928	-61.30	653.27	19.933	0.936	0.860
5816	149.15	631.71	19.907	0.354	0.850	5287	54.67	550.98	19.934	0.425	0.940
2046	290.54	314.05	19.907	0.420	0.933	6025	-98.80	680.21	19.934	1.735	0.885
999	232.81	212.23	19.907	0.890	0.867	5000	110.40	520.31	19.935	0.324	0.873
5885	-47.02	645.91	19.907	0.447	0.950	5833	-166.63	634.73	19.937	1.108	0.863
1433	165.13	261.51	19.908	0.890	0.988	3973	246.30	438.37	19.937	0.526	0.966
20	70.86	10.01	19.908	0.745	0.828	5780	54.47	626.37	19.937	1.346	1.092
4186	-239.61	452.18	19.908	0.244	1.050	6087	29.51	692.57	19.937	0.928	0.847
5004	197.00	520.81	19.909	0.413	0.827	5872	-79.62	643.82	19.937	0.240	0.908
5486	107.44	576.95	19.909	0.324	0.933	88	-142.77	38.71	19.937	0.767	0.920
5645	148.11	601.17	19.910	0.081	0.858	2736	280.30	363.32	19.937	0.203	0.843
4901	26.28	510.13	19.910	0.703	1.037	841	-57.86	191.04	19.938	0.384	0.782
6052	13.31	685.31	19.910	0.828	0.906	1141	92.52	229.18	19.938	0.804	0.850
5786	-165.78	627.35	19.911	0.732	0.860	4547	42.82	481.07	19.938	0.904	1.326
4428	-56.56	470.63	19.911	0.394	0.998	780	183.97	182.46	19.939	0.126	0.967
4333	-76.68	464.28	19.911	0.688	1.010	169	-72.79	61.22	19.940	1.109	0.858
409	2.78	118.31	19.912	0.802	1.085	4383	-81.54	467.48	19.940	0.724	0.910
4106	-113.99	447.17	19.912	0.449	0.933	1699	221.33	286.34	19.940	0.472	0.905
1232	-79.83	240.43	19.912	0.564	0.840	6133	19.89	708.67	19.940	0.620	0.841
4027	215.94	442.15	19.913	0.712	0.865	507	-63.41	140.65	19.940	0.811	0.937
5338	-228.17	557.49	19.914	0.126	0.942	6022	-27.04	679.39	19.941	0.805	0.720
2257	-168.78	330.66	19.914	0.153	0.848	412	101.78	118.83	19.941	0.843	1.005

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
4374	-173.21	467.05	19.941	0.485	0.871	1692	114.75	286.00	19.965	1.122	1.010
4645	226.68	487.58	19.942	0.488	0.923	661	18.29	162.97	19.965	0.549	0.886
474	168.33	132.85	19.942	1.012	0.938	1126	300.81	227.69	19.965	0.110	0.938
3578	149.22	412.73	19.943	0.913	0.973	887	179.54	197.31	19.966	0.663	0.895
405	-77.17	117.29	19.943	0.802	0.808	3419	136.95	403.08	19.967	0.519	1.073
3465	-76.44	406.18	19.944	0.534	0.888	5689	-132.51	607.05	19.967	0.320	0.853
6353	-81.87	811.14	19.944	0.867	0.875	6387	-126.38	827.21	19.967	0.735	0.865
6410	47.95	841.24	19.944	0.341	0.955	6004	-22.04	674.33	19.968	1.058	0.915
689	117.82	166.42	19.944	1.052	1.013	1288	260.65	245.76	19.968	0.833	0.780
738	105.44	175.43	19.945	0.648	0.933	1669	226.61	284.34	19.969	0.741	0.870
4763	111.98	496.40	19.945	0.450	1.060	4769	284.27	497.30	19.969	0.652	0.907
221	98.35	74.20	19.946	0.224	0.958	1789	67.28	294.79	19.970	0.238	1.036
1399	237.21	257.64	19.946	1.092	0.907	1486	-135.03	267.70	19.970	0.194	0.817
4416	1.59	469.59	19.946	0.142	1.157	2511	120.35	348.30	19.970	-0.021	1.725
982	79.79	210.73	19.948	0.390	0.897	5690	117.88	607.64	19.970	0.789	0.693
5191	128.59	540.00	19.948	0.660	0.808	3641	-166.20	416.60	19.971	0.854	0.913
6390	-20.01	829.84	19.948	0.482	0.930	2811	-130.55	367.83	19.971	0.775	0.947
4606	196.33	485.06	19.949	0.895	0.888	5759	249.61	621.32	19.973	1.135	0.923
6361	-82.88	814.52	19.950	0.307	0.838	1768	166.28	293.23	19.973	1.059	0.780
1859	85.72	300.25	19.950	0.687	0.880	1550	119.90	273.50	19.974	1.428	0.915
4037	-91.19	442.65	19.951	0.513	0.900	5444	-32.33	571.04	19.974	-0.211	0.887
5982	-1.52	669.15	19.951	0.625	0.837	2693	250.75	360.62	19.975	0.893	0.955
4816	-94.77	501.93	19.951	0.530	0.896	5229	-2.75	544.77	19.975	0.300	1.050
4144	-168.23	449.63	19.951	0.181	0.871	5863	180.09	640.72	19.976	0.285	0.837
5102	-58.82	529.92	19.951	0.557	0.803	859	71.40	194.49	19.977	0.456	0.925
441	12.66	125.82	19.951	0.469	1.030	4812	-205.13	501.54	19.978	0.707	0.913
961	156.09	207.24	19.952	1.063	0.890	5242	-77.82	545.63	19.978	1.208	0.973
1407	58.82	258.66	19.952	0.323	0.948	1585	-242.38	276.62	19.978	0.326	1.065
3079	199.68	384.18	19.953	0.344	0.924	6246	-203.83	752.31	19.978	0.379	0.833
652	73.09	161.38	19.953	0.157	0.990	5013	-122.91	521.26	19.979	0.134	0.890
6358	-127.78	812.09	19.953	0.667	0.858	4496	191.88	475.54	19.979	0.616	0.896
5661	265.27	603.70	19.954	0.899	0.870	6062	-84.76	686.66	19.979	0.355	0.860
670	295.40	163.82	19.954	0.718	0.970	5897	-118.51	647.31	19.980	0.659	0.800
2838	-228.61	369.31	19.954	0.890	0.914	622	-175.25	156.75	19.980	0.233	0.963
3549	-167.02	411.04	19.954	-0.369	0.908	2005	-140.76	310.90	19.980	0.690	0.823
5054	135.97	511.93	19.955	0.280	0.855	4072	267.02	444.84	19.981	0.461	1.009
865	206.68	194.85	19.955	0.518	0.950	4321	70.84	462.81	19.981	0.748	1.168
5691	-182.55	608.02	19.955	1.626	0.930	1345	287.37	251.73	19.982	0.415	1.115
5999	-139.09	673.83	19.956	0.522	0.878	4500	173.21	475.91	19.982	0.378	0.907
1511	2.11	269.35	19.957	0.137	1.070	4646	-2.02	487.69	19.982	0.090	1.072
5290	-125.53	551.21	19.957	0.858	0.933	4990	-213.39	518.69	19.982	0.755	0.975
4492	-203.41	474.82	19.958	0.309	0.963	58	27.05	26.03	19.982	1.079	0.932
6357	-55.52	811.82	19.958	0.612	0.893	808	268.77	185.63	19.983	1.205	0.723
837	39.75	190.12	19.958	0.738	0.885	5005	80.90	520.81	19.983	0.521	1.013
3231	-104.04	391.96	19.958	0.001	1.093	87	268.77	38.25	19.984	0.734	0.983
4803	196.04	500.73	19.959	0.452	0.981	4725	191.05	493.74	19.984	0.676	0.908
4742	-177.30	495.04	19.959	1.083	0.965	6184	-221.56	724.87	19.984	0.263	1.117
484	-55.32	134.75	19.959	0.514	0.745	1254	-127.29	242.25	19.984	0.284	0.900
890	-119.57	197.86	19.960	0.533	0.880	5752	42.68	619.48	19.985	0.724	0.942
4889	195.55	508.11	19.961	0.020	0.910	394	243.90	115.22	19.986	0.508	1.133
224	-196.68	75.07	19.961	1.036	0.838	6263	179.13	761.36	19.987	0.838	0.837
1031	-8.00	215.96	19.961	0.440	0.885	6322	-164.50	791.48	19.987	0.578	0.940
6016	-14.74	678.03	19.962	0.953	0.960	5212	-28.79	542.84	19.987	0.640	0.965
4958	45.24	515.62	19.963	0.473	0.924	294	149.07	91.69	19.988	1.264	1.050
823	183.78	188.70	19.963	0.213	0.807	3927	-214.91	435.28	19.988	0.913	1.010
1	-105.68	-2.95	19.963	-0.237	0.930	5636	22.61	600.51	19.988	0.193	0.876
6002	199.60	674.16	19.964	0.394	0.875	5248	-39.89	545.97	19.988	1.857	0.830
5106	276.27	530.11	19.965	0.733	0.860	607	184.79	154.56	19.989	0.929	0.853
6098	-73.62	695.49	19.965	0.489	0.848	565	-95.84	148.82	19.990	1.128	1.028
1514	-201.86	269.75	19.965	1.156	0.950	3435	-204.40	403.95	19.990	0.835	0.902

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
6364	164.07	817.10	19.990	1.454	0.990	1972	100.60	308.83	20.016	1.061	1.063
483	87.53	134.52	19.990	0.610	0.838	5626	78.56	597.97	20.017	0.158	0.867
5199	-123.36	541.00	19.991	0.402	1.177	5917	-188.12	650.32	20.017	0.535	0.830
1244	113.42	241.30	19.991	0.956	1.090	6091	-82.28	693.33	20.018	0.655	0.975
33	281.01	16.87	19.992	0.341	0.827	2821	274.44	368.23	20.018	0.544	0.985
3479	170.84	406.97	19.992	0.743	1.024	4658	185.80	489.04	20.018	0.229	0.776
6060	-146.43	686.06	19.992	0.609	0.903	5779	156.32	625.78	20.019	0.828	0.767
6416	-164.92	845.48	19.994	0.703	0.640	732	142.37	174.48	20.019	0.820	1.013
5409	30.87	565.61	19.994	0.337	0.928	1041	284.46	217.06	20.020	0.860	0.830
3405	148.17	402.02	19.994	0.617	1.043	1751	-177.01	291.26	20.020	0.744	0.975
527	279.80	142.62	19.995	0.918	0.870	5615	124.77	536.44	20.021	0.733	0.920
6033	-46.64	682.14	19.996	0.549	0.778	114	-171.35	46.35	20.021	0.572	0.950
5837	-95.19	634.92	19.996	0.599	0.927	927	-24.30	202.51	20.022	0.436	0.832
4846	12.67	504.88	19.996	0.542	1.030	3995	262.85	439.79	20.023	0.320	1.029
4002	277.77	440.29	19.998	0.526	0.978	2115	-22.59	318.63	20.023	0.691	1.055
5668	-136.36	604.87	19.998	0.637	0.832	326	46.21	99.81	20.023	0.477	0.930
4674	166.83	490.19	19.998	0.310	0.940	368	-64.11	109.70	20.024	0.611	1.040
973	310.27	208.87	19.998	0.541	0.730	2103	273.99	317.40	20.024	1.018	0.853
5988	-32.79	671.44	19.999	1.113	0.975	3039	-40.84	381.64	20.024	0.544	1.000
1664	-101.68	283.81	20.000	0.225	0.778	4760	123.82	496.11	20.024	0.427	0.904
69	39.96	30.53	20.000	0.704	0.983	1611	124.22	278.76	20.025	0.549	0.890
4231	128.71	456.30	20.000	0.563	0.942	1914	141.92	304.19	20.025	0.446	0.845
843	-65.27	191.38	20.001	0.402	0.832	1695	86.56	286.10	20.026	0.470	1.090
842	-132.65	191.21	20.001	0.079	0.955	1674	261.89	284.77	20.026	0.835	0.873
1872	182.36	300.84	20.001	0.582	0.900	6040	120.07	682.78	20.026	0.593	0.827
4465	-214.43	472.93	20.001	0.494	0.911	5315	-116.81	554.09	20.027	0.878	1.030
2688	149.20	360.53	20.003	0.421	1.148	5770	-56.34	624.77	20.027	1.133	0.790
633	24.54	158.12	20.003	0.487	0.901	6352	142.84	809.48	20.027	0.881	1.020
2251	186.30	330.34	20.003	0.225	0.930	3890	-202.43	432.53	20.028	1.110	0.889
4508	-116.85	477.04	20.004	0.355	0.893	3102	-239.29	385.51	20.028	0.662	0.982
5479	3.82	576.29	20.004	0.390	1.064	6035	-74.56	682.45	20.028	0.478	1.072
6313	-7.75	784.23	20.004	0.515	0.853	90	-156.06	39.73	20.028	0.946	0.803
6243	96.25	752.06	20.004	0.516	0.817	883	-208.44	197.02	20.029	0.598	0.837
2771	-208.38	365.39	20.004	0.742	0.840	52	-79.04	22.32	20.030	0.230	0.805
28	45.93	13.10	20.005	0.352	0.857	810	57.12	186.09	20.030	0.586	0.854
4327	-68.00	463.56	20.007	0.157	0.870	706	29.25	170.91	20.030	0.629	0.847
1414	207.88	259.77	20.007	0.511	0.935	741	84.73	175.66	20.031	0.442	0.853
754	210.60	177.97	20.008	0.715	0.905	5838	-85.30	634.97	20.031	0.346	0.827
1257	-217.00	242.39	20.008	0.151	0.827	4800	-141.12	500.60	20.033	1.127	1.074
6042	-112.38	683.65	20.009	0.109	0.853	5980	168.44	668.80	20.033	0.242	0.780
974	274.18	209.01	20.009	0.418	0.747	1044	-170.52	217.52	20.033	0.990	0.965
5245	104.00	545.83	20.010	0.893	0.955	3404	-183.65	402.01	20.034	0.538	0.954
716	126.68	172.15	20.010	0.476	0.793	1274	214.62	244.47	20.034	0.943	0.803
2530	-181.51	349.92	20.011	0.490	0.930	5572	44.69	589.44	20.034	0.913	0.857
6021	-181.00	678.76	20.011	0.629	0.865	3912	-142.75	434.26	20.035	0.506	0.973
5193	-136.30	540.06	20.011	0.140	0.903	5280	-41.27	549.62	20.035	0.632	0.940
6305	192.47	781.27	20.012	0.507	0.880	4844	-22.11	504.53	20.035	0.463	1.070
3618	-177.61	415.05	20.012	1.128	0.875	873	119.96	196.12	20.036	0.550	0.905
5542	198.14	585.94	20.013	0.334	0.863	3967	291.02	438.04	20.037	0.386	0.900
2727	155.57	362.71	20.013	-0.013	0.881	22	295.94	10.53	20.037	-0.095	0.870
4417	132.51	469.71	20.013	0.268	0.996	5983	-41.34	669.18	20.038	0.453	0.800
4877	135.83	507.12	20.014	0.687	1.350	6419	-89.14	848.51	20.038	0.204	0.942
5768	128.21	623.88	20.014	0.301	0.875	422	288.19	120.06	20.039	0.335	0.868
3784	-153.16	425.75	20.014	0.729	0.990	5738	-85.74	616.68	20.039	0.562	0.793
446	114.79	127.52	20.015	0.585	0.897	5062	74.97	525.66	20.039	0.081	1.060
5534	-38.39	584.46	20.015	1.069	0.770	6400	159.16	835.39	20.039	0.931	1.170
4099	-218.43	446.64	20.015	0.723	0.894	1063	178.07	220.44	20.039	0.880	0.770
4	-3.95	-1.41	20.015	0.322	0.913	5931	-162.72	654.50	20.039	0.216	0.910
1122	194.92	227.39	20.016	0.394	0.958	862	174.09	194.64	20.039	0.507	0.790
2099	170.69	317.08	20.016	0.312	1.053	285	270.71	90.02	20.041	0.110	0.957

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
629	68.92	157.36	20.041	0.179	0.923	5452	-120.59	572.20	20.067	0.538	1.120
6308	-98.79	782.51	20.042	0.637	0.950	751	164.37	177.39	20.068	0.824	0.913
515	-116.19	141.23	20.042	0.530	0.763	755	127.78	178.17	20.068	0.649	0.877
1039	104.52	216.74	20.042	0.618	1.095	5550	228.08	586.90	20.068	0.413	0.735
6267	-90.21	763.46	20.042	1.073	1.108	5859	230.48	640.02	20.068	1.109	0.895
6318	117.98	787.77	20.042	0.933	0.943	916	74.03	201.48	20.069	0.418	0.875
3168	287.42	388.81	20.042	0.709	1.030	1960	260.55	308.28	20.069	0.350	0.943
4600	148.85	484.77	20.043	0.595	0.921	5441	287.13	576.67	20.070	1.163	0.790
390	138.90	114.95	20.043	0.278	0.780	5625	90.77	597.96	20.072	0.354	0.760
1361	182.22	253.09	20.045	0.199	0.975	5537	-150.91	585.09	20.072	0.697	0.893
184	-34.49	65.31	20.045	0.143	0.873	5795	-128.29	628.16	20.072	0.700	0.873
6202	106.76	733.66	20.045	0.229	0.970	6298	-186.71	778.71	20.072	0.127	0.953
588	96.78	152.34	20.045	0.022	0.917	3077	293.87	384.14	20.073	0.592	0.879
662	182.32	163.01	20.046	1.176	0.903	5867	-141.75	641.41	20.073	0.655	0.887
5888	174.52	646.05	20.046	1.104	0.925	4657	-206.22	488.93	20.074	0.873	0.987
6158	152.56	716.72	20.048	0.804	1.035	498	-30.41	138.67	20.075	0.620	0.960
4524	-169.23	478.49	20.048	0.453	0.933	4353	124.18	465.81	20.075	0.556	0.938
33	-4.55	50.99	20.048	0.688	1.023	4886	27.77	507.73	20.076	0.451	1.220
529	209.33	380.90	20.049	0.510	0.932	902	243.31	199.04	20.076	0.631	0.870
827	-30.21	189.07	20.049	0.652	0.870	2277	-196.22	332.08	20.077	0.294	0.870
5471	81.44	575.72	20.049	0.210	0.920	5660	13.11	603.68	20.077	0.356	0.886
5971	8.09	666.62	20.050	0.488	0.920	6311	214.41	783.74	20.077	0.448	1.030
1185	161.01	235.29	20.050	0.706	0.925	5275	197.40	548.81	20.077	0.747	0.960
886	52.12	197.29	20.051	0.427	0.864	2837	282.60	369.29	20.078	0.368	0.969
5091	147.02	529.00	20.051	0.297	1.020	5491	-35.84	577.97	20.078	-0.009	0.820
1416	-86.19	259.78	20.051	0.718	0.915	772	288.32	180.57	20.078	0.651	0.825
2642	241.15	357.45	20.051	-0.126	1.007	3688	-115.72	419.61	20.078	0.659	0.915
6379	20.67	823.51	20.051	1.005	0.924	1821	154.81	297.31	20.079	0.660	0.885
3611	-157.94	414.75	20.051	0.607	0.918	5606	-93.57	595.13	20.079	4.862	1.103
4191	-18.01	452.50	20.052	0.438	1.158	2055	263.17	314.48	20.080	0.287	0.948
5240	84.78	545.53	20.053	0.719	0.783	1017	84.59	214.14	20.081	0.032	1.110
6015	-67.92	677.95	20.054	0.034	1.033	6118	-62.45	701.80	20.081	-0.170	0.910
1495	217.11	268.46	20.055	1.493	0.943	5477	52.89	576.16	20.082	0.269	1.061
5531	-172.72	554.03	20.056	0.624	0.960	5449	83.72	571.91	20.083	0.564	0.832
6375	162.43	822.85	20.057	0.710	0.893	5916	-7.28	650.30	20.083	0.141	0.810
2340	215.26	336.50	20.058	0.431	1.033	5952	-2.71	661.73	20.083	0.568	0.780
5234	59.93	545.07	20.058	0.419	0.841	3401	-83.36	401.93	20.084	0.724	1.060
4919	201.06	511.30	20.058	0.978	0.833	6241	118.98	751.78	20.085	1.179	0.787
1849	-83.97	299.29	20.059	0.341	0.870	571	-164.57	149.44	20.085	-0.038	0.887
801	-100.22	184.77	20.059	0.516	0.807	4553	281.94	481.29	20.085	0.599	0.838
802	135.34	184.82	20.059	0.570	0.767	4441	-36.17	471.62	20.085	0.406	0.980
2485	-107.62	346.97	20.060	0.483	1.043	324	101.98	99.46	20.086	0.124	0.838
5712	-146.98	611.97	20.060	0.202	1.033	3527	-238.81	409.66	20.086	0.305	0.954
5055	133.08	525.23	20.060	0.415	0.873	5153	-70.63	535.37	20.086	0.726	1.007
5335	-23.93	557.12	20.060	0.631	0.830	5313	-153.15	553.94	20.086	0.107	0.863
3703	208.88	420.92	20.060	0.983	0.996	6275	51.10	767.02	20.087	0.955	0.915
62	-59.86	27.59	20.061	0.529	0.970	4801	172.75	500.61	20.087	0.416	0.977
5502	-200.67	579.53	20.061	0.468	0.775	6196	-76.04	730.96	20.087	0.004	0.840
3313	-172.57	396.48	20.062	0.984	0.930	863	263.64	194.72	20.087	0.531	0.873
5309	-146.92	553.85	20.062	0.673	0.740	2498	-152.05	347.74	20.088	0.340	0.908
5262	205.33	547.92	20.063	0.967	0.793	1648	-177.25	261.87	20.088	0.544	0.820
5939	300.99	657.17	20.063	1.288	0.978	311	-9.38	95.97	20.088	0.193	0.838
106	-188.71	44.98	20.063	0.609	0.928	197	136.56	68.73	20.089	0.423	0.823
1757	220.25	292.02	20.063	0.822	0.918	1700	-215.56	286.35	20.090	1.697	0.865
992	37.55	211.56	20.064	0.937	0.860	3	-41.77	-1.51	20.090	-0.030	0.847
6000	72.51	674.03	20.064	0.261	1.006	6072	30.36	689.27	20.090	0.399	0.863
5416	146.85	566.71	20.064	0.461	0.965	4941	169.31	513.28	20.094	1.060	0.978
1720	186.21	286.42	20.064	0.327	0.983	6137	-49.86	709.44	20.095	1.147	0.877
4268	216.36	458.74	20.066	-0.022	0.932	797	154.01	184.06	20.095	0.345	0.880
5185	235.44	538.92	20.066	0.482	0.900	5250	-120.28	546.07	20.095	0.253	0.980

ID	X	Y	V	B - V	$\bar{X}$	ID	X	Y	V	B - V	$\bar{X}$
302	-133.93	94.00	20.095	0.827	0.943	4878	-13.17	507.13	20.120	0.519	0.93E
3936	244.46	436.01	20.096	0.381	0.950	6328	66.56	796.07	20.120	0.305	0.948
1182	168.42	235.08	20.096	0.656	0.825	5183	101.89	538.76	20.120	1.059	0.903
3445	-223.41	404.74	20.096	0.603	0.988	6269	-103.34	763.92	20.121	0.869	0.915
3513	-124.52	408.40	20.097	0.607	0.898	2759	241.00	384.53	20.121	0.926	0.947
43	-131.39	19.19	20.098	0.738	0.920	5009	-3.28	521.14	20.122	0.902	1.118
2974	-165.01	377.70	20.098	0.651	0.963	230	35.78	76.96	20.122	0.547	0.964
2577	-164.77	353.20	20.099	0.518	0.879	548	170.49	146.16	20.123	0.510	0.915
5352	-8.94	559.00	20.100	0.828	0.897	514	26.12	141.16	20.123	0.395	0.811
853	-79.31	193.47	20.100	0.381	0.907	255	295.19	81.89	20.124	0.024	0.887
5945	90.61	659.16	20.100	0.569	0.910	615	176.47	155.53	20.124	0.319	0.840
1384	122.78	255.96	20.100	1.166	0.860	3477	168.60	406.63	20.124	-0.047	0.965
89	95.55	39.21	20.101	0.705	0.937	4293	195.18	461.01	20.125	0.326	0.856
1741	164.79	290.06	20.101	0.325	0.845	5397	115.76	564.71	20.125	0.967	0.940
6128	53.19	705.41	20.101	0.464	1.016	3892	241.47	432.60	20.125	0.574	0.906
5372	171.96	561.53	20.102	1.039	0.765	5772	-51.97	625.17	20.125	-0.339	0.777
6344	47.67	804.86	20.102	0.529	0.893	764	114.52	179.15	20.126	0.215	1.043
3342	-160.80	410.72	20.103	-0.309	0.803	5947	48.63	659.82	20.126	0.535	0.868
5078	-124.63	528.05	20.103	0.351	0.997	5751	-51.93	619.06	20.126	0.266	0.980
3500	-97.02	407.73	20.105	0.710	0.855	573	-1C.47	149.65	20.129	0.065	0.883
2248	199.96	329.80	20.105	0.912	0.763	876	64.83	196.52	20.129	0.502	1.045
4196	-127.52	453.17	20.105	0.494	0.940	5347	128.79	558.53	20.130	0.588	0.873
1598	171.36	277.77	20.105	0.028	0.797	6350	198.52	807.81	20.130	0.543	0.833
2777	264.60	365.85	20.106	0.638	0.981	279	-51.36	88.70	20.130	0.343	0.967
6360	64.91	812.55	20.106	0.485	0.838	5600	161.67	594.55	20.130	-0.011	0.910
626	199.62	157.08	20.106	0.933	0.880	4788	155.51	499.59	20.130	0.601	0.987
4818	-167.33	502.40	20.107	0.642	1.020	3415	-143.65	402.85	20.130	0.611	0.952
5989	113.39	671.84	20.107	0.115	0.980	167	-127.08	60.59	20.130	0.960	0.930
2455	222.70	344.83	20.107	1.024	1.147	5878	-37.95	644.58	20.131	0.479	1.065
1167	166.14	232.69	20.108	0.403	0.863	4376	-122.82	467.13	20.131	0.416	0.932
6074	232.69	689.46	20.108	0.373	0.997	1279	54.02	245.26	20.131	1.217	0.985
4984	101.73	518.17	20.108	1.092	0.935	5720	64.50	613.38	20.131	0.806	0.870
840	-124.00	190.98	20.109	1.478	0.890	4970	191.36	516.54	20.132	0.743	0.948
578	-125.22	150.46	20.109	0.374	0.840	5972	-168.78	666.62	20.132	1.238	0.815
4793	-125.16	499.94	20.109	0.273	1.057	366	46.67	109.47	20.132	0.850	0.885
3705	-59.69	421.14	20.110	0.416	1.110	141	-57.98	53.81	20.133	0.502	0.907
5757	231.40	620.72	20.110	0.729	0.828	4306	165.22	461.74	20.133	0.312	0.959
100	197.99	43.84	20.111	0.498	0.893	745	32.25	176.14	20.133	0.827	0.945
6240	-30.74	751.67	20.111	0.780	0.885	4455	229.30	472.35	20.133	-0.222	0.871
5277	-4.92	548.91	20.111	0.539	0.930	6274	87.75	766.40	20.134	0.574	0.873
175	7.62	62.24	20.112	0.524	0.934	3173	231.91	389.13	20.135	0.642	0.925
948	25.39	205.61	20.112	0.013	1.068	4729	55.55	494.38	20.135	0.666	1.168
3486	216.67	407.19	20.112	1.072	1.150	5325	18.81	555.60	20.136	0.304	1.073
638	-14.86	159.47	20.112	0.959	0.940	4561	-113.55	481.77	20.136	0.154	1.015
4934	55.64	512.43	20.112	0.412	0.859	2430	228.18	342.86	20.137	0.455	1.007
1016	-46.96	213.89	20.113	0.098	0.920	5776	-159.61	625.43	20.138	0.688	0.930
5267	-173.80	548.34	20.114	0.734	0.920	6019	196.00	678.65	20.138	0.468	0.800
1627	107.07	279.77	20.114	0.649	0.978	3773	172.35	425.18	20.140	0.445	1.205
472	-100.26	132.65	20.115	0.009	1.023	5088	-121.55	528.85	20.140	-0.252	0.890
4259	192.96	457.87	20.115	0.684	0.836	5695	164.35	608.25	20.141	0.751	0.823
5654	-45.32	602.70	20.116	0.758	0.893	5306	265.48	553.68	20.143	0.179	0.777
1698	241.28	286.29	20.116	0.169	1.322	355	-9.07	107.59	20.143	0.840	0.913
1481	198.06	267.15	20.116	1.060	0.823	210	101.15	71.43	20.143	0.223	0.870
6247	-37.51	752.67	20.116	0.561	0.848	389	13.34	114.80	20.145	0.411	0.898
2667	-197.56	358.70	20.117	0.179	0.808	6332	103.45	798.60	20.145	0.484	0.850
5623	-0.65	597.63	20.117	0.862	0.860	1144	84.48	229.32	20.145	0.318	0.973
3998	-95.79	439.99	20.118	0.996	1.127	426	76.94	121.44	20.146	0.638	0.933
3265	-219.67	393.81	20.119	0.577	1.010	1149	248.98	229.44	20.148	0.135	1.070
						6282	-217.30	769.92	20.148	0.124	0.822
						3354	308.71	399.29	20.151	0.938	0.923

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
5360	-113.86	560.35	20.151	0.458	0.850	6383	131.72	825.63	20.190	0.186	0.597
6014	83.86	677.61	20.152	0.384	0.850	692	-60.97	167.20	20.191	0.143	0.850
5659	127.39	603.38	20.152	1.048	0.917	4822	190.16	502.66	20.191	0.119	0.870
5569	-161.58	588.99	20.152	0.210	0.783	1364	-125.29	253.60	20.192	0.430	0.940
5862	-0.63	640.68	20.153	0.188	0.955	1022	205.60	214.88	20.192	0.674	0.897
743	129.79	175.80	20.153	0.788	0.837	6020	-142.36	678.65	20.194	0.772	0.920
5142	37.18	534.03	20.154	0.212	0.952	1405	-94.25	258.28	20.195	0.989	1.330
5437	66.57	569.71	20.154	0.853	0.900	143	-217.17	53.93	20.195	1.026	0.740
5364	253.45	560.64	20.155	0.132	0.837	3018	-160.37	380.09	20.195	0.520	0.990
3595	-108.88	413.94	20.156	0.317	1.128	5910	-220.78	649.94	20.195	0.290	0.788
1024	-106.12	214.98	20.156	0.523	0.970	3408	234.28	402.10	20.196	0.576	0.948
680	243.56	165.51	20.156	0.856	0.800	729	-155.47	174.36	20.196	0.360	0.942
3691	114.89	419.75	20.158	0.302	1.335	3439	253.61	404.25	20.197	0.208	0.956
6018	128.38	678.47	20.159	1.095	0.943	435	-90.19	124.58	20.197	0.457	0.965
3193	194.67	390.08	20.160	0.252	0.822	191	308.56	66.07	20.197	0.574	0.913
5189	111.19	539.52	20.160	0.631	0.910	6070	286.10	688.83	20.197	0.696	0.853
5927	191.30	653.12	20.161	0.850	0.892	1668	109.98	284.33	20.199	0.778	0.837
5428	190.54	568.80	20.163	0.386	1.077	5617	8.02	596.49	20.199	0.462	1.002
993	58.29	211.53	20.164	0.716	1.001	4738	168.61	494.81	20.199	0.805	0.957
1491	212.91	267.96	20.165	0.715	0.900	5765	14.53	622.44	20.199	0.623	1.065
127	217.29	48.98	20.165	0.398	0.807	600	-33.88	153.54	20.200	0.107	0.847
1791	253.13	295.15	20.166	1.627	0.905	365	-174.13	109.35	20.200	0.683	0.918
4997	-74.17	519.89	20.166	0.449	0.925	2721	141.94	362.24	20.201	0.664	1.070
5404	196.22	565.21	20.167	-0.014	1.033	3347	-127.41	398.61	20.201	1.492	1.003
564	-69.84	148.61	20.167	0.146	0.923	4431	-161.98	470.83	20.201	0.398	0.870
1062	34.73	220.41	20.167	0.805	0.980	6397	-157.09	832.35	20.202	0.885	0.880
6193	14.18	729.21	20.167	-0.926	0.860	2077	-184.04	315.72	20.203	0.562	0.915
5616	-144.94	596.47	20.168	0.220	0.873	5466	-147.01	575.19	20.203	-0.002	0.817
5704	127.39	610.32	20.168	0.382	0.815	4641	17.05	487.34	20.205	1.166	1.173
791	-174.78	183.55	20.168	0.077	0.783	3014	-209.85	379.85	20.205	-0.041	0.940
669	-11.73	163.74	20.171	0.478	0.935	6401	-119.68	835.43	20.205	0.793	0.888
4381	287.44	467.33	20.172	0.872	0.973	2263	-150.43	330.90	20.208	0.054	0.910
6427	179.41	851.16	20.172	1.725	0.865	306	107.20	94.30	20.209	0.916	0.823
51	-203.46	21.12	20.173	0.517	0.828	983	285.46	210.79	20.209	0.606	0.910
620	57.20	156.27	20.173	0.630	1.052	3043	-171.35	381.84	20.210	0.766	0.823
5807	16.81	630.48	20.174	1.789	1.067	4755	-185.53	495.85	20.211	0.885	0.953
5842	-126.81	635.74	20.175	0.672	0.835	5802	-202.44	629.92	20.211	0.515	0.980
5104	-62.92	530.04	20.176	0.537	0.885	2730	284.60	362.88	20.212	0.509	0.866
5788	254.01	627.67	20.176	0.261	0.793	2945	312.19	376.29	20.213	0.679	0.888
1785	223.33	294.49	20.177	0.510	0.913	551	-206.39	146.35	20.213	0.683	0.890
23	116.83	10.92	20.177	1.164	0.808	1250	65.95	241.79	20.214	-0.183	0.933
746	274.68	176.25	20.177	0.615	0.870	6013	3.53	676.95	20.214	0.053	0.960
4357	72.86	466.04	20.177	0.758	1.110	2241	192.74	329.34	20.214	0.703	0.730
5920	-147.38	651.22	20.178	0.660	0.957	6312	209.77	784.02	20.217	1.267	1.020
619	-218.74	155.94	20.178	0.498	0.870	6188	151.49	725.58	20.217	1.156	0.895
5624	137.36	597.84	20.179	0.301	0.790	575	-202.91	149.67	20.218	0.373	0.858
1477	35.35	266.59	20.179	0.613	1.080	4497	223.44	475.71	20.218	0.305	0.953
253	137.17	81.14	20.182	0.897	1.060	381	-52.60	112.68	20.218	0.270	0.983
4040	-241.85	442.89	20.182	0.303	1.082	2615	-160.66	356.10	20.218	-0.059	0.830
6291	32.39	775.28	20.183	1.294	0.933	5304	3.01	553.15	20.219	-0.039	0.894
536	-203.47	144.10	20.185	0.114	0.908	4118	157.76	448.02	20.219	0.654	1.010
6381	116.22	824.19	20.185	0.490	0.875	822	12.37	188.49	20.220	0.663	0.855
4329	207.72	463.98	20.185	0.658	1.081	5901	60.83	648.30	20.221	0.552	0.983
3395	-176.72	401.53	20.185	0.564	0.940	1992	254.67	310.34	20.221	0.734	0.888
1498	221.70	268.68	20.185	0.757	0.990	6189	-0.09	726.31	20.222	0.442	0.978
5148	282.76	534.67	20.186	1.009	0.900	173	-155.75	61.91	20.222	0.448	0.868
5536	-185.06	584.86	20.186	0.295	0.940	6319	-182.85	789.76	20.223	0.026	1.053
798	276.49	184.16	20.188	0.746	0.840	268	-182.06	86.17	20.224	0.081	0.973
655	-205.93	161.97	20.189	1.083	0.920	1243	233.63	241.28	20.224	1.101	0.870
3160	-131.34	388.25	20.190	-0.176	0.913	2053	307.65	314.25	20.224	0.343	0.893

ID	X	Y	V	B-V	$\bar{\chi}$	ID	X	Y	V	B-V	$\bar{\chi}$
1003	170.78	212.55	20.225	1.610	0.953	2159	-120.98	322.87	20.255	0.284	0.955
2928	274.09	375.42	20.225	0.332	0.930	506	5.51	140.43	20.255	0.523	0.978
5954	-230.11	661.84	20.225	0.078	0.935	5494	-143.79	578.72	20.256	0.064	0.810
4390	240.96	467.98	20.226	0.667	0.907	678	260.38	165.05	20.257	0.456	0.892
66	-95.61	29.60	20.227	0.641	0.877	5549	27.57	586.59	20.258	0.509	0.868
770	-44.95	179.97	20.228	0.312	0.935	5876	-26.36	644.26	20.258	0.555	1.015
2271	283.44	331.51	20.229	0.394	1.007	5084	-39.99	528.59	20.259	0.754	0.753
5320	259.75	554.71	20.229	0.494	0.867	771	38.64	180.54	20.259	1.062	1.015
99	245.20	43.76	20.230	0.708	1.007	4753	287.28	495.65	20.259	0.650	0.943
5959	100.34	663.94	20.230	0.191	0.877	4257	-105.27	457.71	20.260	0.682	0.887
4904	-144.42	510.19	20.231	0.736	0.940	164	125.29	59.03	20.261	1.018	0.970
5190	173.79	539.93	20.231	0.267	0.945	707	128.85	171.02	20.262	-0.031	0.822
4642	-130.20	487.48	20.231	0.263	1.002	5414	-147.24	566.26	20.262	0.686	0.800
1538	-44.19	272.38	20.232	0.243	1.043	1458	227.29	264.08	20.263	1.045	0.757
5948	-141.50	659.87	20.232	0.667	0.985	1164	28.67	232.13	20.263	0.370	0.991
3590	190.93	413.50	20.235	0.760	0.847	4399	-37.95	468.69	20.264	0.627	0.958
291	-148.16	91.41	20.236	1.131	0.885	1101	23.71	224.76	20.264	0.339	1.051
320	20.27	98.05	20.236	1.025	0.800	351	234.36	106.58	20.265	0.854	0.850
4166	217.15	451.33	20.236	0.497	0.875	5969	-15.43	666.51	20.265	0.662	0.883
762	196.83	178.78	20.237	0.449	0.855	4711	295.08	492.79	20.267	0.526	0.867
5184	-35.74	538.85	20.238	0.503	1.070	313	135.27	96.51	20.269	0.709	0.815
6395	64.19	831.97	20.239	0.593	0.920	817	185.98	187.87	20.269	0.754	0.780
1565	285.21	275.21	20.240	0.627	0.817	5685	199.91	606.81	20.269	0.351	0.885
621	-95.63	156.52	20.240	0.650	0.980	4095	148.71	446.43	20.269	-0.027	0.921
4356	182.39	466.01	20.240	0.701	0.863	5902	114.77	648.42	20.271	0.484	1.235
5037	-141.69	523.09	20.241	0.183	0.865	6111	-168.73	700.33	20.271	0.403	0.890
2522	-113.49	248.72	20.241	0.541	0.890	1366	271.62	253.75	20.273	0.708	0.755
4544	307.01	480.91	20.242	0.831	0.803	1201	158.27	237.34	20.273	0.954	0.830
457	-122.36	129.66	20.242	0.896	0.765	5023	-63.35	522.12	20.273	0.302	0.830
5854	265.96	638.72	20.242	0.505	1.003	3803	298.66	427.11	20.274	0.404	1.268
1654	122.49	282.58	20.242	0.786	0.873	1315	119.89	248.33	20.275	0.481	0.898
6365	183.45	817.27	20.243	0.522	1.033	783	161.53	182.59	20.277	0.838	0.835
5563	273.22	588.38	20.245	1.013	0.953	3894	-186.98	432.96	20.277	1.035	0.940
4719	-153.10	493.12	20.245	0.804	0.927	4947	-141.69	514.21	20.278	0.381	0.767
2235	-221.40	329.16	20.245	0.872	0.883	6279	307.59	768.14	20.278	0.508	0.863
4560	-133.57	481.74	20.245	-0.257	1.195	3685	303.22	419.48	20.280	0.533	0.844
609	179.62	154.64	20.245	0.949	0.882	3698	-119.03	420.10	20.284	0.650	0.915
1756	228.18	291.79	20.246	0.400	0.840	5856	272.77	639.10	20.284	0.482	0.875
6167	-188.52	719.13	20.246	0.160	0.813	1735	210.77	270.52	20.284	0.277	0.823
468	53.64	131.33	20.247	0.766	0.923	299	195.84	93.18	20.284	0.647	0.873
241	290.98	79.25	20.247	1.015	0.937	2787	192.80	366.42	20.285	0.413	0.944
5136	65.96	533.28	20.247	0.288	0.953	5595	136.78	594.11	20.285	0.899	0.835
6324	64.60	793.54	20.248	0.461	0.955	6138	-136.82	709.60	20.285	0.497	1.017
4280	254.60	459.83	20.248	1.215	0.932	4439	210.68	471.52	20.285	0.231	0.898
981	92.09	210.66	20.248	0.715	0.785	4870	251.95	506.71	20.286	0.508	0.965
4477	-226.30	473.61	20.249	0.625	0.914	1880	179.66	301.73	20.287	0.844	0.878
994	-117.53	211.64	20.249	0.496	0.940	683	-54.44	165.92	20.287	0.761	0.740
2776	-123.01	365.76	20.250	0.535	0.937	3911	-127.29	434.22	20.287	0.768	0.825
6232	-144.98	748.18	20.251	0.842	0.898	6231	13.41	747.63	20.288	1.265	1.013
2219	143.15	327.61	20.251	0.194	0.900	3857	-162.19	430.18	20.289	0.661	1.018
5809	190.15	630.68	20.251	0.158	0.973	325	-133.79	99.57	20.290	0.074	0.940
5210	-82.09	542.49	20.252	0.768	0.860	5629	175.27	598.46	20.290	0.432	0.900
3089	-131.61	384.73	20.253	0.135	0.915	2735	151.86	363.31	20.291	0.694	0.970
1435	-200.08	261.72	20.253	0.486	0.790	5126	-7.52	531.90	20.293	-0.166	1.030
345	-127.10	105.01	20.253	0.277	0.848	6310	-104.44	782.96	20.293	0.501	0.958
867	27.73	195.15	20.253	0.603	0.943	416	82.72	119.48	20.295	0.397	0.820
6117	183.49	701.56	20.254	0.714	0.987	122	299.74	48.04	20.295	0.194	0.868
510	193.63	141.00	20.254	0.086	0.930	3747	-105.46	423.49	20.296	0.884	0.855
4827	245.16	503.20	20.254	0.448	0.888	1102	231.30	224.96	20.297	0.432	0.855
38	220.18	17.66	20.255	1.025	0.880	4765	267.90	496.60	20.297	0.414	0.915

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
1794	179.72	295.46	20.298	0.663	1.053	2018	152.65	311.88	20.332	-0.004	0.885
5052	163.57	524.66	20.298	-0.080	1.020	1021	163.12	214.82	20.332	0.586	0.755
4302	219.74	461.47	20.300	0.744	0.943	4868	294.47	506.66	20.333	0.762	0.891
499	86.21	138.70	20.300	0.478	0.928	6286	-148.57	771.13	20.334	0.430	0.948
567	175.35	149.00	20.300	0.997	0.805	2674	-163.47	359.18	20.335	0.439	0.798
794	127.25	34.02	20.300	0.668	0.807	2893	192.82	372.36	20.335	0.321	0.973
3882	238.32	432.02	20.301	0.514	0.895	3087	177.29	384.56	20.336	0.750	1.150
5570	292.21	589.30	20.302	0.701	0.910	5202	-65.85	541.21	20.336	0.455	0.863
5101	121.40	529.85	20.302	0.687	0.800	922	184.66	202.06	20.337	0.594	0.803
1273	304.37	244.14	20.303	-0.001	0.873	4995	-235.59	519.52	20.339	0.507	0.945
386	156.14	113.79	20.303	1.104	0.820	397	-114.14	115.73	20.340	0.311	0.880
941	105.20	204.75	20.303	0.793	0.870	3409	227.93	402.24	20.340	0.586	1.009
6205	-234.82	734.53	20.303	0.202	0.913	6342	-99.34	803.65	20.341	0.758	1.027
5334	-191.35	556.89	20.303	0.878	0.945	942	-181.66	275.02	20.342	0.163	0.983
721	263.16	173.30	20.304	1.298	0.830	5154	-178.11	535.50	20.343	0.281	0.855
1994	293.70	310.38	20.305	1.367	0.853	4556	-195.85	481.34	20.344	0.220	0.940
4963	175.93	515.98	20.305	0.591	0.877	1395	247.24	257.09	20.344	0.616	0.907
6437	310.74	855.09	20.306	0.543	1.057	6229	-156.95	746.48	20.345	0.460	0.843
5979	298.04	668.43	20.307	0.695	0.923	6337	-46.45	802.11	20.346	0.452	0.865
5858	171.36	639.81	20.307	0.130	0.775	2700	-224.86	361.14	20.347	0.697	0.918
4250	272.65	457.18	20.307	0.429	0.906	735	-103.59	175.21	20.347	0.345	0.967
5949	-60.09	659.95	20.309	0.788	0.855	45	-228.27	19.32	20.347	0.935	0.853
3904	209.96	433.80	20.309	0.509	1.088	5454	-34.28	572.42	20.347	0.500	0.945
6173	97.08	720.71	20.311	0.289	0.903	1052	54.84	218.34	20.348	0.244	0.975
180	136.10	63.52	20.312	-0.059	0.733	4936	223.36	512.55	20.348	0.622	0.997
419	-18.51	119.81	20.313	0.131	0.955	5060	-161.39	525.64	20.349	0.433	0.880
200	-0.10	70.22	20.313	0.557	0.965	5981	210.31	669.11	20.349	1.068	0.980
715	0.10	172.11	20.313	-0.048	0.950	1138	101.56	228.86	20.350	0.855	0.877
5539	-168.46	585.20	20.314	0.811	0.887	404	35.80	117.20	20.350	0.661	0.903
4683	182.17	490.73	20.315	0.540	0.862	5758	300.26	621.03	20.351	0.820	0.995
166	-104.61	60.25	20.316	0.741	0.880	1198	125.29	237.06	20.353	0.664	0.687
4091	100.16	446.14	20.316	0.268	0.986	1858	-172.88	299.71	20.353	0.097	0.908
6235	72.38	749.29	20.318	0.661	1.105	1709	-146.54	287.06	20.353	0.724	0.955
5655	41.31	602.38	20.318	0.256	1.005	2278	-145.22	332.10	20.354	-0.060	0.830
2634	161.60	357.22	20.318	0.322	1.023	5993	143.17	673.19	20.355	0.577	1.100
4187	-165.58	452.21	20.320	1.033	0.765	4098	272.65	446.55	20.356	0.766	0.935
6259	-202.93	758.13	20.320	0.700	0.868	6061	-195.01	686.54	20.356	0.237	0.933
2018	129.75	312.05	20.321	0.176	0.870	6256	119.98	757.35	20.356	0.403	0.810
5762	29.75	621.66	20.321	0.776	0.876	5630	122.24	598.47	20.357	0.357	0.887
2603	-118.82	355.14	20.322	0.496	0.860	3555	-115.47	411.70	20.357	0.272	1.097
135	-191.85	51.22	20.322	0.534	0.930	270	222.01	86.42	20.358	0.812	1.068
1434	27.48	261.65	20.322	0.373	0.988	5766	159.79	622.59	20.358	0.278	0.805
851	19.58	192.74	20.323	0.834	0.827	5992	-220.70	673.08	20.360	0.464	1.070
4436	-115.33	471.29	20.323	0.153	0.875	1107	140.99	225.93	20.360	0.267	0.933
5387	60.71	563.19	20.324	0.595	0.986	1404	81.07	258.22	20.360	0.382	0.720
227	251.33	76.27	20.324	0.558	0.900	730	-68.01	174.39	20.361	0.704	0.857
5831	-82.90	634.41	20.324	0.990	0.740	1484	-214.49	267.24	20.361	0.761	0.807
5942	-111.22	658.35	20.325	0.777	0.897	1969	240.71	308.68	20.363	0.751	0.853
3150	-166.70	387.53	20.326	0.577	0.923	2888	224.45	372.14	20.364	0.462	0.918
5440	122.78	570.55	20.326	0.722	0.965	5941	136.08	657.27	20.365	0.444	0.905
430	148.67	122.21	20.327	0.380	0.940	3884	272.13	432.04	20.368	0.576	0.782
4881	-99.35	507.42	20.328	0.275	0.770	5733	-174.19	615.63	20.368	0.581	0.835
6384	12.05	826.50	20.328	0.565	0.958	3484	-160.74	407.15	20.370	0.632	1.003
5893	109.00	646.54	20.329	0.285	0.980	3284	165.27	394.75	20.370	-0.202	0.868
541	300.37	145.02	20.329	-0.101	0.853	6402	-27.92	835.94	20.371	0.953	0.863
146	136.26	54.55	20.329	0.249	0.888	5559	221.26	587.94	20.373	0.856	0.743
1268	-158.64	243.66	20.329	0.640	0.890	6150	-189.31	714.01	20.373	0.955	0.853
4617	-150.03	485.52	20.330	0.400	0.973	640	-116.23	159.61	20.374	0.713	0.897
5746	-6.54	618.63	20.331	0.902	0.933	4864	107.05	506.04	20.376	0.037	0.978
5431	109.55	569.03	20.331	0.287	0.853	1178	74.23	234.50	20.376	1.012	0.907

ID	X	Y	V	B - V	$\bar{\chi}$	ID	X	Y	V	B - V	$\bar{\chi}$
6398	-49.95	834.22	20.376	0.883	0.993	460	205.64	130.05	20.448	1.257	0.937
5124	-182.22	531.82	20.378	1.125	0.807	618	-162.61	155.92	20.449	0.078	1.010
5747	39.03	618.73	20.378	0.780	1.080	6386	-102.84	827.13	20.452	1.199	0.863
6054	9.15	685.49	20.379	0.843	0.887	4445	259.20	471.74	20.452	0.371	0.950
6367	-195.00	817.40	20.379	0.217	0.820	5092	-178.65	529.08	20.452	0.071	0.855
3975	-143.94	433.60	20.380	0.661	0.855	155	111.37	56.67	20.452	0.103	0.905
4491	305.81	474.67	20.381	0.557	0.892	5047	108.07	524.15	20.453	0.281	0.947
6415	-180.51	844.97	20.381	0.847	0.990	3969	273.11	438.13	20.453	0.651	0.994
4594	-70.21	484.20	20.385	0.083	1.048	5218	27.10	543.69	20.454	-0.115	0.803
1116	97.91	226.93	20.388	0.815	0.850	6417	69.40	845.70	20.454	0.846	1.128
3903	152.45	433.69	20.389	0.475	1.007	5926	-47.06	652.62	20.454	0.226	0.820
284	-138.31	89.94	20.389	0.761	0.973	855	256.25	193.72	20.455	0.823	0.850
444	106.73	127.10	20.390	0.457	0.833	4282	226.67	459.96	20.455	1.160	0.930
5520	-104.64	582.69	20.391	0.821	0.740	3968	306.55	438.11	20.456	0.671	0.825
5336	8.80	557.14	20.391	0.114	0.943	3250	185.91	392.98	20.457	0.215	0.780
5940	52.08	657.26	20.392	0.368	0.897	1582	-46.41	276.30	20.458	0.368	0.933
6270	80.82	764.21	20.394	0.715	0.933	3113	261.69	386.33	20.459	0.440	0.988
316	41.64	97.13	20.394	0.130	0.925	6012	25.42	676.12	20.460	0.529	0.753
6430	-63.99	852.42	20.394	0.096	0.880	3657	229.68	417.18	20.461	0.354	0.988
4940	-62.40	513.22	20.396	0.396	1.020	549	311.49	146.25	20.461	1.639	0.970
303	49.65	94.06	20.397	0.616	0.917	5337	121.54	557.41	20.463	0.254	0.910
213	-69.98	71.63	20.399	0.404	0.975	5459	88.51	573.96	20.464	0.156	0.760
759	-74.01	178.63	20.399	0.380	0.948	6050	211.28	684.81	20.466	-0.192	0.940
5665	223.14	604.29	20.402	0.298	0.938	2110	164.97	317.97	20.466	0.144	0.857
4676	-225.89	450.30	20.402	0.276	0.890	3263	158.77	393.73	20.466	0.377	1.003
4743	-194.75	495.12	20.403	0.526	0.845	5933	1.40	654.92	20.467	1.266	1.133
5707	93.91	610.83	20.403	0.313	0.910	32	228.24	16.80	20.468	0.232	0.990
4839	201.67	504.03	20.404	0.424	0.993	1012	-60.72	213.54	20.469	0.042	0.803
1222	201.46	239.73	20.407	0.922	0.865	6199	-169.43	732.44	20.469	0.457	0.900
3266	251.23	393.84	20.409	1.264	0.930	2870	197.82	370.95	20.470	0.460	1.083
120	-213.82	47.50	20.410	0.366	0.858	3369	180.33	400.21	20.471	0.393	0.969
5990	135.37	672.02	20.412	0.248	0.950	6082	114.06	691.65	20.472	-0.025	1.027
5740	129.09	617.86	20.412	0.289	0.868	407	212.72	117.97	20.473	0.484	0.785
5464	24.32	575.09	20.415	0.841	0.853	1716	302.67	287.80	20.475	0.739	0.770
4655	209.25	488.82	20.415	0.721	1.010	1539	209.97	272.69	20.475	0.097	0.970
6281	205.48	769.76	20.418	0.576	0.822	5196	69.16	540.31	20.476	0.260	0.863
778	54.93	181.81	20.418	0.612	0.923	5840	152.92	635.22	20.477	0.618	0.785
5564	194.85	588.55	20.422	0.950	0.950	295	-63.78	92.00	20.477	0.489	1.057
828	66.79	189.12	20.423	-0.216	0.910	464	160.63	131.04	20.478	0.460	0.905
378	18.30	111.90	20.423	0.404	0.945	641	61.82	159.67	20.479	0.011	0.913
4328	155.88	463.83	20.423	0.339	1.007	82	232.41	37.23	20.481	0.960	0.965
3771	278.79	425.11	20.432	0.774	1.040	1095	65.92	224.37	20.482	0.739	0.910
534	41.65	143.82	20.433	0.382	0.855	1077	-63.46	222.73	20.482	0.399	0.960
401	248.50	116.88	20.433	0.472	0.890	5370	19.41	561.09	20.485	0.610	1.023
5432	16.49	569.43	20.435	0.779	0.970	6304	244.73	781.15	20.487	0.086	0.953
4227	-61.80	456.11	20.436	1.061	0.940	6289	101.42	771.94	20.488	0.241	0.990
5066	120.48	526.11	20.437	0.900	0.900	5918	97.20	650.68	20.488	0.641	0.858
2453	218.63	344.61	20.437	0.224	0.993	5493	279.80	578.63	20.491	0.038	0.727
491	32.50	136.68	20.438	0.675	0.910	6145	23.66	711.44	20.493	0.945	0.794
919	147.56	201.74	20.439	0.185	0.835	3846	188.56	429.41	20.495	0.643	0.950
1440	255.15	262.19	20.440	0.173	0.845	6226	268.09	745.82	20.495	0.116	0.870
2467	285.25	345.42	20.442	0.434	0.920	1784	261.65	294.37	20.496	0.135	0.993
5635	-32.24	599.93	20.444	0.068	0.983	4115	-177.92	447.67	20.496	0.584	0.938
6186	-175.36	725.46	20.444	-0.470	0.833	220	165.56	73.82	20.498	0.323	0.920
3094	236.65	385.10	20.446	0.215	0.840	6436	-110.22	855.09	20.500	0.050	0.920
1304	5.58	247.37	20.447	0.798	0.940	6130	-202.07	706.60	20.501	0.623	1.083
3311	-112.32	396.37	20.447	1.071	0.976	6272	68.48	764.75	20.502	0.741	0.909
2437	182.07	343.36	20.447	0.586	0.955	1391	178.16	256.68	20.504	0.282	0.913
5585	233.85	591.96	20.448	0.916	0.943	4908	41.64	510.38	20.504	0.572	0.908
5996	248.56	673.36	20.448	0.877	0.907	1567	207.28	275.45	20.505	0.342	1.013

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
6385	1.13	827.08	20.506	0.985	0.890	5588	-89.28	592.40	20.614	-0.208	0.925
6209	167.88	735.98	20.506	0.822	0.770	5773	265.14	625.17	20.617	0.182	0.900
5688	-74.20	606.97	20.510	0.292	0.903	5113	68.48	530.69	20.617	0.164	1.067
57	184.11	25.97	20.512	0.257	0.933	717	301.89	172.60	20.617	0.702	0.935
182	84.59	64.25	20.512	0.441	0.860	24	193.37	11.92	20.618	0.863	0.900
5934	-107.89	654.96	20.513	1.188	0.860	1238	48.20	241.01	20.618	0.707	1.030
532	-157.30	143.21	20.515	0.356	0.847	6187	-6.69	725.57	20.621	0.545	0.880
539	72.97	144.75	20.516	0.494	0.800	4285	298.05	460.24	20.622	0.386	1.045
4830	-182.58	503.30	20.518	0.019	0.907	2533	-170.92	350.09	20.622	0.293	0.935
5799	21.14	629.26	20.519	2.096	0.950	3523	187.80	409.45	20.625	0.525	0.913
5384	-201.98	562.86	20.522	0.396	0.827	4768	250.62	497.19	20.632	0.579	1.035
5509	118.21	581.06	20.523	0.155	0.737	1701	229.84	286.35	20.633	0.270	0.843
3818	254.48	427.89	20.525	0.820	0.947	5203	53.75	734.31	20.633	0.405	0.917
5621	170.52	597.20	20.526	0.637	0.880	373	-147.16	110.94	20.635	-0.007	0.875
742	51.54	175.69	20.527	0.223	0.878	5739	231.36	616.68	20.643	0.413	0.840
98	54.99	43.28	20.531	0.235	0.958	2749	-161.02	364.04	20.645	0.629	0.908
5439	-143.19	570.09	20.531	0.526	0.840	6366	-3.29	817.38	20.646	0.425	0.868
5098	124.89	529.67	20.531	0.190	0.873	1230	129.04	240.27	20.646	0.281	0.767
1573	222.69	275.89	20.535	0.510	0.855	6213	31.01	737.51	20.646	0.835	0.981
3599	-167.18	414.12	20.536	-0.324	0.980	5266	61.65	548.32	20.648	0.384	0.890
2757	230.37	364.47	20.538	0.346	0.845	634	261.68	158.55	20.648	0.219	0.975
250	182.18	81.03	20.538	-0.058	0.905	72	227.17	31.70	20.648	0.269	0.873
5203	-200.63	541.22	20.541	0.756	0.870	5065	176.20	525.98	20.652	-0.076	0.770
215	119.17	71.98	20.543	0.155	0.953	3117	204.81	386.40	20.654	0.216	1.090
3446	192.67	404.78	20.544	0.471	0.937	4355	-193.50	465.96	20.654	0.691	0.852
4060	212.33	444.11	20.545	0.266	0.823	3156	-227.26	387.82	20.656	0.081	1.013
900	30.69	198.97	20.545	0.778	0.906	5634	-3.14	599.84	20.657	0.383	0.890
6179	55.19	722.64	20.546	0.309	0.910	438	120.32	125.23	20.663	0.252	0.727
930	233.59	203.19	20.548	0.242	0.777	4914	-130.69	510.95	20.666	0.205	0.970
4737	200.91	494.74	20.551	0.493	0.917	4693	-222.82	491.56	20.667	0.450	0.872
5445	120.40	571.25	20.552	-0.068	0.893	6165	195.00	719.06	20.669	-0.447	0.847
5870	-31.53	642.86	20.561	0.111	0.785	5844	-77.61	636.43	20.670	0.681	0.863
750	71.68	177.06	20.562	0.205	0.810	599	32.96	153.51	20.673	0.148	0.927
247	108.09	80.34	20.562	0.335	0.950	5874	4.82	644.11	20.675	0.474	0.963
2605	259.28	355.23	20.567	0.194	0.847	546	63.45	145.80	20.678	0.797	0.785
6099	-163.17	695.79	20.570	-0.147	0.915	4458	-166.20	472.53	20.680	-0.014	0.887
612	27.01	155.01	20.571	0.678	0.887	3200	-100.05	390.30	20.682	0.362	0.950
5426	-47.68	568.59	20.571	1.216	1.020	413	-0.30	119.31	20.685	0.131	1.092
3994	-164.78	439.77	20.573	0.982	1.025	363	25.02	109.14	20.685	0.108	0.875
5677	100.13	606.13	20.575	0.250	0.870	93	212.05	41.58	20.687	0.578	0.955
157	51.53	57.37	20.575	0.483	0.911	113	25.39	46.18	20.690	0.545	1.093
553	42.55	146.93	20.577	1.137	0.858	269	-87.20	86.24	20.691	0.519	0.835
128	64.93	50.03	20.578	0.652	0.892	935	14.48	203.93	20.693	-0.037	0.993
4238	-231.84	456.51	20.580	0.402	0.863	6157	-122.80	716.04	20.694	0.562	0.863
5171	251.43	537.40	20.581	0.458	0.950	376	182.23	111.45	20.697	0.134	0.967
6048	206.02	684.76	20.585	0.066	0.730	2434	306.18	343.17	20.698	0.353	0.907
6399	-131.61	834.55	20.589	0.106	1.055	2742	-182.42	363.72	20.715	0.231	0.887
5188	134.99	539.49	20.590	0.613	0.943	49	72.16	20.66	20.715	0.426	0.925
1442	283.80	262.30	20.590	0.391	0.845	5813	183.49	631.31	20.716	-0.129	0.847
5686	-38.21	606.86	20.594	-0.538	0.930	582	216.14	150.88	20.718	0.246	0.850
1156	57.74	231.23	20.596	-0.288	0.870	5463	93.83	574.56	20.718	0.512	1.023
249	186.00	80.58	20.600	0.833	0.885	1333	-68.81	251.27	20.719	0.021	0.882
1291	82.20	246.22	20.602	-0.266	0.970	198	5.88	69.57	20.721	0.291	0.820
785	194.21	182.87	20.608	0.882	0.767	5353	-73.87	559.40	20.726	0.099	0.823
586	14.57	152.12	20.610	0.105	0.910	91	42.21	40.35	20.733	0.858	0.910
6029	77.08	681.49	20.610	0.475	0.898	4656	112.48	488.83	20.734	-0.119	1.046
1104	91.77	225.36	20.611	0.342	0.903	997	-50.60	212.13	20.745	0.879	0.910
4825	-76.78	502.94	20.611	0.024	0.890	639	56.01	159.53	20.766	0.310	1.010
1303	282.85	247.37	20.612	-0.142	0.828	3676	249.29	418.74	20.768	0.071	0.913
4938	158.45	512.96	20.613	0.262	0.890	1763	311.01	292.47	20.769	0.614	1.120

ID	X	Y	V	B-V	$\bar{X}$	ID	X	Y	V	B-V	$\bar{X}$
5580	-234.17	590.86	20.778	0.826	0.960	5956	23.98	661.95	20.976	0.195	1.003
3085	299.11	384.47	20.789	0.141	0.873	5331	-162.66	556.23	20.980	-0.286	0.977
1922	151.04	305.00	20.790	-0.216	0.948	5075	129.70	527.56	20.992	-0.229	0.800
266	269.77	85.78	20.790	0.826	0.907	6124	-53.94	704.32	20.993	-0.158	0.823
5775	-122.51	625.28	20.790	0.104	1.090	703	120.77	170.60	20.996	-0.218	0.848
3558	-172.20	411.90	20.794	0.600	0.853	102	-162.46	44.14	21.011	-0.850	0.933
214	38.36	71.81	20.798	1.113	0.865	456	97.60	129.57	21.022	0.090	0.843
4859	-141.81	505.69	20.800	0.264	0.855	6392	-191.80	830.74	21.026	0.183	0.853
6372	-143.63	819.90	20.802	0.312	0.777	6273	99.81	765.75	21.034	-0.103	0.780
6339	-201.06	802.92	20.803	0.471	0.885	328	-155.94	99.98	21.034	-0.025	0.845
5899	5.86	648.02	20.810	-1.169	0.740	5568	-62.76	588.79	21.035	-0.498	0.900
2341	192.16	336.53	20.813	-0.166	0.930	6086	-113.26	692.40	21.036	0.022	1.030
6105	55.66	697.75	20.816	1.057	1.033	1549	289.01	273.41	21.040	-0.109	0.803
5513	136.01	581.50	20.825	0.386	0.880	3440	-174.66	404.33	21.041	-1.061	0.958
5131	-127.93	532.53	20.826	-0.534	0.915	5767	309.14	623.14	21.042	0.168	0.825
144	-130.80	54.19	20.827	-0.552	0.820	5887	250.69	646.04	21.064	0.141	0.957
5117	300.43	531.22	20.828	-0.726	1.090	3893	-224.43	432.77	21.067	0.374	0.830
5465	-112.57	575.11	20.831	0.585	0.897	1036	137.85	216.36	21.089	-0.245	0.923
5418	-38.19	567.04	20.840	0.020	0.983	6139	-54.88	710.19	21.096	-0.170	0.880
4716	-102.25	493.01	20.840	-0.445	0.973	428	195.29	122.11	21.099	0.144	0.765
937	142.44	204.17	20.841	0.114	1.000	995	87.97	211.84	21.101	0.231	0.943
4201	-205.78	453.44	20.844	0.404	0.877	6028	239.90	681.43	21.103	-0.079	0.777
2169	152.32	323.80	20.847	-0.455	0.840	6288	96.59	771.88	21.110	0.132	0.953
1602	290.44	278.04	20.849	0.009	0.813	5164	224.89	536.87	21.126	-0.547	0.940
67	17.65	30.02	20.852	-0.123	1.017	1370	110.02	254.38	21.130	-0.829	0.990
228	279.23	76.37	20.864	0.536	0.880	31	298.76	16.77	21.135	-0.319	1.000
6373	-44.99	821.31	20.866	0.212	0.960	6303	-222.84	780.64	21.191	-1.193	0.833
4952	-112.17	514.83	20.875	0.249	1.005	1233	179.01	240.43	21.218	-0.439	0.980
3414	-119.15	402.70	20.877	-0.210	0.950	3363	-185.38	399.84	21.258	-0.302	0.940
5726	36.20	614.44	20.878	0.023	1.100	490	-37.59	136.59	21.317	-1.313	0.918
5991	-63.39	672.22	20.890	0.233	1.013	4047	243.11	443.14	21.323	-0.019	0.998
4673	221.43	490.14	20.897	0.341	0.940	1158	113.67	231.56	21.398	-0.069	0.873
5390	-18.11	563.73	20.898	0.004	0.910	5825	165.39	632.78	21.550	-0.488	0.700
1006	295.33	213.09	20.914	0.163	0.817	6106	238.37	698.31	21.568	-0.246	0.805
5710	166.59	611.53	20.916	-0.024	0.880	1691	248.62	285.79	21.811	-0.878	1.095
50	65.37	20.68	20.926	1.202	1.018	6176	113.99	721.46	21.820	-0.523	0.795
4774	-17.74	498.05	20.935	0.584	0.963	461	111.57	130.42	21.841	-0.884	0.700
1028	97.31	215.75	20.959	0.657	0.980	686	80.96	136.05	22.087	-1.457	0.935
562	-83.40	148.43	20.968	-0.450	0.867						