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The Ultimate Light Curve of SN 1998bw/GRB 980425

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ABSTRACT

We present multicolor light curves of SN 1998bw which appeared in ESO184-G82 in close temporal and spacial association with GRB 980425. They are based on observations done at Cerro Tololo Inter-American Observatory and data from the literature. The CTIO photometry reaches ~86 days after the GRB in U and ~160 days after the GRB in $BV(RI)_C$. The observations in U extend by about 30 days the previously known coverage, and determine the slope of the early exponential tail.

We calibrate a large set of local standards in common with those of previous studies and use them to transform published observations of the SN to our realization of the standard photometric system. We show that the photometry from different sources merges smoothly and provide a unified set of 300 observations of the SN in five bands. Using the extensive set of spectra in public domain we compute extinction and K corrections, and build quasi-bolometric unreddened rest frame light curves. We provide low degree piecewise spline fits to these light curves with daily sampling. They reach ~86 rest frame days after the GRB with U band coverage, and ~498 rest frame days after the GRB without U.

Subject headings: supernovae: general — GRB: general — supernovae: individual(SN 1998bw) GRB: individual(GRB 980425)

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1. Introduction

Stripped envelope core–collapse Supernovae (SNe) remain one of the open frontiers for basic observational work on SNe. Without the appeal of Type Ia and Type II SNe which, through different techniques can be used as distance estimators, their follow up is typically neglected when they are discovered in SN searches, unless they are particularly bright or display puzzling peculiarities. As a consequence, progress in this area comes at a slower pace.

After a peak in activity during 1993–1995, which resulted mainly from the impact of the bright and well observed SNe 1993J and 1994I, the field of these "exotic" SNe entered a time of slower productivity. In 1998, however, a long-duration γ–ray burst (GRB) provided a new insight into core–collapse SNe, and gave new incentives to justify their follow up. The association of long-duration, soft-spectrum GRBs with SNe has been explored in many publications (Woosley & Bloom 2006; Hartmann 2010; Wheeler & Akiyama 2010). It is now considered that most long-duration soft-spectrum GRBs are accompanied by massive stellar explosions.

One of the events that made a significant contribution to establish the connection GRB-SNe was SN 1998bw / GRB980425 (Galama et al. 1998). It was the target of extensive coverage both in terms of wavelength range and time span, and subject of many theoretical studies to understand the nature of the progenitor and details of the certainly asymmetric explosion.

SN 1998bw was discovered after a search triggered by GRB980425, 1.6 arc-minutes away from the center of the 8 arc-minute error box of the Wide Field Camera of BeppoSAX (Galama et al. 1998). After some initial confusion, it was recognized as a peculiar Type Ib/c SNe (Saddler et al. 1998). It appeared superimposed on a complicated background, as became clear with the exquisite resolution of *HST* (Patat et al. 2001). Hence, while simple aperture photometry, or Point Spread Function (PSF) fitting photometry, were reasonable approaches when the SN was bright, more sophisticated techniques became necessary, when it was fading on. Galama et al. (1998) presented the first set of observations in the optical and near infrared passbands. Their light curves start as early as $\sim$17 hours after the GRB, in V and R_C, and extend up to $\sim$57 days after the GRB with $UBV(RI)_C$ coverage. They use simple aperture photometry to estimate the SN brightness. McKenzie & Shaeffer (1999) present BVI_C photometry, from $\sim$64 up to $\sim$187 days after the GRB. Patat et al. (2001) present an extensive set of observations, including spectroscopy, spectropolarimetry, and photometry. The later spans the range from 323 up to 426 days after the GRB, and the brightness is measured with Point Spread Function (PSF) fitting photometry using a software specifically designed for analyzing point sources superimposed on bright, spatially variable, backgrounds. Sollerman et al. (2002) present $BV(RI)_C$ photometry that extends from 140 up to more than 500 days after the GRB, and includes data from a reanalysis of the images used by Patat et al. (2001). They estimate the SN brightness by doing PSF fitting photometry on images where the background light of the galaxy had been removed using very late, high quality images. Finally, Fynbo et al. (2000) analyze very late HST images of ESO184-G82 taken through non standard passbands, and provide estimates of the SN brightness more than 750 days after the GRB.

The main purpose of this paper is to present an independent set of photometric observations done at Cerro Tololo Inter-American Observatory between June and October of 1998, from ∼40 up to 160 days after the GRB. The CTIO observations overlap most of the data sets mentioned above, and our U band observations reach about 30 days later than those published so far.

We purposely calibrated our photometry with the same set of local standards used by Galama et al. (1998) for the early light curve, and Sollerman et al. (2002) for the very late light curve. Therefore, if S-corrections (Pignata et al. 2004) between the different realizations of the passbands are not large, these data sets could be straightforwardly merged. This provides a secondary goal for this paper. We merge our data with the earlier set of Galama et al. (1998) and later set of Sollerman et al. (2002) providing an ensemble of 300 $UBV(RI)_C$ observations, spanning from about 15 days before up to more than 500 days after maximum light, consistently calibrated with the sequence of local standards as defined by the CTIO realization of the standard photometric system. Finally having this photometry available, it is possible to obtain multicolor, unreddened, rest frame light curves, as well as quasi-bolometric light curves. We do so providing fits to the photometry that extend more than ∼80 days after the GRB with $UBV(RI)_C$ coverage, and close to 500 days after the GRB with only $BV(RI)_C$.

In §2 we present our observations, in §3 we describe the comparison and merging of our data with those already published, and the computing of K and extinction corrections to obtain the rest frame unreddened light curve of SN 1998bw, which we present interpolated with low degree piecewise splines. Finally, in §4 we summarize our work.

2. Observations

The CTIO observations started ∼40 days after the GRB (about a month after maximum light). The 0.9m telescope with a direct CCD camera attached was used. The detector was a TEK 2048 CCD, with a pixel size of 24 μ, providing a scale of 0.396 arc-seconds per pixel.

The passbands routinely used were the standard $UBV(RI)_C$ of the Johnson, Kron–Cousins photometric system (Kron & Smith 1951; Johnson 1955; Cousins 1976). $BV(RI)_C$ images were taken on 15 nights while U images were taken on 12. Five of those nights appeared to be photometric, and extensive sets of standards from the lists of Landolt (1992) were observed as well, to fit color terms for the instrument and extinction coefficients for the nights.

Reduction of the images was done in the usual manner within the *IRAF*[1] environment. Briefly, images were trimmed, bias-corrected, and flat-fielded. A sequence of isolated stars with good signal to noise ratio was located and used to build a variable PSF for each image using the package DAOPhot (Stetson 1987). The PSF is later fitted to all the stars of the local photometric sequence indicated in Figure 1, and the SN, to estimate their instrumental magnitudes. Using the instrumental magnitudes, the $UBV(RI)_C$ magnitudes for the local sequence and the color terms for the instrument that had been measured in the photometric nights, we transformed the instrumental PSF magnitudes of the SN into calibrated magnitudes.

After reduction, two of the five supposedly photometric nights gave larger than expected residuals for the photometric fits. Then, they were used in the fitting of color terms, but not in the absolute calibration of the sequence of local standards. The magnitudes of the local sequence of standards is given in Table 1. The photometry of SN 1998bw is given in Table 2, under reference code (2), and plotted in Figure 2.

3. Light Curves

3.1. Merged Photometry

The photometry presented above can be joined with data published elsewhere to build a well sampled and extended multicolor light curve of SN 1998bw. After comparing our raw observations with those of Galama et al. (1998); McKenzie & Shaeffer (1999) and Sollerman et al. (2002), we decided to join our data with those of Galama et al. (1998) and Sollerman et al. (2002). At early times, the data of Galama et al. (1998) is unique, and must be considered. At late times, the data of Sollerman et al. (2002) include a reanalysis of the images used by Patat et al. (2001), and corresponds to PSF photometry on images with the background subtracted. An additional consideration is that Galama et al. (1998) and Sollerman et al. (2002) calibrate the photometry using a common set of 15 local standards

[1]The Image Reduction and Analysis Facility is developed and maintained by NOAO, under contract with the National Science Foundation.

while McKenzie & Shaeffer (1999) use a different local sequence.

After a careful comparison, we found phase dependent systematic differences between our photometry and that of McKenzie & Shaeffer (1999). They are probably the result of slightly different realizations of the photometric passbands combined with the non stellar character of the spectrum of SN 1998bw, the different set of local standards used, and the different technique applied to estimate the SN brightness (aperture versus PSF photometry). The effects of bandpass differences causing large systematic errors in supernova photometry has been known for quite a while (Suntzeff et al. 1988). Since our earlier data are coincident in time with those of McKenzie & Shaeffer (1999), and at late times our data merges already with those of Sollerman et al. (2002) we decided not to use the observations of the former in our combined light curve.

We also found small systematic differences between our photometry and that of Galama et al. (1998) and Sollerman et al. (2002) as well. Within the uncertainties, however, the differences were constant with SN phase. We took this as an indication of negligible S-corrections between our photometry and those of either Galama et al. (1998) or Sollerman et al. (2002). Since the three studies had in common a sequence of 15 local standards, it was possible to fit zero points and relative color terms between the two sets, and transform all the observations to the system defined by the magnitudes of the local standard set given in Table 1. The transformed magnitudes merge very well. The transformed photometry from different sources is consistent within the uncertainties. It is particularly reassuring that they merge very well at our latest times in the passbands R_C and I_C, which are those where the effect of the S-corrections are expected to be strongest (see Figure 3). Since Sollerman et al. (2002), who obtained the very late time photometry shown in the figure, did correct the observations for background light contamination and we did not, this means in addition, that as late as $\sim$160 days after the GRB, contamination by background light was not critically important, and that our PSF fitted photometry is not biased.

The transformed photometry is given in Table 2 under reference codes (1) and (3), and plotted in Figure 2 together with the new data presented here. In addition to providing a consistently calibrated bridge between the photometry of Galama et al. (1998) and that of Sollerman et al. (2002) the CTIO observations define the slope of the early exponential tail in U, which was not known.

3.2. The Unreddened Rest Frame Light curves

To compute the intrinsic light curve of SN 1998bw, it is necessary to correct the photometry for the effect of extinction by foreground material and apply K-corrections to transform it to the rest frame of ESO184-G82. It is always a challenge to compute the extinction towards an object of exotic type, like SN 1998bw, because the intrinsic colors are not known. All the indications, however, suggest that the amount of foreground matter between us and the SN is small. The Galactic dust towards ESO184-G82 contributes $A_V \sim 0.2$, according to Schlegel, Finkbeiner & Davis (1998), up from the earlier value of $A_V \sim 0.05$ given by Burstein & Heiles (1982). Patat et al. (2001) obtained high resolution spectra of SN 1998bw near maximum light. They did not find Na D absorption lines neither at the redshift of ESO184-G82 nor zero, and set upper limits to the extinction consistent even with the higher estimate of Schlegel, Finkbeiner & Davis (1998).

The peculiarities of the spectrum of SN 1998bw and the fact that it evolves in time prompted us to compute a time dependent extinction in each passbands using the excellent series of spectra of Patat et al. (2001), which is publicly available. We took the transmittance of the $BV(RI)_C$ passbands given by Bessell (1990), transformed them from energy-based to photon-based units, convolved them with a typical CCD quantum efficiency, the spectral response of two aluminum coated surfaces, and a typical response of the sky telluric absorption bands, and used this combined sensitivity curves to compute the difference in magnitudes between the unreddened and reddened spectra of SN 1998bw. The differences between the extinction computed in this way and a constant are small but they vary with time, allowing for small systematic changes in the trends of the light curves.

The extinction law towards γ-ray bursts has deserved some attention (see Liang & Li 2010, and references therein). It has been found that, in some cases, the extinction estimated from the γ-ray burst spectrum is different from that of the Milky Way or Magellanic Clouds. When there are differences, however, they are typically marked in the UV, at wavelengths below ~2500 Å, and modest at longer wavelengths. This, together with the low estimate of the extinction towards SN 1998bw, make it reasonable to assume a typical Milky Way extinction law to unredden the lights curves presented here. We take as a model the extinction curve of Cardelli, Clayton, & Mathis (1989) with $R_V = 3.1$.

Similar considerations apply to the K-corrections, which, at the redshift of ESO184-G82 ($z = 0.0087$, Foley et al. 2006), are expected to be small, but still variable in time. We used the passbands of Bessell (1990), prepared as stated above and the spectra of Patat et al. (2001) to compute the time dependent K-corrections of SN 1998bw.

Using the computed reddening and K corrections unreddened and transformed to the rest frame the photometry of SN 1998bw given in Table 2. The results, fitted with low-degree piecewise polinomial and/or spline fits to provide daily sampling, are presented in Table 3. The uncertainties given in the table are the result of combining in quadrature the uncertainties of photometry, reddening and K-corrections.

Having the multicolor rest frame photometry it is possible to convert the observed single-bandpass light curves into monochromatic fluxes at the effective wavelengths of the passbands, integrate them over frequency, and obtain quasi-bolometric light curves that include the energy output in all the observed bands (Suntzeff & Bouchet 1990). We used the zero-points of Bessell (2000) and integrated the monochromatic fluxes using a trapezoid rule. We did not extrapolate the flux beyond the limits of the U (or B) and I_C passbands. The distance to ESO 184-G082 was taken to be 37.3 ± 2.6 Mpc, as computed by the NED database[2] from the redshift measured by Foley et al. (2006), a Hubble constant of 74.2 km s^{-1} Mpc^{-1} (Riess et al. 2009), and a the model of the local velocity field given by Mould et al. (2000). The $UBV(RI)_C$ and $BV(RI)_C$ luminosities have been included in Table 3.

4. Conclusions

We present 72 new photometric observations of SN 1998bw in the $UBV(RI)_C$ bands, spanning from ∼40 up to ∼60 days after the GRB. Our U data extends by about 30 days the previously known coverage and sample the early exponential tail.

We collect previously published photometry and transform it to our realization of the standard system using relative zero points and color terms measured from the common local standard sequence. We show that data from different sources merges smoothly, providing a homogeneous set of 300 observations covering about 500 days since explosion.

Finally, we use the extensive series of spectra in public domain to compute time dependent reddening and K corrections and compute the unreddened rest frame multicolor and quasi-bolometric light curves. We fit them with low degree piecewise splines to provide daily sampling and give the results as a table.

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[2]http://nedwww.ipac.caltech.edu/

line database of SN spectra and of the NASA/IPAC Extragalactic Database (NED) which is operated by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.

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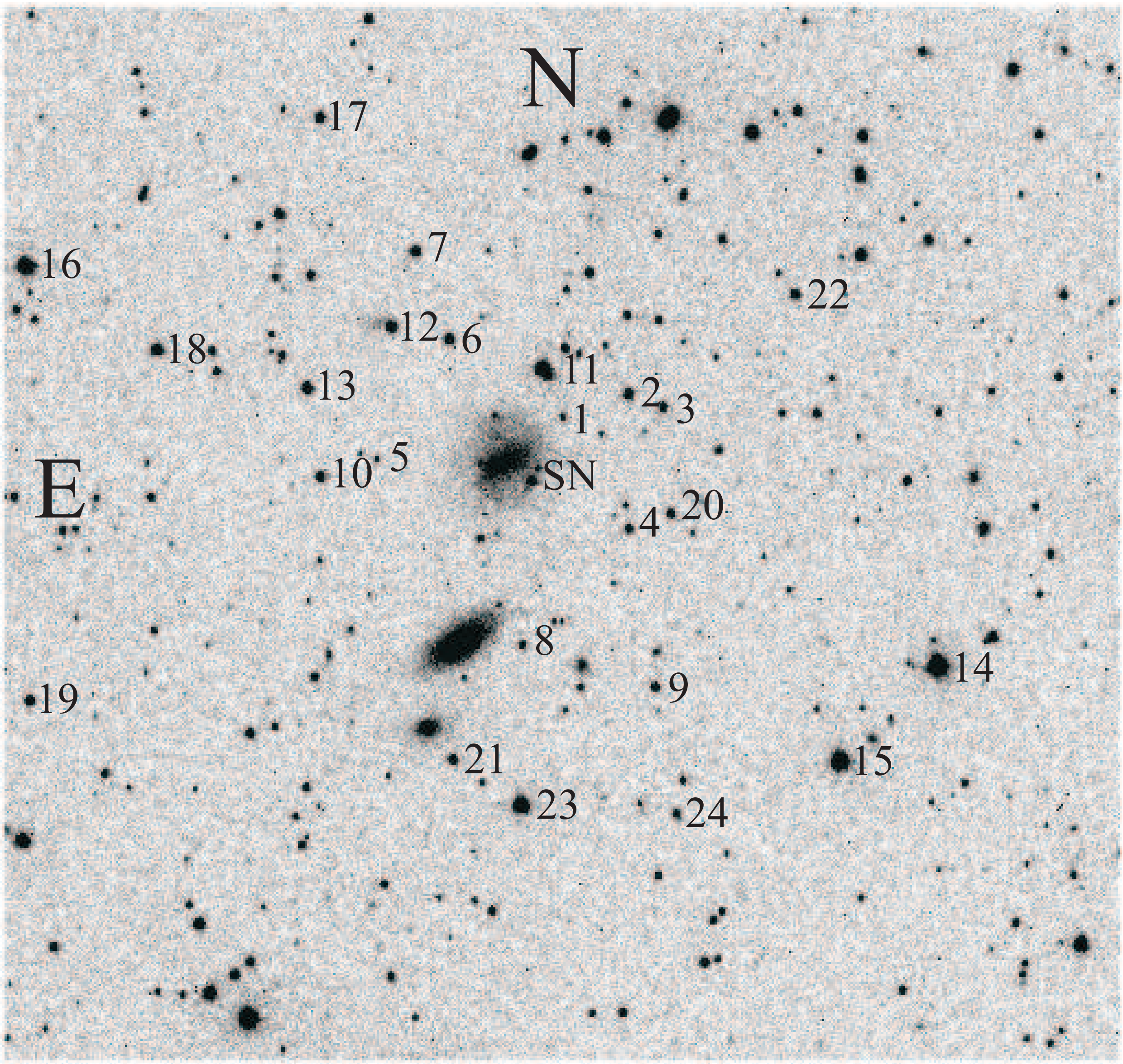

Fig. 1.— Local Standard Sequence for SN 1998bw. The image was taken with CTIO 0.9m telescope on October 2, 1998, using the I_{rmC} passband. Exposure time was 600 seconds. North is up and East is left. The width of the field in the East-West direction is approximately 6.6 arc-minutes. Stars number 1 to 15 are the same local sequence of Galama et al. (1998).

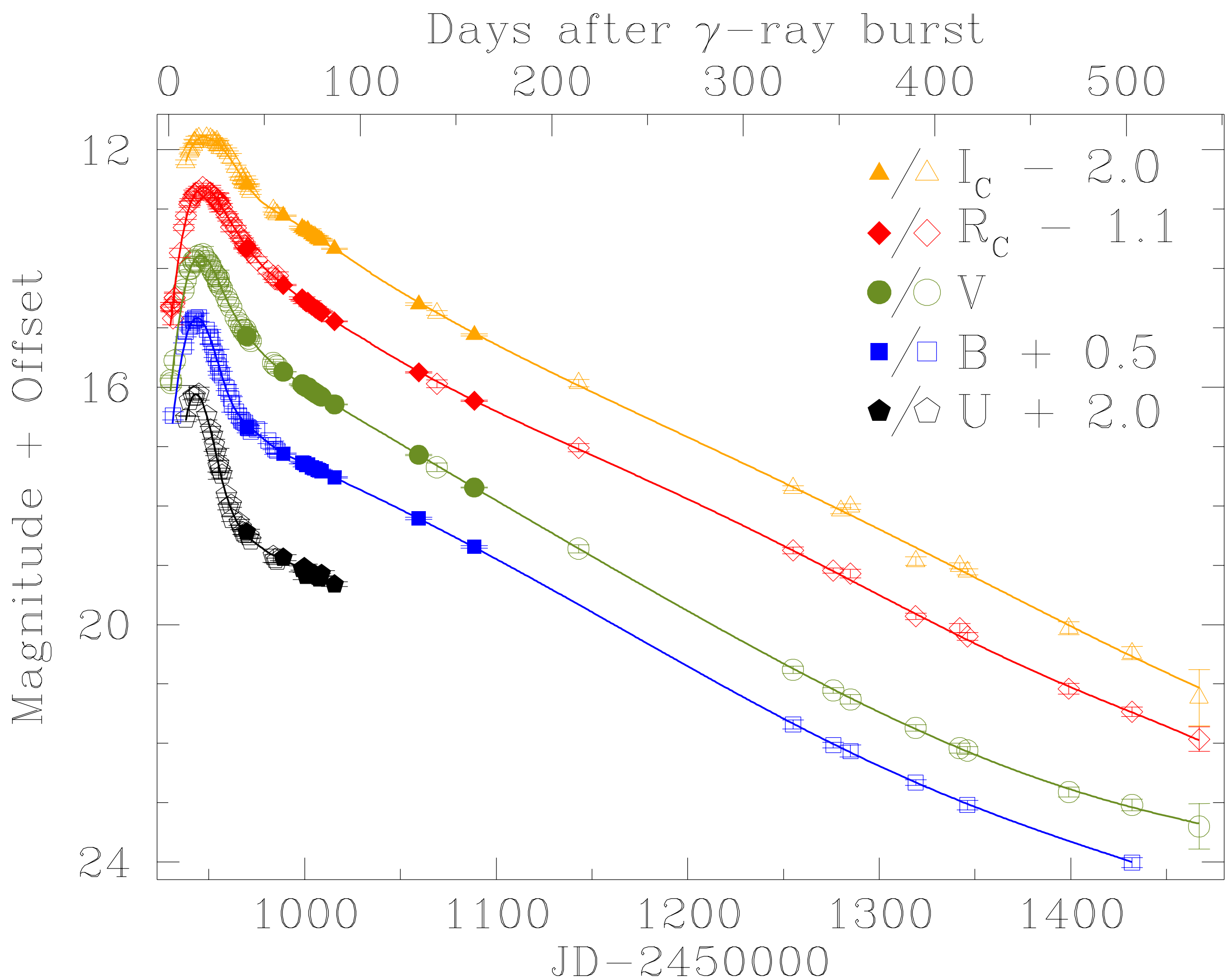

Fig. 2.— Complete light curves of SN 1998bw. Open symbols display the observations of Galama et al. (1998) at early time and Sollerman et al. (2002) at late times. Solid symbols bridging the two sets are the CTIO observations presented here. All the observations were transformed to the photometric system defined by the local standards in Table 1. The solid lines are the fits used to build the intrinsic light curves given in Table 3.

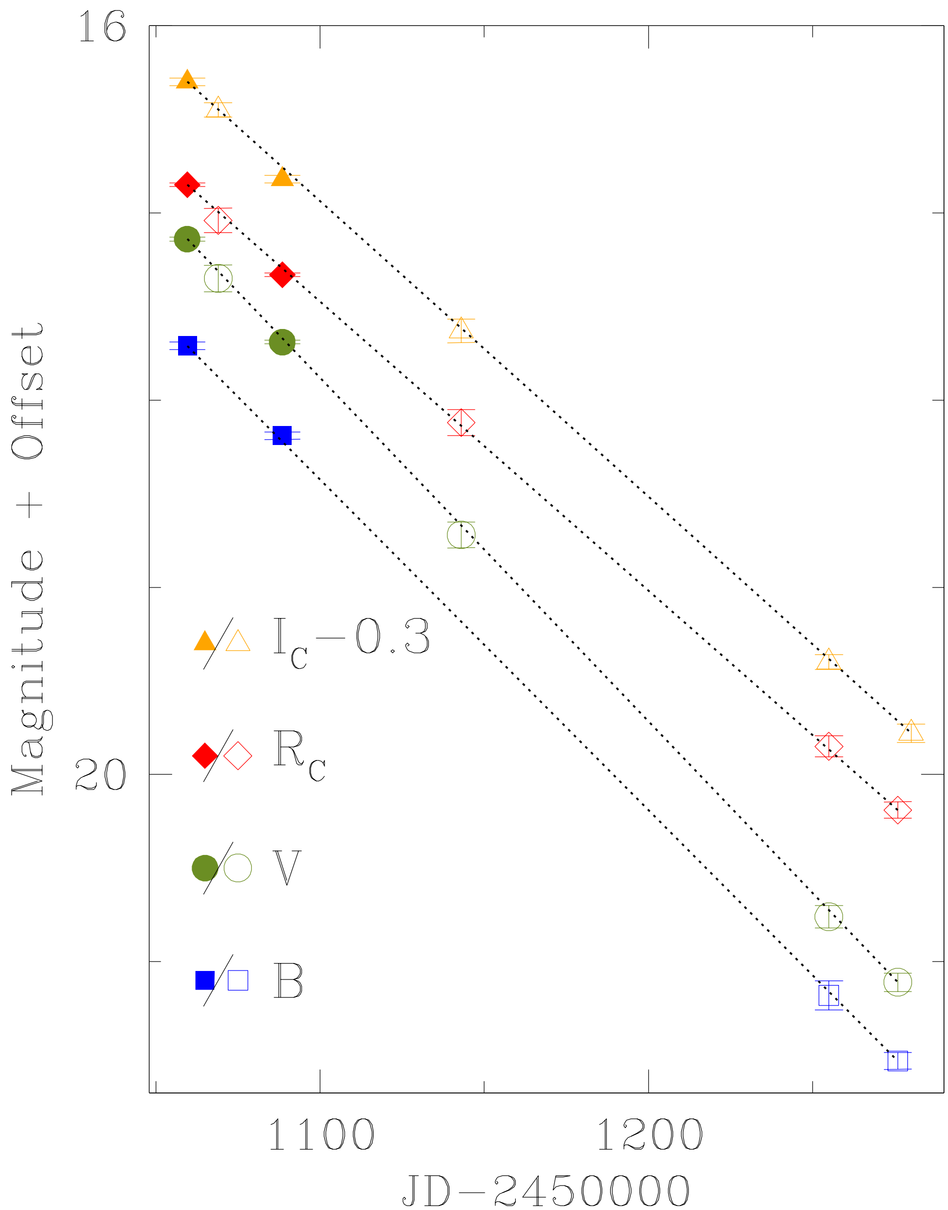

Fig. 3.— Expanded view of the region of overlap between the CTIO observations and those of Sollerman et al. (2002). Solid symbols correspond to the last epochs of CTIO photometry (Table 2 under reference number 2), open symbols to the first epochs observed by Sollerman et al. (2002). For each passband, dotted straight lines connect the first and last observation plotted.

Table 1. Local Standard Sequence for SN 1998bw

ID[a]	V	$B-V$	$U-B$	$V-Rc$	$V-Ic$
1	18.503 ± 0.032	0.422 ± 0.053	-0.208 ± 0.053	0.293 ± 0.050	0.576 ± 0.043
2	17.696 ± 0.006	1.161 ± 0.044	0.964 ± 0.179	0.717 ± 0.010	1.309 ± 0.007
3	18.072 ± 0.008	0.864 ± 0.031	0.570 ± 0.041	0.495 ± 0.023	0.972 ± 0.012
4	17.792 ± 0.022	0.696 ± 0.024	0.085 ± 0.039	0.399 ± 0.023	0.780 ± 0.025
5	19.403 ± 0.021	0.772 ± 0.030	···	0.435 ± 0.029	0.855 ± 0.041
6	17.215 ± 0.014	0.641 ± 0.016	0.022 ± 0.013	0.397 ± 0.016	0.761 ± 0.016
7	17.489 ± 0.021	0.831 ± 0.022	0.315 ± 0.016	0.524 ± 0.022	1.024 ± 0.021
8	18.572 ± 0.018	0.622 ± 0.021	-0.025 ± 0.034	0.394 ± 0.051	0.753 ± 0.029
9	17.983 ± 0.017	0.909 ± 0.029	0.560 ± 0.034	0.524 ± 0.018	0.983 ± 0.027
10	17.496 ± 0.021	0.840 ± 0.038	0.410 ± 0.034	0.484 ± 0.024	0.911 ± 0.022
11	15.561 ± 0.002	0.999 ± 0.013	0.556 ± 0.019	0.550 ± 0.007	1.059 ± 0.002
12	16.740 ± 0.035	0.599 ± 0.039	0.009 ± 0.017	0.370 ± 0.045	0.746 ± 0.036
13	16.676 ± 0.004	0.762 ± 0.008	0.317 ± 0.030	0.444 ± 0.007	0.826 ± 0.005
14	14.070 ± 0.012	0.755 ± 0.019	0.335 ± 0.018	0.429 ± 0.023	0.833 ± 0.019
15	14.515 ± 0.014	0.665 ± 0.021	0.151 ± 0.019	0.380 ± 0.025	0.752 ± 0.021
16	15.204 ± 0.004	0.845 ± 0.006	0.533 ± 0.020	0.457 ± 0.005	0.846 ± 0.005
17	17.190 ± 0.005	0.849 ± 0.011	0.418 ± 0.027	0.482 ± 0.006	0.931 ± 0.006
18	16.701 ± 0.005	0.640 ± 0.006	0.014 ± 0.020	0.403 ± 0.005	0.811 ± 0.006
19	17.569 ± 0.007	0.952 ± 0.014	0.624 ± 0.039	0.572 ± 0.009	1.081 ± 0.007
20	17.886 ± 0.007	1.052 ± 0.013	0.818 ± 0.035	0.575 ± 0.009	1.059 ± 0.008
21	17.516 ± 0.005	0.669 ± 0.008	0.130 ± 0.022	0.381 ± 0.006	0.755 ± 0.009
22	17.710 ± 0.008	0.998 ± 0.010	0.712 ± 0.028	0.586 ± 0.009	1.101 ± 0.008
23	16.046 ± 0.005	1.349 ± 0.006	1.244 ± 0.023	0.866 ± 0.005	1.688 ± 0.005
24	17.973 ± 0.007	0.654 ± 0.009	0.007 ± 0.024	0.394 ± 0.008	0.759 ± 0.011
25[b]	18.007 ± 0.007	0.925 ± 0.014	0.734 ± 0.035	0.535 ± 0.009	0.999 ± 0.018

[a]Stars number 1 to 15 are the same as those of Galama et al. (1998).

[b]Star number 25 falls outside the finding chart of Figure 1. It is located 23.1 arc-seconds North and 20.6 arc-seconds East from star number 19.

Table 2. Photometry of SN 1998bw transformed to CTIO System

JD[a]	U	B	V	Rc	Ic	Ref.[b]
930.13	···	···	15.88 ± 0.08	15.74 ± 0.07	···	(1)
930.25	···	···	···	15.77 ± 0.06	···	(1)
930.31	···	···	15.93 ± 0.08	15.74 ± 0.07	···	(1)
931.30	···	15.98 ± 0.07	···	15.94 ± 0.11	···	(1)
931.92	···	···	···	15.69 ± 0.06	···	(1)
932.19	···	···	15.55 ± 0.08	15.59 ± 0.07	···	(1)
932.22	···	···	···	15.59 ± 0.09	···	(1)
934.83	···	···	···	14.84 ± 0.08	···	(1)
936.84	···	14.81 ± 0.06	14.36 ± 0.05	14.41 ± 0.05	···	(1)
937.91	14.53 ± 0.05	14.57 ± 0.08	14.19 ± 0.06	14.21 ± 0.06	14.21 ± 0.04	(1)
939.83	14.23 ± 0.26	14.46 ± 0.06	14.00 ± 0.05	14.02 ± 0.05	14.03 ± 0.04	(1)
940.28	···	14.48 ± 0.07	14.01 ± 0.06	13.98 ± 0.06	14.00 ± 0.04	(1)
941.83	14.16 ± 0.05	14.36 ± 0.05	13.88 ± 0.05	13.90 ± 0.05	13.92 ± 0.03	(1)
942.27	···	14.38 ± 0.08	13.90 ± 0.07	13.85 ± 0.07	13.87 ± 0.05	(1)
942.83	14.15 ± 0.04	14.33 ± 0.05	13.85 ± 0.05	13.86 ± 0.05	13.87 ± 0.03	(1)
943.29	···	14.36 ± 0.11	13.87 ± 0.08	13.82 ± 0.07	13.82 ± 0.05	(1)
944.76	14.11 ± 0.11	14.32 ± 0.07	13.78 ± 0.08	13.79 ± 0.08	13.80 ± 0.04	(1)
946.90	···	···	13.76 ± 0.13	13.73 ± 0.07	···	(1)
947.90	···	···	13.82 ± 0.06	···	···	(1)
948.90	14.48 ± 0.07	14.53 ± 0.06	13.87 ± 0.06	13.78 ± 0.05	13.79 ± 0.05	(1)
949.88	···	···	13.90 ± 0.06	···	···	(1)
950.72	···	14.65 ± 0.12	13.95 ± 0.08	13.82 ± 0.12	···	(1)
950.89	14.71 ± 0.05	14.68 ± 0.10	13.97 ± 0.08	13.82 ± 0.08	13.81 ± 0.05	(1)
951.85	14.81 ± 0.07	14.79 ± 0.08	14.03 ± 0.07	13.85 ± 0.07	13.84 ± 0.04	(1)
952.81	14.98 ± 0.10	14.93 ± 0.07	14.09 ± 0.06	13.89 ± 0.07	13.87 ± 0.04	(1)
953.74	15.10 ± 0.05	15.01 ± 0.06	14.13 ± 0.06	13.92 ± 0.06	13.88 ± 0.04	(1)
954.10	···	···	14.13 ± 0.06	13.96 ± 0.06	13.85 ± 0.04	(1)
954.85	···	···	14.21 ± 0.06	13.97 ± 0.06	···	(1)
954.88	15.33 ± 0.10	15.15 ± 0.08	14.24 ± 0.06	13.94 ± 0.12	13.93 ± 0.08	(1)
955.20	15.29 ± 0.26	15.08 ± 0.22	14.17 ± 0.14	13.97 ± 0.13	13.91 ± 0.07	(1)
955.86	···	···	···	14.03 ± 0.12	···	(1)

Table 2—Continued

JD[a]	U	B	V	Rc	Ic	Ref.[b]
955.88	15.40 ± 0.04	15.26 ± 0.09	14.30 ± 0.07	14.02 ± 0.07	13.97 ± 0.04	(1)
956.80	15.47 ± 0.06	15.30 ± 0.07	14.34 ± 0.06	14.07 ± 0.07	13.97 ± 0.05	(1)
959.17	15.82 ± 0.04	15.51 ± 0.05	14.48 ± 0.05	14.19 ± 0.05	14.02 ± 0.05	(1)
960.13	16.02 ± 0.05	15.58 ± 0.06	14.56 ± 0.07	14.24 ± 0.06	14.06 ± 0.04	(1)
961.66	15.98 ± 0.04	15.69 ± 0.05	14.65 ± 0.06	14.40 ± 0.08	14.14 ± 0.08	(1)
962.08	16.22 ± 0.04	15.79 ± 0.13	···	14.33 ± 0.05	···	(1)
964.12	···	15.91 ± 0.05	14.83 ± 0.05	14.42 ± 0.05	14.29 ± 0.03	(1)
965.80	16.28 ± 0.05	15.98 ± 0.05	14.92 ± 0.05	14.54 ± 0.05	14.42 ± 0.04	(1)
966.87	16.36 ± 0.04	16.05 ± 0.05	14.99 ± 0.05	14.60 ± 0.05	14.48 ± 0.03	(1)
967.82	16.44 ± 0.04	16.08 ± 0.05	15.03 ± 0.05	14.63 ± 0.05	14.55 ± 0.03	(1)
968.81	16.46 ± 0.05	16.10 ± 0.05	15.08 ± 0.05	14.70 ± 0.05	14.56 ± 0.03	(1)
969.06	···	···	15.03 ± 0.05	14.72 ± 0.05	14.47 ± 0.03	(1)
969.76	16.44 ± 0.05	16.17 ± 0.02	15.14 ± 0.01	14.76 ± 0.01	14.58 ± 0.01	(2)
970.22	···	16.18 ± 0.09	15.13 ± 0.07	14.77 ± 0.06	14.54 ± 0.04	(1)
970.87	16.51 ± 0.04	16.19 ± 0.05	15.18 ± 0.05	14.80 ± 0.05	14.66 ± 0.04	(1)
971.89	16.58 ± 0.04	16.25 ± 0.05	15.22 ± 0.05	14.84 ± 0.05	14.71 ± 0.04	(1)
975.06	···	16.21 ± 0.10	···	14.95 ± 0.05	···	(1)
981.04	···	16.40 ± 0.05	···	15.14 ± 0.05	···	(1)
983.58	16.84 ± 0.11	16.48 ± 0.07	15.59 ± 0.06	15.22 ± 0.06	15.01 ± 0.04	(1)
984.63	16.89 ± 0.07	16.55 ± 0.08	15.63 ± 0.06	15.28 ± 0.06	15.06 ± 0.08	(1)
985.69	16.92 ± 0.04	16.57 ± 0.05	15.65 ± 0.05	15.29 ± 0.05	15.09 ± 0.03	(1)
986.04	···	···	···	15.22 ± 0.06	···	(1)
0988.83	16.87 ± 0.05	16.62 ± 0.01	15.74 ± 0.00	15.38 ± 0.01	15.11 ± 0.01	(2)
0998.74	17.06 ± 0.05	16.77 ± 0.02	15.95 ± 0.01	15.60 ± 0.02	15.31 ± 0.02	(2)
0999.73	17.03 ± 0.05	16.78 ± 0.01	15.98 ± 0.01	15.64 ± 0.01	15.34 ± 0.01	(2)
1000.76	17.18 ± 0.06	16.81 ± 0.03	16.00 ± 0.02	15.67 ± 0.02	15.37 ± 0.02	(2)
1001.70	···	16.80 ± 0.02	16.00 ± 0.02	15.66 ± 0.02	15.35 ± 0.02	(2)
1003.69	17.13 ± 0.05	16.85 ± 0.02	16.06 ± 0.01	15.73 ± 0.01	15.42 ± 0.01	(2)
1004.80	17.14 ± 0.05	16.87 ± 0.01	16.08 ± 0.01	15.75 ± 0.01	15.45 ± 0.01	(2)
1005.70	17.16 ± 0.05	16.87 ± 0.02	16.10 ± 0.01	15.78 ± 0.01	15.46 ± 0.01	(2)
1006.72	17.19 ± 0.05	16.89 ± 0.01	16.12 ± 0.01	15.80 ± 0.01	15.49 ± 0.01	(2)

Table 2—Continued

JD[a]	U	B	V	Rc	Ic	Ref.[b]
1007.60	17.22 ± 0.04	16.90 ± 0.01	16.14 ± 0.01	15.82 ± 0.01	15.51 ± 0.01	(2)
1008.72	17.14 ± 0.05	16.92 ± 0.01	16.16 ± 0.01	15.84 ± 0.01	15.53 ± 0.01	(2)
1015.57	17.32 ± 0.04	17.02 ± 0.01	16.29 ± 0.01	15.99 ± 0.01	15.67 ± 0.01	(2)
1059.57	···	17.71 ± 0.02	17.14 ± 0.01	16.85 ± 0.01	16.60 ± 0.02	(2)
1069.00	···	···	17.35 ± 0.07	17.04 ± 0.07	16.75 ± 0.04	(3)
1088.55	···	18.19 ± 0.02	17.69 ± 0.01	17.33 ± 0.01	17.12 ± 0.02	(2)
1143.00	···	···	18.72 ± 0.07	18.12 ± 0.07	17.93 ± 0.06	(3)
1255.00	···	21.18 ± 0.08	20.76 ± 0.06	19.85 ± 0.06	19.70 ± 0.04	(3)
1276.00	···	21.53 ± 0.05	21.11 ± 0.05	20.19 ± 0.04	···	(3)
1280.00	···	···	···	···	20.08 ± 0.05	(3)
1285.00	···	21.63 ± 0.10	21.26 ± 0.08	20.24 ± 0.07	20.01 ± 0.05	(3)
1319.00	···	22.16 ± 0.05	21.74 ± 0.05	20.96 ± 0.05	20.93 ± 0.07	(3)
1342.00	···	···	22.08 ± 0.08	21.16 ± 0.08	21.01 ± 0.05	(3)
1346.00	···	22.54 ± 0.08	22.12 ± 0.07	21.30 ± 0.07	21.11 ± 0.05	(3)
1399.00	···	···	22.82 ± 0.09	22.18 ± 0.09	22.06 ± 0.11	(3)
1432.00	···	23.51 ± 0.09	23.04 ± 0.10	22.57 ± 0.08	22.48 ± 0.11	(3)
1467.00	···	···	23.40 ± 0.38	23.03 ± 0.21	23.23 ± 0.48	(3)

[a]Mean Julian Date minus 2450000.

[b]References for photometry are: (1) Galama et al. (1998), (2) This work, (3) Sollerman et al. (2002).

Table 3. Intrinsic Light Curve of SN 1998bw

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$ [c]	$F_{BV(RI)_C}$ [c]
938	8.5	14.20 ± 0.04	14.36 ± 0.12	13.98 ± 0.08	14.03 ± 0.08	14.05 ± 0.01	520.973 ± 39.134	403.065 ± 29.406
939	9.5	14.04 ± 0.04	14.25 ± 0.06	13.86 ± 0.06	13.91 ± 0.06	13.95 ± 0.01	581.517 ± 27.301	448.978 ± 21.199
940	10.5	13.91 ± 0.06	14.16 ± 0.01	13.76 ± 0.03	13.80 ± 0.05	13.87 ± 0.01	636.446 ± 17.171	491.197 ± 13.565
941	11.5	13.83 ± 0.02	14.10 ± 0.01	13.67 ± 0.01	13.72 ± 0.02	13.80 ± 0.01	683.884 ± 6.995	528.501 ± 5.135
942	12.5	13.78 ± 0.03	14.05 ± 0.01	13.61 ± 0.01	13.64 ± 0.01	13.75 ± 0.01	722.256 ± 6.137	559.822 ± 4.203
943	13.5	13.75 ± 0.04	14.02 ± 0.01	13.56 ± 0.03	13.59 ± 0.02	13.70 ± 0.01	749.795 ± 12.392	583.606 ± 9.806
944	14.5	13.76 ± 0.01	14.02 ± 0.01	13.53 ± 0.03	13.55 ± 0.02	13.67 ± 0.02	766.461 ± 13.486	600.031 ± 11.953
945	15.5	13.79 ± 0.03	14.03 ± 0.01	13.51 ± 0.01	13.52 ± 0.02	13.65 ± 0.01	772.324 ± 8.626	608.760 ± 6.209
946	16.5	13.85 ± 0.01	14.05 ± 0.01	13.51 ± 0.01	13.50 ± 0.02	13.63 ± 0.01	767.691 ± 9.791	609.733 ± 7.951
947	17.5	13.93 ± 0.02	14.10 ± 0.02	13.52 ± 0.02	13.49 ± 0.01	13.63 ± 0.01	754.239 ± 11.470	604.003 ± 8.560
948	18.4	14.02 ± 0.02	14.16 ± 0.01	13.55 ± 0.01	13.50 ± 0.02	13.63 ± 0.01	732.902 ± 8.147	592.157 ± 6.288
949	19.4	14.13 ± 0.01	14.23 ± 0.01	13.58 ± 0.02	13.51 ± 0.03	13.63 ± 0.01	705.803 ± 10.884	575.488 ± 10.127
950	20.4	14.25 ± 0.01	14.31 ± 0.02	13.63 ± 0.02	13.53 ± 0.03	13.64 ± 0.01	674.712 ± 11.467	555.124 ± 9.836
951	21.4	14.38 ± 0.02	14.40 ± 0.02	13.68 ± 0.04	13.56 ± 0.02	13.66 ± 0.01	640.630 ± 13.889	531.926 ± 11.899
952	22.4	14.52 ± 0.04	14.50 ± 0.01	13.74 ± 0.04	13.60 ± 0.02	13.68 ± 0.01	605.068 ± 13.494	506.774 ± 11.926
953	23.4	14.66 ± 0.02	14.60 ± 0.04	13.80 ± 0.03	13.64 ± 0.02	13.70 ± 0.02	569.122 ± 15.949	480.624 ± 12.868
954	24.4	14.80 ± 0.02	14.70 ± 0.03	13.87 ± 0.01	13.68 ± 0.03	13.72 ± 0.02	533.918 ± 9.466	454.446 ± 7.596
955	25.4	14.95 ± 0.03	14.81 ± 0.02	13.95 ± 0.01	13.73 ± 0.02	13.75 ± 0.01	499.760 ± 7.093	428.436 ± 5.743
956	26.4	15.08 ± 0.04	14.92 ± 0.04	14.02 ± 0.03	13.78 ± 0.01	13.79 ± 0.03	467.486 ± 11.242	403.412 ± 8.749
957	27.4	15.21 ± 0.07	15.03 ± 0.01	14.10 ± 0.01	13.84 ± 0.01	13.82 ± 0.01	437.264 ± 3.727	379.477 ± 2.291
958	28.4	15.34 ± 0.05	15.13 ± 0.02	14.18 ± 0.02	13.89 ± 0.01	13.86 ± 0.01	409.464 ± 5.847	357.084 ± 4.519
959	29.4	15.45 ± 0.02	15.22 ± 0.04	14.25 ± 0.03	13.95 ± 0.01	13.90 ± 0.04	384.201 ± 8.895	336.463 ± 7.511
960	30.3	15.55 ± 0.08	15.31 ± 0.04	14.32 ± 0.02	14.00 ± 0.01	13.94 ± 0.05	361.452 ± 9.245	317.610 ± 7.085

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$ [c]	$F_{BV(RI)_C}$ [c]
961	31.3	15.64 ± 0.01	15.39 ± 0.05	14.38 ± 0.03	14.06 ± 0.03	13.99 ± 0.03	340.896 ± 10.813	300.287 ± 9.252
962	32.3	15.72 ± 0.09	15.46 ± 0.01	14.45 ± 0.03	14.11 ± 0.01	14.04 ± 0.03	322.261 ± 6.691	284.383 ± 5.585
963	33.3	15.80 ± 0.07	15.53 ± 0.01	14.51 ± 0.01	14.16 ± 0.03	14.08 ± 0.02	305.460 ± 5.698	269.901 ± 4.896
964	34.3	15.87 ± 0.02	15.59 ± 0.01	14.57 ± 0.01	14.22 ± 0.04	14.13 ± 0.01	290.181 ± 5.308	256.543 ± 4.872
965	35.3	15.93 ± 0.02	15.64 ± 0.01	14.63 ± 0.01	14.27 ± 0.03	14.19 ± 0.02	276.104 ± 3.807	244.144 ± 3.467
966	36.3	15.98 ± 0.05	15.69 ± 0.01	14.68 ± 0.01	14.32 ± 0.01	14.24 ± 0.04	263.403 ± 2.617	232.846 ± 2.175
967	37.3	16.02 ± 0.02	15.73 ± 0.02	14.73 ± 0.02	14.37 ± 0.01	14.29 ± 0.05	251.911 ± 4.436	222.522 ± 3.936
968	38.3	16.07 ± 0.01	15.77 ± 0.01	14.78 ± 0.01	14.42 ± 0.01	14.34 ± 0.06	241.355 ± 4.164	213.009 ± 3.857
969	39.3	16.11 ± 0.01	15.80 ± 0.01	14.83 ± 0.03	14.46 ± 0.02	14.39 ± 0.06	231.624 ± 5.888	204.203 ± 5.692
970	40.3	16.14 ± 0.04	15.84 ± 0.04	14.87 ± 0.01	14.51 ± 0.03	14.44 ± 0.03	222.657 ± 5.377	196.032 ± 4.504
971	41.3	16.17 ± 0.02	15.87 ± 0.03	14.91 ± 0.03	14.55 ± 0.02	14.48 ± 0.03	214.466 ± 5.401	188.585 ± 4.692
972	42.2	16.20 ± 0.02	15.89 ± 0.06	14.95 ± 0.02	14.60 ± 0.01	14.53 ± 0.03	206.877 ± 4.491	181.655 ± 3.422
973	43.2	16.23 ± 0.01	15.92 ± 0.02	14.99 ± 0.02	14.64 ± 0.01	14.57 ± 0.02	199.771 ± 2.611	175.174 ± 2.237
974	44.2	16.26 ± 0.01	15.95 ± 0.03	15.03 ± 0.01	14.68 ± 0.01	14.61 ± 0.01	193.299 ± 1.719	169.267 ± 1.205
975	45.2	16.28 ± 0.01	15.97 ± 0.06	15.07 ± 0.01	14.72 ± 0.01	14.64 ± 0.01	187.186 ± 2.876	163.734 ± 1.791
976	46.2	16.31 ± 0.01	16.00 ± 0.06	15.11 ± 0.01	14.75 ± 0.01	14.67 ± 0.01	181.512 ± 3.121	158.605 ± 2.114
977	47.2	16.33 ± 0.01	16.02 ± 0.06	15.14 ± 0.01	14.79 ± 0.01	14.70 ± 0.02	176.157 ± 3.643	153.792 ± 2.701
978	48.2	16.35 ± 0.01	16.05 ± 0.06	15.18 ± 0.02	14.82 ± 0.01	14.73 ± 0.02	171.163 ± 3.805	149.312 ± 2.931
979	49.2	16.38 ± 0.01	16.08 ± 0.04	15.21 ± 0.01	14.86 ± 0.01	14.75 ± 0.02	166.472 ± 2.799	145.137 ± 2.133
980	50.2	16.40 ± 0.01	16.10 ± 0.04	15.24 ± 0.01	14.89 ± 0.01	14.78 ± 0.02	162.102 ± 2.726	141.253 ± 2.113
981	51.2	16.42 ± 0.01	16.13 ± 0.04	15.27 ± 0.02	14.92 ± 0.01	14.80 ± 0.02	157.888 ± 2.674	137.518 ± 2.132
982	52.2	16.44 ± 0.01	16.16 ± 0.03	15.30 ± 0.02	14.95 ± 0.01	14.82 ± 0.01	153.904 ± 2.382	133.984 ± 1.902
983	53.2	16.46 ± 0.01	16.18 ± 0.03	15.33 ± 0.02	14.98 ± 0.01	14.84 ± 0.01	150.227 ± 1.985	130.714 ± 1.578

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
984	54.1	16.48 ± 0.02	16.20 ± 0.01	15.35 ± 0.01	15.01 ± 0.01	14.86 ± 0.01	146.780 ± 0.930	127.662 ± 0.743
985	55.1	16.49 ± 0.05	16.23 ± 0.03	15.38 ± 0.01	15.04 ± 0.01	14.88 ± 0.03	143.401 ± 2.262	124.657 ± 1.720
986	56.1	16.51 ± 0.05	16.25 ± 0.01	15.41 ± 0.01	15.06 ± 0.06	14.90 ± 0.03	140.252 ± 3.882	121.858 ± 3.499
987	57.1	16.52 ± 0.02	16.27 ± 0.01	15.43 ± 0.01	15.09 ± 0.04	14.92 ± 0.02	137.216 ± 2.448	119.160 ± 2.239
988	58.1	16.54 ± 0.02	16.29 ± 0.01	15.46 ± 0.01	15.12 ± 0.02	14.94 ± 0.01	134.397 ± 1.298	116.638 ± 1.076
989	59.1	16.55 ± 0.05	16.31 ± 0.01	15.48 ± 0.01	15.14 ± 0.01	14.96 ± 0.01	131.634 ± 0.781	114.177 ± 0.552
990	60.1	16.57 ± 0.04	16.33 ± 0.01	15.50 ± 0.01	15.17 ± 0.01	14.98 ± 0.01	129.133 ± 0.923	111.935 ± 0.710
991	61.1	16.58 ± 0.04	16.34 ± 0.01	15.52 ± 0.01	15.20 ± 0.01	14.99 ± 0.01	126.646 ± 0.835	109.707 ± 0.634
992	62.1	16.60 ± 0.03	16.36 ± 0.01	15.54 ± 0.01	15.22 ± 0.01	15.01 ± 0.01	124.252 ± 0.542	107.542 ± 0.391
993	63.1	16.61 ± 0.02	16.37 ± 0.01	15.56 ± 0.01	15.24 ± 0.01	15.03 ± 0.01	121.987 ± 0.639	105.487 ± 0.484
994	64.1	16.62 ± 0.02	16.39 ± 0.01	15.58 ± 0.01	15.27 ± 0.01	15.05 ± 0.01	119.720 ± 0.629	103.442 ± 0.528
995	65.1	16.64 ± 0.01	16.40 ± 0.01	15.60 ± 0.01	15.29 ± 0.01	15.07 ± 0.01	117.509 ± 0.483	101.429 ± 0.385
996	66.0	16.65 ± 0.01	16.41 ± 0.01	15.62 ± 0.01	15.32 ± 0.01	15.09 ± 0.01	115.368 ± 0.562	99.494 ± 0.488
997	67.0	16.67 ± 0.01	16.43 ± 0.01	15.64 ± 0.01	15.35 ± 0.01	15.12 ± 0.01	113.273 ± 0.700	97.592 ± 0.627
998	68.0	16.68 ± 0.01	16.44 ± 0.01	15.66 ± 0.01	15.37 ± 0.02	15.14 ± 0.01	111.132 ± 0.863	95.672 ± 0.780
999	69.0	16.69 ± 0.01	16.46 ± 0.01	15.69 ± 0.01	15.39 ± 0.01	15.16 ± 0.01	109.092 ± 0.745	93.837 ± 0.674
1000	70.0	16.71 ± 0.01	16.47 ± 0.01	15.70 ± 0.02	15.42 ± 0.01	15.18 ± 0.01	107.135 ± 1.006	92.080 ± 0.936
1001	71.0	16.72 ± 0.10	16.49 ± 0.01	15.72 ± 0.01	15.44 ± 0.01	15.20 ± 0.01	105.174 ± 0.869	90.311 ± 0.437
1002	72.0	16.74 ± 0.06	16.50 ± 0.01	15.74 ± 0.01	15.46 ± 0.02	15.23 ± 0.02	103.192 ± 1.505	88.539 ± 1.191
1003	73.0	16.75 ± 0.03	16.52 ± 0.01	15.77 ± 0.01	15.49 ± 0.01	15.25 ± 0.01	101.277 ± 0.552	86.826 ± 0.401
1004	74.0	16.77 ± 0.01	16.53 ± 0.01	15.79 ± 0.01	15.51 ± 0.01	15.27 ± 0.01	99.432 ± 0.811	85.175 ± 0.677
1005	75.0	16.78 ± 0.01	16.55 ± 0.01	15.81 ± 0.01	15.53 ± 0.01	15.29 ± 0.01	97.597 ± 0.382	83.526 ± 0.288
1006	76.0	16.80 ± 0.02	16.56 ± 0.01	15.83 ± 0.01	15.56 ± 0.01	15.32 ± 0.01	95.826 ± 0.737	81.948 ± 0.655

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1007	77.0	16.81 ± 0.03	16.58 ± 0.01	15.85 ± 0.01	15.58 ± 0.01	15.34 ± 0.01	94.051 ± 0.722	80.364 ± 0.575
1008	77.9	16.82 ± 0.01	16.59 ± 0.01	15.87 ± 0.01	15.60 ± 0.01	15.36 ± 0.01	92.386 ± 0.563	78.887 ± 0.509
1009	78.9	16.84 ± 0.05	16.61 ± 0.01	15.89 ± 0.01	15.62 ± 0.01	15.38 ± 0.01	90.750 ± 0.675	77.436 ± 0.461
1010	79.9	16.86 ± 0.05	16.62 ± 0.01	15.91 ± 0.01	15.65 ± 0.01	15.40 ± 0.01	89.093 ± 0.405	75.965 ± 0.225
1011	80.9	16.87 ± 0.03	16.64 ± 0.01	15.93 ± 0.01	15.67 ± 0.01	15.42 ± 0.01	87.517 ± 0.432	74.569 ± 0.284
1012	81.9	16.89 ± 0.02	16.65 ± 0.01	15.95 ± 0.01	15.69 ± 0.01	15.44 ± 0.01	85.956 ± 0.345	73.198 ± 0.260
1013	82.9	16.90 ± 0.01	16.67 ± 0.01	15.97 ± 0.01	15.71 ± 0.01	15.46 ± 0.01	84.437 ± 0.422	71.853 ± 0.325
1014	83.9	16.92 ± 0.01	16.68 ± 0.01	15.99 ± 0.01	15.73 ± 0.01	15.48 ± 0.01	82.977 ± 0.297	70.566 ± 0.251
1015	84.9	16.93 ± 0.02	16.70 ± 0.01	16.01 ± 0.01	15.75 ± 0.01	15.50 ± 0.01	81.519 ± 0.353	69.281 ± 0.253
1016	85.9	16.95 ± 0.02	16.71 ± 0.01	16.03 ± 0.01	15.77 ± 0.01	15.52 ± 0.01	80.130 ± 0.311	68.060 ± 0.222
1017	86.9	···	16.73 ± 0.01	16.05 ± 0.01	15.79 ± 0.01	15.54 ± 0.01	···	66.818 ± 0.224
1018	87.9	···	16.74 ± 0.01	16.07 ± 0.01	15.81 ± 0.01	15.56 ± 0.01	···	65.641 ± 0.195
1019	88.9	···	16.76 ± 0.01	16.09 ± 0.01	15.84 ± 0.01	15.59 ± 0.01	···	64.477 ± 0.216
1020	89.8	···	16.77 ± 0.01	16.11 ± 0.01	15.86 ± 0.01	15.61 ± 0.01	···	63.341 ± 0.188
1021	90.8	···	16.79 ± 0.01	16.13 ± 0.01	15.88 ± 0.01	15.63 ± 0.01	···	62.234 ± 0.364
1022	91.8	···	16.80 ± 0.01	16.15 ± 0.01	15.89 ± 0.01	15.65 ± 0.01	···	61.142 ± 0.332
1023	92.8	···	16.82 ± 0.01	16.17 ± 0.01	15.91 ± 0.01	15.67 ± 0.01	···	60.053 ± 0.350
1024	93.8	···	16.83 ± 0.01	16.19 ± 0.01	15.93 ± 0.01	15.69 ± 0.01	···	59.006 ± 0.343
1025	94.8	···	16.85 ± 0.01	16.21 ± 0.01	15.95 ± 0.01	15.71 ± 0.01	···	57.942 ± 0.326
1026	95.8	···	16.86 ± 0.01	16.23 ± 0.01	15.97 ± 0.01	15.73 ± 0.01	···	56.949 ± 0.285
1027	96.8	···	16.88 ± 0.01	16.25 ± 0.01	15.99 ± 0.01	15.75 ± 0.01	···	55.946 ± 0.263
1028	97.8	···	16.90 ± 0.01	16.27 ± 0.01	16.01 ± 0.01	15.78 ± 0.01	···	54.980 ± 0.240
1029	98.8	···	16.91 ± 0.01	16.29 ± 0.01	16.03 ± 0.01	15.80 ± 0.01	···	54.023 ± 0.237

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1030	99.8	···	16.93 ± 0.01	16.31 ± 0.01	16.05 ± 0.01	15.82 ± 0.01	···	53.063 ± 0.238
1031	100.8	···	16.94 ± 0.01	16.33 ± 0.01	16.07 ± 0.01	15.84 ± 0.01	···	52.139 ± 0.180
1032	101.7	···	16.96 ± 0.01	16.35 ± 0.01	16.09 ± 0.01	15.86 ± 0.01	···	51.233 ± 0.173
1033	102.7	···	16.97 ± 0.01	16.36 ± 0.01	16.11 ± 0.01	15.88 ± 0.01	···	50.357 ± 0.149
1034	103.7	···	16.99 ± 0.01	16.39 ± 0.01	16.13 ± 0.01	15.90 ± 0.01	···	49.457 ± 0.160
1035	104.7	···	17.00 ± 0.01	16.40 ± 0.01	16.16 ± 0.01	15.93 ± 0.01	···	48.452 ± 0.290
1036	105.7	···	17.02 ± 0.01	16.42 ± 0.01	16.18 ± 0.01	15.95 ± 0.01	···	47.628 ± 0.331
1037	106.7	···	17.04 ± 0.01	16.44 ± 0.01	16.20 ± 0.01	15.97 ± 0.01	···	46.794 ± 0.322
1038	107.7	···	17.05 ± 0.01	16.46 ± 0.01	16.22 ± 0.01	15.99 ± 0.01	···	45.995 ± 0.284
1039	108.7	···	17.07 ± 0.01	16.48 ± 0.01	16.24 ± 0.01	16.00 ± 0.01	···	45.200 ± 0.221
1040	109.7	···	17.08 ± 0.01	16.50 ± 0.01	16.26 ± 0.01	16.02 ± 0.01	···	44.431 ± 0.179
1041	110.7	···	17.10 ± 0.01	16.52 ± 0.01	16.28 ± 0.01	16.04 ± 0.01	···	43.666 ± 0.176
1042	111.7	···	17.12 ± 0.01	16.54 ± 0.01	16.30 ± 0.01	16.06 ± 0.01	···	42.926 ± 0.146
1043	112.7	···	17.13 ± 0.01	16.55 ± 0.01	16.32 ± 0.01	16.08 ± 0.01	···	42.173 ± 0.137
1044	113.6	···	17.15 ± 0.01	16.57 ± 0.01	16.33 ± 0.01	16.10 ± 0.01	···	41.473 ± 0.159
1045	114.6	···	17.16 ± 0.01	16.59 ± 0.01	16.35 ± 0.01	16.12 ± 0.01	···	40.771 ± 0.127
1046	115.6	···	17.18 ± 0.01	16.61 ± 0.01	16.37 ± 0.01	16.14 ± 0.01	···	40.092 ± 0.205
1047	116.6	···	17.20 ± 0.01	16.63 ± 0.01	16.39 ± 0.01	16.16 ± 0.01	···	39.389 ± 0.176
1048	117.6	···	17.21 ± 0.01	16.65 ± 0.01	16.41 ± 0.01	16.17 ± 0.01	···	38.735 ± 0.202
1049	118.6	···	17.23 ± 0.01	16.67 ± 0.01	16.43 ± 0.01	16.19 ± 0.01	···	38.080 ± 0.201
1050	119.6	···	17.25 ± 0.01	16.69 ± 0.01	16.45 ± 0.01	16.21 ± 0.01	···	37.435 ± 0.187
1051	120.6	···	17.26 ± 0.01	16.71 ± 0.01	16.47 ± 0.01	16.23 ± 0.01	···	36.818 ± 0.195
1052	121.6	···	17.28 ± 0.01	16.73 ± 0.01	16.49 ± 0.01	16.25 ± 0.01	···	36.190 ± 0.164

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	${F_{UBV(RI)_C}}^{c}$	${F_{BV(RI)_C}}^{c}$
1053	122.6	···	17.30 ± 0.01	16.74 ± 0.01	16.50 ± 0.01	16.26 ± 0.01	···	35.588 ± 0.192
1054	123.6	···	17.31 ± 0.01	16.76 ± 0.01	16.52 ± 0.01	16.28 ± 0.01	···	35.001 ± 0.192
1055	124.6	···	17.33 ± 0.01	16.78 ± 0.01	16.54 ± 0.01	16.30 ± 0.01	···	34.404 ± 0.209
1056	125.5	···	17.35 ± 0.01	16.80 ± 0.01	16.56 ± 0.01	16.32 ± 0.02	···	33.853 ± 0.245
1057	126.5	···	17.36 ± 0.01	16.82 ± 0.01	16.58 ± 0.01	16.34 ± 0.03	···	33.285 ± 0.302
1058	127.5	···	17.38 ± 0.01	16.84 ± 0.01	16.60 ± 0.01	16.35 ± 0.03	···	32.716 ± 0.325
1059	128.5	···	17.40 ± 0.01	16.86 ± 0.01	16.61 ± 0.01	16.37 ± 0.03	···	32.172 ± 0.358
1060	129.5	···	17.41 ± 0.01	16.88 ± 0.01	16.63 ± 0.02	16.39 ± 0.03	···	31.652 ± 0.371
1061	130.5	···	17.43 ± 0.01	16.89 ± 0.01	16.65 ± 0.02	16.41 ± 0.02	···	31.117 ± 0.377
1062	131.5	···	17.45 ± 0.01	16.91 ± 0.01	16.67 ± 0.02	16.43 ± 0.02	···	30.612 ± 0.385
1063	132.5	···	17.46 ± 0.01	16.93 ± 0.02	16.69 ± 0.02	16.44 ± 0.01	···	30.104 ± 0.452
1064	133.5	···	17.48 ± 0.01	16.95 ± 0.02	16.70 ± 0.03	16.46 ± 0.02	···	29.617 ± 0.506
1065	134.5	···	17.50 ± 0.01	16.97 ± 0.02	16.72 ± 0.03	16.48 ± 0.02	···	29.124 ± 0.516
1066	135.5	···	17.52 ± 0.01	16.99 ± 0.02	16.74 ± 0.03	16.49 ± 0.01	···	28.648 ± 0.502
1067	136.5	···	17.53 ± 0.01	17.01 ± 0.03	16.76 ± 0.03	16.51 ± 0.01	···	28.163 ± 0.625
1068	137.4	···	17.55 ± 0.01	17.03 ± 0.03	16.77 ± 0.04	16.53 ± 0.01	···	27.716 ± 0.610
1069	138.4	···	17.57 ± 0.01	17.05 ± 0.03	16.79 ± 0.04	16.55 ± 0.01	···	27.264 ± 0.633
1070	139.4	···	17.58 ± 0.01	17.07 ± 0.03	16.81 ± 0.03	16.56 ± 0.01	···	26.818 ± 0.598
1071	140.4	···	17.60 ± 0.01	17.08 ± 0.02	16.83 ± 0.04	16.58 ± 0.01	···	26.384 ± 0.528
1072	141.4	···	17.62 ± 0.01	17.10 ± 0.02	16.84 ± 0.03	16.60 ± 0.01	···	25.965 ± 0.484
1073	142.4	···	17.63 ± 0.01	17.12 ± 0.03	16.86 ± 0.03	16.61 ± 0.01	···	25.538 ± 0.525
1074	143.4	···	17.65 ± 0.01	17.14 ± 0.03	16.88 ± 0.03	16.63 ± 0.01	···	25.121 ± 0.433
1075	144.4	···	17.67 ± 0.01	17.16 ± 0.02	16.90 ± 0.03	16.65 ± 0.01	···	24.717 ± 0.380

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1076	145.4	···	17.68 ± 0.01	17.18 ± 0.02	16.91 ± 0.02	16.66 ± 0.01	···	24.302 ± 0.351
1077	146.4	···	17.70 ± 0.01	17.20 ± 0.02	16.93 ± 0.02	16.68 ± 0.01	···	23.904 ± 0.374
1078	147.4	···	17.72 ± 0.01	17.22 ± 0.02	16.95 ± 0.02	16.70 ± 0.01	···	23.528 ± 0.343
1079	148.4	···	17.74 ± 0.01	17.24 ± 0.01	16.96 ± 0.02	16.71 ± 0.02	···	23.137 ± 0.306
1080	149.3	···	17.75 ± 0.01	17.26 ± 0.01	16.98 ± 0.01	16.73 ± 0.02	···	22.776 ± 0.269
1081	150.3	···	17.77 ± 0.01	17.27 ± 0.01	17.00 ± 0.02	16.75 ± 0.02	···	22.407 ± 0.322
1082	151.3	···	17.79 ± 0.01	17.29 ± 0.01	17.01 ± 0.01	16.76 ± 0.02	···	22.054 ± 0.283
1083	152.3	···	17.80 ± 0.01	17.31 ± 0.01	17.03 ± 0.01	16.78 ± 0.02	···	21.691 ± 0.207
1084	153.3	···	17.82 ± 0.01	17.33 ± 0.01	17.05 ± 0.01	16.80 ± 0.02	···	21.350 ± 0.206
1085	154.3	···	17.84 ± 0.01	17.35 ± 0.01	17.06 ± 0.01	16.81 ± 0.02	···	21.014 ± 0.224
1086	155.3	···	17.86 ± 0.01	17.37 ± 0.01	17.08 ± 0.01	16.83 ± 0.03	···	20.674 ± 0.192
1087	156.3	···	17.87 ± 0.01	17.39 ± 0.01	17.10 ± 0.01	16.84 ± 0.03	···	20.342 ± 0.207
1088	157.3	···	17.89 ± 0.01	17.41 ± 0.01	17.11 ± 0.01	16.86 ± 0.03	···	20.016 ± 0.170
1089	158.3	···	17.91 ± 0.01	17.43 ± 0.01	17.13 ± 0.01	16.88 ± 0.03	···	19.701 ± 0.191
1090	159.3	···	17.92 ± 0.01	17.45 ± 0.01	17.15 ± 0.01	16.89 ± 0.03	···	19.382 ± 0.133
1091	160.3	···	17.94 ± 0.01	17.47 ± 0.01	17.16 ± 0.01	16.91 ± 0.03	···	19.077 ± 0.179
1092	161.2	···	17.96 ± 0.01	17.48 ± 0.01	17.18 ± 0.01	16.93 ± 0.02	···	18.774 ± 0.129
1093	162.2	···	17.98 ± 0.01	17.50 ± 0.01	17.20 ± 0.01	16.94 ± 0.03	···	18.479 ± 0.161
1094	163.2	···	17.99 ± 0.01	17.52 ± 0.01	17.21 ± 0.01	16.96 ± 0.02	···	18.183 ± 0.111
1095	164.2	···	18.01 ± 0.01	17.54 ± 0.01	17.23 ± 0.01	16.97 ± 0.02	···	17.900 ± 0.138
1096	165.2	···	18.03 ± 0.01	17.56 ± 0.01	17.24 ± 0.01	16.99 ± 0.01	···	17.618 ± 0.109
1097	166.2	···	18.05 ± 0.01	17.58 ± 0.01	17.26 ± 0.01	17.00 ± 0.02	···	17.341 ± 0.128
1098	167.2	···	18.06 ± 0.01	17.60 ± 0.01	17.28 ± 0.01	17.02 ± 0.01	···	17.063 ± 0.084

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1099	168.2	···	18.08 ± 0.01	17.62 ± 0.01	17.29 ± 0.01	17.04 ± 0.01	···	16.800 ± 0.118
1100	169.2	···	18.10 ± 0.01	17.64 ± 0.01	17.31 ± 0.01	17.05 ± 0.01	···	16.536 ± 0.086
1101	170.2	···	18.11 ± 0.01	17.66 ± 0.01	17.32 ± 0.01	17.07 ± 0.01	···	16.279 ± 0.117
1102	171.2	···	18.13 ± 0.01	17.68 ± 0.01	17.34 ± 0.01	17.08 ± 0.01	···	16.021 ± 0.091
1103	172.2	···	18.15 ± 0.01	17.69 ± 0.01	17.35 ± 0.01	17.10 ± 0.01	···	15.774 ± 0.113
1104	173.1	···	18.17 ± 0.01	17.71 ± 0.01	17.37 ± 0.02	17.11 ± 0.01	···	15.526 ± 0.136
1105	174.1	···	18.18 ± 0.01	17.73 ± 0.01	17.39 ± 0.01	17.13 ± 0.01	···	15.282 ± 0.118
1106	175.1	···	18.20 ± 0.01	17.75 ± 0.01	17.40 ± 0.02	17.14 ± 0.01	···	15.047 ± 0.123
1107	176.1	···	18.22 ± 0.01	17.77 ± 0.01	17.42 ± 0.01	17.16 ± 0.01	···	14.810 ± 0.113
1108	177.1	···	18.24 ± 0.01	17.79 ± 0.01	17.43 ± 0.02	17.18 ± 0.01	···	14.578 ± 0.128
1109	178.1	···	18.26 ± 0.01	17.81 ± 0.01	17.45 ± 0.01	17.19 ± 0.01	···	14.349 ± 0.123
1110	179.1	···	18.27 ± 0.01	17.83 ± 0.01	17.46 ± 0.02	17.21 ± 0.01	···	14.132 ± 0.144
1111	180.1	···	18.29 ± 0.01	17.85 ± 0.01	17.48 ± 0.01	17.22 ± 0.01	···	13.915 ± 0.135
1112	181.1	···	18.31 ± 0.01	17.86 ± 0.01	17.49 ± 0.02	17.24 ± 0.01	···	13.701 ± 0.147
1113	182.1	···	18.33 ± 0.01	17.88 ± 0.01	17.51 ± 0.03	17.25 ± 0.02	···	13.490 ± 0.177
1114	183.1	···	18.34 ± 0.01	17.90 ± 0.01	17.52 ± 0.02	17.27 ± 0.01	···	13.284 ± 0.146
1115	184.1	···	18.36 ± 0.01	17.92 ± 0.01	17.54 ± 0.03	17.28 ± 0.02	···	13.080 ± 0.178
1116	185.0	···	18.38 ± 0.01	17.94 ± 0.01	17.55 ± 0.02	17.30 ± 0.02	···	12.879 ± 0.137
1117	186.0	···	18.40 ± 0.01	17.96 ± 0.01	17.57 ± 0.03	17.31 ± 0.02	···	12.682 ± 0.168
1118	187.0	···	18.41 ± 0.01	17.98 ± 0.01	17.58 ± 0.02	17.33 ± 0.02	···	12.491 ± 0.142
1119	188.0	···	18.43 ± 0.01	18.00 ± 0.01	17.60 ± 0.03	17.34 ± 0.02	···	12.299 ± 0.180
1120	189.0	···	18.45 ± 0.01	18.02 ± 0.01	17.61 ± 0.02	17.36 ± 0.02	···	12.110 ± 0.146
1121	190.0	···	18.47 ± 0.01	18.03 ± 0.01	17.63 ± 0.03	17.37 ± 0.03	···	11.930 ± 0.172

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1122	191.0	···	18.48 ± 0.01	18.05 ± 0.01	17.64 ± 0.02	17.39 ± 0.02	···	11.746 ± 0.140
1123	192.0	···	18.50 ± 0.01	18.07 ± 0.01	17.66 ± 0.02	17.40 ± 0.03	···	11.566 ± 0.171
1124	193.0	···	18.52 ± 0.01	18.09 ± 0.01	17.67 ± 0.03	17.42 ± 0.02	···	11.392 ± 0.182
1125	194.0	···	18.54 ± 0.01	18.11 ± 0.01	17.69 ± 0.02	17.43 ± 0.03	···	11.217 ± 0.162
1126	195.0	···	18.56 ± 0.01	18.13 ± 0.01	17.70 ± 0.03	17.45 ± 0.03	···	11.045 ± 0.170
1127	196.0	···	18.57 ± 0.01	18.15 ± 0.01	17.72 ± 0.02	17.46 ± 0.03	···	10.880 ± 0.162
1128	196.9	···	18.59 ± 0.01	18.16 ± 0.01	17.73 ± 0.03	17.48 ± 0.03	···	10.713 ± 0.172
1129	197.9	···	18.61 ± 0.01	18.18 ± 0.01	17.75 ± 0.02	17.49 ± 0.03	···	10.550 ± 0.170
1130	198.9	···	18.63 ± 0.01	18.20 ± 0.01	17.76 ± 0.03	17.51 ± 0.03	···	10.392 ± 0.162
1131	199.9	···	18.65 ± 0.01	18.22 ± 0.01	17.78 ± 0.02	17.52 ± 0.03	···	10.232 ± 0.152
1132	200.9	···	18.66 ± 0.01	18.24 ± 0.01	17.79 ± 0.03	17.54 ± 0.03	···	10.074 ± 0.161
1133	201.9	···	18.68 ± 0.01	18.26 ± 0.01	17.80 ± 0.03	17.56 ± 0.04	···	9.924 ± 0.184
1134	202.9	···	18.70 ± 0.01	18.28 ± 0.01	17.82 ± 0.03	17.57 ± 0.03	···	9.773 ± 0.163
1135	203.9	···	18.72 ± 0.01	18.30 ± 0.01	17.84 ± 0.03	17.59 ± 0.04	···	9.622 ± 0.172
1136	204.9	···	18.74 ± 0.01	18.32 ± 0.01	17.85 ± 0.03	17.60 ± 0.03	···	9.476 ± 0.151
1137	205.9	···	18.75 ± 0.01	18.33 ± 0.01	17.86 ± 0.03	17.62 ± 0.04	···	9.335 ± 0.176
1138	206.9	···	18.77 ± 0.01	18.35 ± 0.01	17.88 ± 0.02	17.63 ± 0.03	···	9.193 ± 0.152
1139	207.9	···	18.79 ± 0.01	18.37 ± 0.01	17.89 ± 0.03	17.65 ± 0.04	···	9.051 ± 0.173
1140	208.8	···	18.81 ± 0.01	18.39 ± 0.01	17.91 ± 0.02	17.66 ± 0.04	···	8.915 ± 0.141
1141	209.8	···	18.83 ± 0.01	18.41 ± 0.01	17.92 ± 0.03	17.68 ± 0.04	···	8.780 ± 0.160
1142	210.8	···	18.85 ± 0.01	18.43 ± 0.01	17.94 ± 0.02	17.69 ± 0.04	···	8.646 ± 0.139
1143	211.8	···	18.86 ± 0.01	18.45 ± 0.01	17.95 ± 0.03	17.71 ± 0.04	···	8.517 ± 0.159
1144	212.8	···	18.88 ± 0.01	18.46 ± 0.01	17.97 ± 0.02	17.72 ± 0.04	···	8.391 ± 0.139

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1145	213.8	···	18.90 ± 0.01	18.48 ± 0.01	17.98 ± 0.03	17.74 ± 0.04	···	8.263 ± 0.146
1146	214.8	···	18.92 ± 0.01	18.50 ± 0.01	18.00 ± 0.02	17.75 ± 0.04	···	8.135 ± 0.128
1147	215.8	···	18.94 ± 0.01	18.52 ± 0.01	18.01 ± 0.03	17.77 ± 0.04	···	8.014 ± 0.144
1148	216.8	···	18.95 ± 0.01	18.54 ± 0.01	18.02 ± 0.02	17.78 ± 0.04	···	7.892 ± 0.125
1149	217.8	···	18.97 ± 0.01	18.56 ± 0.01	18.04 ± 0.02	17.80 ± 0.04	···	7.772 ± 0.142
1150	218.8	···	18.99 ± 0.01	18.58 ± 0.01	18.05 ± 0.02	17.81 ± 0.04	···	7.657 ± 0.115
1151	219.8	···	19.01 ± 0.01	18.59 ± 0.01	18.07 ± 0.02	17.83 ± 0.04	···	7.542 ± 0.119
1152	220.7	···	19.03 ± 0.01	18.61 ± 0.01	18.08 ± 0.02	17.84 ± 0.04	···	7.426 ± 0.115
1153	221.7	···	19.05 ± 0.01	18.63 ± 0.01	18.10 ± 0.02	17.86 ± 0.04	···	7.318 ± 0.117
1154	222.7	···	19.06 ± 0.01	18.65 ± 0.01	18.11 ± 0.02	17.88 ± 0.04	···	7.205 ± 0.112
1155	223.7	···	19.08 ± 0.01	18.67 ± 0.01	18.12 ± 0.01	17.89 ± 0.04	···	7.094 ± 0.086
1156	224.7	···	19.10 ± 0.01	18.69 ± 0.01	18.14 ± 0.02	17.90 ± 0.03	···	6.989 ± 0.092
1157	225.7	···	19.12 ± 0.01	18.71 ± 0.01	18.15 ± 0.01	17.92 ± 0.04	···	6.884 ± 0.091
1158	226.7	···	19.14 ± 0.01	18.73 ± 0.01	18.17 ± 0.01	17.93 ± 0.03	···	6.781 ± 0.093
1159	227.7	···	19.16 ± 0.01	18.75 ± 0.01	18.18 ± 0.01	17.95 ± 0.04	···	6.680 ± 0.084
1160	228.7	···	19.17 ± 0.01	18.76 ± 0.01	18.20 ± 0.01	17.96 ± 0.03	···	6.577 ± 0.083
1161	229.7	···	19.19 ± 0.01	18.78 ± 0.01	18.21 ± 0.01	17.98 ± 0.04	···	6.480 ± 0.075
1162	230.7	···	19.21 ± 0.01	18.80 ± 0.01	18.23 ± 0.01	18.00 ± 0.03	···	6.381 ± 0.079
1163	231.7	···	19.23 ± 0.01	18.82 ± 0.01	18.24 ± 0.01	18.01 ± 0.03	···	6.286 ± 0.072
1164	232.6	···	19.25 ± 0.01	18.84 ± 0.01	18.26 ± 0.01	18.02 ± 0.04	···	6.190 ± 0.085
1165	233.6	···	19.27 ± 0.01	18.86 ± 0.01	18.27 ± 0.01	18.04 ± 0.03	···	6.098 ± 0.064
1166	234.6	···	19.28 ± 0.01	18.88 ± 0.01	18.29 ± 0.01	18.05 ± 0.04	···	6.006 ± 0.062
1167	235.6	···	19.30 ± 0.01	18.89 ± 0.01	18.30 ± 0.01	18.07 ± 0.03	···	5.918 ± 0.057

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1168	236.6	⋯	19.32 ± 0.01	18.91 ± 0.01	18.31 ± 0.01	18.09 ± 0.03	⋯	5.827 ± 0.049
1169	237.6	⋯	19.34 ± 0.01	18.93 ± 0.01	18.33 ± 0.01	18.10 ± 0.03	⋯	5.740 ± 0.063
1170	238.6	⋯	19.36 ± 0.01	18.95 ± 0.01	18.34 ± 0.01	18.11 ± 0.03	⋯	5.653 ± 0.057
1171	239.6	⋯	19.37 ± 0.01	18.97 ± 0.01	18.36 ± 0.01	18.13 ± 0.03	⋯	5.569 ± 0.058
1172	240.6	⋯	19.39 ± 0.01	18.99 ± 0.01	18.37 ± 0.01	18.14 ± 0.03	⋯	5.486 ± 0.050
1173	241.6	⋯	19.41 ± 0.01	19.01 ± 0.01	18.39 ± 0.01	18.16 ± 0.03	⋯	5.403 ± 0.053
1174	242.6	⋯	19.43 ± 0.01	19.02 ± 0.01	18.40 ± 0.01	18.17 ± 0.03	⋯	5.321 ± 0.061
1175	243.6	⋯	19.45 ± 0.01	19.04 ± 0.01	18.42 ± 0.01	18.19 ± 0.02	⋯	5.243 ± 0.053
1176	244.5	⋯	19.47 ± 0.01	19.06 ± 0.01	18.43 ± 0.01	18.20 ± 0.03	⋯	5.163 ± 0.053
1177	245.5	⋯	19.48 ± 0.01	19.08 ± 0.01	18.45 ± 0.01	18.22 ± 0.02	⋯	5.086 ± 0.053
1178	246.5	⋯	19.50 ± 0.01	19.10 ± 0.01	18.46 ± 0.01	18.24 ± 0.03	⋯	5.008 ± 0.047
1179	247.5	⋯	19.52 ± 0.01	19.12 ± 0.01	18.48 ± 0.01	18.25 ± 0.02	⋯	4.932 ± 0.051
1180	248.5	⋯	19.54 ± 0.01	19.14 ± 0.01	18.49 ± 0.01	18.27 ± 0.03	⋯	4.858 ± 0.058
1181	249.5	⋯	19.56 ± 0.01	19.16 ± 0.01	18.50 ± 0.01	18.28 ± 0.02	⋯	4.784 ± 0.057
1182	250.5	⋯	19.58 ± 0.01	19.17 ± 0.01	18.52 ± 0.01	18.30 ± 0.02	⋯	4.713 ± 0.043
1183	251.5	⋯	19.59 ± 0.01	19.19 ± 0.01	18.53 ± 0.01	18.31 ± 0.02	⋯	4.643 ± 0.051
1184	252.5	⋯	19.61 ± 0.01	19.21 ± 0.01	18.55 ± 0.01	18.33 ± 0.02	⋯	4.571 ± 0.042
1185	253.5	⋯	19.63 ± 0.01	19.23 ± 0.01	18.56 ± 0.01	18.34 ± 0.02	⋯	4.502 ± 0.049
1186	254.5	⋯	19.65 ± 0.01	19.25 ± 0.01	18.58 ± 0.01	18.36 ± 0.02	⋯	4.433 ± 0.047
1187	255.5	⋯	19.67 ± 0.01	19.27 ± 0.01	18.59 ± 0.01	18.37 ± 0.01	⋯	4.368 ± 0.047
1188	256.4	⋯	19.68 ± 0.01	19.28 ± 0.01	18.61 ± 0.02	18.39 ± 0.02	⋯	4.303 ± 0.056
1189	257.4	⋯	19.70 ± 0.01	19.30 ± 0.01	18.62 ± 0.01	18.41 ± 0.01	⋯	4.238 ± 0.046
1190	258.4	⋯	19.72 ± 0.01	19.32 ± 0.01	18.64 ± 0.02	18.42 ± 0.02	⋯	4.173 ± 0.054

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1191	259.4	···	19.74 ± 0.01	19.34 ± 0.02	18.65 ± 0.01	18.44 ± 0.01	···	4.110 ± 0.049
1192	260.4	···	19.76 ± 0.01	19.36 ± 0.01	18.67 ± 0.02	18.45 ± 0.02	···	4.049 ± 0.057
1193	261.4	···	19.77 ± 0.01	19.38 ± 0.01	18.68 ± 0.01	18.47 ± 0.01	···	3.988 ± 0.043
1194	262.4	···	19.79 ± 0.01	19.39 ± 0.01	18.70 ± 0.02	18.48 ± 0.01	···	3.927 ± 0.048
1195	263.4	···	19.81 ± 0.01	19.41 ± 0.01	18.71 ± 0.01	18.50 ± 0.02	···	3.869 ± 0.042
1196	264.4	···	19.83 ± 0.01	19.43 ± 0.01	18.73 ± 0.02	18.51 ± 0.01	···	3.811 ± 0.042
1197	265.4	···	19.85 ± 0.01	19.45 ± 0.02	18.74 ± 0.01	18.53 ± 0.02	···	3.753 ± 0.045
1198	266.4	···	19.87 ± 0.01	19.47 ± 0.01	18.76 ± 0.02	18.54 ± 0.01	···	3.696 ± 0.045
1199	267.4	···	19.88 ± 0.01	19.49 ± 0.01	18.77 ± 0.02	18.56 ± 0.01	···	3.640 ± 0.050
1200	268.3	···	19.90 ± 0.01	19.50 ± 0.01	18.79 ± 0.02	18.57 ± 0.01	···	3.585 ± 0.044
1201	269.3	···	19.92 ± 0.01	19.52 ± 0.01	18.80 ± 0.02	18.59 ± 0.01	···	3.532 ± 0.044
1202	270.3	···	19.94 ± 0.01	19.54 ± 0.02	18.82 ± 0.02	18.61 ± 0.01	···	3.478 ± 0.047
1203	271.3	···	19.96 ± 0.01	19.56 ± 0.01	18.83 ± 0.02	18.62 ± 0.01	···	3.426 ± 0.045
1204	272.3	···	19.98 ± 0.01	19.58 ± 0.01	18.85 ± 0.01	18.64 ± 0.01	···	3.374 ± 0.043
1205	273.3	···	19.99 ± 0.01	19.59 ± 0.01	18.86 ± 0.02	18.65 ± 0.01	···	3.324 ± 0.043
1206	274.3	···	20.01 ± 0.01	19.61 ± 0.01	18.88 ± 0.01	18.67 ± 0.01	···	3.273 ± 0.032
1207	275.3	···	20.03 ± 0.01	19.63 ± 0.01	18.89 ± 0.02	18.68 ± 0.01	···	3.224 ± 0.037
1208	276.3	···	20.05 ± 0.01	19.65 ± 0.01	18.91 ± 0.01	18.70 ± 0.01	···	3.175 ± 0.034
1209	277.3	···	20.06 ± 0.01	19.67 ± 0.01	18.93 ± 0.02	18.71 ± 0.01	···	3.128 ± 0.042
1210	278.3	···	20.08 ± 0.01	19.68 ± 0.01	18.94 ± 0.01	18.73 ± 0.01	···	3.080 ± 0.031
1211	279.3	···	20.10 ± 0.01	19.70 ± 0.01	18.96 ± 0.02	18.74 ± 0.01	···	3.034 ± 0.036
1212	280.2	···	20.12 ± 0.01	19.72 ± 0.01	18.97 ± 0.02	18.76 ± 0.01	···	2.989 ± 0.037
1213	281.2	···	20.14 ± 0.01	19.74 ± 0.01	18.99 ± 0.02	18.77 ± 0.01	···	2.943 ± 0.034

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$ [c]	$F_{BV(RI)_C}$ [c]
1214	282.2	···	20.15 ± 0.01	19.76 ± 0.01	19.00 ± 0.02	18.79 ± 0.01	···	2.899 ± 0.040
1215	283.2	···	20.17 ± 0.01	19.77 ± 0.01	19.02 ± 0.02	18.81 ± 0.01	···	2.855 ± 0.032
1216	284.2	···	20.19 ± 0.01	19.79 ± 0.01	19.03 ± 0.02	18.82 ± 0.01	···	2.811 ± 0.034
1217	285.2	···	20.21 ± 0.01	19.81 ± 0.01	19.05 ± 0.01	18.84 ± 0.01	···	2.769 ± 0.025
1218	286.2	···	20.23 ± 0.01	19.83 ± 0.01	19.06 ± 0.02	18.85 ± 0.01	···	2.728 ± 0.029
1219	287.2	···	20.24 ± 0.01	19.85 ± 0.01	19.08 ± 0.01	18.87 ± 0.01	···	2.685 ± 0.029
1220	288.2	···	20.26 ± 0.01	19.87 ± 0.01	19.09 ± 0.02	18.88 ± 0.01	···	2.645 ± 0.032
1221	289.2	···	20.28 ± 0.01	19.88 ± 0.01	19.11 ± 0.01	18.90 ± 0.01	···	2.606 ± 0.023
1222	290.2	···	20.30 ± 0.01	19.90 ± 0.01	19.13 ± 0.02	18.91 ± 0.01	···	2.566 ± 0.026
1223	291.2	···	20.31 ± 0.01	19.92 ± 0.01	19.14 ± 0.02	18.93 ± 0.01	···	2.527 ± 0.028
1224	292.1	···	20.33 ± 0.01	19.94 ± 0.01	19.16 ± 0.02	18.95 ± 0.01	···	2.489 ± 0.025
1225	293.1	···	20.35 ± 0.01	19.95 ± 0.01	19.17 ± 0.02	18.96 ± 0.01	···	2.452 ± 0.031
1226	294.1	···	20.37 ± 0.01	19.97 ± 0.01	19.19 ± 0.01	18.98 ± 0.01	···	2.414 ± 0.022
1227	295.1	···	20.38 ± 0.01	19.99 ± 0.01	19.21 ± 0.02	18.99 ± 0.01	···	2.378 ± 0.025
1228	296.1	···	20.40 ± 0.01	20.01 ± 0.01	19.22 ± 0.01	19.01 ± 0.01	···	2.342 ± 0.020
1229	297.1	···	20.42 ± 0.01	20.03 ± 0.01	19.24 ± 0.02	19.02 ± 0.01	···	2.307 ± 0.025
1230	298.1	···	20.44 ± 0.01	20.04 ± 0.01	19.25 ± 0.01	19.04 ± 0.01	···	2.271 ± 0.018
1231	299.1	···	20.45 ± 0.01	20.06 ± 0.01	19.27 ± 0.01	19.05 ± 0.01	···	2.237 ± 0.020
1232	300.1	···	20.47 ± 0.01	20.08 ± 0.01	19.29 ± 0.01	19.07 ± 0.01	···	2.204 ± 0.017
1233	301.1	···	20.49 ± 0.01	20.10 ± 0.01	19.30 ± 0.01	19.08 ± 0.01	···	2.170 ± 0.020
1234	302.1	···	20.51 ± 0.01	20.11 ± 0.01	19.32 ± 0.02	19.10 ± 0.01	···	2.138 ± 0.024
1235	303.1	···	20.52 ± 0.01	20.13 ± 0.01	19.33 ± 0.01	19.11 ± 0.01	···	2.106 ± 0.017
1236	304.0	···	20.54 ± 0.01	20.15 ± 0.01	19.35 ± 0.02	19.13 ± 0.01	···	2.074 ± 0.020

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1237	305.0	···	20.56 ± 0.01	20.17 ± 0.01	19.36 ± 0.01	19.14 ± 0.02	···	2.043 ± 0.018
1238	306.0	···	20.57 ± 0.01	20.18 ± 0.01	19.38 ± 0.01	19.16 ± 0.01	···	2.012 ± 0.019
1239	307.0	···	20.59 ± 0.01	20.20 ± 0.01	19.40 ± 0.01	19.18 ± 0.01	···	1.981 ± 0.016
1240	308.0	···	20.61 ± 0.01	20.22 ± 0.01	19.41 ± 0.01	19.19 ± 0.01	···	1.951 ± 0.018
1241	309.0	···	20.63 ± 0.01	20.24 ± 0.01	19.43 ± 0.01	19.21 ± 0.01	···	1.923 ± 0.016
1242	310.0	···	20.64 ± 0.01	20.25 ± 0.01	19.45 ± 0.01	19.22 ± 0.01	···	1.893 ± 0.013
1243	311.0	···	20.66 ± 0.01	20.27 ± 0.01	19.46 ± 0.01	19.24 ± 0.01	···	1.865 ± 0.012
1244	312.0	···	20.68 ± 0.01	20.29 ± 0.01	19.48 ± 0.01	19.25 ± 0.02	···	1.837 ± 0.017
1245	313.0	···	20.70 ± 0.01	20.31 ± 0.01	19.49 ± 0.01	19.27 ± 0.01	···	1.809 ± 0.018
1246	314.0	···	20.71 ± 0.01	20.32 ± 0.01	19.51 ± 0.01	19.28 ± 0.02	···	1.781 ± 0.017
1247	315.0	···	20.73 ± 0.01	20.34 ± 0.01	19.53 ± 0.01	19.30 ± 0.01	···	1.755 ± 0.014
1248	315.9	···	20.75 ± 0.01	20.36 ± 0.01	19.54 ± 0.01	19.32 ± 0.02	···	1.728 ± 0.013
1249	316.9	···	20.76 ± 0.01	20.38 ± 0.01	19.56 ± 0.01	19.33 ± 0.02	···	1.702 ± 0.017
1250	317.9	···	20.78 ± 0.01	20.39 ± 0.02	19.58 ± 0.01	19.35 ± 0.01	···	1.676 ± 0.016
1251	318.9	···	20.80 ± 0.01	20.41 ± 0.02	19.59 ± 0.01	19.36 ± 0.02	···	1.651 ± 0.018
1252	319.9	···	20.82 ± 0.01	20.43 ± 0.02	19.61 ± 0.01	19.38 ± 0.01	···	1.626 ± 0.018
1253	320.9	···	20.83 ± 0.01	20.45 ± 0.01	19.62 ± 0.01	19.39 ± 0.02	···	1.602 ± 0.015
1254	321.9	···	20.85 ± 0.01	20.46 ± 0.02	19.64 ± 0.01	19.41 ± 0.01	···	1.578 ± 0.016
1255	322.9	···	20.86 ± 0.01	20.48 ± 0.02	19.66 ± 0.01	19.42 ± 0.02	···	1.554 ± 0.017
1256	323.9	···	20.88 ± 0.02	20.50 ± 0.02	19.67 ± 0.01	19.44 ± 0.02	···	1.530 ± 0.020
1257	324.9	···	20.90 ± 0.01	20.51 ± 0.02	19.69 ± 0.01	19.45 ± 0.02	···	1.508 ± 0.016
1258	325.9	···	20.91 ± 0.01	20.53 ± 0.02	19.71 ± 0.01	19.47 ± 0.02	···	1.485 ± 0.017
1259	326.9	···	20.93 ± 0.02	20.55 ± 0.02	19.72 ± 0.01	19.49 ± 0.01	···	1.463 ± 0.019

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1260	327.8	···	20.95 ± 0.01	20.57 ± 0.02	19.74 ± 0.01	19.50 ± 0.02	···	1.440 ± 0.015
1261	328.8	···	20.96 ± 0.01	20.58 ± 0.02	19.76 ± 0.01	19.52 ± 0.01	···	1.419 ± 0.014
1262	329.8	···	20.98 ± 0.02	20.60 ± 0.02	19.77 ± 0.01	19.53 ± 0.02	···	1.397 ± 0.019
1263	330.8	···	21.00 ± 0.01	20.62 ± 0.01	19.79 ± 0.01	19.55 ± 0.01	···	1.377 ± 0.013
1264	331.8	···	21.01 ± 0.01	20.63 ± 0.02	19.81 ± 0.01	19.57 ± 0.02	···	1.356 ± 0.014
1265	332.8	···	21.03 ± 0.02	20.65 ± 0.02	19.82 ± 0.01	19.58 ± 0.01	···	1.336 ± 0.017
1266	333.8	···	21.05 ± 0.01	20.67 ± 0.01	19.84 ± 0.01	19.60 ± 0.02	···	1.315 ± 0.013
1267	334.8	···	21.06 ± 0.01	20.68 ± 0.02	19.86 ± 0.01	19.61 ± 0.01	···	1.296 ± 0.016
1268	335.8	···	21.08 ± 0.02	20.70 ± 0.02	19.87 ± 0.01	19.63 ± 0.01	···	1.276 ± 0.016
1269	336.8	···	21.09 ± 0.01	20.72 ± 0.01	19.89 ± 0.01	19.64 ± 0.01	···	1.257 ± 0.010
1270	337.8	···	21.11 ± 0.02	20.73 ± 0.02	19.91 ± 0.01	19.66 ± 0.01	···	1.238 ± 0.015
1271	338.8	···	21.13 ± 0.02	20.75 ± 0.02	19.92 ± 0.01	19.67 ± 0.01	···	1.220 ± 0.014
1272	339.7	···	21.14 ± 0.01	20.77 ± 0.01	19.94 ± 0.01	19.69 ± 0.01	···	1.202 ± 0.011
1273	340.7	···	21.16 ± 0.02	20.78 ± 0.02	19.95 ± 0.01	19.71 ± 0.01	···	1.183 ± 0.014
1274	341.7	···	21.18 ± 0.02	20.80 ± 0.02	19.97 ± 0.01	19.72 ± 0.01	···	1.166 ± 0.015
1275	342.7	···	21.19 ± 0.01	20.82 ± 0.02	19.99 ± 0.01	19.74 ± 0.01	···	1.148 ± 0.014
1276	343.7	···	21.21 ± 0.02	20.83 ± 0.02	20.00 ± 0.01	19.76 ± 0.01	···	1.131 ± 0.014
1277	344.7	···	21.22 ± 0.01	20.85 ± 0.02	20.02 ± 0.02	19.77 ± 0.01	···	1.113 ± 0.016
1278	345.7	···	21.24 ± 0.01	20.87 ± 0.02	20.04 ± 0.67	19.79 ± 0.01	···	1.096 ± 0.287
1279	346.7	···	21.25 ± 0.01	20.88 ± 0.02	20.05 ± 0.67	19.81 ± 0.01	···	1.080 ± 0.282
1280	347.7	···	21.27 ± 0.01	20.90 ± 0.02	20.07 ± 0.67	19.82 ± 0.01	···	1.064 ± 0.279
1281	348.7	···	21.29 ± 0.01	20.91 ± 0.02	20.09 ± 0.67	19.84 ± 0.02	···	1.047 ± 0.277
1282	349.7	···	21.30 ± 0.01	20.93 ± 0.02	20.11 ± 0.67	19.86 ± 0.06	···	1.032 ± 0.280

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1283	350.7	⋯	21.32 ± 0.01	20.95 ± 0.03	20.12 ± 0.67	19.88 ± 0.08	⋯	1.017 ± 0.283
1284	351.6	⋯	21.33 ± 0.02	20.96 ± 0.02	20.14 ± 0.67	19.89 ± 0.12	⋯	1.001 ± 0.285
1285	352.6	⋯	21.35 ± 0.02	20.98 ± 0.02	20.16 ± 0.67	19.91 ± 0.14	⋯	0.986 ± 0.287
1286	353.6	⋯	21.36 ± 0.02	21.00 ± 0.02	20.17 ± 0.67	19.93 ± 0.13	⋯	0.971 ± 0.278
1287	354.6	⋯	21.38 ± 0.03	21.01 ± 0.02	20.19 ± 0.67	19.94 ± 0.13	⋯	0.957 ± 0.275
1288	355.6	⋯	21.39 ± 0.02	21.03 ± 0.01	20.21 ± 0.67	19.96 ± 0.11	⋯	0.943 ± 0.266
1289	356.6	⋯	21.41 ± 0.03	21.04 ± 0.02	20.22 ± 0.67	19.98 ± 0.10	⋯	0.928 ± 0.261
1290	357.6	⋯	21.43 ± 0.02	21.06 ± 0.01	20.24 ± 0.67	19.99 ± 0.08	⋯	0.914 ± 0.252
1291	358.6	⋯	21.44 ± 0.03	21.07 ± 0.01	20.26 ± 0.67	20.01 ± 0.08	⋯	0.901 ± 0.247
1292	359.6	⋯	21.45 ± 0.02	21.09 ± 0.01	20.27 ± 0.67	20.03 ± 0.07	⋯	0.887 ± 0.241
1293	360.6	⋯	21.47 ± 0.03	21.11 ± 0.01	20.29 ± 0.67	20.04 ± 0.05	⋯	0.874 ± 0.235
1294	361.6	⋯	21.48 ± 0.02	21.12 ± 0.01	20.31 ± 0.67	20.06 ± 0.05	⋯	0.861 ± 0.231
1295	362.6	⋯	21.50 ± 0.02	21.14 ± 0.01	20.32 ± 0.67	20.08 ± 0.03	⋯	0.848 ± 0.224
1296	363.5	⋯	21.52 ± 0.02	21.15 ± 0.01	20.34 ± 0.67	20.09 ± 0.02	⋯	0.836 ± 0.219
1297	364.5	⋯	21.53 ± 0.02	21.17 ± 0.01	20.36 ± 0.67	20.11 ± 0.02	⋯	0.823 ± 0.214
1298	365.5	⋯	21.54 ± 0.02	21.18 ± 0.01	20.37 ± 0.67	20.13 ± 0.01	⋯	0.811 ± 0.210
1299	366.5	⋯	21.56 ± 0.02	21.20 ± 0.01	20.39 ± 0.67	20.15 ± 0.01	⋯	0.799 ± 0.207
1300	367.5	⋯	21.57 ± 0.02	21.21 ± 0.01	20.41 ± 0.04	20.16 ± 0.03	⋯	0.787 ± 0.019
1301	368.5	⋯	21.59 ± 0.02	21.23 ± 0.01	20.42 ± 0.04	20.18 ± 0.03	⋯	0.776 ± 0.018
1302	369.5	⋯	21.60 ± 0.01	21.25 ± 0.01	20.44 ± 0.04	20.20 ± 0.04	⋯	0.764 ± 0.018
1303	370.5	⋯	21.62 ± 0.02	21.26 ± 0.01	20.46 ± 0.03	20.21 ± 0.06	⋯	0.753 ± 0.021
1304	371.5	⋯	21.63 ± 0.01	21.28 ± 0.01	20.47 ± 0.03	20.23 ± 0.06	⋯	0.742 ± 0.019
1305	372.5	⋯	21.65 ± 0.02	21.29 ± 0.01	20.49 ± 0.03	20.25 ± 0.08	⋯	0.731 ± 0.021

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1306	373.5	···	21.66 ± 0.01	21.31 ± 0.01	20.51 ± 0.02	20.27 ± 0.09	···	0.720 ± 0.020
1307	374.5	···	21.68 ± 0.02	21.32 ± 0.01	20.52 ± 0.01	20.28 ± 0.10	···	0.710 ± 0.020
1308	375.4	···	21.69 ± 0.01	21.34 ± 0.02	20.54 ± 0.01	20.30 ± 0.11	···	0.700 ± 0.020
1309	376.4	···	21.70 ± 0.01	21.35 ± 0.01	20.56 ± 0.01	20.32 ± 0.12	···	0.689 ± 0.020
1310	377.4	···	21.72 ± 0.01	21.37 ± 0.02	20.57 ± 0.01	20.33 ± 0.14	···	0.679 ± 0.022
1311	378.4	···	21.73 ± 0.01	21.38 ± 0.01	20.59 ± 0.01	20.35 ± 0.14	···	0.669 ± 0.021
1312	379.4	···	21.75 ± 0.01	21.40 ± 0.02	20.61 ± 0.01	20.37 ± 0.15	···	0.659 ± 0.024
1313	380.4	···	21.76 ± 0.01	21.41 ± 0.01	20.62 ± 0.01	20.39 ± 0.17	···	0.650 ± 0.025
1314	381.4	···	21.77 ± 0.01	21.43 ± 0.02	20.64 ± 0.01	20.40 ± 0.17	···	0.640 ± 0.027
1315	382.4	···	21.79 ± 0.01	21.44 ± 0.02	20.66 ± 0.03	20.42 ± 0.18	···	0.631 ± 0.032
1316	383.4	···	21.80 ± 0.01	21.45 ± 0.02	20.67 ± 0.03	20.44 ± 0.20	···	0.622 ± 0.033
1317	384.4	···	21.82 ± 0.01	21.47 ± 0.02	20.69 ± 0.03	20.45 ± 0.21	···	0.613 ± 0.035
1318	385.4	···	21.83 ± 0.01	21.48 ± 0.02	20.71 ± 0.04	20.47 ± 0.21	···	0.604 ± 0.035
1319	386.4	···	21.84 ± 0.01	21.50 ± 0.02	20.72 ± 0.04	20.49 ± 0.23	···	0.595 ± 0.038
1320	387.3	···	21.86 ± 0.01	21.51 ± 0.03	20.74 ± 0.04	20.51 ± 0.21	···	0.587 ± 0.035
1321	388.3	···	21.87 ± 0.01	21.53 ± 0.02	20.76 ± 0.03	20.52 ± 0.21	···	0.579 ± 0.032
1322	389.3	···	21.89 ± 0.01	21.54 ± 0.03	20.77 ± 0.02	20.54 ± 0.19	···	0.570 ± 0.029
1323	390.3	···	21.90 ± 0.01	21.56 ± 0.02	20.79 ± 0.01	20.56 ± 0.17	···	0.562 ± 0.023
1324	391.3	···	21.91 ± 0.01	21.57 ± 0.02	20.81 ± 0.01	20.57 ± 0.17	···	0.554 ± 0.022
1325	392.3	···	21.93 ± 0.01	21.59 ± 0.02	20.82 ± 0.01	20.59 ± 0.15	···	0.546 ± 0.020
1326	393.3	···	21.94 ± 0.01	21.60 ± 0.02	20.84 ± 0.01	20.61 ± 0.14	···	0.539 ± 0.020
1327	394.3	···	21.95 ± 0.01	21.61 ± 0.02	20.86 ± 0.02	20.62 ± 0.13	···	0.531 ± 0.020
1328	395.3	···	21.97 ± 0.01	21.63 ± 0.02	20.87 ± 0.03	20.64 ± 0.11	···	0.524 ± 0.020

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1329	396.3	···	21.98 ± 0.01	21.64 ± 0.02	20.89 ± 0.03	20.65 ± 0.10	···	0.516 ± 0.018
1330	397.3	···	22.00 ± 0.01	21.66 ± 0.02	20.90 ± 0.04	20.67 ± 0.09	···	0.509 ± 0.019
1331	398.3	···	22.01 ± 0.01	21.67 ± 0.01	20.92 ± 0.67	20.69 ± 0.07	···	0.502 ± 0.133
1332	399.2	···	22.02 ± 0.01	21.69 ± 0.02	20.94 ± 0.67	20.70 ± 0.07	···	0.495 ± 0.131
1333	400.2	···	22.04 ± 0.01	21.70 ± 0.01	20.95 ± 0.67	20.72 ± 0.05	···	0.488 ± 0.127
1334	401.2	···	22.05 ± 0.01	21.71 ± 0.02	20.97 ± 0.67	20.73 ± 0.04	···	0.481 ± 0.124
1335	402.2	···	22.06 ± 0.01	21.73 ± 0.01	20.99 ± 0.67	20.75 ± 0.03	···	0.474 ± 0.122
1336	403.2	···	22.08 ± 0.01	21.74 ± 0.01	21.00 ± 0.67	20.77 ± 0.01	···	0.468 ± 0.119
1337	404.2	···	22.09 ± 0.01	21.75 ± 0.01	21.02 ± 0.67	20.78 ± 0.01	···	0.462 ± 0.116
1338	405.2	···	22.10 ± 0.01	21.77 ± 0.01	21.03 ± 0.67	20.80 ± 0.01	···	0.455 ± 0.115
1339	406.2	···	22.11 ± 0.01	21.78 ± 0.01	21.05 ± 0.67	20.82 ± 0.03	···	0.449 ± 0.114
1340	407.2	···	22.13 ± 0.02	21.80 ± 0.01	21.07 ± 0.67	20.83 ± 0.04	···	0.443 ± 0.114
1341	408.2	···	22.14 ± 0.02	21.81 ± 0.01	21.08 ± 0.67	20.85 ± 0.05	···	0.437 ± 0.113
1342	409.2	···	22.16 ± 0.01	21.82 ± 0.01	21.10 ± 0.67	20.87 ± 0.07	···	0.431 ± 0.113
1343	410.2	···	22.17 ± 0.02	21.84 ± 0.01	21.11 ± 0.67	20.88 ± 0.06	···	0.425 ± 0.111
1344	411.1	···	22.18 ± 0.02	21.85 ± 0.01	21.13 ± 0.67	20.90 ± 0.05	···	0.419 ± 0.109
1345	412.1	···	22.19 ± 0.02	21.86 ± 0.02	21.14 ± 0.67	20.91 ± 0.04	···	0.414 ± 0.107
1346	413.1	···	22.21 ± 0.02	21.88 ± 0.02	21.16 ± 0.67	20.93 ± 0.03	···	0.408 ± 0.105
1347	414.1	···	22.22 ± 0.02	21.89 ± 0.02	21.18 ± 0.05	20.95 ± 0.03	···	0.402 ± 0.013
1348	415.1	···	22.23 ± 0.01	21.90 ± 0.02	21.19 ± 0.67	20.97 ± 0.03	···	0.397 ± 0.101
1349	416.1	···	22.25 ± 0.01	21.92 ± 0.02	21.21 ± 0.67	20.98 ± 0.03	···	0.392 ± 0.100
1350	417.1	···	22.26 ± 0.02	21.93 ± 0.02	21.22 ± 0.67	21.00 ± 0.03	···	0.386 ± 0.099
1351	418.1	···	22.27 ± 0.02	21.94 ± 0.02	21.24 ± 0.67	21.02 ± 0.03	···	0.381 ± 0.097

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1352	419.1	···	22.28 ± 0.01	21.96 ± 0.02	21.25 ± 0.67	21.03 ± 0.02	···	0.376 ± 0.095
1353	420.1	···	22.30 ± 0.01	21.97 ± 0.02	21.27 ± 0.05	21.05 ± 0.02	···	0.371 ± 0.010
1354	421.1	···	22.31 ± 0.01	21.98 ± 0.01	21.29 ± 0.67	21.06 ± 0.03	···	0.366 ± 0.092
1355	422.1	···	22.32 ± 0.01	22.00 ± 0.02	21.30 ± 0.67	21.08 ± 0.02	···	0.361 ± 0.091
1356	423.0	···	22.33 ± 0.01	22.01 ± 0.02	21.32 ± 0.67	21.10 ± 0.02	···	0.357 ± 0.090
1357	424.0	···	22.34 ± 0.01	22.02 ± 0.01	21.33 ± 0.67	21.11 ± 0.01	···	0.352 ± 0.088
1358	425.0	···	22.36 ± 0.01	22.03 ± 0.02	21.35 ± 0.67	21.13 ± 0.01	···	0.347 ± 0.086
1359	426.0	···	22.37 ± 0.01	22.05 ± 0.02	21.36 ± 0.67	21.15 ± 0.02	···	0.343 ± 0.086
1360	427.0	···	22.38 ± 0.01	22.06 ± 0.02	21.38 ± 0.67	21.16 ± 0.01	···	0.338 ± 0.084
1361	428.0	···	22.39 ± 0.01	22.07 ± 0.01	21.39 ± 0.67	21.18 ± 0.01	···	0.334 ± 0.083
1362	429.0	···	22.41 ± 0.01	22.08 ± 0.02	21.41 ± 0.04	21.20 ± 0.01	···	0.329 ± 0.006
1363	430.0	···	22.42 ± 0.01	22.10 ± 0.02	21.42 ± 0.67	21.21 ± 0.01	···	0.325 ± 0.081
1364	431.0	···	22.43 ± 0.01	22.11 ± 0.01	21.44 ± 0.04	21.23 ± 0.01	···	0.321 ± 0.006
1365	432.0	···	22.44 ± 0.01	22.12 ± 0.01	21.45 ± 0.03	21.25 ± 0.01	···	0.317 ± 0.005
1366	433.0	···	22.45 ± 0.01	22.13 ± 0.02	21.47 ± 0.04	21.26 ± 0.01	···	0.313 ± 0.006
1367	434.0	···	22.47 ± 0.01	22.14 ± 0.01	21.48 ± 0.03	21.28 ± 0.01	···	0.309 ± 0.005
1368	434.9	···	22.48 ± 0.01	22.16 ± 0.01	21.50 ± 0.03	21.29 ± 0.01	···	0.305 ± 0.004
1369	435.9	···	22.49 ± 0.01	22.17 ± 0.01	21.52 ± 0.03	21.31 ± 0.01	···	0.301 ± 0.005
1370	436.9	···	22.50 ± 0.01	22.18 ± 0.01	21.53 ± 0.03	21.33 ± 0.01	···	0.297 ± 0.004
1371	437.9	···	22.51 ± 0.01	22.19 ± 0.01	21.55 ± 0.02	21.34 ± 0.01	···	0.293 ± 0.004
1372	438.9	···	22.52 ± 0.01	22.20 ± 0.01	21.56 ± 0.03	21.36 ± 0.01	···	0.290 ± 0.004
1373	439.9	···	22.54 ± 0.01	22.22 ± 0.01	21.57 ± 0.02	21.38 ± 0.01	···	0.286 ± 0.004
1374	440.9	···	22.55 ± 0.01	22.23 ± 0.01	21.59 ± 0.03	21.39 ± 0.01	···	0.282 ± 0.004

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$ [c]	$F_{BV(RI)_C}$ [c]
1375	441.9	···	22.56 ± 0.01	22.24 ± 0.01	21.60 ± 0.02	21.41 ± 0.01	···	0.279 ± 0.004
1376	442.9	···	22.57 ± 0.01	22.25 ± 0.01	21.62 ± 0.01	21.43 ± 0.02	···	0.275 ± 0.003
1377	443.9	···	22.58 ± 0.01	22.26 ± 0.01	21.63 ± 0.02	21.44 ± 0.02	···	0.272 ± 0.004
1378	444.9	···	22.59 ± 0.01	22.28 ± 0.01	21.65 ± 0.01	21.46 ± 0.01	···	0.269 ± 0.003
1379	445.9	···	22.61 ± 0.01	22.29 ± 0.01	21.66 ± 0.01	21.48 ± 0.02	···	0.265 ± 0.003
1380	446.8	···	22.62 ± 0.01	22.30 ± 0.01	21.68 ± 0.01	21.49 ± 0.02	···	0.262 ± 0.004
1381	447.8	···	22.63 ± 0.01	22.31 ± 0.01	21.69 ± 0.01	21.51 ± 0.03	···	0.259 ± 0.003
1382	448.8	···	22.64 ± 0.01	22.32 ± 0.02	21.71 ± 0.01	21.52 ± 0.03	···	0.256 ± 0.004
1383	449.8	···	22.65 ± 0.01	22.33 ± 0.02	21.72 ± 0.01	21.54 ± 0.02	···	0.252 ± 0.003
1384	450.8	···	22.66 ± 0.01	22.34 ± 0.02	21.73 ± 0.01	21.56 ± 0.03	···	0.249 ± 0.003
1385	451.8	···	22.68 ± 0.01	22.36 ± 0.03	21.75 ± 0.01	21.57 ± 0.03	···	0.246 ± 0.004
1386	452.8	···	22.69 ± 0.01	22.37 ± 0.02	21.76 ± 0.01	21.59 ± 0.03	···	0.243 ± 0.004
1387	453.8	···	22.70 ± 0.01	22.38 ± 0.02	21.78 ± 0.01	21.61 ± 0.03	···	0.240 ± 0.004
1388	454.8	···	22.71 ± 0.01	22.39 ± 0.02	21.79 ± 0.01	21.62 ± 0.03	···	0.238 ± 0.004
1389	455.8	···	22.72 ± 0.01	22.40 ± 0.03	21.80 ± 0.01	21.64 ± 0.03	···	0.235 ± 0.005
1390	456.8	···	22.73 ± 0.01	22.41 ± 0.03	21.82 ± 0.01	21.66 ± 0.04	···	0.232 ± 0.005
1391	457.8	···	22.74 ± 0.01	22.42 ± 0.03	21.83 ± 0.02	21.67 ± 0.04	···	0.229 ± 0.005
1392	458.7	···	22.75 ± 0.01	22.43 ± 0.04	21.85 ± 0.02	21.69 ± 0.04	···	0.226 ± 0.005
1393	459.7	···	22.77 ± 0.01	22.44 ± 0.04	21.86 ± 0.02	21.70 ± 0.04	···	0.224 ± 0.006
1394	460.7	···	22.78 ± 0.01	22.45 ± 0.04	21.88 ± 0.03	21.72 ± 0.04	···	0.221 ± 0.006
1395	461.7	···	22.79 ± 0.01	22.46 ± 0.05	21.89 ± 0.03	21.74 ± 0.05	···	0.219 ± 0.007
1396	462.7	···	22.80 ± 0.01	22.47 ± 0.05	21.90 ± 0.03	21.75 ± 0.05	···	0.216 ± 0.007
1397	463.7	···	22.81 ± 0.01	22.48 ± 0.04	21.92 ± 0.04	21.77 ± 0.04	···	0.213 ± 0.007

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$ [c]	$F_{BV(RI)_C}$ [c]
1398	464.7	···	22.82 ± 0.01	22.50 ± 0.05	21.93 ± 0.03	21.79 ± 0.05	···	0.211 ± 0.007
1399	465.7	···	22.83 ± 0.01	22.50 ± 0.05	21.95 ± 0.04	21.80 ± 0.05	···	0.208 ± 0.008
1400	466.7	···	22.84 ± 0.01	22.52 ± 0.05	21.96 ± 0.04	21.82 ± 0.04	···	0.206 ± 0.007
1401	467.7	···	22.85 ± 0.01	22.53 ± 0.04	21.97 ± 0.03	21.83 ± 0.05	···	0.204 ± 0.007
1402	468.7	···	22.86 ± 0.01	22.54 ± 0.04	21.99 ± 0.04	21.85 ± 0.04	···	0.201 ± 0.007
1403	469.7	···	22.88 ± 0.01	22.55 ± 0.04	22.00 ± 0.04	21.87 ± 0.04	···	0.199 ± 0.006
1404	470.6	···	22.89 ± 0.01	22.56 ± 0.03	22.01 ± 0.03	21.88 ± 0.03	···	0.197 ± 0.005
1405	471.6	···	22.90 ± 0.01	22.57 ± 0.03	22.03 ± 0.03	21.90 ± 0.03	···	0.195 ± 0.005
1406	472.6	···	22.91 ± 0.01	22.58 ± 0.03	22.04 ± 0.02	21.91 ± 0.03	···	0.192 ± 0.004
1407	473.6	···	22.92 ± 0.01	22.59 ± 0.02	22.05 ± 0.02	21.93 ± 0.02	···	0.190 ± 0.004
1408	474.6	···	22.93 ± 0.01	22.60 ± 0.02	22.07 ± 0.03	21.95 ± 0.02	···	0.188 ± 0.004
1409	475.6	···	22.94 ± 0.01	22.61 ± 0.02	22.08 ± 0.02	21.96 ± 0.02	···	0.186 ± 0.004
1410	476.6	···	22.95 ± 0.01	22.62 ± 0.01	22.09 ± 0.02	21.98 ± 0.01	···	0.184 ± 0.003
1411	477.6	···	22.96 ± 0.01	22.63 ± 0.02	22.11 ± 0.02	22.00 ± 0.01	···	0.182 ± 0.003
1412	478.6	···	22.97 ± 0.01	22.64 ± 0.02	22.12 ± 0.01	22.01 ± 0.01	···	0.180 ± 0.002
1413	479.6	···	22.98 ± 0.01	22.64 ± 0.01	22.13 ± 0.02	22.03 ± 0.01	···	0.178 ± 0.002
1414	480.6	···	22.99 ± 0.01	22.65 ± 0.01	22.15 ± 0.02	22.04 ± 0.01	···	0.176 ± 0.002
1415	481.6	···	23.00 ± 0.01	22.66 ± 0.01	22.16 ± 0.01	22.06 ± 0.01	···	0.174 ± 0.002
1416	482.5	···	23.02 ± 0.01	22.67 ± 0.01	22.17 ± 0.01	22.07 ± 0.01	···	0.172 ± 0.002
1417	483.5	···	23.02 ± 0.01	22.68 ± 0.01	22.19 ± 0.01	22.09 ± 0.01	···	0.170 ± 0.002
1418	484.5	···	23.04 ± 0.01	22.69 ± 0.01	22.20 ± 0.01	22.11 ± 0.02	···	0.168 ± 0.002
1419	485.5	···	23.05 ± 0.01	22.70 ± 0.01	22.21 ± 0.01	22.12 ± 0.02	···	0.166 ± 0.002
1420	486.5	···	23.06 ± 0.01	22.71 ± 0.01	22.23 ± 0.01	22.14 ± 0.02	···	0.165 ± 0.002

Table 3—Continued

JD[a]	Phase[b]	U_0	B_0	V_0	Rc_0	Ic_0	$F_{UBV(RI)_C}$[c]	$F_{BV(RI)_C}$[c]
1421	487.5	···	23.07 ± 0.01	22.72 ± 0.01	22.24 ± 0.01	22.15 ± 0.02	···	0.163 ± 0.002
1422	488.5	···	23.08 ± 0.01	22.73 ± 0.02	22.25 ± 0.01	22.17 ± 0.03	···	0.161 ± 0.002
1423	489.5	···	23.09 ± 0.01	22.74 ± 0.02	22.27 ± 0.01	22.19 ± 0.03	···	0.159 ± 0.002
1424	490.5	···	23.10 ± 0.01	22.75 ± 0.02	22.28 ± 0.01	22.20 ± 0.03	···	0.158 ± 0.002
1425	491.5	···	23.11 ± 0.01	22.76 ± 0.03	22.29 ± 0.01	22.22 ± 0.04	···	0.156 ± 0.003
1426	492.5	···	23.12 ± 0.01	22.77 ± 0.03	22.30 ± 0.01	22.23 ± 0.04	···	0.154 ± 0.003
1427	493.5	···	23.13 ± 0.01	22.77 ± 0.03	22.32 ± 0.01	22.25 ± 0.04	···	0.152 ± 0.003
1428	494.4	···	23.14 ± 0.01	22.78 ± 0.03	22.33 ± 0.01	22.26 ± 0.04	···	0.151 ± 0.003
1429	495.4	···	23.15 ± 0.01	22.79 ± 0.03	22.34 ± 0.01	22.28 ± 0.05	···	0.149 ± 0.003
1430	496.4	···	23.16 ± 0.01	22.80 ± 0.03	22.36 ± 0.01	22.30 ± 0.06	···	0.148 ± 0.003
1431	497.4	···	23.18 ± 0.01	22.81 ± 0.04	22.37 ± 0.01	22.31 ± 0.05	···	0.146 ± 0.004
1432	498.4	···	23.18 ± 0.01	22.82 ± 0.04	22.38 ± 0.01	22.33 ± 0.06	···	0.145 ± 0.004

[a]Mean Julian Date minus 2450000.

[b]Rest frame days after γ-ray burst.

[c]Units are 10^{40} erg cm^{-2} s^{-1}. Uncertainty does not include the $\sim$7% uncertainty in the distance.