COMMUNICATIONS
FROM THE
KONKOLY OBSERVATORY
OF THE
HUNGARIAN ACADEMY OF SCIENCES

MITTEILUNGEN
DER
STERNWARTE
DER UNGARISCHEN AKADEMIE
DER WISSENSCHAFTEN

BUDAPEST – SVÁBHEGY

No. 97.

(Vol. 11, Part 4)

PHOTOMETRY OF THE PECULIAR POPULATION II CEPHEID RU CAMELOPARDALIS (1966 – 1982)

B. SZEIDL, K. OLÁH, L. SZABADOS
K. BARLAI and L. PATKÓS

BUDAPEST, 1992

ISBN 963 8361 35 2
HU ISSN 0238 - 2091
Felelős kiadó: Szeidl Béla

Hozott anyagról sokszorosítva
9320942 AKAPRINT Nyomdaipari Kft. Budapest. F. v.: dr. Héczey Lászlóné

Photometry of the Peculiar Population II Cepheid RU Camelopardalis (1966-1982)

B. SZEIDL, K. OLÁH, L. SZABADOS,
K. BARLAI and L. PATKÓS

Abstract

Photoelectric photometry of RU Cam was carried out at Konkoly Observatory on 1343 nights between 1966 and 1982. 1453 observations both in V and B and 30 observations in U have been published. Using all available data the period and light curve changes of the star have been investigated. A slight continuous period decrease took place between 1907 (P = 22.19 days) and 1965 (P = 22.07 days). After 1965 the period has become very unstable and fluctuated between 17.4 and 26.6 days. It happened several times (probably at irregular time intervals) that after a short-lived recovery phase the amplitude decreased again and the light variation almost disappeared. The light curve also showed that there were time intervals when the light varied irregularly and the count of epoch numbers became very uncertain.

The photoelectric data obtained in the years 1965–1982 have been Fourier-analysed. There was no indication for modulation effects. A number of peaks appeared in the spectrum around f = 0.046 cycle/day suggesting that stochastic or chaotic characters have become dominant in the star's pulsation.

1. Introduction

Although the peculiar behaviour of RU Camelopardalis was known before 1966, it was regarded as a normal Population II Cepheid. The only strikingly abnormal characteristics in its spectrum discovered as early as in 1919 (*Joy*, 1919, *Cannon*, 1920) was that the carbon features were clearly marked. Its spectral type at minimum light was R0 (*Sanford*, 1927, 1928) or $C6_2$ (*Keenan and Morgan*, 1941) or $C3_2$e (*Bidelman*, 1954), while at maximum light it was close to K0. The hydrogen lines were in emission near median magnitude on the rising branch of the light curve and at velocity maximum between the 3^{rd} and 6^{th} days after minimum light (*Sanford*, 1928; *Jehoulet*, 1954; *Climenhaga*, 1960). The radial velocity measurements showed evidence of stratification effects and the presence of an expanding chromosphere was indicated by the high negative velocity of the emission components of CaII H and K (*Faraggiana and Hack*, 1967a, b). In spite of the fact that RU Cam is a Population II star, it is not metal poor, the metal abundance is almost normal, with a slight excess of a factor of 2 or 3 for Ca, Ti, V, Ni and the rare earths with respect to Fe. The star is not H poor either and the excess of carbon is not larger than 2 or 3 (*Faraggiana and Hack*, 1967b). The high abundance of C^{13} (relative to C^{12}) (*Faraggiana and Hack*, 1967b; *Climenhaga*, 1960) produced by the carbon cycle indicates that RU Cam is in an advanced evolutionary state.

In the beginning of 1966 *Demers and Fernie* (1966) reported that they were unable to detect light variations in RU Cam exceeding 0.1-0.2 mag but the star was apparently still unstable with irregular fluctuations of the order of 0.2 mag. This observation initiated a series of speculations about ceasing pulsation in RU Cam. Since the star showed strong irregular changes in the past, too, there was some suspicion that the star did not stop pulsating, only the amplitude of its light variation decreased temporarily. *Detre* (1966) even suggested cyclic amplitude variations and predicted the increase of amplitude. Following *Demers and Fernie*'s announcement photoelectric photometry of RU Cam was commenced at some observatories (*Wamsteker*, 1966, 1968; *Cester*, 1967, 1968, 1969; *Broglia*, 1967, 1969; *Broglia and Guerrero*, 1969a, b, 1971, 1972a, b, 1973; *Broglia et al.*, 1978, *Fernie and Watt*, 1967; *Fernie*, 1968; *Zaitseva*, 1967, 1968; *Zaitseva and Ljutiy*, 1969, 1971, 1978; *Zaitseva et al.*, 1973, *Kovalenko*, 1974), in order to investigate the peculiar behaviour of the star. The photoelectric observations at Konkoly Observatory were started in August, 1966.

As to a brief historical overview, the light variability of RU Cam (BD +69°417 (8.5) = HD 56167 (K0) = 2.1907) was discovered by *Mme L. Ceraski* on *Blazhko*'s plate collection obtained between 1899-1906 (*Ceraski*, 1907). Using his visual estimates of 1907 and photographic observations obtained in the years 1904-1906, *Blazhko* (1907) determined the period of light variation and gave the elements for maximum light:

$$\text{Max.} = \text{J.D. } 2417620.0 + 22\overset{d}{.}27 \times \text{E}.$$

Luizet (1907, 1912), *Ichinohe* (1909), *Shapley* (1913), *Silva* (1922), *Leiner* (1923, 1929), *Haas* (1923), *Edelberg* (1932), *Florja and Kukarkina* (1953), published visual or photographic estimates, while *Lenouvel and Jehoulet* (1953), *Lenouvel and Dagouillon* (1954), *Eggen et al.* (1957), *Lenouvel and Fiogère* (1957), *Delsemme and Delsemme-Jehoulet* (1958), *Michalowska-Smak and Smak* (1965), *Mitchell et al.* (1964), *Williams* (1966) and *Smak* (1966) published photoelectric observations of RU Cam obtained prior to *Demers and Fernie*'s announcement.

Leiner (1923) already suspected that the light curve of RU Camelopardalis varied from cycle to cycle and the period of the star was also changing. Further investigations (*Haas*, 1923; *Leiner*, 1929; *Edelberg*, 1932; *Nielsen and Sjögren*, 1943) confirmed this suspicion.

Although the star was included in the general list of Cepheid variables, *Robinson* (1933) called the attention to the peculiarities of RU Cam in its spectrum, light curve, period and radial velocity. He supposed that between these peculiarities certain interrelationships existed but did not see any reason to exclude this star from the list of Cepheids. *Payne-Gaposchkin* (1941) noted that W Virginis resembled RU Cam in the shape of light curve, the variation of period, the correspondence between light and velocity curves, and the occurrence of bright lines at and following the minima.

The complex character of the variability of RU Cam during the 50's and early 60's was traced back on Sonneberg archival plates (*Huth and Wenzel*, 1966; *Huth*, 1966, 1967) and *Huth* ascertained that the light amplitude of the star might undergo considerable changes within several months. The large irregularities in the light variation of this object were obvious from a mere visual inspection of the time series of its luminosity, and it was also clear that the cycle length was also undergoing irregular fluctuations.

Parallel with the irregular behaviour of the light variation the radial velocity changes of the star showed complex character (*Demers and Crampton*, 1966; *Wallerstein and Crampton*, 1967). During the period when the amplitude was smaller than 0.05 mag, no emission lines were visible in the spectrum of the star and its radial velocity seemed to be constant and approximately equal to *Sanford*'s gamma velocity (*Sanford*, 1928). *Wallerstein* (1968) investigated the atmospheric parameters of the star during this "quiescent" period in the early 1965. *Lloyd Evans* (1983) suggested that there might be a possible connection between extreme irregularity and the occurrence of an overabundance of carbon in RU Cam.

2. Observations

The photoelectric photometry of RU Camelopardalis was started by *L. Detre* and one of the authors of the present paper (*Detre and Szeidl*, 1967) at Konkoly Observatory on August 10, 1966. The observations were carried out by the observatory's 24 in. telescope at Budapest and by the 20 in. telescope at Piszkéstető Mountain Station.

At Budapest the photometer was equipped with an unrefrigerated EMI 9502B photomultiplier and Schott filters UG1 for the U, BG12+GG13 for the B and GG11 for the V band and was placed at the Newtonian focus (f/6) of the 24 in. telescope. Since 1972 photoelectric observations have also been obtained by the 20 in. Cassegrain telescope (f/15) at Piszkéstető. At this location we used an integrating photometer equipped with an unrefrigerated EMI 9058QB photomultiplier and the following Schott filters: UG2 in U, BG12+GG13 in B and GG11 in V.

BD +70°448 was used as the main comparison star. Several other stars were also observed in order to check the constancy of the main comparison and to determine the transformation coefficients. Tie-in observations of the comparison stars were made on six nights and Table 1 presents the results of these observations. Their errors are about 0.01 mag in V and B and 0.03 mag in U.

Table 1

Brightness and colours of the comparison stars

star	V	$B-V$	$U-B$
BD +69°420 = HD 57201 (F8)	8.906	+0.506	+0.055
BD +69°422 = HD 57308 (G0)	8.021	+0.801	+0.487
BD +70°447 = HD 56323 (F5)	9.056	+0.326	+0.072
BD +70°448	9.059	+1.090	+0.934

In order to get a judgement about the accuracy of the brightness and colours of the main comparison star all these values obtained by different observers for BD +70°448 are collected in Table 2. The agreement between the different observers is fairly good.

During 1343 nights 119, 7597 and 7597 observations were made in U, B and V, respectively at Konkoly Observatory. The observations have been corrected for atmospheric extinction and transformed into the UBV system in the traditional way. Each observing run mostly consisted of six observations which were composed into normal values. In this way 30 normal points were obtained in U and 1453 normal values in both B and V.

Table 2

Magnitudes and colours of BD +70°448 in other studies

V	$B-V$	$U-B$	source
9.09	+1.10	+0.98	Lenouvel & Fiogère, 1957
9.058	+1.092	+0.972	Michalowska-Smak & Smak, 1965
9.09	+1.09		Cester, 1967
9.083	+1.077	+0.957	Fernie & Watt, 1967
9.090	+1.089		Cester, 1968

The B and V normal values are given in Table 3 and the U values in Table 4 (see on pages 273–300). The Julian Dates of the observations obtained at Piszkéstető are marked by asterisks. Tables 3 and 4 also present the number of observations (n), the r.m.s. errors, the $B-V$ colour indices and the average zenith distance at the observations. In order to cover the light curve of RU Camelopardalis as fully as possible, the star was observed during the nights of poor quality, as well, and this circumstance explains the lower precision of some of the normals.

During the period of our observations (J.D.2439348 – 2445260) photoelectric photometry of RU Cam was carried out at other observatories, as well. Since there are a number of common nights of observation our photometry can be compared with that of others. While comparing the observations we supposed that the changes in brightness of RU Cam during a night may be neglected.

We have 243 common nights of observation in V and 204 in B with *Broglia et al.*, (*Broglia*, 1969; *Broglia and Guerrero*, 1969b, 1972a, 1973; *Broglia, Conconi and Guerrero*, 1978). They used the same comparison star as we did but they accepted *Lenouvel and Fiogère*'s (1957) magnitudes and colours for it. Taking into account the differences in the accepted magnitudes of the comparison star we came to the conclusion that the average systematic differences (zero point shifts) between *Broglia et al.*'s and our observations in V and B are:

$$\overline{\Delta V} = n^{-1}\sum \Delta V_i = -0.0002 \text{ mag}, \qquad \sigma(V) = \sqrt{(n-1)^{-1}\sum(\Delta V_i)^2} = 0.0125,$$

$$\overline{\Delta B} = n^{-1}\sum \Delta B_i = 0.0000 \text{ mag}, \qquad \sigma(B) = \sqrt{(n-1)^{-1}\sum(\Delta B_i)^2} = 0.0147.$$

The distributions of the ΔV_i and ΔB_i values are nearly normal and are shown in Figure 1. The above results indicate that our observations fit in well with that of *Broglia et al.*

A comparison with *Cester*'s (1968, 1969) observations led to a similar result. There were 38 and 39 common nights of observation in V and B, respectively. The zero point shifts between his and our V and B are:

$$\overline{\Delta V} = +0.0007 \text{ mag}, \qquad \sigma(V) = 0.0148,$$

$$\overline{\Delta B} = +0.0038 \text{ mag}, \qquad \sigma(B) = 0.0212.$$

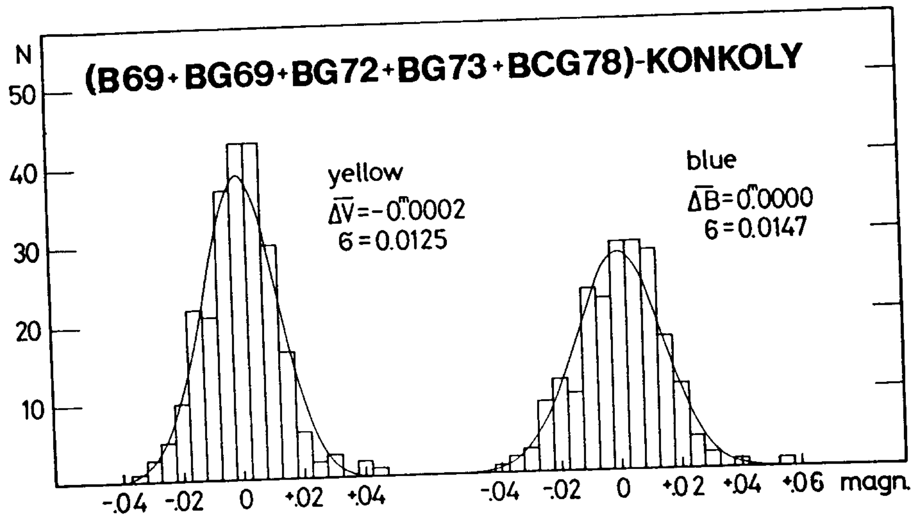


Figure 1. The distribution of the ΔV_i and ΔB_i values

The conformity between *Cester*'s and our observations in V is also good, however in B it is not quite satisfactory, but still acceptable. The comparison of *Cester*'s and *Broglia et al.*'s observations resulted in the same conclusion.

Wamsteker (1968) observed the star only in yellow light and had 11 common nights of observation with us. Comparing his observations to ours an average difference of:

$$\overline{\Delta V} = -0.0035 \text{ mag}, \qquad \sigma(V) = 0.0061$$

can be deduced in the characteristic parameters. These values indicate that *Wamsteker*'s photometric system is close to ours.

Fernie (1968) published 50 observations in V, and 49 ones in B (one of them, on J.D. 2439646 may be misprinted in his Table). There were 14 common nights of observation in V and 13 in B. The comparison to our observations gave the following results:

$$\overline{\Delta V} = +0.0091 \text{ mag}, \qquad \sigma(V) = 0.0204,$$

$$\overline{\Delta B} = -0.0137 \text{ mag}, \qquad \sigma(B) = 0.0263.$$

The difference between *Fernie*'s and our photometric systems is significant, although the discrepancy can partly be attributed to the fact that the times of observation of the common nights usually differed by more than eight hours.

Zaitseva and Ljutiy (*Zaitseva*, 1967, 1968, *Zaitseva and Ljutiy*, 1969, 1971, 1978) observed the star between 1966 May and 1975 May on 206 nights of which 95 were common with ours. The comparison of the observations of the common nights resulted in:

$$\overline{\Delta V} = +0.0154 \text{ mag}, \quad \sigma(V) = 0.0209,$$

$$\overline{\Delta B} = -0.0025 \text{ mag}, \quad \sigma(B) = 0.0230.$$

The differences between the two photometries are rather large, both significant systematic and large random differences occur.

To sum up the discussion about the photometries carried out during the time interval covered by our observations we conclude that *Broglia et al.*'s, *Cester*'s and *Wamsteker*'s photometry is in accord with ours, while *Fernie*'s (and co-workers') as well as *Zaitseva and Ljutiy*'s photometry differs from ours rather significantly. Therefore the latter two photometries are only used in the further discussion for lack of other photoelectric observations. Figure 2a-i presents our V observations (dots) and those of *Broglia* et al., *Cester and Wamsteker* (crosses).

3. Period changes and discussion

Since the discovery of the variability of RU Cam a great number of visual, photographic and photoelectric observations have been collected for the star. As the light minima are sharp and usually well-defined unlike the light maxima which are broad and blunt, the period changes of the star can be examined more exactly from the times of minima. Table 5 contains all the available times of minima prior to the remarkable amplitude decrease in early 1965. The $O-C_1$ values are computed by the formula:

$$C_1 = \text{J.D. } 2417610.5 + 22^{\mathrm{d}}.16 \times E_1.$$

Although changes in the period (either abrupt or smooth) occurred several times, but on the average, the period P = 22.16 days held on during the time interval J.D. 2412868 - J.D. 2438680 (1874 February - 1964 October). The $O-C_1$ residuals are plotted against time in Figure 3. The abrupt changes in the period might occur at around J.D. 2421000, J.D. 2423000, J.D. 2426300, J.D.2434500 and J.D. 2437000 (see the study of period changes in detail by *Huth*, 1967), though continuous and/or erratic changes cannot be excluded. Moreover, *Leiner* (1929) found jumps in the phase of minima. He observed a phase shift of 1 1/2 days at the end of 1922. If we assume that the period fluctuations $(P_i - \overline{P})$ may be regarded as random variables with zero mean and that the stochastic process is stationary, the $O-C$ diagram consisting of cycles of different lengths and amplitudes can take its origin from the accumulation of random fluctuations in the period (e.g. *Sterne*, 1934, or *Balázs-Detre and Detre*, 1966). By all means, however, a systematic period decrease can be presumed from 1907 (P = 22.19 days) till 1965 (P = 22.07 days).

The photoelectric observations made at Konkoly Observatory and those available in the literature were used to determine the moments and magnitudes of light minima and maxima for the V band. In order to derive the times and magnitude values as accurately as possible, parabolas were fitted to the observations around minima and maxima. The results are given in Table 6 and Table 7, respectively.

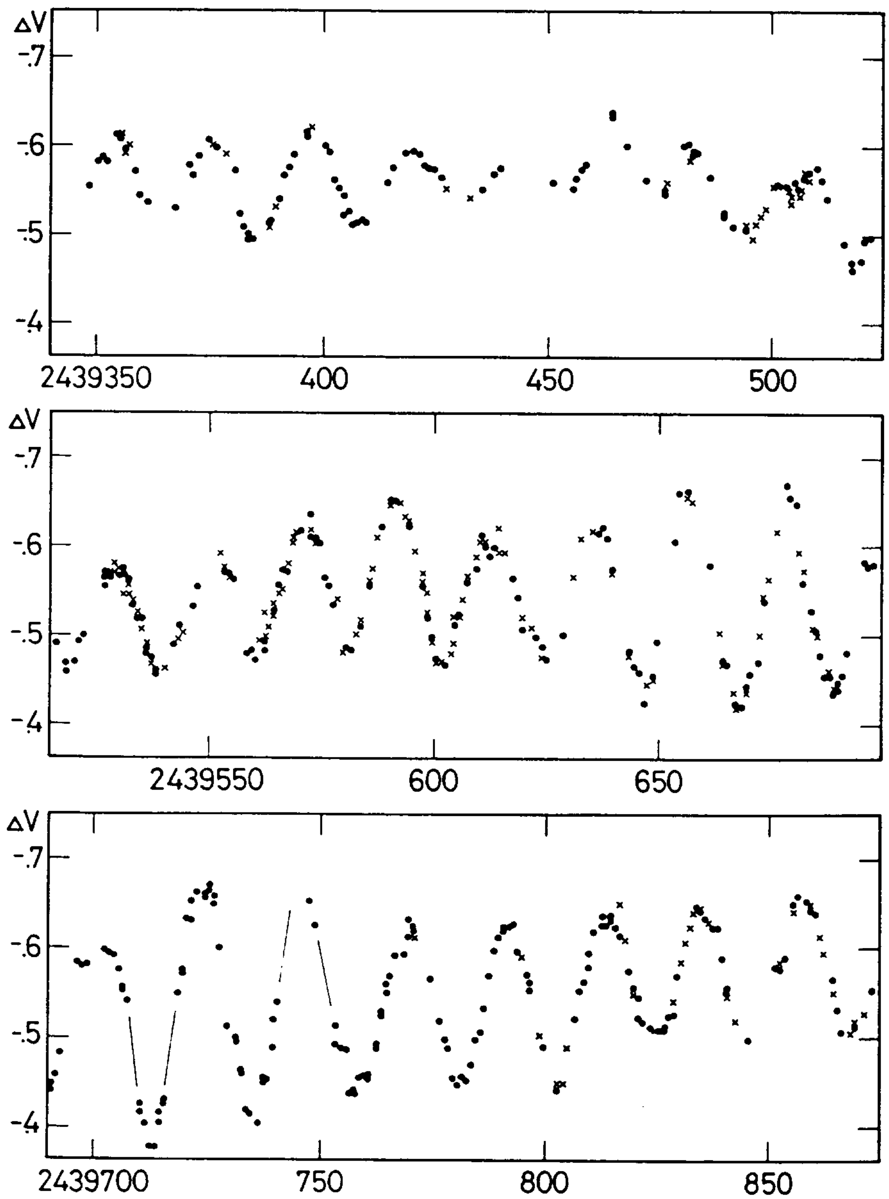


Figure 2a. Photoelectric V observations (dots: Konkoly observations)

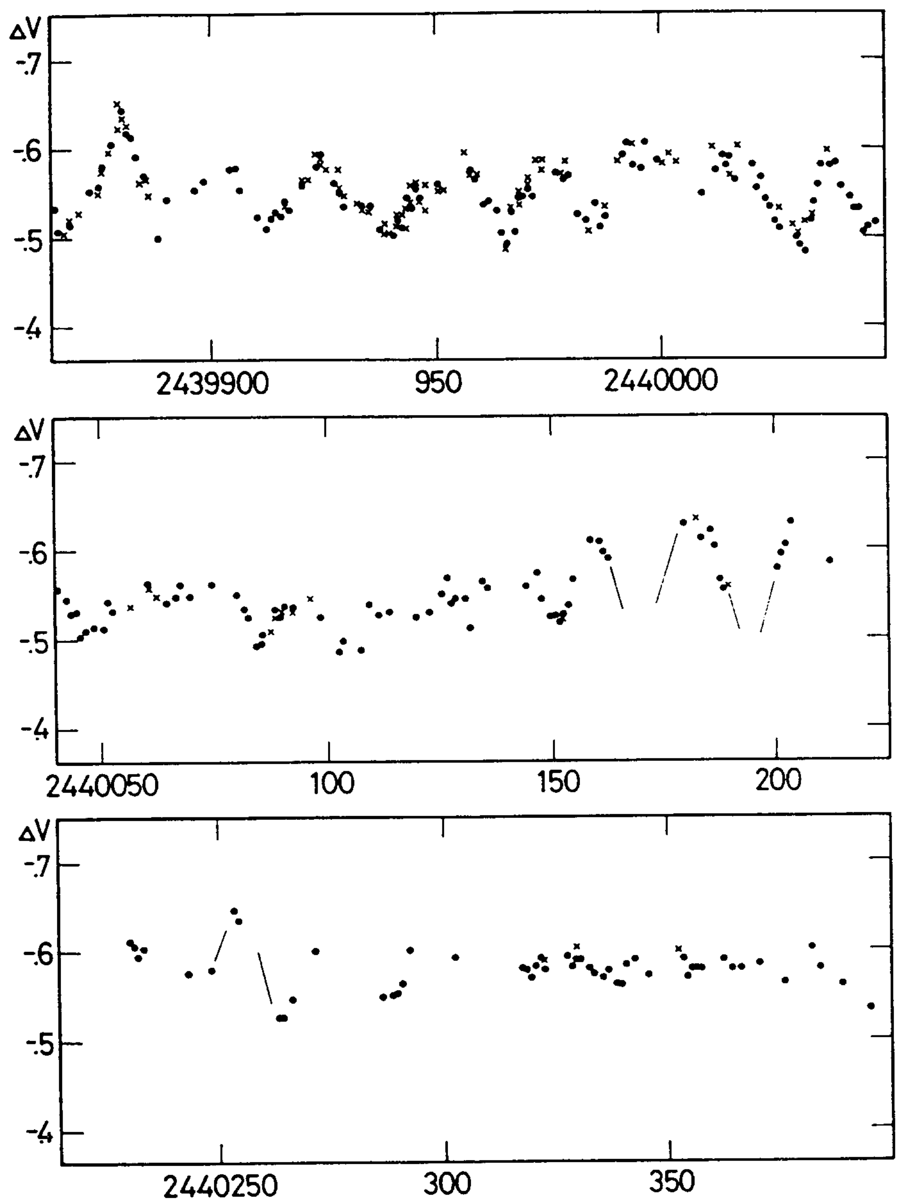


Figure 2b. The same as Fig. 2a.

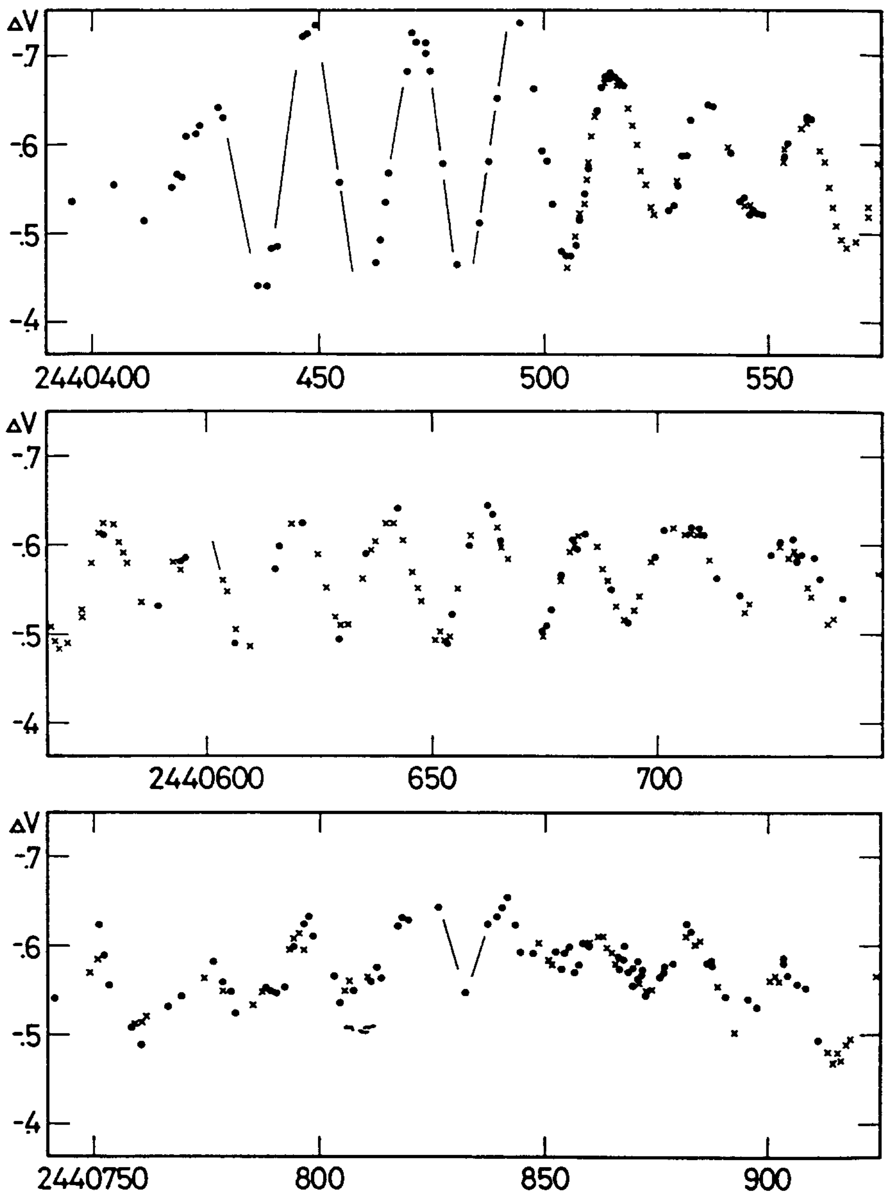


Figure 2c. The same as Fig. 2a.

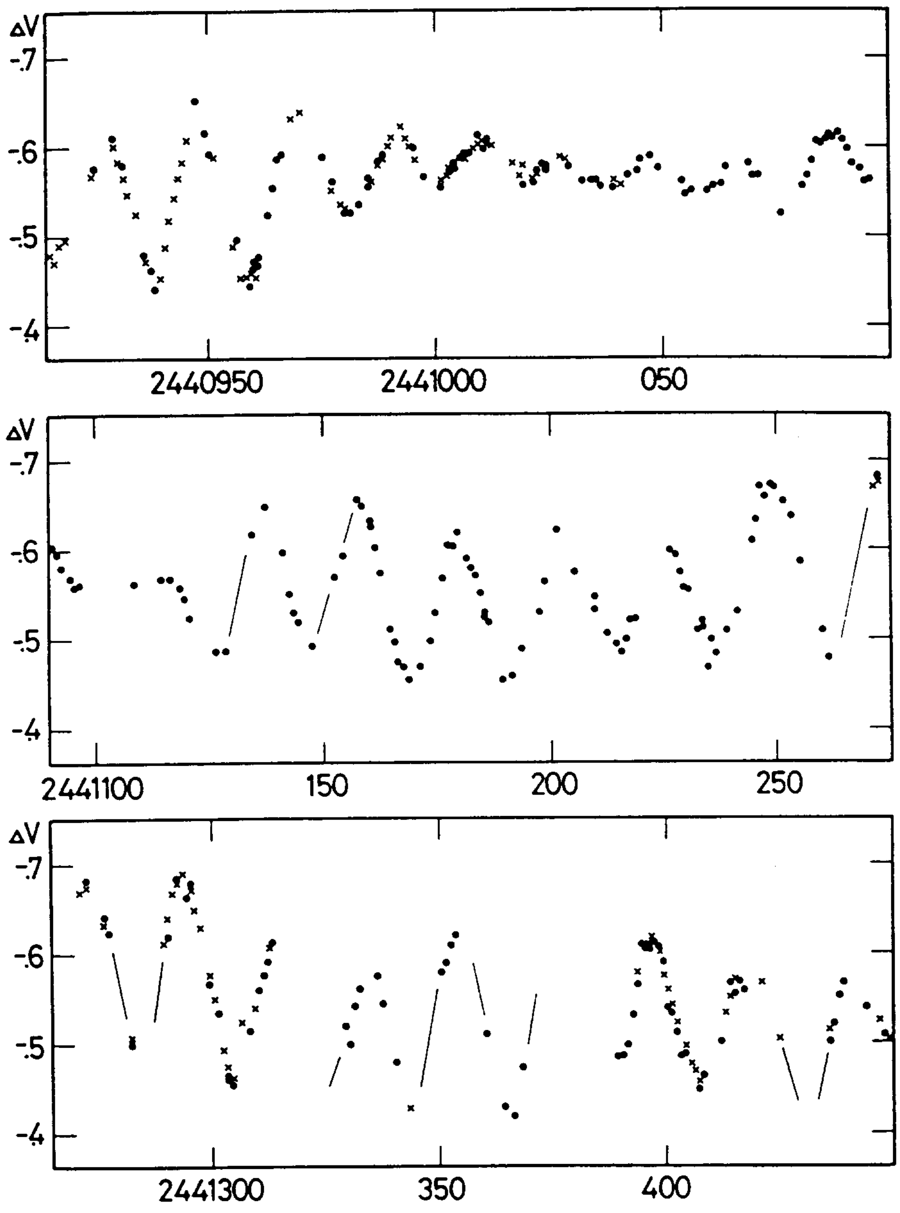


Figure 2d. The same as Fig. 2a.

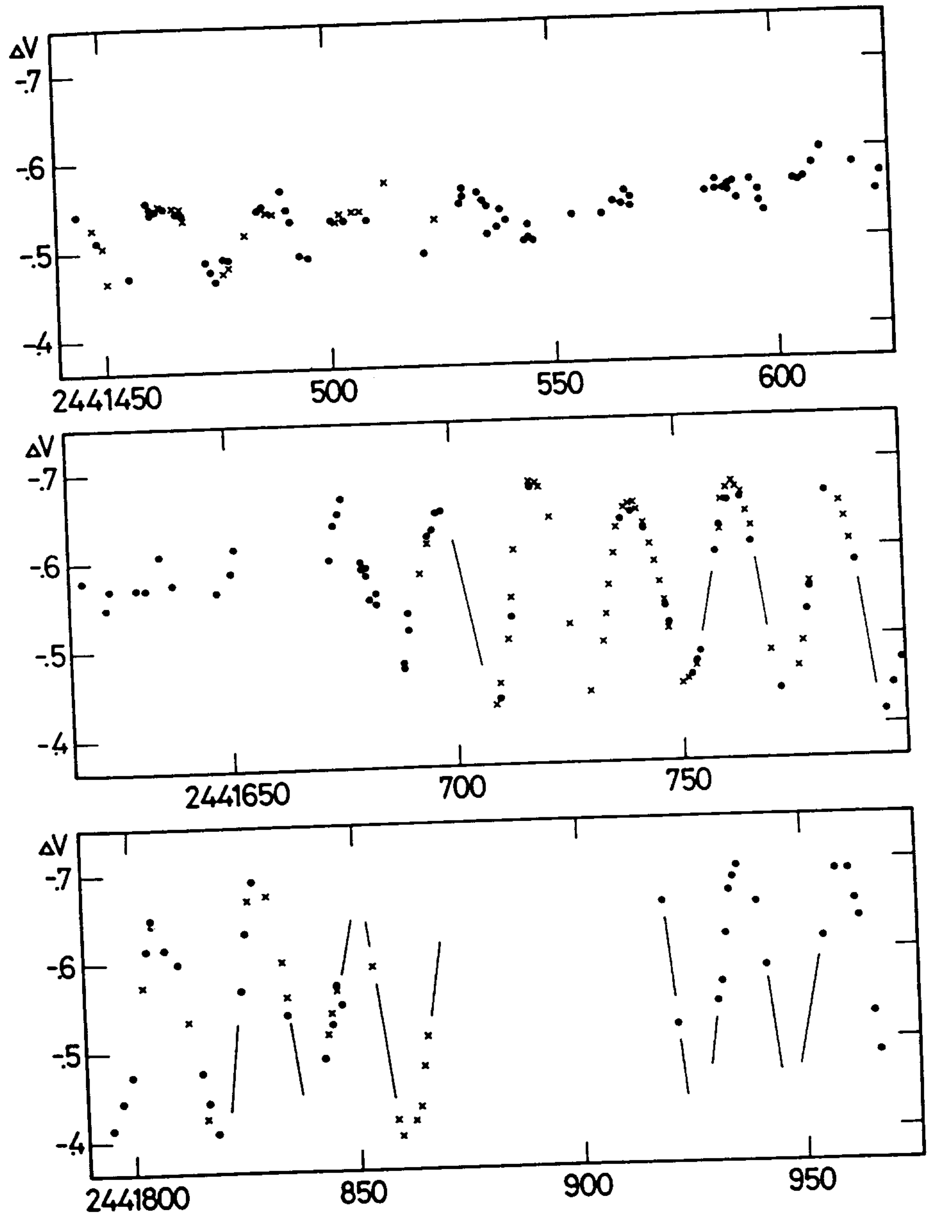


Figure 2e. The same as Fig. 2a.

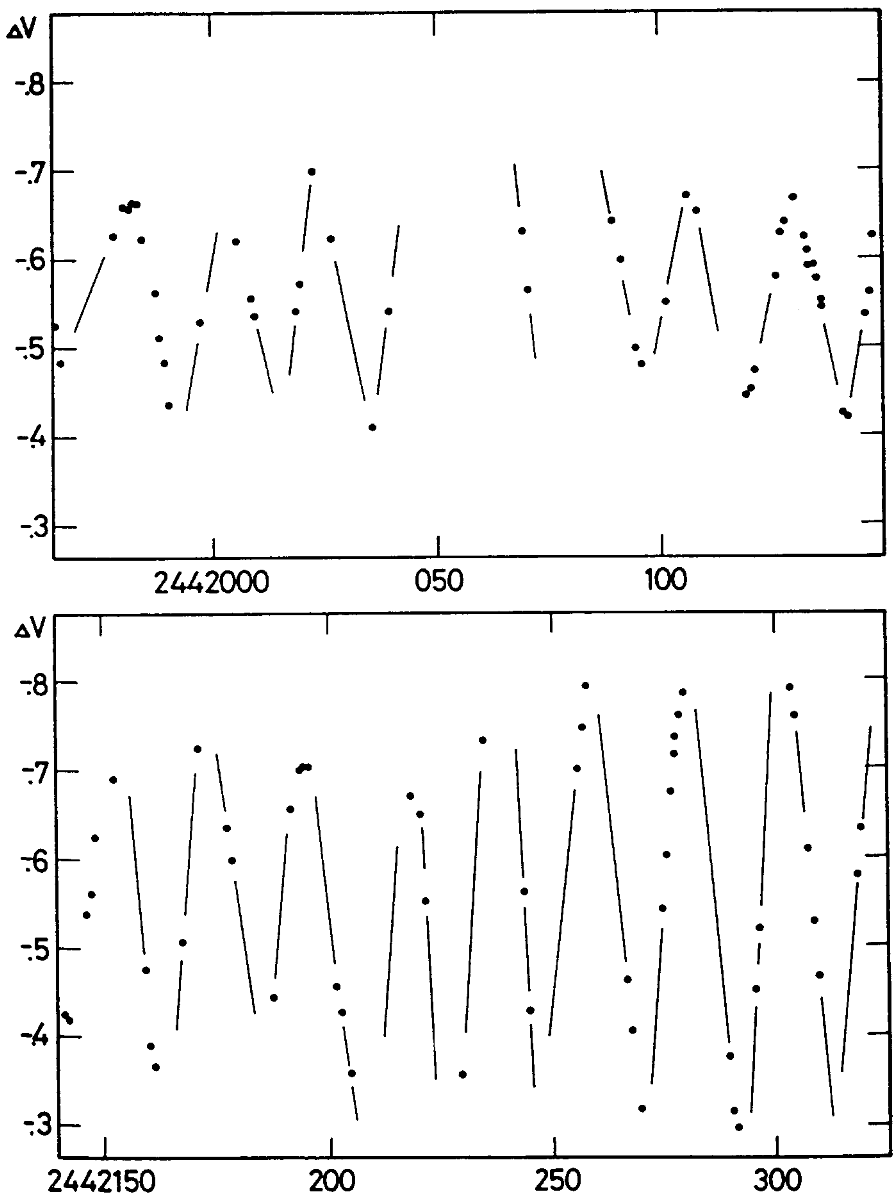
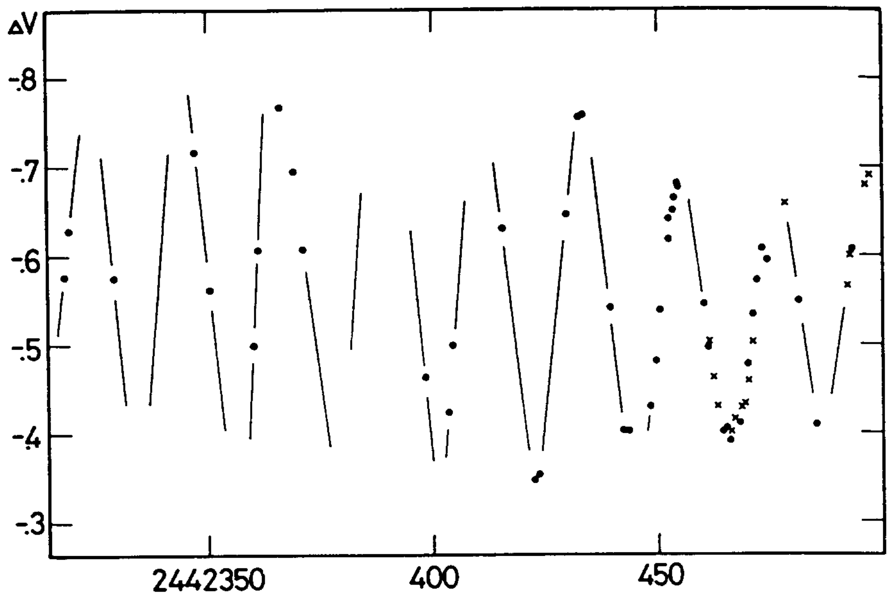


Figure 2f. The same as Fig. 2a.



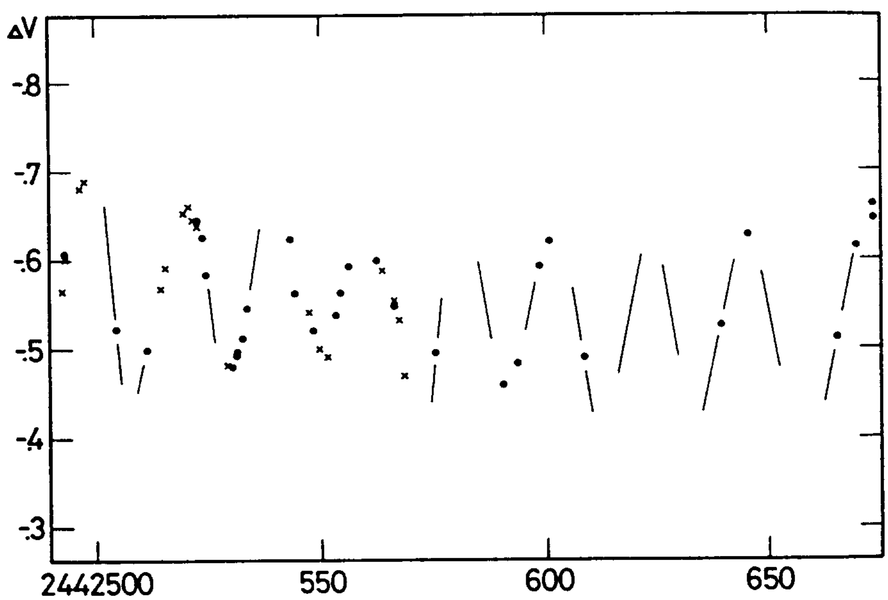


Figure 2g. The same as Fig. 2a.

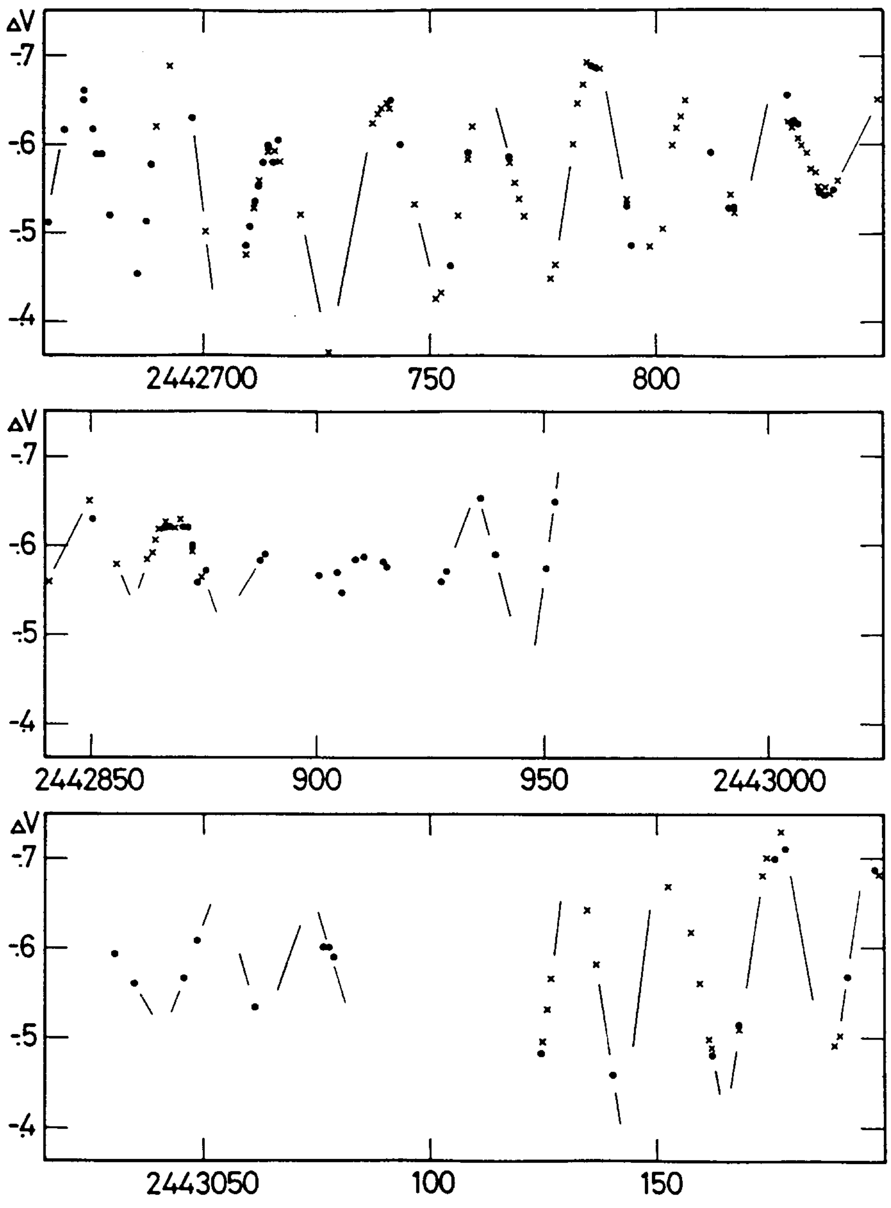


Figure 2h. The same as Fig. 2a.

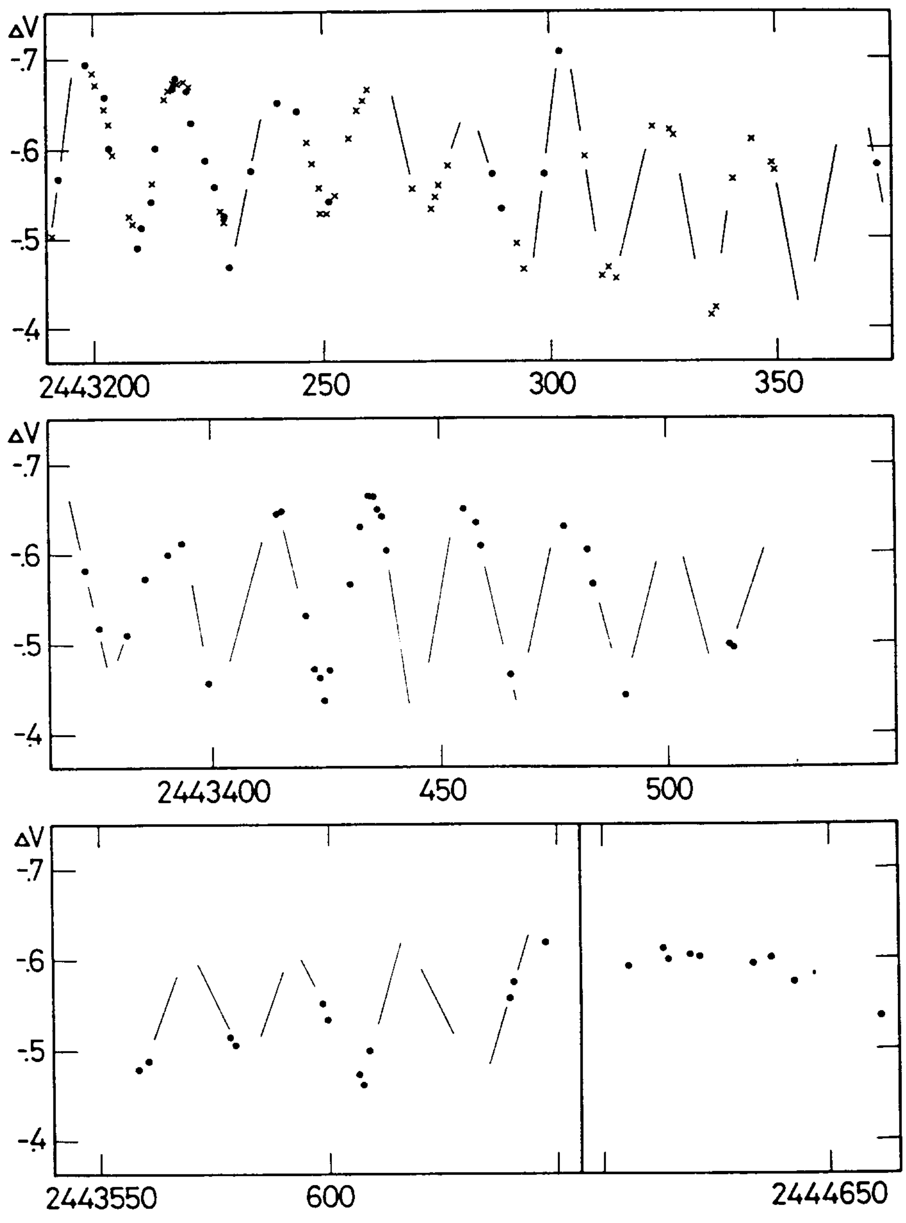


Figure 2i. The same as Fig. 2a.

Table 5

Times of minima prior to the amplitude decrease of 1965

t_{min} 2400000+		E_1	$O-C_1$	References
12868	v	−214	−0.3	K07
13601	v	−181	1.5	K07
17610.5	v	0	0.0	B07
17655.2	v	+2	0.4	L07; L12; I09
17676.5	v	3	−0.5	I09; S13 (E.S. Haynes)
17699.1	v	4	0.0	L07; L12; S13 (E.S. Haynes)
17722.0	v	5	0.7	I09; S13 (E.S. Haynes)
17743.9	v	6	0.4	L07; L12; I09
17766.7	v	7	1.1	L07; L12; S13 (E.S. Haynes)
17788.2	v	8	0.4	S13 (E.S. Haynes)
17831.9	v	10	−0.2	I09 (N36)
17855.1	v	11	0.8	S13 (E.S. Haynes)
17943.6	v	15	0.7	S13 (E.S. Haynes)
17966.0	v	16	0.9	I09; S13 (E.S. Haynes)
18010.8	v	18	1.4	S13 (E.S. Haynes)
18032.1	v	19	0.6	S13 (E.S. Haynes)
18054.3	v	20	0.6	S13 (E.S. Haynes)
18077.0	v	21	1.1	S13 (E.S. Haynes & F.H. Seares)
18099.0	v	22	1.0	S13 (E.S. Haynes & F.H. Seares)
18121.2	v	23	1.0	L12; S13 (E.S. Haynes & F.H. Seares)
18143.8	v	24	1.5	L12; S13 (E.S. Haynes & F.H. Seares)
18232.0	v	28	1.0	L12
18364.5	v	34	0.6	L12; S13 (E.S. Haynes)
18387.4	v	35	1.3	S13 (E.H.Haynes)
18519.0	v	41	−0.1	L12
18586.7	v	44	1.2	L12
18651		47	−1.0	Y16
18719.5	v	50	1.0	L12 (N36)
18741.9	v	51	1.2	L12
18763.2	v	52	0.4	L12
18786.9	v	53	1.9	L12
18940.0	v	60	−0.1	L12
18963.0	v	61	0.7	L12
19051.9	v	65	1.0	L12
19074.8	v	66	1.7	L12
19140.7	v	69	1.2	L12
19229.6	v	73	1.4	L12
19252.0	v	74	1.7	L12
19339.8	v	78	0.8	L12
19450.4	v	83	0.6	L12
19474.4	v	84	2.5	L12
19496.9	v	85	2.8	L12
19539.7	v	87	1.3	L12
20117.6	v	113	3.0	S22
20428.7	v	127	3.9	S22
20494.3	v	130	3.0	S22
20561		133	3.2	Y16
20958.4	v	151	1.7	S22
22178.0	v	206	2.5	L23
22266.5	v	210	2.4	L23

Table 5 (cont.)

t_{min}		E_1	$O-C_1$	References
22355.3	v	214	2.6	L23
22443.3	v	218	1.9	L23
22487.4	v	220	1.7	L23 (S28)
22531.5	v	222	1.5	L23
22576.4	v	224	2.1	L23 (S28)
22619.8	v	226	1.1	L23
22641.8	v	227	1.0	L23 (S28)
22708.6	v	230	1.3	L23 (N36)
22797.2	v	234	1.3	L23
22818.6	v	235	0.5	L23 (S28)
22841.7	v	236	1.4	L23 (S28)
22885.6	v	238	1.0	L23
22907.8	v	239	1.1	L23 (S28)
22930.1	v	240	1.2	L23 (S28)
22974.4	v	242	1.2	L23
23085.1	v	247	1.1	L23
23129.4	v	249	1.1	L23 (S28)
23173.4	v	251	0.7	L23
23240.2	v	254	1.1	L23
23261.9	v	255	0.6	H23 (S28; N36)
23283.4	v	256	−0.1	L23 (S28)
23328.7	v	258	0.9	L23
23440.9	v	263	2.3	L29
23529.4	v	267	2.2	L29
23618.1	v	271	2.2	L29
23706.6	v	275	2.1	L29
23750.7	v	277	1.9	L29 (N36)
23839.7	v	281	2.2	L29
24105.5	v	293	2.1	L29
24282.3	v	301	1.6	L29
24616.8	v	316	3.7	L29
24683.3	v	319	3.8	L29
24772.5	v	323	4.3	L29
25039.6	v	335	5.5	L29 (N36)
25173.5	v	341	6.4	L29
25306.1	v	347	6.1	L29
25417.2	v	352	6.4	L29
25461.9	v	354	6.8	L29
25484.3	v	355	7.0	L29
25506.3	v	356	6.8	E32
25528.1	v	357	6.5	E32
25617.2	v	361	6.9	E32
25683.3	v	364	6.6	N30
25706.0	v	365	7.1	E32
25862.1	v	372	8.1	E32
25884.2	pg	373	8.0	H67
25994.3	v	378	7.3	E32
26040.6	pg	380	9.3	H67
26416.5	pg	397	8.5	H67
26439.0	v	398	8.8	E32
26483.0	v	400	8.5	E32
26571.3	v	404	8.2	E32
26594.5	v	405	9.2	E32
26748.4	pg	412	8.0	H67
27081.2	v	427	8.4	P56
27214.7	pg	433	8.9	H67
28076.4	v	472	6.4	L38
28519.4	v	492	6.2	K37
29382.4	v	531	4.9	NS41
30002.9	v	559	5.0	N52
30201.8	v	568	4.4	NS43
30314.3	v	573	6.1	M64
30334.3	v	574	4.0	M64
30623.4	v	587	5.0	M64
30645.3	v	588	4.7	M64
31044.1	v	606	4.6	N52
31996.3	v	649	4.0	N52
32217.8	v	659	3.9	LJ53 (P. Ledoux)
32771.0	v	684	3.1	N55
32859.7	pe	688	3.1	E57
32968.3	pg	693	0.9	H67
33568.2	pg	720	2.5	H67
33656.1	pg	724	1.8	H67
33678.5	pg	725	2.0	LJ53 (B.S.Whitney)
33744.8	v	728	1.8	N55
34010.4	v	740	1.5	N55
34076.4	pe	743	1.0	LJ53
34298.7	pg	753	1.7	H67
34430.8	pe	759	0.9	LD54
34652.5	pg	769	1.0	H67
34696.5	pe	771	0.6	LD54
35052.6	pg	787	2.2	H67
35362.8	pg	801	2.1	H67
35539.8	pe	809	1.9	LF57
35605.0	pg	812	0.6	H67
35895.0	pe	825	2.5	DJ58
35917.2	pe	826	2.5	DJ58
36005	v	830	1.7	AAVSO (N.O. Hutchings)
36073	v	833	3.2	AAVSO (N.O. Hutchings)
36161.0	pg	837	2.6	H67
36227.2	pg	840	2.3	H67
36316	v	844	2.5	AAVSO (N.O. Hutchings)
36603.4	pg	857	1.8	H67
36958.2	pg	873	2.0	H67
37024.5	pe	876	1.8	Mi64
37401.2	pg	893	1.8	H67
37577.4	pg	901	0.7	H67
37731.6	pg	908	−0.2	H67
37775.5	pe	910	−0.6	MS65
37886.5	pg	915	−0.4	H67
38085.6	pg	924	−0.7	H67
38284.3	pg	933	−1.5	H67
38415.5	pg	939	−3.2	H67
38504.4	pg	943	−3.0	H67
38680.4	pg	951	−4.3	H67

References: K07 = Kreutz 1907; B07 = Blazhko 1907; L07 = Luizet 1907; L12 = Luizet 1912; I09 = Ichinohe 1909; S13 = Shapley 1913; Y16 = Yendell 1916; S22 = Silva 1922; L23 = Leiner 1923; L29 = Leiner 1929; H23 = Haas 1923; S28 = Sanford 1928; N30 = Nielsen 1930; N36 = Nielsen 1936; N52 = Nielsen 1952; N55 = Nielsen 1955; E32 = Edelberg 1932; K37 = Krebs 1937; L38 = Larson 1938; NS41 = Nielsen & Sjögren 1941; NS43 = Nielsen & Sjögren 1943; LJ = Lenouvel & Jehoulet 1953; LD54 = Lenouvel & Daguillon 1954; E57 = Eggen et al. 1957; LF57 = Lenouvel & Fiogère 1957; DJ58 = Delsemme & Delsemme-Jehoulet 1958; P56 = Parenago 1956; M64 = Model 1964; Mi64 = Mitchell et al. 1964; MS65 = Michalowska-Smak & Smak 1965; H67 = Huth 1967

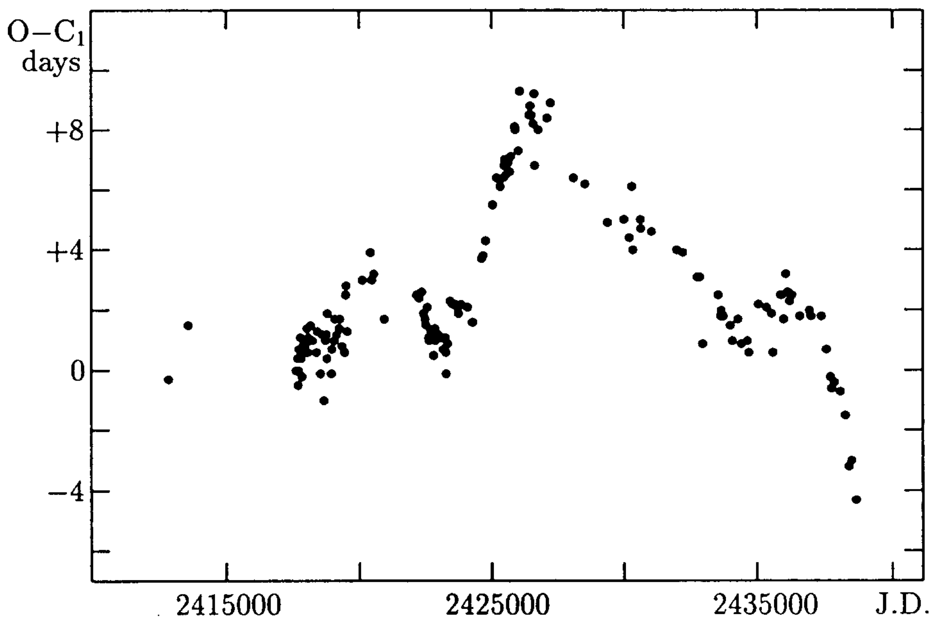


Figure 3. $O - C_1$ diagram of RU Cam

Although most observers took note of light curve changes of RU Cam, especially in the depth of the light minima (sometimes it reached 0.5 mag.) and called attention to the peculiarities of RU Cam (*Silva*, 1922; *Leiner*, 1923, 1929; *Haas*, 1923; *Edelberg*, 1932, *Robinson*, 1933; *Nielsen and Sjögren*, 1943) no one realized the star's extreme nature until the announcement of *Demers and Fernie* (1966). They observed the unprecedented amplitude decrease of the star in 1965.

After the 1965 event the period of the star has become very unstable and fluctuated between 17.4 and 26.6 days. Figure 4 presents the frequency distribution of the observed $P_i = t_{i+1}^{min} - t_i^{min}$ periods since 1965. The values of the period usually fell into the 20-24 day time interval with an average value of 21.75 days. After 1965 the O−C residuals have been computed by the formula:

$$C_2 = \text{J.D. } 2439079.6 + 21\overset{d}{.}75 \times E_2$$

where $E_2 = E_1 - 969$. The $O-C_2$ diagram (Figure 5) also shows that the period underwent large fluctuations, especially during the times when the amplitude of the light variation

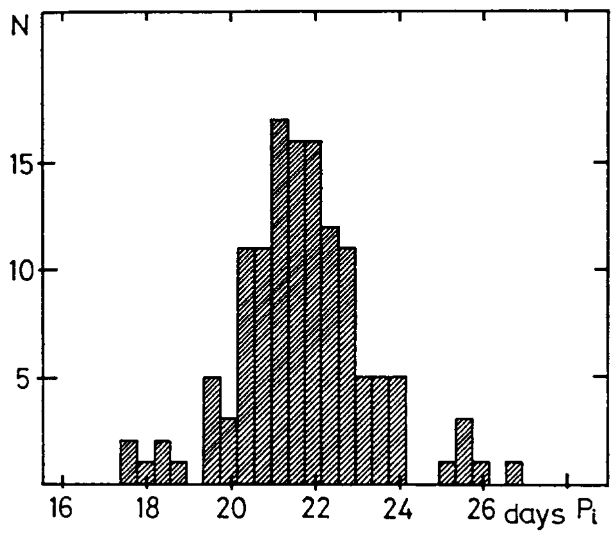


Figure 4. Frequency distribution of the observed P_i periods since 1966

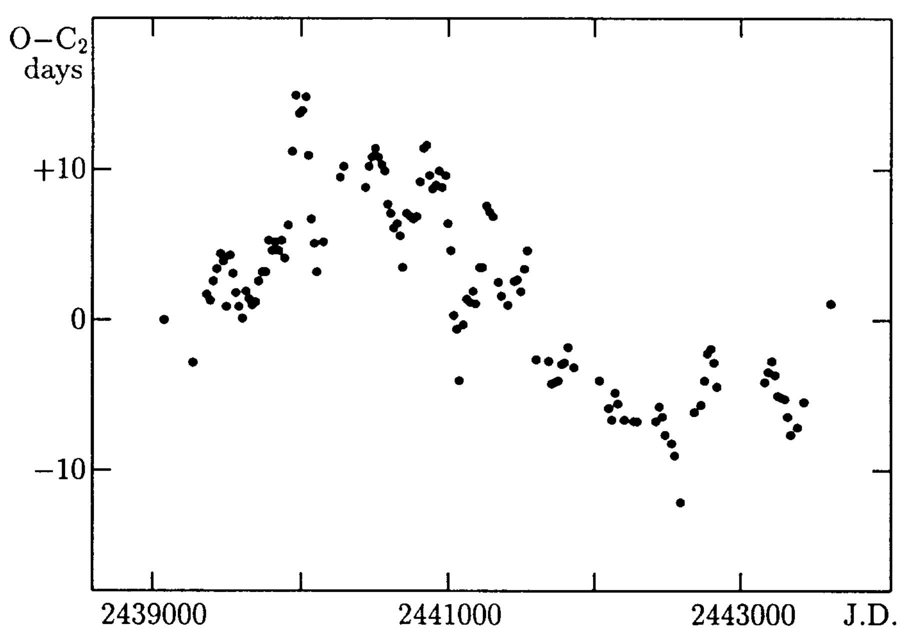


Figure 5. $O - C_2$ diagram of RU Cam

Table 6

Times and brightness of minima from photoelectric V observations

t_{min} 2400000+	m_V^{min}	E_2	$O-C_2$	References
32859.7	9.09	−281	$-108^{d}.2$	E57
34076.4	9.15	−226	−87.7	LJ53
34430.8	9.27	−210	−81.3	LD54
34696.5	9.26	−198	−76.6	LD54
35539.8	9.17	−160	−59.8	LF57
35895.0	9.58	−144	−52.6	DJ58
35917.2	9.60	−143	−52.1	DJ58
37024.5	9.11	−93	−32.3	M64
37775.5	9.77	−59	−20.9	MS65
39079.6	8.61	0	0.0	W66
39272.6	8.55	9	−2.8	Z67
39364	8.55	13	1.7	Pp
39385.4	8.568	14	1.3	Pp
39408.4	8.548	15	2.6	Pp
39431	8.52	16	3.4	W68
39453.7	8.514	17	4.4	Pp
39475	8.52	18	3.9	Pp; B69
39493.7	8.559	19	0.9	Pp; C68
39518.9	8.595	20	4.3	Pp
39539.4	8.602	21	3.1	Pp; B69
39559.9	8.582	22	1.8	Pp
39580.8	8.581	23	0.9	Pp; B69
39601.7	8.593	24	0.1	Pp; C68; B69
39625.3	8.589	25	1.9	Pp; B69
39646.5	8.628	26	1.4	Pp
39667.9	8.639	27	1.0	Pp; B69
39689.8	8.620	28	1.2	Pp; B69
39712.9	8.685	29	2.6	Pp
39735.3	8.666	30	3.2	Pp
39757.0	8.624	31	3.2	Pp
39780.9	8.613	32	5.3	Pp
39802.0	8.615	33	4.6	Pp; W68
39824.3	8.552	34	5.2	Pp; BG69
39845.5	8.559	35	4.6	Pp
39867.9	8.554	36	5.3	Pp; BG69
39888.4	8.562	37	4.1	Pp
39912.4	8.543	38	6.3	Pp; BG69
39939.0	8.558	39	11.2	Pp; C69; BG69
39964.5	8.563	40	14.9	Pp; C69; BG69
39985.0	8.548	41	13.7	Pp; BG69
40007	8.53	42	13.9	Pp
40029.7	8.570	43	14.8	Pp; BG69
40047.5	8.550	44	10.9	Pp
40065[i)]	8.51	45	6.7	Pp
40085.2	8.562	46	5.1	Pp
40105[ii)]	8.57	47	3.2	Pp
40150.5	8.54	49	5.2	Pp; C69
40263.6	8.530	54	9.5	Pp
40286[iii)]	8.51	55	10.2	Pp
40436.9	8.624	62	8.8	Pp
40460	8.62	63	$10^{d}.2$	Pp
40482.4	8.603	64	10.8	Pp
40504.8	8.591	65	11.4	Pp; BG72
40525.9	8.550	66	10.8	Pp; BG72
40547.1	8.540	67	10.3	Pp
40568.5	8.578	68	9.9	BG72
40588	8.53	69	7.7	Pp; BG72
40609.2	8.574	70	7.1	Pp; BG72
40629.9	8.555	71	6.1	Pp; BG72
40652.0	8.567	72	6.4	Pp; BG72
40673	8.56	73	5.6	BG72
40692.6	8.546	74	3.5	Pp; BG72
40718.0	8.526	75	7.1	Pp; BG72
40739.5	8.544	76	6.9	BG72
40761.0	8.550	77	6.7	Pp; BG72
40783	8.54	78	6.9	Pp; BG72
40807	8.51	79	9.2	Pp; BG72
40831	8.51	80	11.4	Pp
40853.0	8.476	81	11.6	Pp; BG73
40872.7	8.506	82	9.6	Pp; BG73
40893.6	8.554	83	8.7	Pp; BG73
40915.6	8.588	84	9.0	BG73
40938.3	8.611	85	9.9	Pp; BG73
40958.9	8.610	86	8.8	Pp; BG73
40981.5	8.533	87	9.6	Pp; BG73
41000.0	8.504	88	6.4	Pp; BG73
41020.0	8.503	89	4.6	Pp; BG73
41037.4	8.504	90	0.3	Pp; BG73
41058.3	8.516	91	−0.6	Pp
41076.6	8.539	92	−4.0	Pp
41102	8.53	93	−0.3	ZL78
41125.5	8.580	94	1.4	Pp
41147.1	8.565	95	1.2	Pp
41169.5	8.607	96	1.9	Pp
41190.5	8.606	97	1.1	Pp
41214.6	8.568	98	3.5	Pp
41236.3	8.575	99	3.5	Pp
41262.2	8.574	100	7.6	Pp
41283.6	8.561	101	7.2	Pp; BG73
41305.0	8.604	102	6.9	Pp; BG73
41344.1	8.635	104	2.5	BG73
41364.9	8.639	105	1.6	Pp
41407.8	8.604	107	1.0	Pp; BG73
41452.9	8.606	109	2.6	Pp; BG73
41474.8	8.593	110	2.7	Pp; BG73
41495.7	8.576	111	1.9	Pp
41519	8.58	112	3.4	Pp
41542[iv)]	8.56	113	4.6	Pp
41600	8.53	116	−2.6	Pp
41686.9	8.590	120	−2.7	Pp

Table 6 (cont.)

t_{min} 2400000+	m_V^{min}	E_2	$O-C_2$	References	t_{min} 2400000+	m_V^{min}	E_2	$O-C_2$	References
41707.2	8.63	121	$-4^{d}.2$	B78	42591	8.60	162	$-12^{d}.1$	Pp
41729.0	8.618	122	−4.1	B78	42684	8.63	166	−6.1	Pp
41750.9	8.609	123	−4.0	Pp; B78	42728	8.72	168	−5.6	B78
41773.7	8.627	124	−2.9	Pp; B78	42751.4	8.633	169	−4.0	B78
41795.6	8.644	125	−2.8	Pp	42774.9	8.623	170	−2.2	B78
41818.3	8.651	126	−1.8	Pp; B78	42797	8.59	171	−1.9	Pp; B78
41860.5	8.661	128	−3.1	B78	42817.8	8.534	172	−2.8	Pp; B78
42033.6	8.663	136	−4.0	Pp	42837.9	8.515	173	−4.4	Pp; B78
42097	8.60	139	−5.8	Pp	43164.5	8.595	188	−4.1	Pp; B78
42118	8.62	140	−6.6	Pp	43187	8.59	189	−3.4	B78
42141.5	8.637	141	−4.8	Pp	43209.4	8.571	190	−2.7	Pp
42162.6	8.701	142	−5.5	Pp	43230.3	8.592	191	−3.6	Pp
42205	8.71	144	−6.6	Pp	43250.6	8.533	192	−5.0	B78
42270.1	8.744	147	−6.7	Pp	43272.2	8.529	193	−5.1	B78
42291.9	8.770	148	−6.7	Pp	43293.9	8.593	194	−5.2	B78
42422.4	8.713	154	−6.7	Pp	43314.4	8.608	195	−6.4	B78
42445.1	8.679	155	−5.7	Pp	43335.0	8.647	196	−7.6	B78
42466.2	8.663	156	−6.4	Pp; B78	43379	8.59	198	−7.1	Pp
42486.7	8.660	157	−7.6	Pp	43424.2	8.617	200	−5.4	Pp
42529.6	8.580	159	−8.2	Pp; B78	43604.7	8.610	208	1.1	Pp
42550.6	8.569	160	−9.0	B78	45254	8.62	284:	−2.6	Pp

References: LJ53 = Lenouvel and Jehoulet, 1953; LD54 = Lenouvel and Daguillon, 1954; LF57 = Lenouvel and Fiogère, 1957; E57 = Eggen et al., 1957, DJ58 = Delsemme and Delsemme-Jehoulet, 1958; M64 = Mitchell et al., 1964; MS65 = Michalowska-Smak and Smak, 1965; W66 = Wamsteker, 1966; Z67 = Zaitseva, 1967; W68 = Wamsteker, 1968; C68 = Cester, 1968; C69 = Cester, 1969; B69 = Broglia, 1969; BG69 = Broglia and Guerrero, 1969b; BG72 = Broglia and Guerrero, 1972a; BG73 = Broglia and Guerrero, 1973; B78 = Broglia et al., 1978; ZL = Zaitseva and Ljutiy, 1978; Pp = Present paper

Remarks:
i) The brightness of the star hardly varies.
ii) Nearly constant, irregular light variation between J.D. 2440110 and 2440145 ($m_V \approx 8.52$).
iii) The star's brightness is nearly constant between J.D. 2440310 and 2440380 ($m_V \approx 8.48$).
iv) From this time a slow increase occurs in brightness until J.D.2441595, no minimum during this time period.

became very small. Figure 6 presents the brightness of maxima and minima between J.D. 2439000 and J.D. 2443640. It can be seen from this figure that it happened several times that after a short-lived recovery phase the amplitude decreased again and the light variation almost disappeared (e.g. around J.D. 2439450, J.D. 2440100, J.D. 2440850 etc.). From the light curve (Figure 2) it is evident that the brightness of the star varied non-periodically between J.D. 2440050 and J.D. 2440150 as well as between J.D. 2440320 and J.D. 2440380. The light was almost constant during this latter time period. Between J.D. 2441540 and J.D. 2441595 there were neither minima nor maxima and the stellar brightness was slowly increasing. During these time intervals the count of epoch numbers is, of course, very uncertain and jumps in phase could occur. In fact, such kind of jumps had already been observed (e.g. *Leiner*, 1929).

Table 7

Times and brightness of maxima from photoelectric V observations

t_{max} 2400000+	m_V^{max}	E_2	$O-C_2$	References	t_{max} 2400000+	m_V^{max}	E_2	$O-C_2$	References
32824.2	8.28	-283	$-100^{d}2$	E57	40493.7	8.320	64	$22^{d}1$	Pp
34064.7	8.24	-227	-77.6	LJ53	40515.1	8.382	65	21.8	Pp; BG72
34421.2	8.15	-211	-69.1	LD54	40536.2	8.415	66	21.1	Pp
35905.2	8.13	-144	-42.4	DJ58	40557.8	8.435	67	20.9	Pp; BG72
37012.2	8.18	-94	-22.9	M64	40578.2	8.438	68	19.6	Pp; BG72
37698.0	8.20	-63	-11.3	MS65	40619.8	8.430	70	17.7	Pp; BG72
37964.0	8.22	-51	-6.3	Wi66	40640.8	8.429	71	16.9	Pp; BG72
39025.5	8.47	-3	11.2	W66	40661.9	8.415	72	16.3	Pp
39354.9	8.452	12	14.3	Pp; W66	40683.5	8.448	73	16.2	Pp; BG72
39375.7	8.459	13	13.3	Pp; W66	40705.4	8.438	74	16.3	Pp; BG72
39397.5	8.443	14	13.4	Pp; W66	40728.8	8.463	75	18.0	Pp; BG72
39419.6	8.468	15	13.8	Pp	40749	8.47	76	16.4	Pp; BG72
39443	8.47	16	15.4	Z67	40774	8.48	77	19.7	Pp; BG72
39463.6	8.422	17	14.2	Pp	40797.7[vii)]	8.442	78	21.6	Pp; BG72
39481.9	8.465	18	10.8	Pp; C68	40819.3	8.425	79	21.5	Pp
39509.4[i)]	8.485	19	16.6	Pp	40840.7	8.409	80	21.1	Pp
39529.6	8.485	20	15.0	Pp; C68; B69	40861.0	8.450	81	19.7	Pp; BG73
39551.1	8.464	21	14.8	B69	40881.6	8.444	82	18.5	Pp; BG73
39571.3	8.430	22	13.2	Pp; C68; B69	40903.0	8.484	83	18.2	Pp; BG73
39591.4	8.407	23	11.5	Pp; W68; B69	40928.4	8.449	84	21.8	Pp; BG73
39612.6	8.452	24	11.0	Pp; W68; B69	40947.6	8.410	85	19.2	Pp
39635	8.43	25	11.6	Pp; B69	40970.7	8.421	86	20.6	BG73
39656.4	8.399	26	11.3	Pp; B69	40991.9	8.441	87	20.0	BG73
39678.5	8.391	27	11.6	Pp	41011.0	8.456	88	17.4	Pp; BG73
39701.9[ii)]	8.459	28	13.3	Pp	41026.7	8.475	89	11.3	Pp; BG73
39723.9	8.389	29	13.6	Pp	41047.7	8.477	90	10.6	Pp
39745	8.38	30	12.9	Pp	41067.5	8.472	91	8.7	Pp
39769.9	8.434	31	16.0	Pp; C69	41087.8	8.446	92	7.2	Pp
39791.2	8.434	32	15.6	Pp	41113	8.48	93	10.6	Pp
39813.6	8.423	33	16.3	Pp	41137.6	8.409	94	13.5	Pp
39834.0[iii)]	8.412	34	14.9	Pp; Z68; BG69	41158.0	8.403	95	12.2	Pp
39857.2	8.400	35	16.4	Pp	41179.8	8.443	96	12.2	Pp
39880.2	8.424	36	17.6	Pp; BG69	41202.0	8.439	97	12.7	Pp
39902	8.48	37	17.6	Pp	41225.1	8.462	98	14.0	Pp
39924.3[iii)]	8.475	38	18.2	Pp; C69; BG69	41249.4	8.384	99	16.6	Pp
39955[ii)]	8.47	39	27.1	C69	41272.3	8.380	100	17.7	Pp; BG73
39974.6[iii)]	8.481	40	25.0	Pp; C69; BG69	41293.7	8.372	101	17.3	Pp; BG73
39996.7	8.458	41	25.3	Pp; BG69	41314.8	8.439	102	16.7	Pp
40015.6[iv)]	8.47	42	22.5	Pp; BG69	41334.5	8.479	103	14.6	Pp
40037.9	8.468	43	23.0	Pp; BG69	41354.3	8.436	104	12.7	Pp
40060	8.50	44	23.4	Pp; BG69	41396.5	8.445	106	11.4	Pp; BG73
40074	8.50	45	15.7	Pp	41418.3	8.484	107	11.5	Pp; BG73
40093.9[v)]	8.519	46	13.8	Pp; BG69	41441.1	8.485	108	12.5	Pp
40159.3	8.449	49	13.9	Pp	41464.0	8.505	109	13.6	Pp; BG73
40181.6	8.424	50	14.5	Pp; BG69	41487.6	8.510	110	15.5	Pp; BG73
40206	8.42	51	17.2	Pp	41512[viii)]	8.49	111	18.2	BG73
40252.5[vi)]	8.410	53	20.1	Pp	41532.0[ix)]	8.496	112	16.4	Pp
40426.5	8.420	61	20.1	Pp	41613	8.46	116	10.4	Pp
40448.2	8.328	62	20.1	Pp	41634.1	8.454	117	9.8	Pp
40471.7	8.344	63	21.8	Pp	41654.4	8.420	118	8.3	ZL78

Table 7 (cont.)

t_{max} 2400000+	m_V^{max}	E_2	O–C_2	References	t_{max} 2400000+	m_V^{max}	E_2	O–C_2	References
41675.6	8.394	119	$7^d.7$	Pp	42519.5	8.400	158	$3^d.4$	B78
41698.5	8.405	120	8.9	Pp	42560.1	8.454	160	0.5	Pp
41718.1	8.379	121	6.7	Pp; B78	42672.6	8.399	165	4.3	Pp
41739.5	8.406	122	6.4	Pp; B78	42694	8.37	166	3.9	B78
41762.3	8.386	123	7.4	B78	42716.0	8.466	167	4.2	Pp; B78
41784.5	8.393	124	7.9	Pp; B78	42740.2	8.411	168	6.6	Pp; B78
41806	8.38	125	7.6	Pp	42786.1	8.370	170	9.0	Pp; B78
41828.5	8.360	126	8.4	Pp; B78	42807.7	8.409	171	8.9	B78
41936.3	8.364	131	7.4	Pp	42868$^{x)}$	8.44	174	3.9	Pp; B78
41958.7	8.362	132	8.1	Pp	43131.5	8.41	186	6.4	B78
41981.6	8.392	133	9.3	Pp	43151.7	8.390	187	4.8	B78
42023.2	8.361	135	7.3	Pp	43177.0	8.342	188	8.4	Pp; B78
42106.4	8.388	139	3.6	Pp	43198.9	8.376	189	8.5	Pp; B78
42129.9	8.391	140	5.3	Pp	43218.1	8.382	190	6.0	Pp; B78
42152.2	8.368	141	5.8	Pp	43241	8.40	191	7.1	Pp
42173	8.33	142	4.9	Pp	43261	8.39	192	5.4	B78
42194.5	8.352	143	4.6	Pp	43303.0	8.351	194	3.9	Pp
42259	8.25	146	3.9	Pp	43325	8.42	195	4.2	B78
42281.1	8.260	147	4.3	Pp	43344.9	8.451	196	2.3	B78
42302.4	8.259	148	3.8	Pp	43415.2	8.410	199	7.3	Pp
42366.3	8.292	151	2.5	Pp	43435.2	8.396	200	5.6	Pp
42433.6	8.299	154	4.5	Pp	43456.7	8.403	201	5.3	Pp
42455.5	8.374	155	4.6	Pp	43640	8.43	209	14.6	Pp
42477	8.39	156	4.4	B78	45222.1	8.350	282:	9.0	Pp
42498.0	8.369	157	3.7	B78					

References: The same as in Table 6 and Wi66=Williams 1966; Z68=Zaitseva 1968.

Remarks:
i) large hump before maximum
ii) hump before maximum
iii) hump after maximum
iv) large scatter in maximum
v) nearly constant, irregular light variation between J.D. 2440110 and 2440145 (m_v~8.52)
vi) nearly constant between J.D. 2440310 and 2440380 (m_v~8.48)
vii) hump on the ascending branch
viii) long (9 days) stillstand on the ascending branch
ix) slow, continuous increase in brightness between J.D. 2441540 and 2441595
x) maximum light was constant during five days ($m_v^{max}\approx 8.44$)

The fluctuations in other parameters have also increased after 1965. For example, the length of the ascending branch, $M-m$, fluctuated between 9.3 and 10.1 days before 1965, while the fluctuations were between 6.7 and 16.3 days, with a mean $\overline{M-m} = 10.91$ days after 1965.

Huth (1967) suspected a connection between the changes of the period and the light amplitude, while *Broglia and Guerrero* (1973) and *Broglia et al.* (1978) denied the existence of such a correlation. They found, however, a correlation between the amplitude (sine fitting) and the period (sine fitting). Our investigations do not support the existence

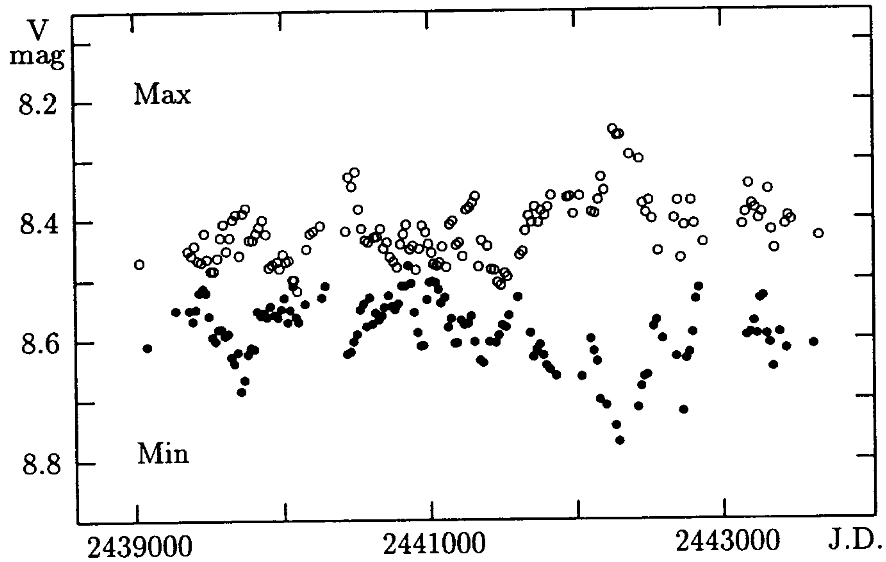


Figure 6. The observed photoelectric maxima (circles) and minima (dots) since 1965

of either the correlation between the variation of the period and the changes of the light curve amplitude or the correlation between the amplitude and period.

As it was pointed out by *Broglia and Guerrero* (1973) and *Broglia et al.* (1978) the mean luminosity of RU Cam did not vary significantly, consequently the energy production of the star was the same after 1965 as before. This means that the outer layers of the star are responsible for its irregular behaviour.

The photometric data obtained in the years 1965-1982 were Fourier analysed, but there were no indications for a modulation effect; instead of some separate peaks a bunch of peaks appeared in the spectrum around the frequency f = 0.046 cycle/day suggesting that the star might pulsate rather in chaotic or stochastic way (see a more detailed discussion in a forthcoming paper of *Kolláth and Szeidl*, 1993).

The unique behaviour of RU Cam – as it was pointed out by *Wallerstein* (1968) – may be associated with the processes of mass loss and mixing which modify the pulsational conditions in the outer layers of the star. Nevertheless, the problem is still unsolved how the more or less regular pulsation of RU Cam ceased in a very short time interval (within one year) and gave place to an oscillation in which the erratic component is sometimes dominant (*Broglia and Guerrero*, 1972a) or which has become chaotic (*Perdang*, 1985).

Acknowledgements

The authors are grateful to dr. G. Kovács for obtaining some of the observations and for valuable discussions. This work has been supported by research grant OTKA No. 829.

Budapest, Svábhegy, December 31, 1992

References

AAVSO *Quarterly Report* No. 23, 24, 25, 27
Balázs-Detre J. and Detre, L., 1966, *Kleine Veröff. Bamberg* **4**, Nr. 60. p. 184
Bidelman, W.P., 1954, *Astrophys. J. Suppl.* **1**, 175
Blazhko, S., 1907, *Astron. Nachr.* **175**, 327
Broglia, P., 1967, *Inf. Bull. Var. Stars* No. 213
Broglia, P., 1969, *Contr. Osserv. Astron. Milano-Merate* No. 318
Broglia, P. and Guerrero, G., 1969a, *Inf. Bull. Var. Stars* No. 335
Broglia, P. and Guerrero, G., 1969b, *Contr. Osserv. Astron. Milano-Merate* No. 326
Broglia, P. and Guerrero, G., 1971, *Inf. Bull. Var. Stars* No. 511
Broglia, P. and Guerrero, G., 1972a, *Astron. Astrophys.* **18**, 201
Broglia, P. and Guerrero, G., 1972b, *Inf. Bull. Var. Stars* No. 732
Broglia, P. and Guerrero, G., 1973, *Contr. Osserv. Astron. Milano-Merate* No. 358
Broglia, P., Conconi, P. and Guerrero, G., 1978, *Astron. Astrophys. Suppl.* **33**, 339
Cannon, A.J., 1920, *Harvard Circ.* No. 221. p. 5
Ceraski, W., 1907, *Astron. Nachr.* **174**, 80
Cester, B., 1967, *Inf. Bull. Var. Stars* No. 204 p. 1
Cester, B., 1968, *Publ. Osservatorio Astron. Trieste* No. 362
Cester, B., 1969, *Mem. Soc. Astr. It.* **40**, 525
Climenhaga, J.L., 1960, *Publ. DAO* **11**, 307
Delsemme, A.H. and Delsemme-Jehoulet, D., 1958, *Mem. Soc. Roy. Sci. Liège* 4.-e, Sèrie **20**, 328
Demers, S. and Crampton, D., 1966, *Astron. J.* **71**, 852
Demers, S. and Fernie, J.D., 1966, *Astrophys. J.* **144**, 440
Detre, L., 1966, *Inf. Bull. Var. Stars* No. 152, p. 3
Detre, L. and Szeidl, B., 1967, *Inf. Bull. Var. Stars* No. 204, p. 3
Edelberg, M., 1932, *Astron. Nachr.* **246**, 173
Eggen, O.J., Gascoigne, S.C.B. and Burr, E.J., 1957, *Monthly Not. RAS* **117**, 406
Faraggiana, R. and Hack, M., 1967a, *Proc. Coll. on Late Type Stars* (ed. M. Hack), Oss. Astr. Trieste pp. 180-185
Faraggiana, R. and Hack, M., 1967b, *Zeitschrift f. Astrophysik* **66**, 343
Fernie, D.J., 1968, *RAS Canada Journ.* **62**, 214
Fernie, J.D. and Watt, V., 1967, *Astrophys. J.* **150**, L113
Florja, N.F. and Kukarkina, N.P., 1953, *Sternberg Trudy* No.23
Haas, J., 1923, *Astron. Nachr.* **220**, 337
Huth, H., 1966, *Die Sterne* **42**, 129
Huth, H., 1967, *Mitt. Veränd. Sterne* **4**, (Heft 3) 50
Huth, H. and Wenzel, W., 1966, *Inf. Bull. Var. Stars* No. 173
Ichinohe, N., 1909, *Astron. Nachr.* **180**, 363
Jehoulet, D., 1954, *Liège Institut l'Astrophys.* No. 360
Joy, A.H., 1919, *Publ. Astr. Soc. Pacific* **31**, 180
Keenan, P.C. and Morgan, W.W., 1941, *Astrophys. J.* **94**, 501
Kolláth, Z., and Szeidl, B., 1993, to be published
Kovalenko, V.M., 1974, *Astron. Tsirk.* No. 835, p. 7
Krebs, C., 1937, *Die Sterne* **17**, 86
Kreutz, H., 1907, *Astron. Nachr.* **174**, 80

Larson, G., 1938, *Astron. Nachr.* **266**, 35
Leiner, E., 1923, *Astron. Nachr.* **219**, 207
Leiner, E., 1929, *Astron. Nachr.* **234**, 345
Lenouvel, F. and Daguillon, J., 1954, *Journal des Obs.* **37**, 137
Lenouvel, F. and Fiogère, U., 1957, *Journal des Obs.* **40**, 37
Lenouvel, F. and Jehoulet, D., 1953, *Ann. d'Aph.* **16**, 139
Lloyd Evans, T., 1983, *The Observatory* **103**, 276
Luizet, M., 1907, *Astron. Nachr.* **175**, 331
Luizet, M., 1912, *Astron. Nachr.* **194**, 83
Michalowska-Smak, A. and Smak, J., 1965, *Acta Astronomica* **15**, 333
Mitchell, R.J., Iriarte, B., Steinmetz, D. and Johnson, H.L., 1964, *Tonantzintla Bol.* **3**, 153 (Num. 24)
Model, A., 1964, *Mitt. Veränd. Sterne* **2**, 133
Nielsen, A.V., 1930, *Astron. Nachr.* **239**, 171
Nielsen, A.V., 1936, *Astron. Nachr.* **260**, 377
Nielsen, A.V., 1952, *København Publ.* No. 157
Nielsen, A.V., 1955, *København Publ.* No. 167
Nielsen, A.V. and Sjögren, T., 1941, *Astron. Nachr.* **271**, 222
Nielsen, A.V. and Sjögren, T., 1943, *Astron. Nachr.* **273**, 270
Parenago, P.P., 1956, *Per. Zvezdy* **11**, 236
Payne-Gaposchkin, C., 1941, *Harvard Bull.* No. 915, p. 10
Perdang, J., 1985, Irregular Stellar Variability, in: *Chaos in Astrophysics* (eds.: J.R. Buchler, J.M. Perdang and E.A. Spiegel) NATO ASI Series, D. Reidel Publ. Co. pp. 11-89
Robinson, L.V., 1933, *Harvard Ann.* **90**, 2
Sanford, R.F., 1927, *Publ. Astr. Soc. Pacific* **39**, 235
Sanford, R.F., 1928, *Astrophys. J.* **68**, 408
Shapley, H., 1913, *Laws Obs. Bull.* **2**, 71 (No. 21)
Silva, G., 1922, *Mem. Soc. Astr. It.* **2**, 191
Smak, J., 1966, *Inf. Bull. Var. Stars* No. 135
Sterne, Th. E., 1934, *Harvard Circ.* No. 386
Wallerstein, G., 1968, *Astrophys. J.* **151**, 1011
Wallerstein, G. and Crampton, D., 1967, *Astrophys. J.* **149**, 225
Wamsteker, W., 1966, *Inf. Bull. Var. Stars* No. 128
Wamsteker, W., 1968, *Bull. Astr. Inst. Neth.* **20**, 75
Williams, J.A., 1966, *Astron. J.* **71**, 615
Zaitseva, G.V., 1967, *Astron. Tsirk.* No. 427, p. 4
Zaitseva, G.V., 1968, *Astron. Tsirk.* No. 466, p. 7
Zaitseva, G.V. and Ljutiy, V.M., 1969, *Astron. Tsirk.* No. 541, p. 4
Zaitseva, G.V. and Ljutiy, V.M., 1971, *Astron. Tsirk.* No. 617, p. 1
Zaitseva, G.V. and Ljutiy, V.M., 1978, *Astron. Tsirk.* No. 994, p. 4
Zaitseva, G.V., Ljutiy, V.M., Kovalenko, V.M and Kovalenko, O.N., 1973, *Astron. Tsirk.* No. 744, p. 1
Yendell, P.S., 1916, *Astron. J.* **29**, 99

Table 3

Photoelectric V and B observations of RU Cam
(variable − BD +70°448)

J.D.	ΔV	ΔB	Δ(B−V)	n	Z
39348.576	−.552±008	−.456±013	.096	3	51
39350.572	−.581±004	−.500±006	.081	3	51
39351.569	−.584±002	−.517±002	.067	5	50
39352.584	−.580±004	−.516±010	.064	4	48
39354.583	−.612±005	−.541±009	.071	6	48
39355.572	−.607±003	−.525±005	.082	6	49
39356.573	−.595±005	−.531±008	.064	6	48
39358.555	−.570±002	−.509±006	.061	4	50
39359.585	−.543±003	−.441±006	.102	2	46
39361.577	−.537±002	−.447±007	.090	3	46
39367.557	−.531±005	−.442±002	.089	4	47
39370.569	−.577±001	−.505±005	.072	6	44
39371.564	−.566±005	−.498±007	.068	4	45
39372.564	−.588±004	−.510±006	.078	3	45
39374.577	−.606±002	−.548±004	.058	5	42
39376.567	−.598±004	−.537±005	.061	5	43
39380.572	−.572±006	−.477±018	.095	4	41
39381.553	−.520±004	−.441±012	.079	5	43
39382.515	−.509±004	−.418±003	.091	4	47
39383.511	−.501±003	−.427±005	.074	5	47
39383.611	−.493±006	−.418±002	.075	2	35
39384.615	−.495±002	−.398±008	.097	3	34
39388.495	−.513±002	−.402±014	.111	3	47
39388.575	−.512±001	−.401±002	.111	3	38
39390.564	−.539±003	−.451±005	.088	5	39
39391.585	−.567±006	−.482±003	.085	3	35
39392.544	−.572±003	−.486±004	.086	5	40
39393.528	−.590±005	−.515±003	.075	6	42
39396.367	−.616±004	−.537±007	.079	5	58
39396.534	−.608±003	−.568±007	.040	5	40
39400.591	−.599±006	−.541±007	.058	3	32
39401.494	−.591±002	−.534±003	.057	5	43
39402.533	−.562±004	−.489±006	.073	5	39
39403.503	−.552±004	−.462±009	.090	6	41
39404.529	−.520±004	−.434±008	.086	7	38
39404.611	−.544±001	−.433±003	.111	6	29
39405.515	−.525±002	−.421±006	.104	8	39
39406.583	−.511±007	−.424±001	.087	3	31
39407.468	−.513±005	−.423±006	.090	3	45
39408.490	−.516±004	−.411±003	.105	8	42
39409.564	−.513±004	−.404±006	.109	4	32
39414.499	−.558±007	−.516±016	.042	5	38
39415.497	−.575±007	−.519±016	.056	6	38
39418.491	−.591±002	−.527±003	.064	3	38
39420.621	−.593±004	−.518±005	.075	4	24
39421.507	−.590±004	−.527±006	.063	4	35
39422.499	−.576±001	−.523±008	.053	5	36
39423.641	−.574±003	−.505±028	.069	2	22
39424.658	−.574±002	−.503±008	.071	4	22
39426.605	−.564±001	−.475±003	.089	6	24
39435.399	−.549±005	−.447±004	.102	2	44
39438.458	−.567±003	−.496±004	.071	6	36

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B−V)	n	Z
39439.477	−.571±004	−.520±004	.051	7	33
39451.445	−.558±002	−.469±004	.089	6	33
39455.558	−.552±005	−.455±010	.097	7	22
39456.461	−.563±003	−.467±009	.096	7	29
39457.422	−.573±003	−.488±005	.085	7	33
39458.419	−.581±001	−.511±002	.070	7	34
39464.420	−.632±003	−.569±008	.063	2	31
39464.550	−.637±001	−.569±002	.068	6	22
39467.594	−.598±002	−.538±005	.060	7	24
39471.442	−.562±005	−.485±004	.077	3	27
39476.345	−.546±003	−.465±006	.081	4	37
39476.451	−.551±006	−.452±007	.099	4	25
39480.655	−.600±004	−.525±006	.075	7	34
39481.405	−.602±001	−.532±006	.070	6	28
39482.363	−.594±004	−.521±007	.073	7	32
39482.607	−.588±003	−.517±006	.071	5	29
39483.366	−.591±001	−.525±007	.066	6	32
39486.587	−.565±006	−.490±005	.075	5	28
39489.321	−.519±001	−.425±006	.094	6	35
39489.497	−.524±001	−.404±003	.120	6	22
39491.211	−.509±006	−.411±010	.098	6	48
39494.281	−.505±003	−.402±004	.103	6	38
39501.461	−.556±002	−.463±004	.093	7	22
39503.326	−.554±001	−.473±006	.081	7	30
39505.503	−.560±001	−.452±002	.108	7	25
39506.519	−.552±001	−.472±001	.080	7	27
39507.573	−.566±002	−.472±007	.094	5	33
39508.265	−.570±001	−.471±005	.099	6	36
39510.248	−.575±003	−.470±003	.105	5	37
39511.316	−.562±003	−.447±007	.115	6	29
39512.649	−.541±004	−.429±009	.112	2	44
39516.262	−.491±004	−.369±004	.122	6	33
39518.364	−.460±002	−.350±004	.110	7	23
39518.643	−.470±004	−.364±003	.106	5	46
39520.360	−.472±001	−.360±004	.112	7	23
39521.242	−.494±006	−.379±015	.115	5	34
39522.280	−.498±005	−.383±013	.115	4	29
39527.286	−.565±003	−.483±004	.082	5	27
39527.395	−.555±001	−.485±003	.070	6	22
39527.584	−.572±006	−.481±006	.091	6	41
39528.267	−.565±002	−.483±002	.082	6	29
39528.545	−.564±001	−.486±003	.078	6	37
39530.272	−.567±002	−.488±005	.079	6	28
39531.284	−.575±003	−.466±003	.109	5	26
39531.464	−.568±001	−.473±004	.095	6	28
39531.613	−.576±003	−.465±006	.111	6	46
39532.318	−.562±002	−.450±007	.112	10	24
39533.557	−.536±003	−.434±003	.102	9	40
39534.347	−.520±002	−.407±004	.113	8	22
39535.281	−.520±002	−.374±006	.146	6	26
39536.363	−.480±002	−.365±008	.115	6	22
39536.592	−.485±002	−.350±006	.135	7	45
39537.274	−.474±002	−.343±006	.131	6	26
39538.270	−.461±003	−.342±002	.119	6	26

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
39538.575	−.458±005	−.358±005	.100	5	44
39542.485	−.491±002	−.400±008	.091	6	34
39544.330	−.512±003	−.439±002	.073	6	22
39546.304	−.532±003	−.478±006	.054	6	22
39547.319	−.555±003	−.475±004	.080	6	22
39553.525	−.571±016	−.494±008	.077	2	43
39554.349	−.570±004	−.470±007	.100	5	24
39555.284	−.563±009	−.475±009	.088	3	22
39558.527	−.479±004	−.371±012	.108	6	45
39559.629	−.483±006	−.359±006	.124	5	56
39560.321	−.472±002	−.360±004	.112	6	23
39562.284	−.483±005	−.392±003	.091	5	22
39562.484	−.493±002	−.387±006	.106	4	41
39564.295	−.528±003	−.444±002	.084	6	23
39565.535	−.556±003	−.490±006	.066	4	48
39566.622	−.574±002	−.518±005	.056	5	57
39567.308	−.572±004	−.510±009	.062	4	23
39570.304	−.618±003	−.565±003	.053	6	24
39572.310	−.638±003	−.541±003	.097	5	24
39572.515	−.609±007	−.531±009	.078	5	48
39573.338	−.609±002	−.521±006	.088	2	27
39574.288	−.603±002	−.501±003	.102	6	23
39575.365	−.564±002	−.467±002	.097	5	30
39576.301	−.556±004	−.452±002	.104	5	25
39577.566	−.535±008	−.409±006	.126	5	54
39580.357	−.487±004	−.365±006	.122	6	31
39581.320	−.485±001	−.365±004	.120	6	27
39583.323	−.510±004	−.433±003	.077	6	28
39585.325	−.555±002	−.502±003	.053	6	29
39588.304	−.622±002	−.606±004	.016	5	28
39590.302	−.653±002	−.625±004	.028	6	28
39591.367	−.651±005	−.611±011	.040	5	36
39594.523	−.622±006	−.527±004	.095	6	55
39597.316	−.555±003	−.436±004	.119	6	32
39598.324	−.519±002	−.396±003	.123	6	33
39599.534	−.499±003	−.376±005	.123	5	57
39600.307	−.473±003	−.361±006	.112	6	32
39602.313	−.468±005	−.360±005	.108	5	33
39604.337	−.512±003	−.425±005	.087	6	37
39605.347	−.524±003	−.444±004	.080	6	38
39607.556	−.560±006	−.503±005	.057	6	60
39609.494	−.575±003	−.499±003	.076	6	56
39610.365	−.610±003	−.567±002	.039	7	42
39611.343	−.600±003	−.560±002	.040	6	40
39612.575	−.590±002	−.515±004	.075	6	61
39613.558	−.599±002	−.548±002	.051	6	61
39617.341	−.565±002	−.468±003	.097	6	41
39618.343	−.543±003	−.441±004	.102	6	42
39619.513	−.508±003	−.398±008	.110	6	59
39622.455	−.498±005	−.363±007	.135	6	55
39623.350	−.488±003	−.356±007	.132	6	45
39624.371	−.471±002	−.357±007	.114	5	47
39628.432	−.501±005	−.417±006	.084	9	55
39636.382	−.616±004	−.588±007	.028	6	52

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B−V)	n	Z
39637.372	−.623±003	−.555±006	.068	6	51
39638.357	−.611±003	−.522±004	.089	6	50
39639.361	−.575±002	−.507±004	.068	6	51
39643.494	−.484±008	−.375±008	.109	2	61
39644.384	−.466±005	−.335±005	.131	3	54
39645.372	−.459±003	−.302±007	.157	5	54
39646.378	−.425±003	−.310±004	.115	6	55
39648.372	−.456±003	−.349±006	.107	6	54
39648.518	−.454±005	−.361±007	.093	6	63
39649.432	−.493±004	−.423±005	.070	3	59
39653.426	−.606±003	−.612±002	−.006	5	60
39654.376	−.661±005	−.636±005	.025	6	56
39656.533	−.664±004	−.660±002	.004	2	63
39661.473	−.580±004	−.486±004	.094	6	62
39664.397	−.473±003	−.360±004	.113	5	60
39665.389	−.468±006	−.335±005	.133	6	59
39667.392	−.425±004	−.313±006	.112	6	60
39668.402	−.422±003	−.321±009	.101	5	61
39669.389	−.444±005	−.356±006	.088	6	60
39670.416	−.458±007	−.366±002	.092	4	61
39672.385	−.471±004	−.431±007	.040	6	60
39673.397	−.539±004	−.496±002	.043	6	61
39678.510	−.670±005	−.623±003	.047	6	62
39679.490	−.656±003	−.637±005	.019	6	63
39680.467	−.649±005	−.553±005	.096	6	63
39682.412	−.560±005	−.520±005	.040	6	62
39684.516	−.529±005	−.426±004	.103	3	61
39685.529	−.507±004	−.415±015	.092	6	61
39686.529	−.480±007	−.377±006	.103	5	61
39687.529	−.456±009	−.347±019	.109	3	60
39688.528	−.456±006	−.323±011	.133	7	60
39689.533	−.436±003	−.328±013	.108	7	60
39690.377	−.448±010	−.329±009	.119	6	62
39690.527	−.439±008	−.326±011	.113	9	60
39691.525	−.458±009	−.314±013	.144	6	60
39692.533	−.483±006	−.361±003	.122	3	59
39696.374	−.583±002	−.498±009	.085	6	62
39697.479	−.579±007	−.513±012	.066	4	61
39698.407	−.580±004	−.550±006	.030	6	63
39702.439	−.598±002	−.546±009	.052	6	62
39703.449	−.595±013	−.518±015	.077	5	62
39704.549	−.593±005	−.493±009	.100	5	56
39705.552	−.575±008	−.476±011	.099	6	55
39706.381	−.556±004	−.459±005	.097	6	63
39706.552	−.553±005	−.456±007	.097	4	55
39707.468	−.541±005	−.401±009	.140	6	61
39710.369	−.418±003	−.302±005	.116	6	63
39710.550	−.427±002	−.291±009	.136	5	54
39711.551	−.404±005	−.267±003	.137	7	54
39712.483	−.377±006	−.233±009	.144	6	59
39713.370	−.378±005	−.254±009	.124	3	63
39714.353	−.405±003	−.272±005	.133	6	63
39714.553	−.418±003	−.255±005	.163	6	53
39715.391	−.432±010	−.330±012	.102	4	63

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
39715.552	–.426±005	–.331±001	.095	5	53
39718.560	–.550±002	–.478±003	.072	6	51
39719.382	–.575±002	–.512±004	.063	6	62
39719.563	–.571±001	–.531±001	.040	6	50
39720.471	–.633±004	–.576±004	.057	4	58
39721.363	–.630±002	–.589±006	.041	6	63
39721.568	–.654±003	–.588±004	.066	6	49
39722.560	–.662±005	–.620±004	.042	6	50
39724.390	–.661±005	–.631±005	.030	6	62
39724.560	–.657±001	–.602±003	.055	5	49
39725.333	–.664±003	–.599±006	.065	6	63
39725.542	–.670±003	–.589±004	.081	6	51
39726.344	–.657±008	–.577±007	.080	5	63
39726.563	–.646±006	–.571±010	.075	6	48
39727.403	–.598±003	–.529±016	.069	6	61
39729.530	–.513±002	–.385±016	.128	2	51
39731.426	–.495±005	–.366±011	.129	7	59
39731.546	–.500±006	–.357±012	.143	5	49
39732.319	–.461±003	–.351±005	.110	8	63
39732.567	–.467±003	–.323±004	.144	5	46
39733.481	–.419±002	–.312±015	.107	5	55
39734.432	–.415±003	–.285±009	.130	10	58
39736.331	–.405±004	–.326±004	.079	4	63
39737.393	–.456±005	–.347±002	.109	6	60
39737.587	–.448±001	–.348±005	.100	6	42
39738.298	–.453±002	–.352±003	.101	4	63
39739.321	–.489±005	–.391±006	.098	6	63
39739.581	–.520±004	–.410±005	.110	6	42
39740.372	–.539±005	–.481±002	.058	6	61
39747.592	–.653±003	–.620±001	.033	2	38
39748.343	–.628±003	–.560±008	.068	4	61
39753.280	–.514±003	–.378±006	.136	6	63
39753.607	–.493±002	–.381±007	.112	4	34
39754.457	–.489±006	–.363±014	.126	3	51
39755.373	–.489±004	–.375±011	.114	6	59
39756.568	–.435±002	–.338±004	.097	6	38
39757.286	–.435±006	–.351±004	.084	6	62
39757.623	–.440±001	–.353±004	.087	6	31
39758.522	–.456±002	–.332±003	.124	5	43
39759.320	–.458±002	–.352±004	.106	5	61
39760.387	–.459±009	–.381±010	.078	4	56
39760.606	–.455±005	–.374±003	.081	2	32
39762.427	–.493±004	–.425±002	.068	6	52
39762.620	–.488±001	–.429±004	.059	6	29
39763.284	–.530±006	–.466±006	.064	6	62
39763.600	–.524±001	–.453±002	.071	6	31
39764.287	–.550±004	–.489±007	.061	6	62
39764.559	–.562±003	–.500±009	.062	6	36
39765.406	–.569±003	–.519±003	.050	8	54
39766.295	–.592±002	–.532±006	.060	6	61
39768.266	–.592±003	–.558±007	.034	4	62
39769.285	–.616±003	–.549±006	.067	5	61
39769.562	–.634±002	–.558±003	.076	6	34
39770.373	–.626±004	–.548±007	.078	6	55

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
39770.640	–.620±002	–.533±002	.087	6	25
39774.416	–.567±004	–.458±004	.109	5	50
39776.436	–.520±004	–.423±007	.097	7	47
39777.407	–.500±004	–.404±006	.096	6	50
39778.417	–.489±006	–.389±006	.100	5	49
39779.337	–.456±002	–.368±004	.088	2	56
39779.557	–.458±002	–.358±006	.100	5	31
39780.454	–.448±005	–.356±009	.092	6	44
39780.545	–.446±001	–.351±004	.095	5	32
39781.514	–.458±006	–.386±004	.072	6	36
39782.457	–.454±003	–.372±004	.082	6	43
39783.478	–.471±002	–.389±002	.082	6	40
39784.461	–.499±001	–.412±003	.087	6	42
39785.283	–.507±003	–.442±006	.065	6	59
39786.423	–.535±001	–.470±003	.065	6	46
39787.448	–.571±003	–.488±002	.083	6	42
39788.329	–.598±005	–.519±003	.079	6	55
39789.287	–.614±001	–.521±006	.093	6	58
39790.374	–.625±004	–.548±009	.077	6	50
39790.518	–.619±003	–.534±006	.085	6	32
39791.261	–.625±005	–.551±007	.074	6	59
39792.344	–.628±003	–.540±006	.088	6	52
39793.591	–.597±002	–.513±007	.084	5	24
39795.289	–.570±004	–.476±006	.094	5	57
39795.497	–.571±004	–.474±006	.097	6	33
39796.227	–.562±003	–.450±003	.112	6	61
39796.439	–.552±003	–.443±004	.109	6	40
39799.231	–.492±003	–.388±011	.104	6	60
39802.392	–.443±009	–.355±009	.088	6	44
39806.230	–.523±008	–.490±006	.033	4	59
39807.482	–.555±008	–.513±013	.042	5	31
39808.294	–.564±003	–.518±002	.046	6	53
39809.373	–.582±007	–.538±005	.044	6	44
39809.509	–.597±003	–.561±005	.036	6	28
39810.510	–.619±003	–.555±002	.064	6	27
39812.254	–.638±005	–.583±010	.055	6	56
39812.420	–.628±003	–.581±009	.047	5	37
39813.335	–.627±003	–.584±007	.043	5	47
39814.219	–.639±004	–.541±004	.098	6	58
39814.577	–.632±003	–.524±004	.108	5	22
39815.459	–.624±006	–.523±008	.101	6	31
39816.451	–.615±008	–.506±004	.109	6	32
39818.317	–.575±003	–.488±005	.087	6	48
39819.551	–.557±002	–.446±007	.111	6	23
39820.432	–.547±001	–.413±001	.134	6	33
39820.601	–.521±004	–.420±004	.101	6	23
39821.236	–.518±005	–.423±015	.095	5	55
39823.411	–.512±002	–.415±003	.097	2	35
39825.540	–.510±001	–.423±002	.087	6	23
39826.208	–.509±003	–.422±009	.087	5	56
39826.660	–.514±005	–.431±003	.083	6	29
39827.503	–.525±002	–.448±003	.077	6	24
39828.255	–.528±004	–.472±002	.056	5	52
39829.671	–.569	–.523	.046	1	31

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
39833.296	−.647±005	−.566±005	.081	6	45
39834.454	−.641±001	−.584±010	.057	2	26
39835.262	−.634±005	−.577±005	.057	6	49
39837.422	−.623±003	−.564±002	.059	6	29
39838.358	−.623±002	−.516±003	.107	5	36
39839.248	−.589±001	−.507±009	.082	4	49
39840.309	−.552±006	−.491±005	.061	6	42
39840.625	−.555±004	−.479±003	.076	5	29
39845.302	−.499±003	−.389±002	.110	6	41
39851.394	−.581±002	−.518±001	.063	2	28
39852.200	−.579±004	−.526±003	.053	6	50
39853.204	−.592±005	−.533±002	.059	6	50
39855.507	−.652	−.590	.062	1	23
39856.205	−.660±004	−.608±004	.052	6	49
39858.220	−.653±002	−.594±004	.059	6	46
39859.443	−.645±001	−.582±001	.063	6	23
39860.705	−.640±007	−.530±005	.110	5	45
39864.231	−.567±006	−.458±008	.109	7	43
39865.227	−.533±004	−.424±006	.109	6	43
39866.468	−.507±004	−.405±005	.102	6	23
39869.203	−.513±003	−.382±005	.131	7	45
39873.221	−.553	−.439	.114	1	41
39875.355	−.558±003	−.494±002	.064	6	25
39876.225	−.582±004	−.494±003	.088	6	39
39878.235	−.606±002	−.550±004	.056	7	38
39880.512	−.642±001	−.526±001	.116	6	29
39881.325	−.617±002	−.538±004	.079	6	27
39882.275	−.615±001	−.533±001	.082	2	32
39883.248	−.590±001	−.514±001	.076	6	35
39885.249	−.569±004	−.479±004	.090	2	34
39888.254	−.497±003	−.401±003	.096	6	32
39890.372	−.542±004	−.416±009	.126	5	22
39896.251	−.552±004	−.481±005	.071	6	30
39898.243	−.563±002	−.517±002	.046	6	30
39904.245	−.576	−.488	.088	1	28
39905.249	−.577±004	−.489±003	.088	5	27
39906.291	−.552±003	−.440±007	.112	6	24
39910.453	−.519±002	−.407±007	.112	6	31
39912.253	−.509	−.401	.108	1	25
39913.459	−.519±002	−.429±005	.090	5	33
39914.253	−.527±001	−.431±006	.096	5	25
39915.297	−.522±005	−.429±003	.093	5	22
39916.636	−.541±002	−.447±003	.094	6	54
39917.375	−.530±002	−.460±003	.070	6	25
39920.449	−.557±003	−.465±005	.092	4	34
39923.332	−.579±001	−.483±005	.096	6	23
39924.344	−.593±003	−.486±007	.107	4	24
39927.494	−.560±002	−.476±006	.084	6	42
39928.293	−.548±003	−.469±003	.079	6	22
39929.636	−.534±003	−.477±006	.057	5	57
39933.302	−.535±002	−.427±005	.108	6	23
39935.286	−.534±002	−.418±003	.116	6	23
39937.402	−.507±006	−.411±007	.096	8	34
39940.297	−.501±002	−.440±008	.061	5	24

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
39941.309	−.518±002	−.441±005	.077	6	25
39942.308	−.509±001	−.422±002	.087	6	25
39943.301	−.543±005	−.434±007	.109	8	25
39944.305	−.531±003	−.442±002	.089	6	25
39945.318	−.552±001	−.435±003	.117	6	27
39946.300	−.544±003	−.441±003	.103	7	26
39951.347	−.557±008	−.445±009	.112	6	32
39957.339	−.574±002	−.497±002	.077	7	33
39958.316	−.564±005	−.491±005	.073	6	30
39960.321	−.535±002	−.443±002	.092	2	32
39961.326	−.540±005	−.441±010	.099	5	32
39963.436	−.531±009	−.448±011	.083	6	47
39964.389	−.501±006	−.369±005	.132	6	42
39965.488	−.491±002	−.424±002	.067	6	53
39966.377	−.527±001	−.416±003	.111	6	41
39967.338	−.504±003	−.429±002	.075	6	36
39968.335	−.543±001	−.448±002	.095	6	36
39969.343	−.545±003	−.440±005	.105	10	37
39969.372	−.544±004	−.456±004	.088	8	41
39969.401	−.543±003	−.451±005	.092	8	45
39970.446	−.553±002	−.503±003	.050	8	50
39971.547	−.545±003	−.502±005	.043	6	59
39976.352	−.569±002	−.477±003	.092	6	41
39978.333	−.564±004	−.456±005	.108	6	39
39979.376	−.568±006	−.466±001	.102	2	45
39981.520	−.523±010	−.448±010	.075	3	59
39983.372	−.517±002	−.439±003	.078	6	45
39985.432	−.536±001	−.441±002	.095	6	53
39986.368	−.508±001	−.432±002	.076	6	46
39987.362	−.521±002	−.456±006	.065	6	46
39991.381	−.591±007	−.520±010	.071	9	49
39992.433	−.605±004	−.496±005	.109	5	55
39993.435	−.580±004	−.527±007	.053	6	55
39995.424	−.576±003	−.490±004	.086	6	55
39996.427	−.605±003	−.500±004	.105	6	55
39999.375	−.585±003	−.542±004	.043	6	51
40009.356	−.547±008	−.480±009	.067	4	52
40012.363	−.573±008	−.510±006	.063	6	53
40013.438	−.590±005	−.528±008	.062	6	59
40014.378	−.580±002	−.531±004	.049	6	55
40015.392	−.588±002	−.489±002	.099	6	56
40016.375	−.562±003	−.482±003	.080	6	55
40020.380	−.580±004	−.469±005	.111	6	57
40021.424	−.553±006	−.444±006	.109	6	60
40022.422	−.566±009	−.481±009	.085	5	60
40023.381	−.539±004	−.494±007	.045	6	58
40024.432	−.532±009	−.479±012	.053	5	61
40025.482	−.515±009	−.464±012	.051	6	62
40026.472	−.509±006	−.390±002	.119	5	62
40030.379	−.497±010	−.381±008	.116	6	59
40031.395	−.488±010	−.392±007	.096	4	60
40032.398	−.484±010	−.402±014	.082	6	60
40033.496	−.518±007	−.427±012	.091	6	63
40034.401	−.538±004	−.457±009	.081	6	61

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
40035.379	−.558±006	−.502±004	.056	6	59
40036.435	−.582±004	−.517±006	.065	8	62
40038.377	−.580±003	−.506±004	.074	6	60
40039.489	−.584±002	−.510±002	.074	6	63
40040.510	−.556±002	−.511±005	.045	6	62
40042.382	−.542±009	−.464±005	.078	4	61
40043.490	−.530±005	−.429±004	.101	6	63
40044.379	−.532±002	−.404±003	.128	6	61
40045.381	−.504±002	−.400±002	.104	6	61
40046.434	−.510±002	−.424±005	.086	6	63
40048.531	−.515±003	−.444±006	.071	6	61
40050.385	−.513±004	−.411±005	.102	6	62
40051.497	−.543±003	−.467±006	.076	6	62
40052.377	−.532±005	−.459±008	.073	4	62
40060.532	−.562±004	−.478±002	.084	6	59
40064.377	−.541±005	−.436±009	.105	6	63
40066.425	−.547±004	−.437±002	.110	3	63
40067.488	−.562±004	−.452±010	.110	4	60
40069.550	−.548±008	−.442±005	.106	6	56
40074.377	−.563±006	−.460±015	.103	5	63
40080.442	−.551±006	−.462±012	.089	6	61
40081.580	−.533±004	−.476±008	.057	6	50
40082.576	−.525±005	−.455±007	.070	6	50
40084.353	−.492±003	−.393±009	.099	6	63
40085.402	−.505±002	−.382±008	.123	6	62
40085.553	−.495	−.377	.118	1	51
40088.513	−.533±004	−.436±006	.097	12	54
40089.474	−.525±002	−.466±008	.059	6	57
40090.492	−.536±006	−.436±008	.100	6	56
40092.504	−.536±003	−.469±006	.067	5	54
40098.605	−.525±005	−.442±001	.083	2	41
40102.348	−.486±003	−.437±002	.049	4	62
40103.424	−.497±004	−.390±010	.107	6	58
40107.426	−.487±009	−.390±012	.097	5	57
40109.564	−.538±004	−.428±008	.110	5	43
40111.485	−.529±004	−.448±008	.081	6	51
40113.496	−.532±004	−.463±004	.069	6	49
40119.574	−.526±004	−.442±004	.084	5	38
40122.559	−.530±002	−.466±003	.064	6	39
40125.454	−.550±004	−.466±004	.084	6	50
40126.452	−.569±004	−.463±010	.106	6	50
40127.432	−.540±003	−.470±008	.070	5	52
40128.516	−.544±003	−.450±009	.094	5	42
40130.405	−.545±003	−.428±005	.117	7	54
40131.392	−.513±006	−.460±006	.053	10	55
40134.586	−.565±007	−.473±007	.092	3	31
40135.454	−.558±004	−.451±005	.107	6	47
40144.391	−.559±002	−.508±004	.051	6	51
40146.634	−.574±002	−.478±002	.096	5	24
40147.352	−.543±002	−.473±005	.070	9	54
40149.356	−.525±001	−.423±003	.102	6	53
40150.335	−.524±004	−.430±005	.094	6	55
40151.348	−.517±006	−.425±003	.092	7	54
40152.474	−.528±004	−.459±002	.069	6	39

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
40153.376	−.546±006	−.483±004	.063	9	50
40154.636	−.566±001	−.505±002	.061	6	23
40158.640	−.610±003	−.549±002	.061	6	22
40160.540	−.608±003	−.530±003	.078	6	29
40161.410	−.596±005	−.559±007	.037	5	44
40162.624	−.590±001	−.544±003	.046	6	22
40179.484	−.629±002	−.579±002	.050	7	29
40183.252	−.613±002	−.559±007	.054	6	54
40185.569	−.620±003	−.507±002	.113	6	22
40186.239	−.603±002	−.560±001	.043	6	55
40187.262	−.565±003	−.512±007	.053	7	52
40188.509	−.555±003	−.469±003	.086	6	24
40200.296	−.580±003	−.488±002	.092	6	45
40201.569	−.597±003	−.523±004	.074	5	23
40202.425	−.604±003	−.559±006	.045	6	28
40203.457	−.631±001	−.586±004	.045	6	25
40212.229	−.587±002	−.500±008	.087	3	49
40230.242	−.612±001	−.548±002	.064	5	41
40231.219	−.606±003	−.525±004	.081	6	44
40232.250	−.594±002	−.538±004	.056	6	40
40233.247	−.604±004	−.527±003	.077	6	40
40243.233	−.576±003	−.500±003	.076	6	38
40248.493	−.580±002	−.505±004	.075	5	27
40253.327	−.647±002	−.563±003	.084	5	25
40254.299	−.636±006	−.534±008	.102	6	27
40263.266	−.526±004	−.446±002	.080	6	28
40264.258	−.527±003	−.438±003	.089	6	28
40266.417	−.547±004	−.471±003	.076	6	25
40271.285	−.600±003	−.545±002	.055	6	24
40286.386	−.548±004	−.452±002	.096	6	27
40288.309	−.552±006	−.472±004	.080	5	22
40289.320	−.556±004	−.469±003	.087	6	23
40290.311	−.564±008	−.493±008	.071	7	23
40292.454	−.601±004	−.516±007	.085	6	37
40302.368	−.592±003	−.529±005	.063	5	30
40317.341	−.582±003	−.495±004	.087	6	31
40318.354	−.579±001	−.506±003	.073	6	33
40319.376	−.570±002	−.476±002	.094	6	36
40320.440	−.586±002	−.495±004	.091	6	45
40321.343	−.593±002	−.505±003	.088	6	33
40322.340	−.579±002	−.495±005	.084	6	33
40327.393	−.593±002	−.520±004	.073	6	41
40328.439	−.584±005	−.511±005	.073	6	47
40329.407	−.591±002	−.516±001	.075	3	43
40330.439	−.589±003	−.513±003	.076	7	47
40332.384	−.582±004	−.494±002	.088	6	42
40333.379	−.573±001	−.512±002	.061	6	41
40335.330	−.569±006	−.492±007	.077	6	36
40336.338	−.578±010	−.487±010	.091	5	38
40338.337	−.564±002	−.478±002	.086	6	38
40339.415	−.563±001	−.496±002	.067	6	48
40340.358	−.585±004	−.487±004	.098	6	41
40342.358	−.589±003	−.517±001	.072	6	42
40345.341	−.572±006	−.476±003	.096	4	41

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
40353.359	−.591±003	−.508±001	.083	6	46
40354.356	−.571±003	−.509±003	.062	6	46
40355.356	−.580±007	−.494±010	.086	6	46
40356.349	−.580±007	−.492±009	.088	6	45
40357.351	−.580±003	−.503±004	.077	6	46
40362.360	−.589±004	−.513±006	.076	6	48
40364.376	−.580±011	−.500±012	.080	8	51
40366.372	−.579±004	−.484±005	.095	6	51
40370.469	−.586±004	−.495±008	.091	6	60
40376.380	−.562±006	−.491±009	.071	6	54
40382.389	−.604±003	−.516±005	.088	6	57
40384.416	−.581±003	−.512±007	.069	6	59
40389.393	−.562±003	−.472±005	.090	5	59
40395.476	−.535±009	−.472±012	.063	5	63
40404.513	−.553±007	−.528±005	.025	6	62
40411.443	−.513±001	−.326±016	.187	2	63
40417.391	−.549±004	−.449±007	.100	6	62
40418.400	−.566±001	−.477±005	.089	6	62
40419.444	−.561±006	−.508±006	.053	6	63
40420.511	−.607±004	−.529±004	.078	6	61
40422.543	−.610±002	−.556±004	.054	6	59
40423.547	−.619±008	−.590±013	.029	7	58
40427.501	−.641±005	−.607±005	.034	7	60
40428.521	−.628±004	−.588±005	.040	6	59
40436.501	−.441±003	−.329±007	.112	6	59
40438.559	−.440±007	−.320±010	.120	8	54
40439.555	−.484±002	−.335±006	.149	6	54
40440.482	−.486±006	−.382±007	.104	5	60
40446.545	−.722±006	−.630±008	.092	8	53
40447.551	−.727±010	−.697±009	.030	3	52
40449.501	−.735±003	−.693±005	.042	6	56
40454.552	−.555±005	−.473±005	.082	7	50
40462.586	−.466±005	−.384±006	.082	6	44
40463.583	−.490±002	−.374±008	.116	6	44
40464.499	−.533±002	−.418±005	.115	6	53
40465.563	−.565±004	−.469±004	.096	6	46
40469.362	−.680±005	−.661±014	.019	3	61
40470.557	−.723±005	−.672±007	.051	6	44
40471.316	−.712±002	−.700±001	.012	3	63
40471.496	−.711±003	−.708±005	.003	6	51
40473.430	−.712±008	−.677±009	.035	3	57
40473.590	−.700±005	−.664±004	.036	6	40
40474.546	−.679±003	−.610±003	.069	6	45
40477.567	−.576±003	−.486±006	.090	6	41
40480.573	−.464±007	−.360±005	.104	4	39
40485.328	−.508±006	−.429±006	.079	6	61
40487.567	−.578±003	−.514±007	.064	6	38
40489.556	−.649±004	−.633±004	.016	5	39
40494.329	−.736±001	−.671±006	.065	3	60
40494.454	−.737±006	−.680±005	.057	6	49
40497.592	−.660±005	−.595±004	.065	4	31
40499.561	−.590±008	−.519±009	.071	4	34
40500.467	−.580±006	−.467±006	.113	6	45
40501.505	−.533±002	−.423±004	.110	6	41

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
40503.577	–.480±004	–.367±006	.113	5	31
40504.443	–.476±005	–.368±003	.108	5	47
40505.477	–.474±007	–.365±003	.109	5	43
40506.398	–.485±002	–.415±001	.070	5	51
40507.558	–.513±002	–.466±002	.047	6	32
40508.569	–.543±002	–.484±003	.059	6	30
40509.487	–.572	–.528	.044	1	40
40511.353	–.636±006	–.588±007	.048	6	55
40512.596	–.663±003	–.622±003	.041	6	26
40513.407	–.675±006	–.641±005	.034	6	49
40513.613	–.673±002	–.644±003	.029	6	25
40514.314	–.679±004	–.637±005	.042	5	57
40514.580	–.673±002	–.630±002	.043	6	28
40515.451	–.672±003	–.622±002	.050	6	43
40516.362	–.667±001	–.605±004	.062	5	52
40516.568	–.670±002	–.612±002	.058	6	28
40517.523	–.665±002	–.581±003	.084	6	33
40527.635	–.515±004	–.445±003	.070	6	22
40528.573	–.531±001	–.470±003	.061	6	25
40529.625	–.553±001	–.512±002	.041	6	22
40530.390	–.586±002	–.540±005	.046	6	45
40531.431	–.586±002	–.566±003	.020	6	40
40532.639	–.628±003	–.595±004	.033	7	22
40536.655	–.644±002	–.587±005	.057	6	24
40537.280	–.641±003	–.572±004	.069	6	55
40541.416	–.590±002	–.495±002	.095	6	38
40543.299	–.535±005	–.447±008	.088	3	51
40544.460	–.540±002	–.430±003	.110	5	32
40545.676	–.521±005	–.429±004	.092	5	27
40546.529	–.524±003	–.435±008	.089	6	24
40547.521	–.521±005	–.452±004	.069	6	25
40548.533	–.521±004	–.428±003	.093	5	24
40553.407	–.586±005	–.522±004	.064	6	35
40554.608	–.599±002	–.552±003	.047	6	24
40558.589	–.630±002	–.534±004	.096	5	23
40559.413	–.626±006	–.519±008	.107	3	32
40577.675	–.612±001	–.557±017	.055	2	37
40589.235	–.533±002	–.440±005	.093	6	44
40594.588	–.582±005	–.515±006	.067	6	32
40595.225	–.588±004	–.527±004	.061	6	43
40606.610	–.490±004	–.392±003	.098	6	39
40615.260	–.574±002	–.529±001	.045	6	32
40616.249	–.599±004	–.544±007	.055	7	33
40621.475	–.624±003	–.568±004	.056	6	28
40629.650	–.494±005	–.422±005	.072	6	51
40635.452	–.591±012	–.539±012	.052	6	29
40642.482	–.642±008	–.541±022	.101	6	35
40653.429	–.491±006	–.408±007	.083	6	32
40654.384	–.521±004	–.447±004	.074	6	27
40658.494	–.601±003	–.562±008	.039	7	42
40662.286	–.645±006	–.572±007	.073	5	22
40663.345	–.636±007	–.571±007	.065	6	26
40665.480	–.606±006	–.519±013	.087	6	43
40674.301	–.504±004	–.392±006	.112	6	25

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
40675.326	−.509±005	−.407±002	.102	6	27
40676.389	−.528±004	−.425±011	.103	6	35
40678.457	−.568±005	−.468±006	.100	6	44
40681.489	−.607±004	−.538±003	.069	6	49
40682.586	−.597±004	−.539±003	.058	6	58
40683.400	−.613±005	−.552±012	.061	6	39
40689.361	−.549±005	−.459±005	.090	6	36
40693.327	−.514±006	−.427±013	.087	3	33
40699.531	−.587±005	−.524±007	.063	4	58
40701.516	−.617±006	−.541±004	.076	6	57
40707.367	−.620±006	−.528±006	.092	6	43
40709.358	−.618±003	−.516±008	.102	6	43
40710.353	−.612±003	−.504±003	.108	6	42
40713.434	−.564±005	−.475±003	.089	10	52
40718.430	−.544±010	−.457±004	.087	2	53
40725.359	−.589±007	−.539±005	.050	6	48
40727.339	−.604±009	−.546±006	.058	6	46
40730.402	−.608±006	−.527±007	.081	6	54
40731.431	−.582±005	−.514±005	.068	6	56
40732.454	−.591±006	−.494±007	.097	18	58
40735.538	−.586±002	−.419±005	.167	6	63
40736.480	−.562±009	−.446±010	.116	6	61
40741.508	−.542±009	−.435±006	.107	5	62
40751.473	−.624±004	−.520±009	.104	6	62
40752.385	−.585±007	−.517±008	.068	6	58
40753.396	−.556±006	−.463±008	.093	4	58
40758.434	−.509±005	−.412±010	.097	6	61
40760.374	−.491±010	−.379±011	.112	4	58
40766.470	−.532±005	−.477±012	.055	6	63
40769.384	−.544±002	−.476±002	.068	6	60
40776.468	−.583±005	−.488±009	.095	5	63
40778.408	−.560±004	−.474±008	.086	4	62
40780.406	−.548±002	−.447±010	.101	6	62
40781.511	−.524±004	−.411±004	.113	6	61
40788.412	−.555±008	−.464±010	.091	8	63
40789.547	−.550	−.459	.091	1	58
40790.375	−.548	−.502	.046	1	62
40792.382	−.555±003	−.564±013	−.009	6	63
40794.510	−.599±001	−.596±003	.003	6	60
40796.383	−.626±004	−.614±006	.012	7	63
40797.390	−.634±003	−.575±011	.059	6	63
40798.473	−.611±007	−.572±009	.039	7	61
40803.436	−.567±005	−.509±003	.058	10	62
40804.524	−.537±006	−.507±007	.030	6	57
40807.458	−.551±001	−.438±004	.113	6	61
40811.513	−.560±001	−.489±003	.071	5	56
40812.424	−.576±009	−.501±007	.075	6	61
40813.433	−.564±006	−.468±008	.096	6	61
40817.363	−.622±008	−.538±007	.084	4	63
40818.380	−.632±008	−.540±011	.092	4	62
40819.529	−.629±007	−.557±003	.072	6	53
40826.475	−.643±004	−.553±010	.090	5	56
40832.361	−.547±008	−.527±007	.020	6	62
40837.315	−.624±008	−.580±007	.044	5	63

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
40839.392	–.634±006	–.613±010	.021	5	59
40840.335	–.646±007	–.557±008	.089	5	62
40841.311	–.656±005	–.556±006	.100	6	62
40843.376	–.624±007	–.583±008	.041	7	60
40844.587	–.592±005	–.537±004	.055	6	38
40847.504	–.591±003	–.584±003	.007	6	47
40852.347	–.592±004	–.509±011	.083	6	60
40852.486	–.592±003	–.527±007	.065	6	48
40853.308	–.575±002	–.505±005	.070	5	62
40854.361	–.592±003	–.510±007	.082	6	59
40855.567	–.599±004	–.521±012	.078	5	37
40856.334	–.570±004	–.537±006	.033	6	60
40857.283	–.580±002	–.533±010	.047	4	62
40857.550	–.582±008	–.523±007	.059	6	38
40858.295	–.604±012	–.534±017	.070	6	62
40859.287	–.598±002	–.550±006	.048	5	62
40859.611	–.599±003	–.549±002	.050	6	30
40866.274	–.588±004	–.503±010	.085	6	62
40866.616	–.575±004	–.496±005	.079	6	27
40867.281	–.601±006	–.488±006	.113	5	61
40867.606	–.585±003	–.454±002	.131	6	28
40868.527	–.568±004	–.481±008	.087	6	37
40869.286	–.574±004	–.489±003	.085	4	61
40869.500	–.554±002	–.477±002	.077	6	40
40870.276	–.584±002	–.450±005	.134	5	61
40870.491	–.563±003	–.464±004	.099	6	41
40871.382	–.571±003	–.470±006	.101	3	53
40871.573	–.567±006	–.474±007	.093	6	31
40872.523	–.544±002	–.448±002	.096	6	36
40875.588	–.565±005	–.521±003	.044	2	28
40876.565	–.577±004	–.505±007	.072	6	30
40877.353	–.594±003	–.517±005	.077	5	54
40877.527	–.569±005	–.487±004	.082	6	34
40878.537	–.579±006	–.538±006	.041	6	33
40881.315	–.623±003	–.547±006	.076	4	57
40882.455	–.616±002	–.553±009	.063	6	42
40886.450	–.580±002	–.511±004	.069	2	41
40887.253	–.578±004	–.507±002	.071	3	60
40887.409	–.583±007	–.500±009	.083	5	45
40890.373	–.542±003	–.434±003	.108	5	49
40895.352	–.540±004	–.454±010	.086	5	50
40897.428	–.533±003	–.470±007	.063	6	40
40903.236	–.586±009	–.512±009	.074	5	58
40903.556	–.579±004	–.512±005	.067	6	24
40904.543	–.567±010	–.492±008	.075	4	25
40906.360	–.558±002	–.490±010	.068	6	45
40908.599	–.554±004	–.457±009	.097	6	22
40911.635	–.496±001	–.402±003	.094	6	24
40925.489	–.578±004	–.490±003	.088	6	25
40929.307	–.610±003	–.522±003	.088	6	44
40931.421	–.581±003	–.476±003	.105	6	29
40936.419	–.479±005	–.353±009	.126	5	28
40937.351	–.462±002	–.337±002	.125	6	36
40938.347	–.441±004	–.337±006	.104	6	36

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
40947.284	−.652±003	−.546±003	.106	5	41
40949.503	−.615±002	−.585±001	.030	6	23
40949.601	−.617±005	−.581±001	.036	4	30
40950.585	−.591±004	−.541±008	.050	3	29
40956.235	−.495±006	−.378±003	.117	6	44
40959.291	−.443±011	−.351±018	.092	8	36
40960.239	−.469±007	−.333±004	.136	6	42
40960.272	−.462±002	−.337±003	.125	6	38
40961.247	−.466±004	−.375±005	.091	6	41
40961.281	−.475±001	−.367±003	.108	5	36
40963.270	−.522±003	−.438±003	.084	6	37
40964.485	−.553±003	−.499±003	.054	12	23
40965.508	−.587±006	−.533±007	.054	6	25
40966.247	−.591±005	−.565±005	.026	6	39
40966.513	−.593±005	−.569±005	.024	3	26
40975.252	−.588±003	−.507±004	.081	6	35
40977.664	−.560±007	−.454±013	.106	5	47
40980.246	−.525±004	−.433±003	.092	7	34
40981.265	−.525±003	−.435±001	.090	6	32
40983.445	−.536±003	−.440±008	.096	6	24
40985.462	−.564±002	−.475±002	.089	6	26
40985.493	−.554±001	−.486±004	.068	6	29
40987.462	−.583±002	−.546±004	.037	5	27
40988.388	−.590±007	−.539±007	.051	12	22
40995.319	−.597±001	−.508±015	.089	2	23
40997.255	−.566±002	−.450±002	.116	6	28
40997.283	−.567±003	−.459±002	.108	5	25
41001.259	−.554±002	−.444±005	.110	6	27
41003.377	−.570±006	−.471±002	.099	6	24
41004.250	−.576±004	−.479±010	.097	6	26
41004.323	−.582±005	−.470±005	.112	6	22
41005.399	−.587±004	−.487±006	.100	6	25
41006.497	−.590±006	−.514±007	.076	6	36
41007.279	−.590±002	−.529±007	.061	12	24
41009.278	−.611±003	−.542±004	.069	10	23
41010.273	−.595±004	−.549±006	.046	6	23
41011.461	−.607±004	−.537±006	.070	6	34
41019.341	−.554±008	−.446±007	.108	6	24
41021.275	−.558±005	−.446±006	.112	6	22
41022.293	−.572±007	−.449±003	.123	5	22
41023.276	−.581±002	−.480±006	.101	6	22
41023.310	−.579±003	−.483±002	.096	6	23
41024.332	−.571±001	−.502±003	.069	6	24
41024.365	−.579±002	−.503±004	.076	6	27
41029.294	−.576±004	−.497±004	.079	8	23
41032.301	−.561±004	−.486±009	.075	3	24
41034.378	−.561±009	−.479±008	.082	6	31
41035.288	−.560±003	−.468±002	.092	6	23
41036.356	−.554±004	−.481±007	.073	6	29
41039.318	−.553±004	−.464±007	.089	6	26
41042.302	−.568±003	−.478±003	.090	6	26
41044.394	−.570±002	−.496±005	.074	6	37
41045.593	−.584±001	−.538±002	.046	2	58
41047.348	−.588±004	−.515±003	.073	6	32

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B-V)	n	Z
41049.347	−.575±004	−.500±003	.075	6	33
41054.308	−.560±002	−.468±002	.092	6	30
41055.361	−.545±006	−.471±009	.074	4	36
41056.313	−.548±002	−.475±003	.073	6	31
41060.325	−.548±003	−.451±006	.097	5	33
41061.328	−.554±003	−.465±004	.089	6	34
41063.432	−.558±005	−.467±006	.091	6	48
41064.325	−.576±009	−.486±009	.090	5	35
41069.350	−.581±005	−.486±004	.095	5	40
41070.379	−.567±007	−.498±007	.069	6	44
41071.356	−.568±003	−.474±003	.094	6	41
41076.435	−.522±007	−.458±005	.064	6	52
41081.340	−.555±007	−.481±009	.074	6	42
41082.399	−.566±003	−.488±008	.078	6	50
41083.346	−.584±004	−.507±006	.077	6	44
41084.353	−.605±005	−.519±008	.086	6	45
41085.348	−.602±004	−.542±008	.060	6	45
41086.360	−.609±005	−.537±005	.072	7	46
41087.348	−.613±015	−.542±016	.071	5	45
41088.352	−.610±002	−.560±008	.050	6	46
41089.375	−.615±011	−.547±007	.068	6	49
41090.362	−.605±004	−.563±007	.042	6	48
41091.367	−.596±004	−.531±013	.065	4	49
41092.363	−.581±004	−.531±008	.050	6	49
41094.437	−.578±006	−.505±004	.073	6	57
41095.358	−.560±004	−.485±004	.075	5	49
41096.365	−.562±002	−.473±003	.089	6	50
41108.374	−.563±002	−.501±003	.062	5	54
41114.447	−.576±001	−.510±002	.066	4	61
41116.445	−.576±003	−.483±004	.093	3	61
41118.448	−.558±005	−.469±007	.089	6	61
41119.383	−.546±003	−.454±005	.092	6	58
41120.381	−.523±003	−.441±010	.082	5	58
41126.381	−.487±008	−.423±010	.064	6	59
41128.455	−.488±007	−.409±010	.079	5	62
41134.413	−.617±007	−.604±005	.013	5	62
41137.383	−.650±006	−.608±009	.042	6	61
41141.515	−.598±002	−.494±005	.104	5	62
41142.384	−.549±005	−.464±003	.085	5	61
41143.425	−.531±005	−.430±012	.101	5	63
41144.392	−.519±010	−.412±015	.107	5	62
41147.380	−.493±004	−.366±002	.127	5	62
41152.540	−.569±010	−.488±013	.081	4	59
41154.525	−.595±005	−.535±005	.060	5	60
41157.539	−.658±010	−.594±003	.064	4	58
41158.537	−.651±009	−.606±004	.045	4	58
41160.361	−.628±007	−.562±013	.066	4	62
41160.544	−.633±005	−.561±011	.072	5	57
41161.355	−.603±006	−.512±006	.091	4	62
41162.417	−.575±005	−.503±003	.072	6	63
41164.450	−.511±004	−.419±007	.092	5	62
41165.536	−.497±002	−.370±010	.127	6	57
41166.549	−.475±005	−.360±006	.115	6	55
41167.555	−.469±009	−.318±013	.151	6	55

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
41168.560	–.455±013	–.281±017	.174	4	54
41171.548	–.469±009	–.346±004	.123	6	54
41173.544	–.498±004	–.399±008	.099	6	54
41174.553	–.530±003	–.436±007	.094	6	53
41176.554	–.568±004	–.501±008	.067	6	52
41177.561	–.606±003	–.507±003	.099	6	51
41178.568	–.606±007	–.547±003	.059	6	51
41179.555	–.619±010	–.566±006	.053	6	51
41181.565	–.590±011	–.535±006	.055	5	50
41182.564	–.580±006	–.510±007	.070	6	50
41183.563	–.572±003	–.486±004	.086	5	50
41184.556	–.551±005	–.445±001	.106	5	50
41185.555	–.523±004	–.414±007	.109	5	50
41185.570	–.529±003	–.429±006	.100	5	48
41186.569	–.521±002	–.381±009	.140	2	48
41189.558	–.455±004	–.329±004	.126	5	48
41191.585	–.460±003	–.343±008	.117	4	44
41193.580	–.489±007	–.374±003	.115	4	45
41197.520	–.532±009	–.495±009	.037	3	50
41198.593	–.565±004	–.521±011	.044	5	41
41201.570	–.622±008	–.573±003	.049	4	43
41205.573	–.574±006	–.525±009	.049	5	41
41209.574	–.547±010	–.444±011	.103	5	40
41209.610	–.533±012	–.439±013	.094	4	35
41212.550	–.507±003	–.387±007	.120	6	42
41214.575	–.496±003	–.401±006	.095	6	38
41215.630	–.486±003	–.395±008	.091	5	31
41216.584	–.499±003	–.421±005	.078	6	36
41217.595	–.520±003	–.414±007	.106	6	35
41218.582	–.521±002	–.438±003	.083	6	36
41226.564	–.598±006	–.554±004	.044	6	35
41227.565	–.594±002	–.526±006	.068	6	35
41228.523	–.573±005	–.510±003	.063	6	40
41229.622	–.558±006	–.489±009	.069	5	28
41230.593	–.555±003	–.471±003	.084	6	30
41232.568	–.509±002	–.418±002	.091	6	33
41233.529	–.512±002	–.396±002	.116	6	37
41233.579	–.520±005	–.398±003	.122	6	31
41234.561	–.467±004	–.418±003	.049	6	33
41235.559	–.502±002	–.371±007	.131	6	33
41236.594	–.484±002	–.386±005	.098	6	29
41238.545	–.509±006	–.414±004	.095	6	33
41241.530	–.529±003	–.472±003	.057	6	34
41244.559	–.611±004	–.562±005	.049	6	30
41245.560	–.634±003	–.588±004	.046	4	30
41246.560	–.671±007	–.615±008	.056	6	29
41247.554	–.660±003	–.621±002	.039	6	29
41248.517	–.674±003	–.620±001	.054	6	34
41249.553	–.670±003	–.628±002	.042	6	29
41251.541	–.654±005	–.598±009	.056	6	30
41253.548	–.636±005	–.554±002	.082	8	29
41255.395	–.587±003	–.514±004	.073	6	46
41260.423	–.511±005	–.387±002	.124	6	41
41261.476	–.479±003	–.393±013	.086	6	34

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
41272.430	–.683±004	–.632±004	.051	6	36
41276.599	–.642±004	–.559±008	.083	6	22
41277.269	–.625±009	–.524±008	.101	6	53
41282.541	–.500±002	–.393±005	.107	6	23
41290.218	–.621±009	–.559±004	.062	4	55
41292.349	–.685±005	–.617±003	.068	6	40
41294.207	–.664±007	–.622±003	.042	6	55
41295.209	–.681±003	–.616±003	.065	6	54
41299.539	–.567±009	–.470±009	.097	2	22
41301.198	–.535±002	–.413±003	.122	6	54
41303.206	–.465±007	–.362±010	.103	6	52
41303.458	–.460±007	–.355±007	.105	6	24
41304.217	–.456±002	–.354±002	.102	6	51
41308.447	–.515±009	–.407±011	.108	3	24
41310.201	–.560±008	–.491±003	.069	6	51
41311.305	–.578±004	–.523±004	.055	8	39
41312.230	–.592±006	–.534±007	.058	6	47
41313.619	–.613±009	–.531±010	.082	5	32
41329.409	–.521±006	–.419±005	.102	5	23
41330.224	–.500±008	–.446±007	.054	6	42
41331.311	–.542±002	–.458±004	.084	6	31
41332.340	–.561±005	–.473±010	.088	6	28
41336.246	–.573±008	–.477±018	.096	5	37
41337.511	–.544±003	–.434±001	.110	6	27
41340.311	–.480±004	–.399±002	.081	6	28
41350.608	–.581±003	–.483±003	.098	6	43
41351.229	–.591±009	–.509±005	.082	6	34
41352.243	–.610±005	–.538±003	.072	6	32
41353.248	–.619±003	–.557±002	.062	6	32
41360.358	–.511±007	–.402±006	.109	8	22
41364.321	–.431±004	–.304±004	.127	6	23
41366.247	–.420±010	–.311±009	.109	6	28
41368.257	–.476±003	–.361±009	.115	6	26
41389.319	–.486±008	–.360±005	.126	6	23
41390.272	–.487±001	–.378±004	.109	6	22
41391.279	–.498±002	–.415±004	.083	6	22
41392.275	–.532±002	–.458±001	.074	6	22
41393.278	–.565±003	–.493±006	.072	6	22
41394.285	–.609±004	–.510±004	.099	6	23
41395.281	–.606±005	–.534±006	.072	6	22
41396.328	–.604±004	–.544±004	.060	7	25
41397.432	–.613±005	–.552±002	.061	6	37
41398.515	–.608±006	–.539±006	.069	6	48
41399.289	–.590±012	–.507±004	.083	6	23
41400.593	–.539±009	–.471±007	.068	6	56
41401.288	–.534±002	–.453±002	.081	6	24
41402.306	–.511±002	–.443±003	.068	6	25
41403.303	–.488±003	–.406±005	.082	6	25
41404.486	–.489±003	–.389±005	.100	6	46
41407.477	–.448±010	–.343±011	.105	6	46
41408.353	–.465±003	–.340±004	.125	6	31
41412.331	–.503±002	–.405±005	.098	8	30
41414.389	–.568±003	–.461±005	.107	4	38
41415.304	–.556±002	–.488±002	.068	6	28

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
41416.332	–.566±003	–.501±001	.065	3	31
41417.591	–.559±006	–.530±003	.029	6	59
41436.340	–.503±006	–.389±006	.114	6	39
41437.349	–.522±002	–.438±004	.084	5	40
41438.329	–.554±002	–.464±005	.090	6	38
41439.326	–.567±006	–.486±003	.081	6	38
41444.572	–.541±005	–.488±004	.053	5	62
41448.356	–.509±006	–.418±007	.091	7	45
41455.346	–.471±003	–.356±003	.115	6	46
41459.420	–.556±005	–.431±010	.125	2	55
41460.359	–.541±012	–.439±009	.102	3	49
41460.548	–.548±008	–.432±010	.116	3	62
41461.354	–.547±003	–.469±007	.078	6	49
41463.379	–.548±002	–.454±005	.094	6	52
41466.361	–.543±004	–.439±005	.104	5	51
41467.392	–.540±004	–.457±002	.083	6	54
41472.419	–.487±006	–.371±007	.116	5	58
41473.540	–.473±005	–.383±005	.090	3	63
41474.363	–.465±004	–.359±012	.106	5	54
41476.385	–.490±003	–.372±007	.118	6	56
41477.374	–.489±006	–.372±009	.117	4	55
41484.366	–.544±002	–.422±010	.122	2	56
41485.493	–.548±007	–.447±006	.101	5	63
41489.461	–.565±004	–.458±003	.107	6	62
41490.384	–.541±002	–.461±004	.080	6	59
41491.393	–.531±003	–.483±005	.048	6	60
41493.519	–.493±008	–.462±008	.031	7	63
41495.377	–.486±004	–.434±014	.052	5	59
41500.373	–.532±003	–.449±008	.083	5	60
41503.373	–.531±011	–.447±014	.084	6	60
41508.536	–.532±005	–.433±008	.099	5	61
41521.543	–.491±011	–.423±009	.068	4	58
41529.557	–.545±005	–.457±008	.088	6	55
41530.367	–.555±004	–.456±006	.099	6	63
41530.547	–.563±006	–.454±006	.109	4	56
41533.377	–.558±005	–.471±006	.087	3	63
41534.386	–.548±008	–.461±001	.087	3	63
41535.357	–.540±005	–.484±007	.056	4	63
41535.570	–.510±005	–.438±005	.072	4	52
41537.350	–.517±004	–.448±007	.069	6	63
41538.562	–.537±011	–.443±006	.094	5	52
41539.478	–.525±006	–.452±008	.073	5	59
41543.547*	–.502±003	–.404±008	.098	5	52
41544.557	–.506±003	–.407±006	.099	6	51
41544.560*	–.520±009	–.397±005	.123	3	51
41545.545	–.502±005	–.394±007	.108	6	52
41545.548*	–.502±003	–.408±005	.094	5	52
41554.570	–.529±009	–.459±013	.070	6	47
41561.576	–.532±006	–.440±006	.092	6	44
41563.569	–.544±003	–.461±010	.083	6	44
41565.586	–.540±002	–.444±006	.096	5	41
41566.590	–.555±006	–.440±008	.115	6	41
41567.572*	–.537±004	–.435±004	.102	4	42

* observation made at Piszkéstető mountain station

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
41567.577	–.547±003	–.447±007	.100	6	42
41584.568	–.552±004	–.475±008	.077	3	37
41586.566	–.565±003	–.470±004	.095	6	36
41586.604*	–.554±004	–.494±004	.060	5	32
41588.553	–.556±002	–.505±002	.051	6	37
41589.447	–.554±005	–.482±012	.072	5	50
41589.607*	–.560±002	–.479±004	.081	5	30
41590.555	–.564±007	–.477±009	.087	6	37
41591.555	–.544±003	–.484±003	.060	6	36
41594.556	–.565±006	–.459±005	.106	6	35
41596.583	–.541±001	–.453±002	.088	6	31
41596.621*	–.553±004	–.443±006	.110	5	27
41597.370	–.531±004	–.451±005	.080	6	55
41604.614	–.564±004	–.506±003	.058	5	26
41605.550	–.562±001	–.504±001	.058	6	32
41606.556	–.565±001	–.503±001	.062	5	31
41608.525	–.584±002	–.518±004	.066	6	35
41610.492	–.597±004	–.514±004	.083	5	38
41617.508	–.581±010	–.474±010	.107	6	33
41622.409	–.549±007	–.479±003	.070	5	44
41623.547	–.569±002	–.456±004	.113	6	27
41629.499	–.571±002	–.492±003	.079	6	30
41631.455	–.570±005	–.515±005	.055	6	35
41634.472	–.608±002	–.502±003	.106	5	32
41637.589	–.574±005	–.506±003	.068	5	22
41647.383	–.565±004	–.465±004	.100	6	39
41650.415	–.586±001	–.540±002	.046	5	34
41651.455*	–.612±006	–.552±008	.060	6	29
41672.211	–.597±007	–.546±008	.051	6	51
41673.218	–.636±006	–.562±008	.074	5	50
41674.515	–.651±003	–.592±008	.059	6	22
41675.250	–.668±005	–.595±004	.073	5	46
41679.199	–.586±008	–.538±007	.048	6	50
41679.275*	–.595±003	–.502±008	.093	4	41
41680.248*	–.579±006	–.493±010	.086	4	44
41680.562	–.587±008	–.483±007	.104	6	26
41681.631*	–.552±002	–.457±009	.095	4	34
41682.208	–.560±005	–.420±008	.140	6	48
41682.277*	–.546	–.426	.120	1	40
41688.234	–.475±006	–.392±005	.083	6	43
41688.258*	–.482±014	–.381±014	.101	4	40
41689.280*	–.517±004	–.435±004	.082	5	37
41689.283	–.536±007	–.428±007	.108	6	37
41694.319	–.622±007	–.578±003	.044	5	31
41695.269	–.629±009	–.589±003	.040	6	37
41696.203	–.648±004	–.597±004	.051	6	44
41697.296	–.649±016	–.594±010	.055	6	33
41709.336	–.438±008	–.307±006	.131	6	25
41712.213	–.529±002	–.461±004	.068	3	38
41717.242	–.673±008	–.655±009	.018	5	33
41737.483	–.636±008	–.611±004	.025	4	35
41739.282	–.643±008	–.627±007	.016	5	23

* observation made at Piszkéstető mountain station

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
41742.361	–.624±004	–.569±005	.055	6	24
41746.283	–.536±002	–.430±004	.106	4	22
41747.403	–.517±002	–.381±004	.136	6	29
41752.473	–.460±003	–.318±003	.142	6	39
41753.358	–.475±012	–.348±011	.127	6	26
41754.282	–.484±004	–.417±005	.067	6	22
41758.335	–.597±006	–.549±009	.048	6	25
41759.273	–.628±003	–.573±007	.055	6	22
41761.292	–.655±002	–.640±001	.015	5	23
41764.285	–.657±005	–.616±004	.041	5	23
41766.291	–.608±006	–.551±006	.057	6	23
41772.285	–.441±005	–.311±007	.130	5	24
41778.338	–.530±004	–.453±005	.077	6	31
41779.353	–.554±008	–.503±005	.051	3	33
41783.408	–.662±002	–.613±003	.049	3	41
41789.473	–.583±006	–.434±007	.149	4	51
41795.306	–.415±005	–.267±008	.148	4	33
41795.320*	–.417±004	–.268±008	.149	4	34
41797.426*	–.445±004	–.332±001	.113	2	48
41799.320	–.472±007	–.403±005	.069	5	36
41803.337	–.615±004	–.583±009	.032	4	39
41804.344	–.651±007	–.616±007	.035	4	40
41807.339	–.616±006	–.570±018	.046	3	41
41810.347	–.601±005	–.507±010	.094	5	43
41815.381	–.477±008	–.294±002	.183	6	49
41816.492	–.443±004	–.278±003	.165	5	59
41818.350	–.408±004	–.281±013	.127	6	46
41824.389	–.568±007	–.539±002	.029	2	52
41825.411	–.634±001	–.620±003	.014	2	54
41827.461	–.690±010	–.654±004	.036	5	59
41834.391	–.540±011	–.463±015	.077	4	55
41842.376	–.490±004	–.387±009	.103	6	55
41844.379	–.528±004	–.471±006	.057	5	56
41845.373	–.572±009	–.497±007	.075	6	56
41846.378	–.549±006	–.580±002	–.031	4	57
41918.553*	–.656±008	–.609±005	.047	4	49
41921.557*	–.518±003	–.371±006	.147	4	47
41930.580	–.543±001	–.443±006	.100	4	42
41931.576	–.565±003	–.502±002	.063	3	43
41932.563	–.618±002	–.593±003	.025	4	44
41933.533	–.666±005	–.624±004	.042	6	47
41934.612	–.682±006	–.669±012	.013	5	37
41935.574	–.694±008	–.662±004	.032	5	41
41939.589	–.652±005	–.573±008	.079	4	38
41941.595	–.582±008	–.448±007	.134	4	37
41954.543	–.613±005	–.565±003	.048	4	39
41957.594	–.688±003	–.668±007	.020	4	31
41960.483	–.687±005	–.612±007	.075	4	44
41961.471	–.653±007	–.578±004	.075	5	45
41962.526	–.635±003	–.528±007	.107	5	38
41965.538	–.527±010	–.376±011	.151	5	35
41966.524	–.484±001	–.297±005	.187	4	37

* observation made at Piszkéstető mountain station

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
41978.484	–.629	–.578	.051	1	38
41980.418	–.660±009	–.611±009	.049	6	45
41981.532	–.659±007	–.576±006	.083	5	31
41982.448	–.665±008	–.582±001	.083	5	41
41983.587	–.668±006	–.555±005	.113	6	25
41984.428	–.623±006	–.526±005	.097	5	43
41987.622	–.563±006	–.424±007	.139	4	22
41988.637	–.512±005	–.354±002	.158	4	22
41989.467	–.483±008	–.332±003	.151	4	36
41990.432	–.437±004	–.333±013	.104	6	40
41997.451	–.539±004	–.486±013	.053	6	36
42005.463	–.620±009	–.510±009	.110	6	31
42008.573	–.557±010	–.411±003	.146	4	22
42009.468	–.536±004	–.428±005	.108	5	29
42018.596	–.541±002	–.456±005	.085	5	23
42019.311	–.570±007	–.519±008	.051	5	45
42022.465	–.697±008	–.652±010	.045	5	26
42026.313	–.623±007	–.554±005	.069	6	43
42035.356	–.409±004	–.307±009	.102	4	34
42039.453	–.540±010	–.469±010	.071	5	24
42069.268	–.632±008	–.505±004	.127	6	34
42070.302	–.565±005	–.466±007	.099	6	30
42089.450	–.642±005	–.550±002	.092	5	27
42091.625	–.598±008	–.474±002	.124	4	48
42094.605	–.497±003	–.365±004	.132	4	47
42095.311	–.478±006	–.353±008	.125	6	23
42101.374	–.550±009	–.443±008	.107	4	24
42106.248	–.671±005	–.616±011	.055	5	25
42108.351	–.653±007	–.631±009	.022	5	23
42119.273	–.445±004	–.361±006	.084	5	22
42120.317	–.455±008	–.354±005	.101	5	23
42121.282	–.472±002	–.386±004	.086	3	22
42126.336	–.580±007	–.522±009	.058	5	26
42127.429	–.628±009	–.564±006	.064	5	37
42128.318	–.642±006	–.620±008	.022	5	25
42130.416	–.668±001	–.574±001	.094	2	36
42132.483*	–.623±009	–.532±006	.091	5	45
42133.311	–.593±006	–.514±009	.079	4	26
42133.495*	–.610±006	–.517±009	.093	3	46
42134.320	–.593±005	–.509±007	.084	6	26
42135.304	–.578±004	–.406±006	.172	4	25
42136.302	–.545±007	–.396±013	.149	4	25
42136.473*	–.552±013	–.413±008	.139	4	45
42141.383	–.426±007	–.262±009	.164	5	36
42142.316	–.420±004	–.283±008	.137	4	28
42146.419	–.538±004	–.445±012	.093	5	42
42147.301	–.561±003	–.486±001	.075	5	28
42148.342	–.626±005	–.616±005	.010	5	33
42152.355	–.691±006	–.625±005	.066	5	36
42159.340	–.473±008	–.307±005	.166	5	36
42160.322	–.391±009	–.222±004	.169	3	34
42161.339	–.368±005	–.228±006	.140	5	37

* observation made at Piszkéstető mountain station

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
42167.502	−.507±007	−.452±005	.055	5	57
42171.323	−.724±010	−.649±015	.075	6	39
42177.397	−.636	−.529	.107	1	49
42178.341	−.598±008	−.458±002	.140	5	43
42187.523*	−.445±014	−.316±014	.129	4	61
42191.394	−.656±008	−.614±008	.042	5	53
42193.410	−.699±003	−.701±008	−.002	5	55
42194.357	−.705±006	−.677±011	.028	5	50
42195.359	−.706±003	−.684±007	.022	5	51
42201.357	−.456±006	−.362±007	.094	4	52
42202.346	−.429±006	−.287±007	.142	5	51
42204.360	−.359±009	−.225±012	.134	5	53
42218.372	−.670±008	−.660±008	.010	4	57
42220.376	−.648±007	−.548±014	.100	3	58
42221.448	−.552±007	−.480±013	.072	5	62
42229.361	−.358±008	−.281±007	.077	5	59
42234.386	−.733±006	−.768±013	−.035	5	61
42243.375	−.562±010	−.481±007	.081	5	62
42244.405	−.430±006	−.221±006	.209	4	62
42255.343	−.700±007	−.599±016	.101	5	62
42256.511	−.745±006	−.738±008	.007	5	59
42257.529	−.792±006	−.760±006	.032	4	58
42266.560	−.464±004	−.348±003	.116	5	53
42267.553	−.406±009	−.249±009	.157	5	54
42269.577	−.319±008	−.174±009	.145	6	51
42274.526	−.544±005	−.462±007	.082	3	54
42275.583	−.603±004	−.590±005	.013	5	48
42276.560	−.674±004	−.686±009	−.012	5	51
42277.551	−.736±004	−.733±003	.003	5	51
42277.559*	−.713±006	−.736±006	−.023	3	50
42278.544*	−.760±010	−.787±012	−.027	4	51
42279.575*	−.785±003	−.839±004	−.054	4	48
42289.562	−.377±012	−.204±017	.173	5	46
42290.541	−.316±010	−.131±012	.185	5	49
42291.449	−.297±008	−.133±007	.164	4	57
42295.524	−.452±007	−.354±003	.098	5	49
42296.559	−.521±005	−.483±007	.038	5	45
42303.496	−.790±007	−.759±006	.031	6	50
42304.589	−.761±005	−.703±004	.058	5	38
42307.565	−.609±004	−.484±004	.125	3	40
42308.600	−.528±011	−.384±009	.144	5	35
42309.555	−.467±007	−.312±005	.155	5	41
42318.515	−.581±005	−.475±005	.106	5	42
42319.433	−.633±004	−.610±002	.023	4	52
42329.420	−.576±005	−.434±003	.142	4	50
42347.297	−.717±005	−.680±010	.037	5	57
42350.493	−.563±007	−.436±013	.127	3	34
42360.557	−.501±002	−.424±013	.077	4	25
42361.636	−.607±001	−.552±002	.055	5	23
42366.614	−.766±005	−.776±007	−.010	5	22
42369.538	−.693±008	−.642±011	.051	5	24
42371.605	−.608±004	−.476±005	.132	5	22

* observation made at Piszkéstető mountain station

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
42398.597	–.462±013	–.207±011	.255	3	27
42403.375	–.423±007	–.278±008	.145	5	31
42404.615	–.498±009	–.416±004	.082	4	30
42415.295	–.631±010	–.536±013	.095	5	37
42422.432	–.347±004	–.177±006	.170	6	22
42423.612	–.354±004	–.194±004	.160	5	36
42429.588	–.644±009	–.626±007	.018	5	35
42432.456	–.754±005	–.738±007	.016	6	23
42433.486	–.757±003	–.757±006	.000	5	25
42439.255	–.541±002	–.400±011	.141	4	34
42442.606	–.403±005	–.246±004	.157	5	42
42443.320	–.403±010	–.228±009	.175	5	26
42448.595	–.430±009	–.383±012	.047	5	42
42449.497	–.479±010	–.428±003	.051	5	31
42450.461	–.537±002	–.483±006	.054	4	27
42452.283*	–.616±002	–.600±004	.016	4	26
42452.459	–.641±010	–.585±011	.056	5	28
42453.262*	–.649±004	–.626±005	.023	4	28
42453.557	–.661±005	–.629±004	.032	4	40
42454.256*	–.676±004	–.669±002	.007	4	28
42454.394	–.680±003	–.641±004	.039	4	23
42460.441	–.545±006	–.416±005	.129	5	28
42461.321	–.494±002	–.366±002	.128	4	23
42464.299	–.401±002	–.242±003	.159	4	23
42465.368	–.406±008	–.221±011	.185	5	23
42466.288	–.390±010	–.276±006	.114	5	23
42468.360	–.411±006	–.326±008	.085	5	23
42470.409	–.476±006	–.410±006	.066	4	27
42471.406	–.533±005	–.473±002	.060	4	27
42472.366	–.570±009	–.505±002	.065	4	24
42473.534	–.609±007	–.548±009	.061	4	43
42474.350	–.595±005	–.578±010	.017	5	24
42481.415	–.547±004	–.420±007	.127	6	31
42485.311	–.408±010	–.312±008	.096	5	23
42493.513	–.607±009	–.569±007	.038	5	47
42504.428*	–.522±006	–.382±005	.140	5	40
42511.365	–.499±007	–.436±007	.063	5	35
42522.328	–.645±008	–.526±004	.119	5	34
42523.367	–.625±006	–.469±008	.156	5	39
42524.330	–.584±007	–.431±008	.153	5	35
42530.410	–.481±006	–.353±008	.128	5	47
42531.353*	–.496±005	–.390±002	.106	3	40
42531.400	–.494±005	–.384±010	.110	5	46
42532.519*	–.511±004	–.411±013	.100	4	58
42533.318	–.545±007	–.447±006	.098	6	37
42543.408	–.623±010	–.508±009	.115	6	50
42544.342	–.564±008	–.463±009	.101	5	44
42548.363*	–.521±006	–.355±009	.166	5	47
42548.477	–.522±005	–.347±007	.175	5	58
42553.474	–.538±009	–.444±011	.094	4	59
42554.341	–.563±005	–.452±003	.111	3	46
42556.517	–.593±004	–.535±014	.058	5	61

* observation made at Piszkéstető mountain station

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
42562.409	–.598±008	–.547±008	.051	5	56
42566.384	–.547±006	–.471±014	.076	4	54
42575.460	–.495±004	–.412±013	.083	5	61
42590.380	–.460±005	–.340±007	.120	4	59
42593.410	–.483±005	–.354±012	.129	5	61
42598.386	–.592±010	–.498±007	.094	5	61
42600.506	–.620±009	–.541±008	.079	6	62
42608.384	–.491±009	–.376±004	.115	4	62
42639.551	–.526±006	–.436±010	.090	6	52
42645.578	–.630±007	–.572±009	.058	5	47
42665.588*	–.512±003	–.403±002	.109	3	39
42669.550*	–.615±006	–.572±009	.043	4	42
42673.517*	–.662±005	–.643±005	.019	4	45
42673.570	–.646±007	–.644±007	.002	5	39
42675.554	–.617±006	–.615±008	.002	4	40
42676.532	–.588±003	–.539±009	.049	4	43
42677.522	–.588±010	–.470±011	.118	5	44
42679.527	–.521±007	–.389±006	.132	5	42
42685.611	–.453±004	–.259±009	.194	5	30
42687.583	–.516±008	–.422±008	.094	4	33
42688.588	–.578±001	–.485±007	.093	5	32
42697.605*	–.631	–.550	.081	1	27
42709.568	–.486±005	–.395±006	.091	6	28
42710.617	–.507±005	–.430±005	.077	5	24
42711.608	–.536±003	–.486±006	.050	5	24
42712.470	–.554±007	–.506±002	.048	5	39
42713.614	–.580±002	–.536±008	.044	5	23
42714.568	–.598±011	–.558±009	.040	4	27
42715.652	–.579±004	–.554±010	.025	4	22
42716.574	–.604±002	–.514±003	.090	4	25
42741.630	–.648±004	–.604±004	.044	5	24
42743.626	–.601±001	–.546±009	.055	5	24
42754.353	–.463±005	–.333±005	.130	6	39
42758.379	–.591±009	–.559±009	.032	5	34
42767.447	–.586±008	–.521±001	.065	3	25
42785.470	–.687±005	–.646±008	.041	5	22
42786.621	–.686±009	–.641±004	.045	4	36
42793.417	–.532±009	–.430±004	.102	5	22
42794.311	–.486±008	–.433±010	.053	4	30
42812.266	–.589±009	–.521±009	.068	5	30
42816.564	–.527±004	–.414±007	.113	4	39
42817.456	–.529±004	–.438±006	.091	4	27
42829.457	–.656±006	–.530±004	.126	4	31
42830.514	–.624±002	–.536±001	.088	4	38
42831.364	–.622±002	–.511±001	.111	4	23
42836.410	–.546±007	–.423±008	.123	4	28
42837.352	–.544±006	–.455±005	.089	4	23
42839.251	–.549±003	–.427±005	.122	4	24
42850.357	–.630±005	–.577±003	.053	4	26
42866.349	–.620±006	–.578±008	.042	4	30
42867.314	–.622±005	–.571±018	.051	4	26
42870.465	–.622±010	–.574±006	.048	4	45

* observation made at Piszkéstető mountain station

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
42871.388	–.620±004	–.564±003	.056	4	36
42872.468	–.601±004	–.529±003	.072	4	46
42873.431	–.557±007	–.500±012	.057	4	42
42875.420	–.573±003	–.476±004	.097	4	42
42887.359	–.583±009	–.542±010	.041	5	38
42888.362	–.592±005	–.560±015	.032	5	39
42900.458	–.567±008	–.472±004	.095	3	53
42904.326	–.571±001	–.493±008	.078	4	39
42905.362	–.546±007	–.472±011	.074	5	45
42908.360	–.586±005	–.488±007	.098	5	45
42910.339	–.588±008	–.515±004	.073	5	43
42914.359	–.582±006	–.498±006	.084	2	47
42915.364	–.576±007	–.487±006	.089	4	48
42927.426	–.560±007	–.468±009	.092	4	57
42928.357	–.570±004	–.499±011	.071	4	51
42936.370	–.655±007	–.592±006	.063	3	55
42939.366	–.589±008	–.521±019	.068	4	55
42950.488	–.573±005	–.554±007	.019	5	63
42952.400	–.650±007	–.574±007	.076	3	60
43030.560	–.593±003	–.506±005	.087	4	43
43034.585	–.559±004	–.494±013	.065	4	39
43045.614	–.566±003	–.464±007	.102	4	32
43048.605	–.608±008	–.499±006	.109	4	32
43061.477	–.534±002	–.510±014	.024	5	43
43076.478	–.602±007	–.520±018	.082	5	38
43077.456	–.602±005	–.512±004	.090	5	40
43078.634	–.589±010	–.485±010	.104	5	23
43124.585	–.482±008	–.393±007	.089	3	25
43140.330	–.458±003	–.323±004	.135	4	35
43162.480	–.481±005	–.354±003	.127	4	24
43168.502	–.513±003	–.440±008	.073	6	28
43176.459	–.701±003	–.671±007	.030	5	26
43178.448	–.710±005	–.601±011	.109	4	25
43192.251	–.567±005	–.529±010	.038	5	27
43198.281	–.688±007	–.640±011	.048	5	24
43202.568	–.658±004	–.557±005	.101	4	47
43203.282	–.601±010	–.522±009	.079	5	23
43209.325	–.489±001	–.425±005	.064	4	23
43210.474	–.512±004	–.405±006	.107	4	38
43212.423	–.541±011	–.491±008	.050	4	32
43213.341	–.601±006	–.545±008	.056	4	24
43217.292	–.666±009	–.635±003	.031	3	23
43218.279	–.679±008	–.632±014	.047	3	22
43220.517	–.664±008	–.586±004	.078	4	46
43221.362	–.629±006	–.565±015	.064	4	28
43224.386	–.587±008	–.472±006	.115	4	32
43226.427	–.558±004	–.436±002	.122	4	37
43228.368	–.524±006	–.394±005	.130	5	31
43229.485	–.467±006	–.393±010	.074	5	46
43234.455	–.575±003	–.467±007	.108	3	44
43240.364	–.651±005	–.606±012	.045	4	34
43244.547	–.642±008	–.523±010	.119	5	56
43251.345	–.541±008	–.416±007	.125	4	36
43287.394	–.570±003	–.450±002	.120	4	53

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
43289.355	−.532±006	−.388±004	.144	5	50
43298.380	−.571±007	−.541±011	.030	4	54
43302.512	−.706±002	−.610±009	.096	4	63
43372.473	−.583±006	−.497±002	.086	3	58
43375.582	−.518±006	−.403±004	.115	3	47
43381.558	−.511±006	−.367±009	.144	3	48
43385.596	−.572±004	−.476±010	.096	3	42
43390.587	−.601±005	−.553±002	.048	3	42
43393.595	−.612±008	−.552±005	.060	3	40
43399.484	−.457±005	−.370±006	.087	3	51
43414.461	−.646±005	−.610±004	.036	3	49
43415.503	−.648±008	−.595±004	.053	3	43
43420.574	−.533±007	−.394±003	.139	3	33
43422.620	−.470±005	−.328±009	.142	3	27
43423.597	−.463±011	−.320±003	.143	3	29
43424.560	−.437±002	−.303±007	.134	3	34
43425.565	−.472±010	−.326±007	.146	3	32
43430.518	−.566±011	−.517±011	.049	5	36
43432.550	−.631±006	−.590±005	.041	4	32
43434.519	−.664±004	−.617±007	.047	4	35
43435.509	−.663±005	−.611±003	.052	3	36
43436.478	−.650±002	−.579±004	.071	3	40
43437.443	−.642±010	−.565±005	.077	4	44
43438.537	−.605±002	−.526±007	.079	3	32
43455.598	−.649±002	−.582±017	.067	3	23
43458.586	−.637±003	−.582±002	.055	3	23
43459.663	−.610±004	−.552±003	.058	3	24
43465.673	−.467±005	−.354±005	.113	4	26
43477.564	−.638±005	−.601±007	.037	3	22
43482.592	−.604±009	−.502±008	.102	4	24
43483.687	−.568±004	−.481±009	.087	3	33
43490.367	−.444±004	−.320±003	.124	3	35
43513.640	−.498±002	−.360±005	.138	9	38
43514.466	−.494±003	−.372±006	.122	5	22
43558.416	−.480±003	−.404±006	.076	4	26
43560.500	−.486±006	−.372±006	.114	4	36
43578.278	−.515±008	−.419±006	.096	5	22
43579.388	−.508±009	−.439±008	.069	5	29
43598.367	−.553±008	−.422±009	.131	4	32
43599.369	−.535±012	−.427±007	.108	3	33
43606.322	−.474±005	−.362±007	.112	3	30
43607.373	−.462±005	−.427±016	.035	4	36
43608.326	−.502±008	−.398±009	.104	6	31
43639.336	−.558±006	−.452±004	.106	3	42
43640.326	−.576±003	−.412±005	.164	3	41
43647.389	−.618±005	−.464±005	.154	4	51
44605.360	−.592±004	−.532±005	.060	4	30
44613.476	−.612±003	−.510±001	.102	4	23
44614.317	−.601±001	−.514±007	.087	3	32
44619.292	−.606±007	−.500±007	.106	4	33
44621.374	−.603±001	−.504±005	.099	4	24
44633.493	−.595±003	−.505±005	.090	4	28
44637.476	−.603±002	−.511±004	.092	4	27
44642.494	−.574±002	−.469±002	.105	4	31

Table 3. (cont.)

J.D.	ΔV	ΔB	Δ(B–V)	n	Z
44661.428	–.536±005	–.452±005	.084	5	29
45218.496	–.632±005	–.665±003	–.033	5	51
45221.507	–.696±006	–.642±003	.054	5	49
45223.519	–.707±007	–.624±009	.083	5	47
45224.511	–.667±009	–.560±005	.107	5	48
45225.552	–.630±007	–.516±007	.114	5	43
45226.526	–.590±005	–.459±007	.131	5	46
45251.545	–.464±002	–.312±008	.152	2	35
45259.526	–.529±001	–.481±002	.048	5	34
45260.540	–.565±007	–.522±007	.043	4	33

Table 4

Photoelectric U observations of RU Cam
(variable – BD +70°448)

J.D.	ΔU	n	J.D.	ΔU	n
39536.591	–.292±009	5	39617.358	–.313±008	3
39538.572	–.318±005	3	39618.359	–.370±006	4
39546.304	–.468±005	5	39623.371	–.365±014	4
39547.319	–.470±004	5	39639.381	–.306±019	3
39562.484	–.337±005	4	39664.420	–.326±011	4
39564.292	–.420±006	6	40449.513	–.714±011	4
39570.304	–.577±006	6	40807.471	–.437±006	3
39585.346	–.465±010	3	41634.484	–.545±003	5
39588.322	–.691±013	3	41637.604	–.506±006	5
39590.324	–.650±002	4	41650.430	–.574±006	5
39598.346	–.345±012	4	41679.275*	–.530±016	4
39600.326	–.287±011	3	41680.248*	–.469±010	4
39604.361	–.336±003	3	41682.277*	–.413	1
39610.392	–.624±009	4	42452.283*	–.644±009	4
39611.361	–.649±011	4	42453.262*	–.654±016	4

* observation made at **Piszkéstető** mountain station