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THE NEW PRIMARY MINIMUM OF OW Gem

The long-period eclipsing binary OW Gem (SAO 095781) was first listed as a possible variable by Hill and Schilt (1952), preliminary period was determined by Kaiser (1988b) as $1258^{d}.56$ and the next time of primary eclipse was predicted to occur on September 2, 1991. First photoelectric photometry was reported by Williams (1989).

The present observations were obtained at three observatories at the High Tatras and Brno and are analysed together with CCD observations by Pravec (1992). The uncooled single channel photometers mounted in Cassegrain focus of the 60 cm telescope at Skalnaté Pleso Observatory with an EMI 6295B photomultiplier (abbr. SP), in Nasmyth focus of the 40 cm telescope with an EMI 6256B photomultiplier at Copernicus Observatory in Brno (abbr. B1), and in Newton focus of the 60 cm with an EMI 6256S photomultiplier telescope at University Observatory in Brno (abbr. B2), and standard UBV filters were used. The integration time of one measurement was ten seconds. The observations were corrected for the influence of differential extinction and transformed to the international UBV system. Table 1 contains the photometric data for all comparison and check stars. These photometric data were derived from the observations of 20 Gem (V=5.81, B−V=+0.475, U−B=+0.065) in two nights and compared with the data from photometric catalogues. The accuracy of these photometric data is about 0.01 mag.

Table 1. Photometric data for OW Gem, comparison and check stars

STAR	SAO	RA 1950.0	DEC 1950.0	V	B−V	U−B
comparison	95810	$6^{h}29^{m}47^{s}$	+17°04.0	7.925	+0.445	+0.415
check1	95819	6 30 12	+16 59.2	7.650	−0.040	−0.550
check2	95777	6 28 44	+17 10.5	9.050	+0.230	+0.080
check3		6 29 02	+17 08.1	9.90	+0.30	+0.02
OW Gem*	95781	6 28 48	+17 07.1	8.270	+0.650	+0.570

*at maximum light

The differences ΔU, ΔB, ΔV between the variable and comparison stars and their errors are given in the Table 2 for all observatories. The number of observations is in the fifth column.

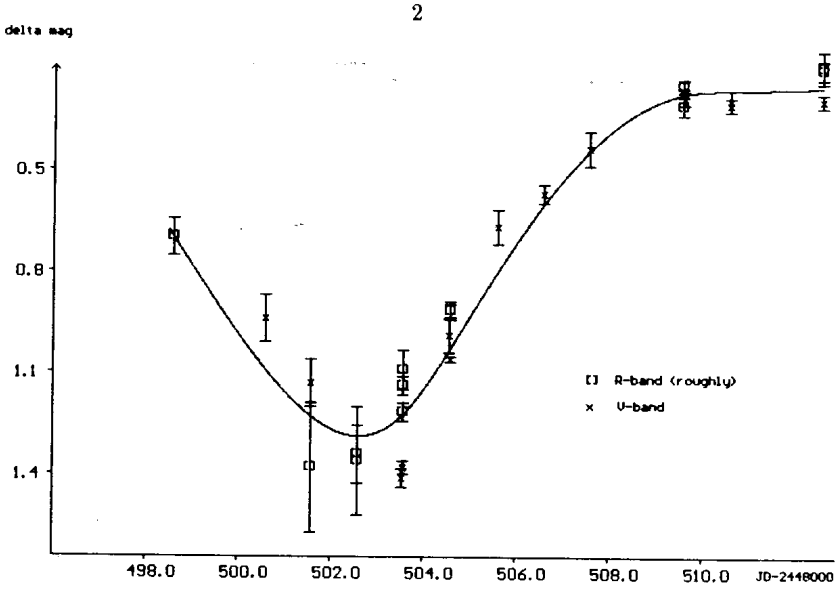

Figure 1. CCD and V differential photometry of OW Gem

Table 2. The observed magnitude differences for OW Gem

JDhel 2448000+	ΔV	ΔB	ΔU	N	Obs
491.582	0.31±0.01	0.50±0.02	0.66±0.03	10	SP
500.604	0.94 0.07	1.17 0.09	1.51 0.10	5	B1
501.598	1.13 0.07	1.20 0.13	1.50 0.17	8	B1
503.554	1.41 0.03	1.79 0.04	1.99 0.08	12	SP
503.593	1.38 0.02	1.76 0.04	1.97 0.08	12	SP
504.565	0.99 0.05	1.36 0.06	–	10	B1
504.591	1.06 0.01	1.38 0.01	1.57 0.05	12	SP
505.608	0.67 0.05	1.13 0.05	1.30 0.05	4	B1
506.604	0.57 0.03	0.80 0.03	1.12 0.03	14	B1
507.573	0.44 0.05	0.68 0.05	1.02 0.05	3	B1
509.596	0.29 0.02	0.48 0.03	0.75 0.03	14	B1
510.592	0.30 0.03	0.44 0.01	–	6	B2
510.604	0.31 0.02	0.47 0.05	0.70 0.04	7	B1
512.607	0.30 0.02	0.51 0.02	0.73 0.02	12	B1
521.636	0.31	0.50 0.01	0.66 0.03	2	SP
531.602	0.31 0.02	0.51 0.01	0.69 0.02	8	SP
573.530	0.32 0.01	0.53 0.01	0.80 0.01	2	SP
600.468	0.33 0.02	0.54 0.01	0.68 0.01	4	B2
619.522	0.31 0.01	0.54 0.02	–	2	B1
625.442	0.33 0.01	0.55 0.01	–	2	B1
625.480	0.34 0.01	0.55 0.03	0.69 0.02	4	B2
677.329	0.33 0.01	0.53 0.01	0.71	2	B2

The large scatter of observations in the nights 2448500−504 was caused by strong interference of the Moon in vicinity of the variable star. Bad coverage of the decreasing branch of the light curve was caused by unfavourable weather conditions. The most interesting part of these data – around primary minimum – is presented in Figure 1.

The time of the primary minimum was determined in the following way. The mean light curve was constructed from CCD observations by Pravec (1992) aand our photoelectric V-band differential magnitudes. The time of minimum brightness was determined by Kwee-van Woerden's (1956) method. The time of the primary minimum obtained (JD_{min}=2448502.58±0.12) is shifted by +0.62 day with respect to Kaiser's prediction. Considering data from Kaiser et al. (1988a) and Kaiser (1988b) the new ephemeris for OW Gem is:

$$JD_{min}=2448502.58+1258.583\times E.$$
$$\pm 0.12 \quad \pm 0.046$$

Observations of the next minimum are highly desirable to improve the ephemeris, which is still uncertain. The next primary minimum is predicted for 1995 February 12.66±0.13. The error resulted mainly from the error of the derived time of the 1991 primary minimum; actual error of the prediction is probably larger.

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