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CHANGES IN THE LIGHT CURVE OF W UMa

New photometric observations of W UMa were carried out on three nights of February 16, March 12, March 13, 1983. The observations were made at the Ostrowik Station of the Warsaw University Observatory. A single channel photometer with an EMI 6256 photomultiplier attached to the 60 cm reflector was used. The comparison star was BD $+56^{\circ}1399$ and BD $+56^{\circ}1398$ served as a check star. The comparison star was the same as used most often in previous investigations of W UMa. The faint visual companion ADS 7494B ($V=12^{m}.3$, $B-V=1^{m}.7$, Eggen, 1963), about 7" from W UMa was included in all measurements of the variable. The observations were made in V and B and were reduced to the standard UBV system. 560 individual observations in V and 559 in B were obtained. Times of minima obtained from these data with the Kwee and Van Woerden (1959) method are given in Table I.

Table I

J.D. Hel 24 40000+	Colour	E	O-C
5382.55723 6	V	1187.5	-0.0004
5382.55688 5	B	1187.5	-0.0007
5406.41124 11	V	1259	-0.0016
5406.41162 15	B	1259	-0.0012
5407.41197 12	V	1262	-0.0017
5407.41279 9	B	1262	-0.0009
5407.58019 12	V	1262.5	-0.0003
5407.57971	B	1262.5	-0.0008

The O-C values in the Table are calculated with the ephemeris (Hamzaoğlu et al. 1982):

$$\text{Min I} = \text{J.D. Hel.}244\ 4986.3624 + 0^{d}.33363808E$$

One can see that the O-C deviations for the secondary minimum are slightly smaller than those for the primary one.

There are no large differences between the light curves obtained on different nights. Therefore all individual observations were phased with the ephemeris:

$$\text{Min I} = \text{J.D. Hel.}244\ 5382.5567 + {}^{d}0.33363808E$$

and the normal points were calculated. They are presented in Figure 1.

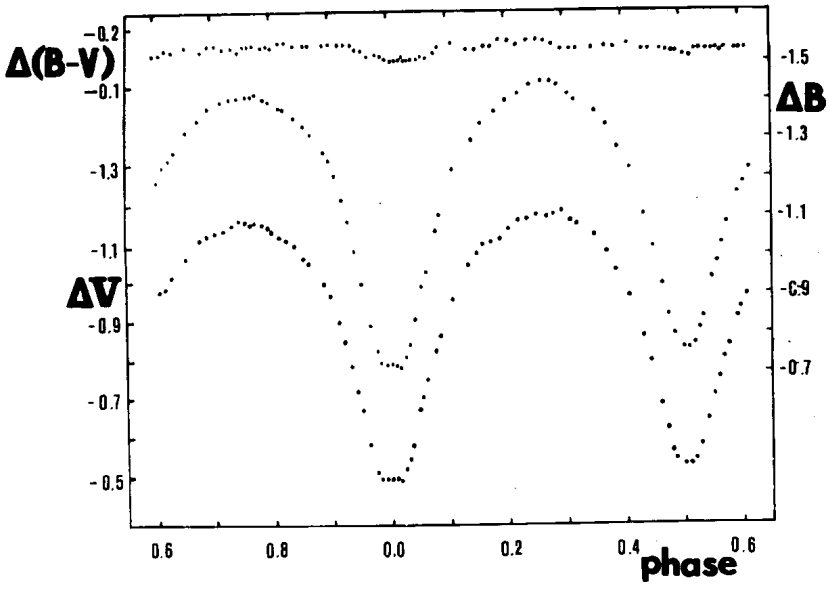

Figure 1

The light and colour curves of W UMa made in 1983

It is well known that the light curve of W UMa is variable in the time scale from weeks to years. This behaviour is not unique among W UMa-type systems. Basing on the available publications I have collected 12 V light curves of W UMa obtained between 1965 and 1983.

Unfortunately direct intercomparison between them was impossible because some observations were left in the instrumental systems. To investigate the seasonal changes in the light curve of W UMa four parameters were chosen (three of them are linearly independent). Denoting the stellar magnitudes at the primary and secondary minima as Min I and Min II, respectively, and the stellar magnitudes at the maxima following the primary and secondary minima

as Max I and Max II, respectively, we can define the parameters:
d1 = MinI - MinII, d2 = MinI - MaxI, d3 = MinII - MaxII, d4 = MaxI - MaxII.
These parameters calculated from 12 light curves are displayed in Figure 2.

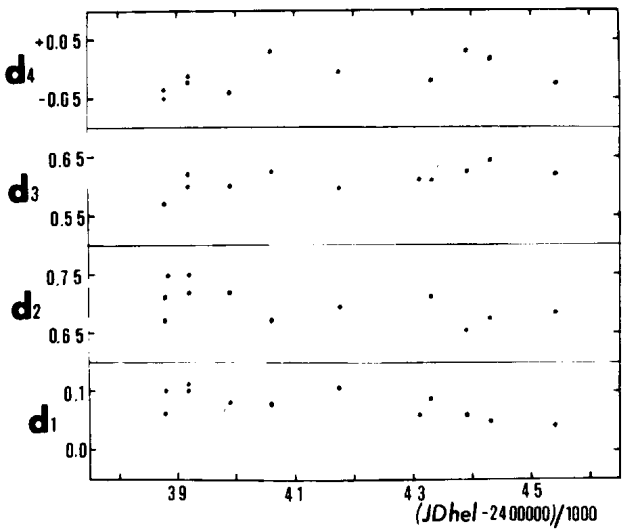

Figure 2

The changes of the parameters describing the light curve of W UMa in the last 17 years.

The observations were taken from the following sources:

1. Binnendijk, L., 1966, Astron. J., 71, 340
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8. Linnaluoto, S., Piirola, V., 1979, Astron. Astrophys. Suppl. Ser., 36, 33
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10. Rigterink, P.V., 1972, Astron. J., 77,230
11. present observations

The mean errors of the points in Figure 2 are in the range $0^m.003$-$0^m.02$. From the inspection of Figure 2 we may conclude:

1. The depth difference d1 between minima can change within at least $0^m.08$ and it has some tendency for decreasing during the last 17 years. The primary minimum is always deeper than the secondary one.
2. The amplitude of d2 is about three times greater than the amplitude of d3.
3. The asymmetry of the maxima d4 changes within $0^m.07$. Usually the Max I is higher than the Max II.

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Hamzaoğlu, E., Keskin, V., Eker, T., 1982, I.B.V.S. No. 2102
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