COMMISSIONS 27 AND 42 OF THE IAU
INFORMATION BULLETIN ON VARIABLE STARS
Number 4134

Konkoly Observatory
Budapest
28 December 1994
HU ISSN 0374 – 0676

VW CANUM VENATICORUM: NEW EPHEMERIS AND LIGHTCURVE

[BAV Mitteilungen Nr. 74]

In this paper we report on our photographic and CCD photometry on the RR Lyr type variable VW CVn.

VW CVn = SVS 1291 was discovered by Kurochkin (1961) as variable of W UMa or β Lyr type with a range of brightness between $11^{\rm m}.4$ and $12^{\rm m}.6$. Kurochkin calculated two sets of first elements and gave first photographic light curves. Elements valid after JD 2436360 were:

$$\mathrm{Min\,I} = \mathrm{HJD}\,2435923.246 + 0^{\rm d}.850012 \times \mathrm{E}$$

With the above data VW CVn is listed in the fourth edition of the GCVS (Kholopov et al. 1985). Until recently the variable remained almost unobserved (exceptions Diethelm 1976, Diethelm 1980 and German 1982) when Vandenbroere (1994) found the elements to be in error. This prompted us to put VW CVn on our observing program.

One of us (T.B.) investigated this variable on 443 plates of the Sonneberg Sky Survey. The observations by the other were made with an SBIG ST6 camera without filters attached to a 20 cm SC telescope. From these measurements we found the variable to be of RR Lyr type, the range of brightness is between $11^{\rm m}.96$ and $12^{\rm m}.43(pg)$ and M−m = 0.46.

Analysing the CCD measurements we got first elements:

$$\mathrm{Min\,I} = \mathrm{HJD}\,2449466.42 + 0^{\rm d}.425 \times \mathrm{E}. \qquad (1)$$

The timespan covered by the Sonneberg plates (1956 – 1994) was divided into several parts. Using this first ephemeris (1) for each of these parts a mean lightcurve was calculated and the time of the normal maximum was derived (see Table 1). Obviously the period did not remain constant in the time interval studied. Considering the accuracy of estimates on photographic plates the period probably changed about epoch number −21000. Least squares fits in each of these intervals yield the following linear elements:

$$\begin{array}{l} \mathrm{Min\,I} = \mathrm{HJD}\,2438387.169 + 0^{\rm d}.4249932 \times \mathrm{E} \\ \qquad\qquad\qquad\quad \pm 7 \qquad\quad \pm 3 \end{array} \qquad (2)$$

(valid between JD 2435861 and JD 2440000)

$$\begin{array}{l} \mathrm{Min\,I} = \mathrm{HJD}\,2449466.428 + 0^{\rm d}.4249786 \times \mathrm{E} \\ \qquad\qquad\qquad\quad \pm 6 \qquad\quad \pm 7 \end{array} \qquad (3)$$

(valid after JD 2440000)

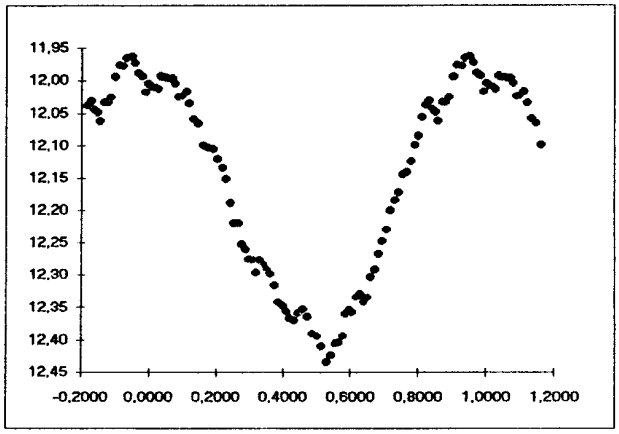

Figure 1: Mean light curve from all photographic estimates of VW CVn on plates of the Sonneberg Sky Survey computed with respect to the new ephemeris (3). Magnitudes according to Kurochkin. The hump near the maximum is a result of very bright observations appearing only temporarily in exactly that range of phase.

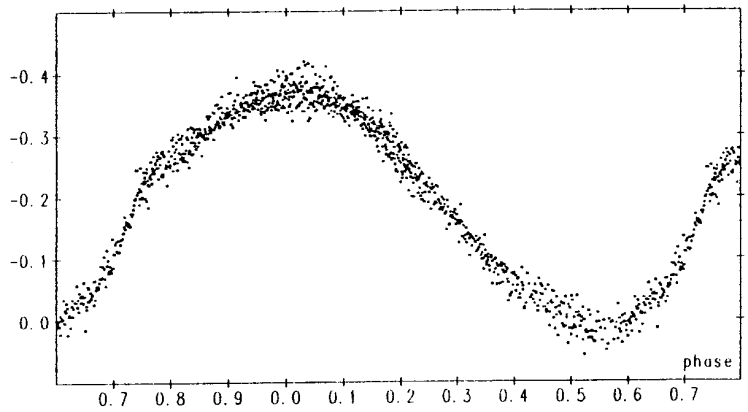

Figure 2: Differential CCD light curve of VW CVn computed with respect to the new ephemeris (3). Each point is the result of one CCD image.

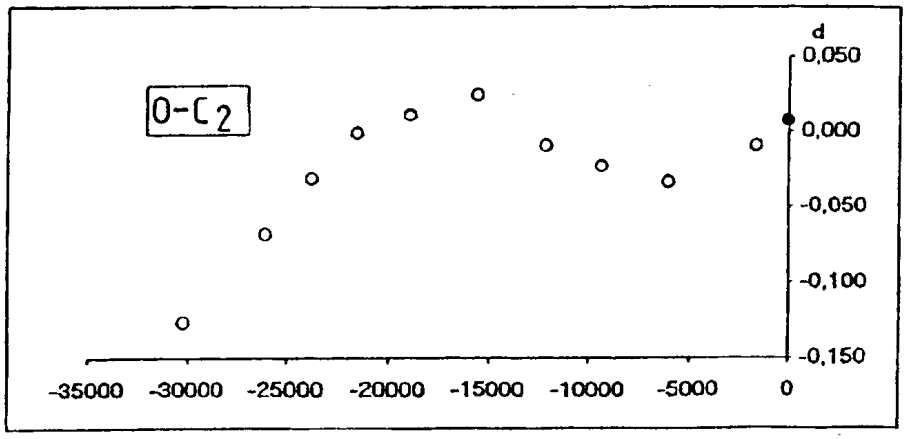

Figure 3: O–C diagram for VW CVn computed with respect to the new ephemeris (3) using all available maximum timings.
• represents photoelectric, o photographic normal maxima.

Times of normal maxima for VW CVn, epochs and residuals computed with respect to the ephemeris (3) derived in this paper.

N	JD hel. 2400000+	W	T*	Epoch	(O–C)	Observer
1	36632.372	1	P	−30199.0	–0.127	T.Berthold
2	38387.167	1	P	−26070.0	–0.069	”
3	39352.330	1	P	−23799.0	–0.032	”
4	40291.988	1	P	−21588.0	–0.002	”
5	41393.545	1	P	−18996.0	+0.010	”
6	42840.186	1	P	−15592.0	+0.024	”
7	44292.729	1	P	−12174.0	–0.010	”
8	45486.055	1	P	−9366.0	–0.023	”
9	46914.822	1	P	−6004.0	–0.034	”
10	48761.379	1	P	−1659.0	–0.010	”
11	49466.435	6	E	0.0	+0.007	F.Agerer

*) P denotes photographic normal maxima,
E CCD observed normal maximum.

A detailed paper dealing with further analysis of the long–time behaviour of the period and the results of the CCD photometry is now in progress.

F. AGERER
T. BERTHOLD
Bundesdeutsche Arbeitsgemeinschaft
für Veränderliche Sterne e.V. (BAV)
Munsterdamm 90,
D-12169 Berlin, Germany

References:

Diethelm, R.: 1976, *BBSAG Bull.*, 25
Diethelm, R.: 1980, *BBSAG Bull.*, 47
German, R.: 1982, *BBSAG Bull.*, 61
Kholopov, P.N. et al.: 1985, Gen. Cat. of Var. Stars, 4th Ed., Nauka, Moscow
Kurochkin, N.E.: 1961, *Perem. Zvezdy*, **13**, 5, 331
Vandenbroere, J.: 1994, *BBSAG Bull.*, 105

ERRATUM

In the No. 4134 issue of the IBVS all ephemerides of VW CVn refer to normal maxima and not Min I (as stated erroneously in the text). The authors of that note and editors of the IBVS are grateful to Dr. N. Samus for calling their attention to this inconsistency.