COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 1978

Konkoly Observatory
Budapest
1981 June 19
HU ISSN 0374-0676

LIGHT CURVES OF DD Com AND TY UMa

DD Com is an eclipsing binary of W UMa type. It has been discovered by Hoffmeister (1964). A photographic light curve has been published by Meinunger and Wenzel (1968). The object has been observed on April 12, April 13, May 13, 1980 and February 11 and February 13, 1981 with the double beam photometer at the 1.06m telescope of Hoher List Observatory. Comparison star has been a 13th magnitude star 11mm left and 13mm above DD Com in the finding chart by Hoffmeister.

The star showed minima at

JD hel.	2444342.3845	Ep. 24379.0	O-C $-0^d.001$
	2444373.48	24494.5	0.00
	2444647.6750	25513.0	+0.010
	2444649.6925	25520.5	+0.008

The previously known light elements by Meinunger and Wenzel can be slightly modified:

JD hel. min. I = 2437779.410 + $0^d.2692061$E

Light curves from the B and V measurements are shown in Figs. 1 and 2. Not only the minima differ well in brightness, but also the first maximum is considerably brighter than the second maximum. These asymmetries have decreased between 1980 and 1981, however. It is concluded that DD Com is a more active contact binary, similar to VW Cep.

TY UMa has been discovered by Beljawsky (1933) and was observed by several authors since then. But only very shortly ago (Broglia and Conconi, 1981) the correct period ($0^d.35$) of this W UMa type eclipsing binary has been announced.

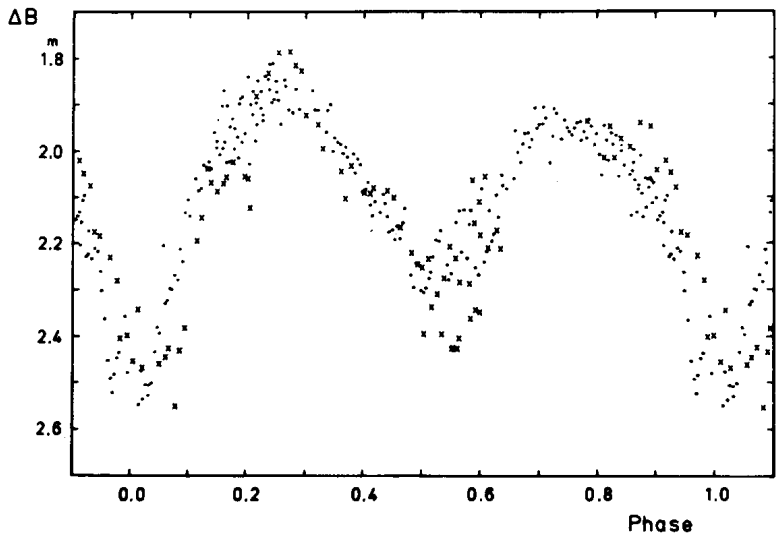

Fig. 1 B light curve of DD Com. Dots: 1980 data, crosses: 1981 data

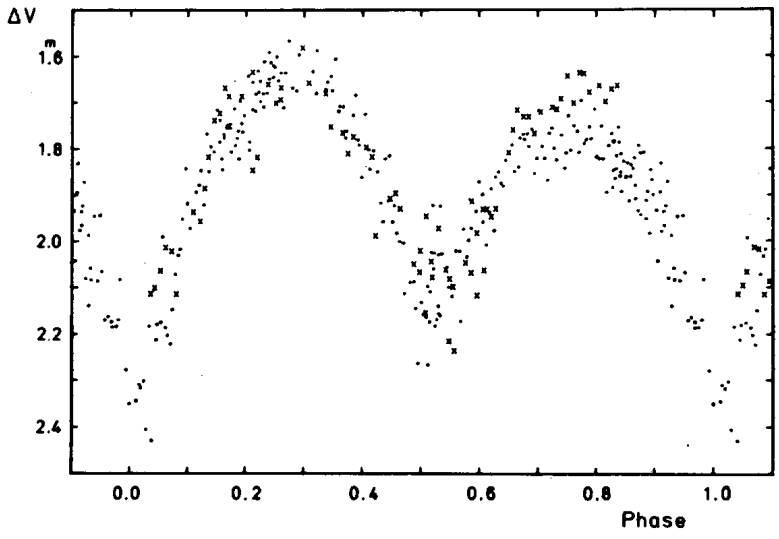

Fig. 2 V light curve of DD Com

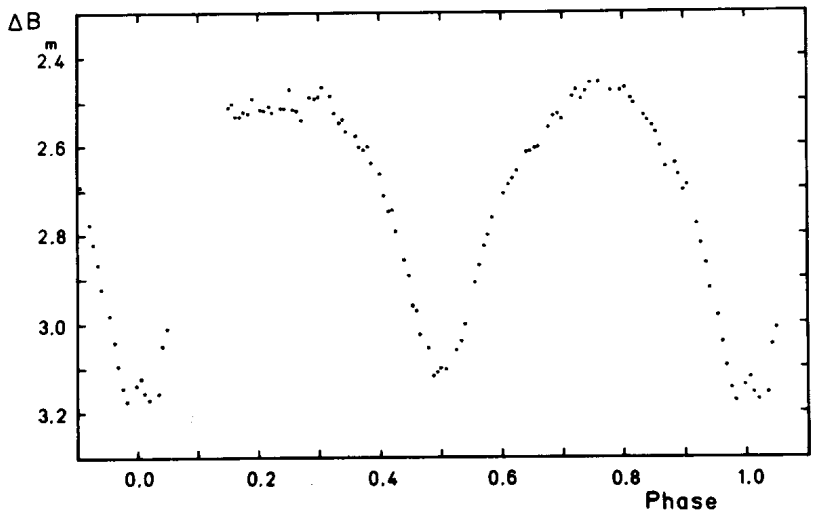

Fig. 3 B light curve of TY UMa

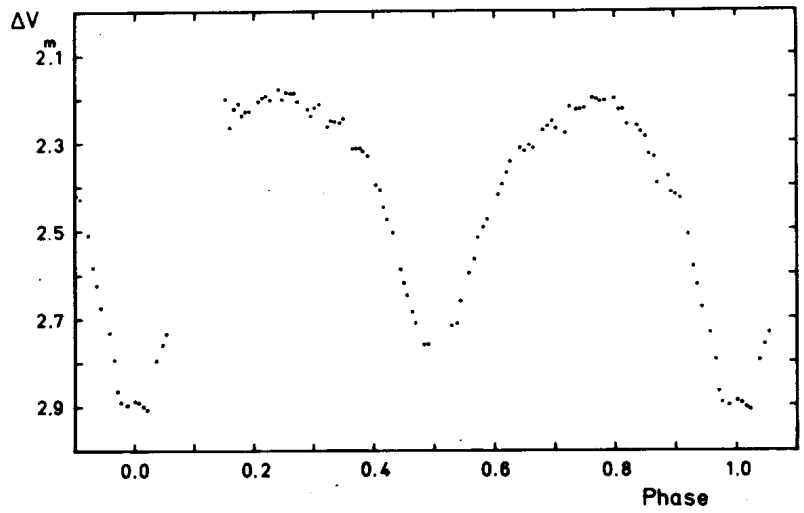

Fig. 4 V light curve of TY UMa

Observations of TY UMa could be obtained on February 13, 1981. BD+56°1572 served as comparison star. The observing instrument was again the 1.06m telescope of Hoher List Observatory with its double beam photometer. The following minima times have been determined:

JD hel. 2444649.389 min.II
2444649.564 min. I

Although both minima are 7 minutes early with respect to the new light elements by Broglia and Conconi, a period change since 1967 cannot be derived from this result yet. Figures 3 and 4 show the light curve of TY UMa in B and V. Especially the V curve shows minima with constant intervals. So this is another W UMa system with complete eclipses.

Fourier coefficients for the light outside the eclipses (phases 0.16...0.34, 0.66...0.84) have been calculated:

$$\ell_B = 0.9031 + 0.0157 \cos\theta - 0.0920 \cos 2\theta - 0.0017 \sin\theta - 0.0158 \sin 2\theta$$

$$\ell_V = 0.8729 + 0.0283 \cos\theta - 0.1059 \cos 2\theta + 0.0115 \sin\theta - 0.0094 \sin 2\theta$$

There are a positive cos θ term and a larger sin 2θ term. They are in contradiction to a light curve free of complications. A detailed analysis should be postponed until reliably undistorted light curves of TY UMa are available.

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References:

Beljawsky, S., 1933, Variable Stars 4, 196

Broglia, P., Conconi, P., 1981, Inf. Bull. Variable Stars No. 1949

Hoffmeister, C., 1964, Astron. Nachr. 288, 49

Meinunger, L., Wenzel, W., 1968, Veröff. Sternw. Sonneberg 7, H. 4, 389