COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 1511

Konkoly Observatory
Budapest
1978 December 11

PHOTOELECTRIC TIMES OF MINIMA AND THE PERIOD OF UV Psc

We have observed the light curve of the eclipsing binary UV Psc photoelectrically in two colours on 16 nights in September and October of 1976 and 1977 with the 30 cm Maksutov telescope of the University Observatory at Ankara. An additional timing of the primary minimum was made in October 1978. The photomultiplier tube used was EMI 16256 S (uncooled) with standard B,V filters.

The observed times of minima are given in the following table, where $MJD_\odot$ stands for the heliocentric "Modified Julian Day".

$MJD_\odot$	s.e.	colour	E	O-C
43052.9928	±0.0003	V	17438	+0.0176
.9923	±0.0004	B	"	+0.0171
43399.9951	±0.0006	V	17841	+0.0184
.9952	±0.0008	B	"	+0.0185
43406.0226	±0.0001	V	17848	+0.0186
.0224	±0.0002	B	"	+0.0184
43424.9658	±0.0002	V	17870	+0.0188
.9661	±0.0002	B	"	+0.0191
43427.9804	±0.0006	V	17873.5	+0.0197
.9809	±0.0003	B	"	+0.0202
43784.8835	±0.0003	V	18288	+0.0192
.8834	±0.0002	B	"	+0.0191

The minima were timed by the method of Kwee and van Woerden (1). The O-C values were calculated using the formula

$$MJD_\odot(\text{Min I}) = 28038.055 + 0^d.861046 \cdot E \quad (1)$$

given by Huth (2). The present observations, excluding the secondary minimum, give $MJD_\odot(\text{Min I}) = 43406.02254 \pm 0.00008$ (s.e) as a best weighted mean.

The O-C diagram based on formula (1) is shown in Fig. 1. All of the observations available to us have been plotted. The plus signs are Huth's (2) photographic observations. The crosses refer to the visual observations (3,4,5,6). The present and previous (7,8,9,10) photoelectric timings are shown as large dots

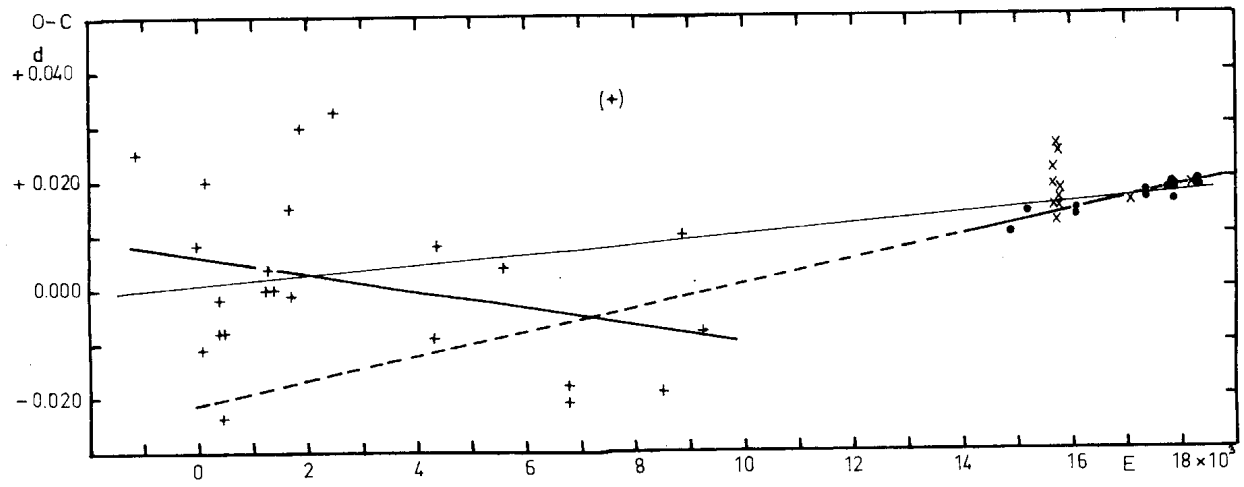

Fig. 1

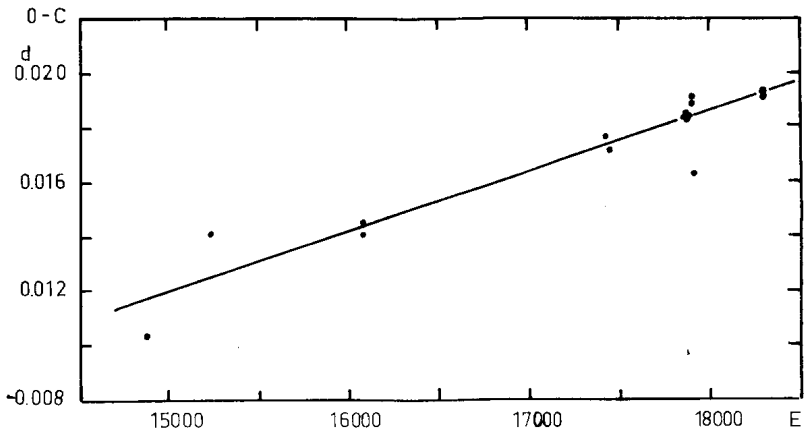

Fig.2

(secondary minimum not plotted). The photoelectric determinations are also plotted on a larger scale in Figure 2, where the straight line is a least squares fit through the points, and corresponds to

$$MJD_{\odot} = 28038.034 \pm 4 + 0.8610482 \pm 2 \cdot E. \text{ (s.e.)}$$

The weak line in Fig.1 represents the formula

$$MJD_{\odot} = 28038.056 \pm 3 + 0.8610469 \pm 2 \cdot E.$$

This has been calculated from all the points by assingning weights according to the precepts worded, for instance, by Binnendijk (11). It can be seen from Fig.1 that this fits the observations only approximately and that, although the more recent observations do indicate a longer period, no single linear formula can adequately represent all the observations, weighted or otherwise. In fact a slightly shorter period than that in formula (1) will fit the photographic observations equally well or even better if the deviant (bracketed) point is excluded as shown by the downsloping line in Fig.1, which corresponds to

$$MJD_{\odot} = 28038.061 \pm 4 + 0.8610444 \pm 10 \cdot E.$$

It is also seen that the photographic minimum times with E>4000 fall, on the average, on the extention of the line through the photoelectric observations (dashed line).

We may therefore conclude that there is evidence that a change of period amounting to about $0^{s}.3$ occurred some time around E=7000 (MJD=34065). Such a change of period should have an important bearing on the evolution of RS CVn binaries, of which UV Psc is supposed to be one.

Finally the observed times of minima for MJD>40859 are well represented by

$$MJD_{\odot}\ (\text{Min I}) = 43406.0225 \pm 1 + 0.8610482 \cdot E. \pm 2\ (\text{s.e.})$$

I wish to thank Prof.B. Cester for calling my attention to, and making available some of the literature on this star, and for advice.

Z. ASLAN

Ankara University Observatory
A.Ü.Fen Falültesi, Ankara, Turkey

References:

(1) Kwee,K.K. and van Woerden, H.,Bull.Astron.Neth.12,327, 1956
(2) Huth, H., MVS No.424, 1959
(3) Locher, K.,B.B.S.A.G. Bulletin 5, 1972
(4) Locher, K.,B.B.S.A.G. Bulletin 6, 1972
(5) Peter, H., B.B.S.A.G. Bulletin 26,1976
(6) Locher, K.,B.B.S.A.G. Bulletin 38,1978
(7) Güdür,N. and Şengonca,H.,I.B.V.S. No.530, 1971
(8) Karacan, H. and Ibanoğlu,C., I.B.V.S. No.647, 1972
(9) Demircan,O.,Baygün,C.,and Ertükel, S.,I.B.V.S.No.937, 1974
(10) Al-Naimiy,H.,Budding,E.,Jassur,D.,and Sadik,A.R.,I.B.V.S. No.1415, 1978
(11) Binnendijk, L., "Vistas in Astronomy" 12, 217, 1970