

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

Number 1157

Konkoly Observatory
Budapest
1976 July 26

CHANGES IN PERIOD OF SHORT TERM VARIABILITY
OF NOVA V1500 CYGNI

We report new photometric observations which confirm the suggestion made by one of us (Semeniuk 1975) that the short term variability period of Nova V1500 Cygni is variable.

The observations were made photoelectrically in V filter with the 60 cm reflector of the Ostrowik station of the Warsaw University Observatory in December 1975 and from May to July 1976. Basing on these observations the following times of minima and maxima were obtained:

MINIMA		
JD ₀ 2442000+	JD ₀ 2442000+	JD ₀ 2442000+
758.244	919.495	952.460
759.234	938.464	954.399
765.225	939.461	961.437
765.369	940.426	962.404

MAXIMA		
JD ₀ 2442000+	JD ₀ 2442000+	JD ₀ 2442000+
757.326	938.413	955.445
759.305	940.500	956.415
765.297	951.408	962.482
937.441	954.465	963.446

The short term light variability was always well expressed with roughly symmetrical and nearly sinusoidal light curve of variable amplitude. In December 1975 the amplitude was around 0.04 mag but in May to July 1976 it was generally higher and varied from night to night between 0.04 and 0.12 mag.

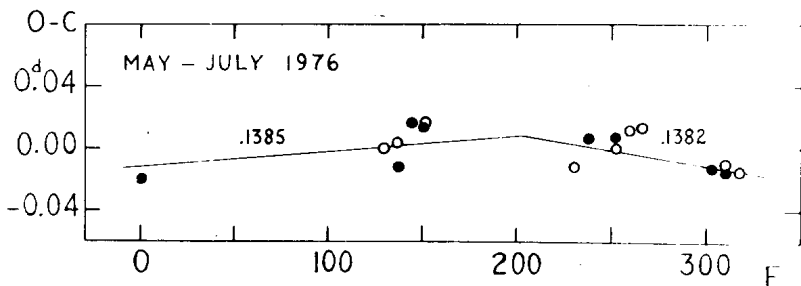


Fig. 1

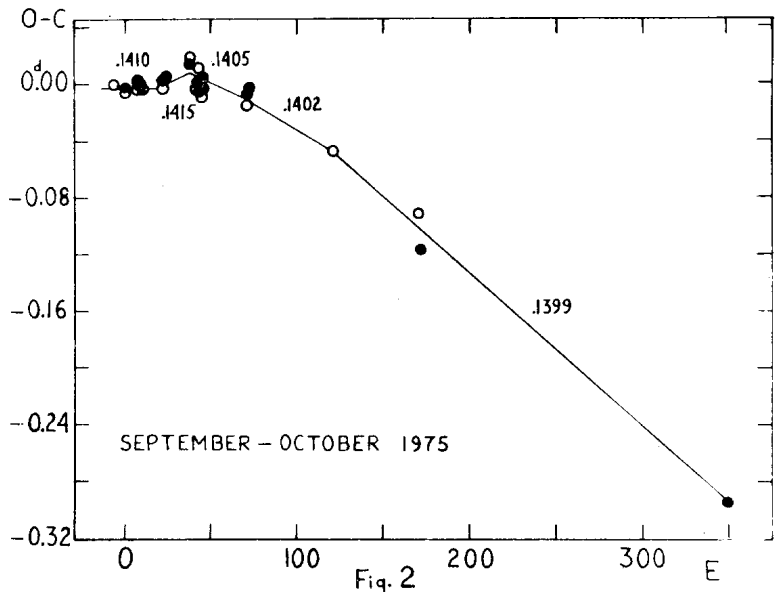


Fig. 2

In September 1975 the period of the short term variations was equal to $0^d.1410$ (Semeniuk 1975, Rosino and Tempesti 1976). Our observations from May to July 1976 fit well into the period $0^d.1384$. Fig. 1 shows the O-C residuals obtained with the elements:

$$JD_{\ominus} \text{Min} = 2442919.515 + 0.1384 \cdot E$$

$$JD_{\ominus} \text{Max} = 2442919.588 + 0.1384 \cdot E$$

Filled dots in Fig. 1 (and also in Fig. 2, following below) correspond to minima, open circles correspond to maxima. We can see that the O-C residuals do not exceed $0^d.02$ and no other period can give such a good agreement. Slightly different values of period could be accepted if the variations of amplitude were sufficiently large to interchange the roles of maximum and minimum, but in any case the period cannot be larger than $0^d.1390$ and this value is much smaller than the value $0^d.1410$ observed in September 1975. Then, we have a strong evidence for a large change of period that occurred during 9 months. Fig. 1 shows that the decrease of period may continue also in June 1976.

As the observations made in December 1975, considered separately, fit into the period $0^d.1396$ we can conclude that the new observations taken together indicate a continuous decrease of period from September 1975 to July 1976. Taking into account this conclusion we have made the O-C diagram for the earliest series of observations from September and October 1975 (Koch and Ambruster 1975a,b; Rosino and Tempesti 1976, Tempesti 1976, Semeniuk 1975). It is shown in Fig. 2, where the O-C residuals were calculated with the elements:

$$JD_{\ominus} \text{Min} = 2442664.305 + 0.1410 \cdot E$$

$$JD_{\ominus} \text{Max} = 2442664.364 + 0.1410 \cdot E$$

Segments of straight line in Figures 1 and 2 represent approximately the changes of period and numerals written beside the different segments denote corresponding values of period. We can see that apart from the decrease of period from the middle of September on there is a marginal indication for an increase of period during a few first days of observations.

Our general conclusion is that there is a good observational evidence for a gradual decrease of period from $0^d.1415$ on

Sept. 12, 1975 to $O^d.1382$ at the end of June 1976. The observed decrease of period by 2.3 % may be interpreted in several ways as a result of mass motion of detached matter in a close binary system if we accept that the observed period reflects the true orbital period. However, it is also possible that we observe phenomena observed already in VW Hyi. During the supermaximum of this dwarf nova an apparent period was larger by 3 % than the constant orbital period, and this apparent period was also showing some decrease in course of the outburst (Marino and Walker 1974, Vogt 1974, Warner 1975).

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