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ON THE ORBITAL PERIOD OF A PROBABLE POLAR HV ANDROMEDAE

The cataclysmic variable HV Andromedae (= S 10777) was discovered by Meinunger (1975) and classified by him as an irregular variable of Ia type. Meinunger (1980) supposed that the object belongs to AM Her-type stars based on photometric and spectral observations. Unfortunately, until now there are no data on polarisation, spectral changes and rapid variability.

HV Andromedae was investigated using 94 ORWO ZU-21 photographic plates, which were obtained on the AZT-3 telescope of Astronomical observatory of Odessa State University in autumn of 1984. The magnitudes of comparison stars were taken from Meinunger (1975).

Individual light curves of HV Andromedae are shown in Figure 1. The magnitude changes with a 81-minute cycle, but periodic variations are perturbed by strong irregular changes. Because the duration of the exposure is 1/7 of the period, the observed light curves are essentially deformed. The magnitude of brightness variations in some nights may be greater than 1^m. As for AM Herculis (Andronov, et al., 1980), the shape of the light curve varies not only from night to night, but also from cycle to cycle. When luminosity decreases, the amplitude of magnitude variations increases, that is usual for "intermediate state" of polars (Andronov, 1984).

By our observations, there was a tendency of brightness increase from night to night, that corresponds to the upper part of ascending branch of luminosity curve. During 16^d the system brightened by $\sim 0^m.3$, which is in fairly good agreement with Meinunger's (1975) data. By his data the duration of the ascending branch on the luminosity curve is $\sim 200^d$ long, that is greater than $30\text{-}80^d$ for AM Herculis.

On the light curve obtained on J.D. 2446007 one may suppose the beating of two similar in magnitude oscillations with the periods of approximately 0.056^d and 0.062^d. But because of the accuracy of photographic observations it is impossible to draw a certain conclusion.

The periodogram for HV Andromedae is shown in Figure 2. The values of periods of $0^d.055994$, $0^d.055404$, $0^d.056600$, $0^d.055043$, $0^d.057010$, $0^d.055627$,

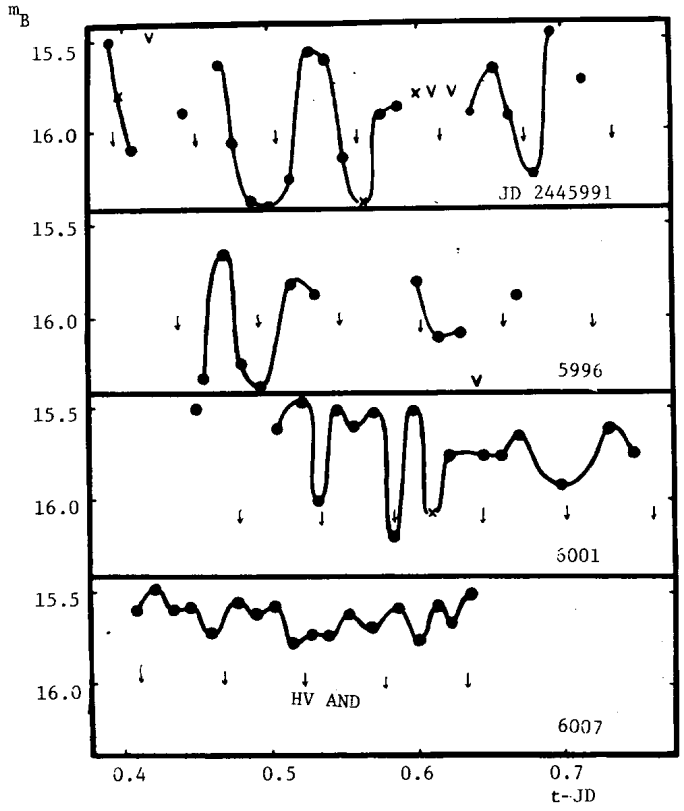

Figure 1: Individual light curves of HV Andromedae. Uncertain observations are marked by crosses, ephemerides for times of minima are marked by arrows.

are possible. As a test parameter we used the dispersion of phases of times of minima which were derived from our observations and are shown in Table I.

Table I

H.J.D.	E	O-C	H.J.D.	E	O-C
2445991.4984	0	$-0^d.0076$	2446001.5319	179	$0^d.0030$
5991.5602	1	-0.0018	6001.5818	180	-0.0031
5991.6220:	2	0.0040	6001.6327	181	-0.0082
5991.6767	3	0.0027	6001.7053:	182	0.0084
5991.7252	4	-0.0048	6007.4057	284	-0.0026
5996.4916	89	0.0021	6007.4605	285	-0.0038
5996.6212	91	0.0198	6007.5256	286	0.0053
			6007.5996:	287	0.0233

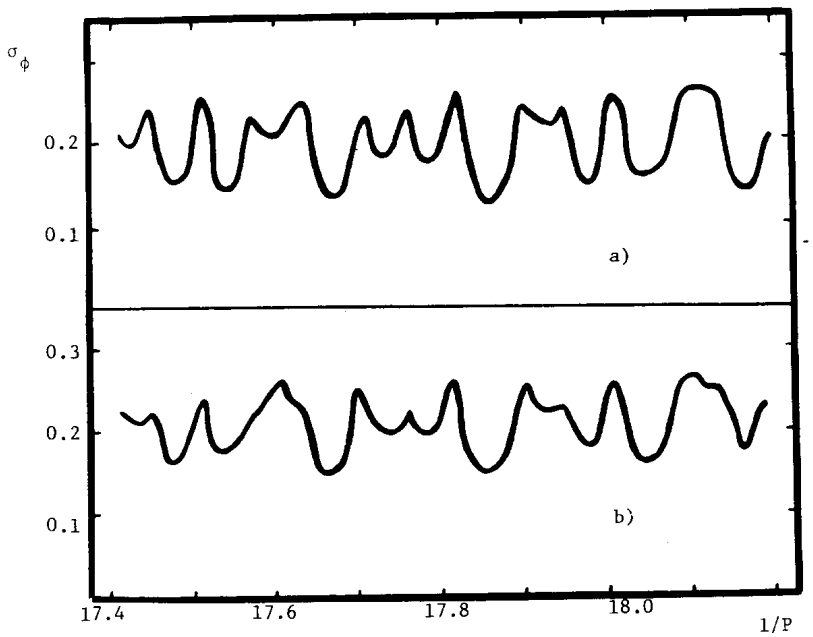

Figure 2: The periodogram for HV Andromedae. The upper curve was obtained for 12 times of minima, the lower one - for 15 (using also observations marked by ":").

Uncertain minima are marked by a symbol ":". From conjugate periods it is not easy to choose the true one, but the most probable elements are as follows:

$$\text{Min.H.J.D.} = 2445991.506 \pm 3 + 0^d.055994 \pm 18\ E.$$

For choosing the true period, new observations are needed.

The data indirectly confirms that HV Andromedae belongs to polars, but polarimetric data are needed for the adequate classification . In addition the star is an interesting object for investigations in X-ray and UV regions; for photometric, polarimetric, and spectral studies.

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