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TU Men, A NEW MEMBER OF THE SU Uma SUBGROUP OF DWARF NOVAE *

TU Men = S 6732 was first discovered by Hoffmeister (1961 and 1963), who also classified it as an U-Geminorum star with a brightness range of 11 - 17 p. During 1963 and 1978 TU Men has been observed in 2193 nights by several members of the VSSRASNZ (Bateson 1979). On these observations Bateson based his assumption that one could distinguish two groups of outbursts: Faint eruptions ($m_v \approx 13^m.5$), which last approximately 1 day and recur every 37 d, and bright eruptions ($m_v > 12^m.5$), which last 4 - 20 days recurring every 194 days.

TU Men therefore seemed to possess two characteristics of SU Uma stars, recently defined by Vogt (1980).

A third, and probably the most important property of SU Uma stars - periodic superhumps during a superoutburst -, has been detected during an observation run at the European Southern Observatory at La Silla, where photometry and spectroscopy of TU Men was performed. (For more details see Table I.)

The light curve, recorded during a time interval of 16 days, is shown in Fig. 1. It should be mentioned that Bateson (1980) reports a visual brightness of $11^m.6$ for TU Men at JD 2444557, so that the duration of the supermaximum exceeds 22 days, as can be seen from Fig. 1.

Figure 1 also demonstrates the periodic superhump phenomenon. The amplitude of the variations decreases from $\Delta m = 0^m.36$ during the first two nights to $\Delta m = 0^m.13$ at the end of the observations.

* Based on observations collected at the European Southern Observatory, La Silla, Chile.

Table I

Date	HJD		Telescope	Filter	Integr. time
	Start 2444500 +	End			
1980-11-20/21	64.543	64.854	62cm Bochum	white	1 sec
1980-11-20/21	64.73	64.85	50cm Danish	u,b,v,y	10 sec
1980-11-21/22	65.520	65.770	62cm Bochum	white	1 sec
1980-11-22/23	66.520	66.631	62cm Bochum	white	~ 5 min
1980-11-23/24	67.527	67.653	62cm Bochum	white	1 sec
1980-11-27/28	71.536	71.780	62cm Bochum	white	1 sec
1980-11-30/01	74.670	74.837	1.5m Danish	white	1 sec*
1980-12-01/02	75.635	75.840	1.5m Danish	white	1 sec*
1980-12-02/03	76.561	76.687	1.5m Danish	white	1 sec*
1980-12-03/04	77.587	77.684	1.5m Danish	white	1 sec*
1980-12-04/05	78.564	78.704	1.5m Danish	B	1 sec
1980-12-04/05	78.535	78.710	1m ESO	I	1 sec
1980-12-05/06	79.545	79.667	1m ESO	B/R	5 sec

Table I: Journal of observations: Photometry

During the nights 1980-11-24/25/26/27 and 1980-11-28/29 the brightness of TU Men was determined at a time between the superhumps during the nearly constant phase in order to record the progress of decline from supermaximum.

- * high speed photometry and simultaneously spectroscopic observations at the 1.5m ESO telescope

The superhump-timings cannot be described by a constant period: With a period P determined from the first two nights, one gets a phase shift of maximal 1.4 P for the last recorded superhump. So, as in the case of VW Hyi (Häfner et al., 1979) and YZ Cnc (Patterson, 1979), a linear decreasing period has been adopted for the superhumps. A least square fit to the observed timings of maximal brightness yields the following ephemerides:

$$\text{HJD} = 2444564.584 + \underset{+3}{.12625}E - 6.1 \times 10^{-6}E^2$$

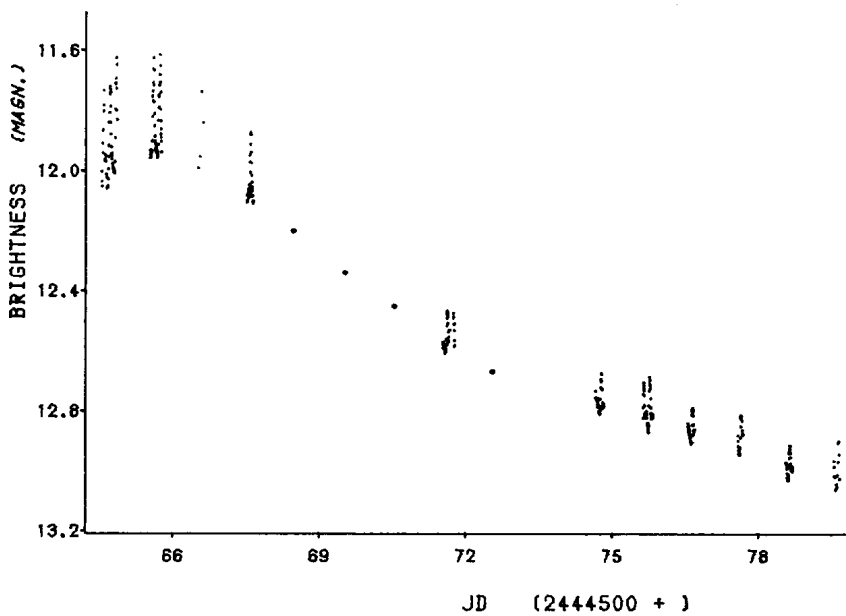


Fig. 1. Light curve of TU Men over the whole observing run (1980, Nov. 20 - Dec. 6). For the reduction of measurements, star "E" from Bateson et al. (1977) was used as comparison star for TU Men.

Note: For the last two nights the B-measurements are displayed.

The most striking fact is the long superhump period P_S , which is the longest known until now. If one accepts that the orbital period P_O of TU Men is slightly different ($\pm 3-4\%$) from P_S , as for other SU UMa stars (Vogt, 1980), then the value of P_O lies in the range of 3^h . As in the case of YZ Cnc (Patterson, 1979) this indicates that the SU UMa stars are not restricted to the ultrashort dwarf novae with $P_O < 2^h$.

A more detailed analysis of the photometry of TU Men together with an analysis of the spectroscopic observations will be published elsewhere.

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