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TU Men, THE FIRST SU UMa STAR BEYOND THE GAP*

In December 1980, TU Men was detected to be a member of the SU UMa subgroup of dwarf novae (Stolz, Schoembs, 1981). Now, spectra of TU Men revealed an orbital period beyond the wellknown gap between 2 and 3 hours as has been suspected from the superhump period $P_s \simeq 3^h$.
Spectroscopy of TU Men has been performed in 4 nights during the superoutburst in Dec. 1980 with the IDS at the 1.5m telescope at ESO.

Table I Journal of observations

Date	covered time interval (JD-2444500)	Dispersion (Å/mm)	number of spectra (20min Int.-time)
1980-11-30/1	74.5661-74.7190	39	8
1980-12-01/2	75.5264-75.8230	114	16
1980-12-02/3	76.5330-76.6836	114	9
1980-12-03/4	77.5264-77.6709	114	9

All spectra show the typical very broad Balmer absorption lines of dwarf novae during outburst. For determination of the orbital period the spectra have been smoothed and the radial velocity for each clearly detectable Balmer absorption line has been measured. A sinus curve has been fitted to the mean velocities of each spectrum. The minimum of rms-error is obtained for the period

$$P_o = 2.823 \text{ hours} \pm 17$$

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

The ephemerides for the upper conjunction are

$$\text{HJD (up.conj.)} = 2\ 444\ 574^{d}.561 \pm 7 + {}^{d}.1176 \pm 7 \cdot E$$

Figure 1 shows the resulting phase diagram.
Including TU Men and WZ Sge orbital and superhump periods are known for 7 objects until now. Figure 2 shows the relation of $(P_s - P_o)/P_o$ versus P_s for these stars.
The values fit quite well to a parabola; the order of the fit is not very significant however.

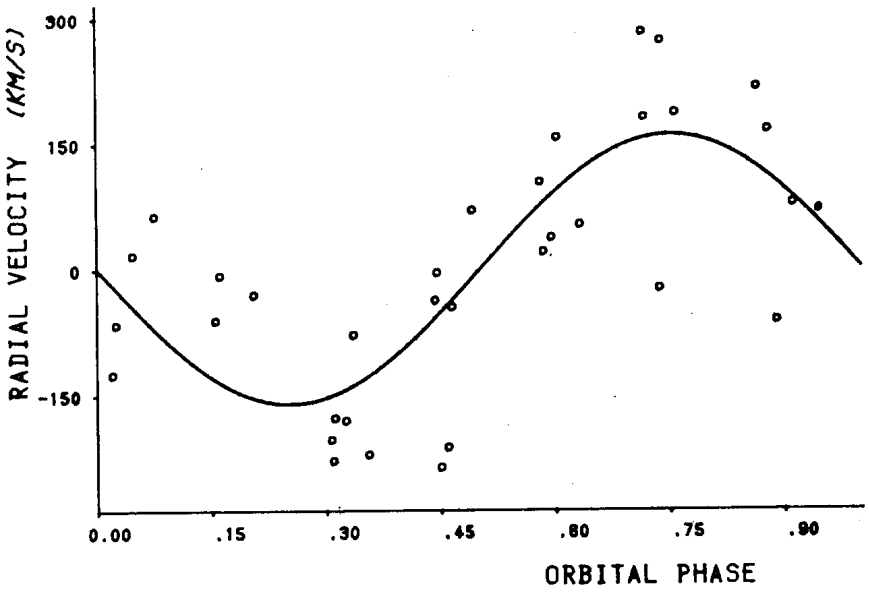

Fig. 1. Radial velocity curve of TU Men obtained during the superoutburst in December 1980.

Using this relation orbital periods for SU UMa objects with P_s known only can be calculated. Table II shows the results.

Table II

Star	P_s(d)	Lit.	computed P_o(d)
EK TRA	.06492	(1)	.0636
AY LYR	.07552	(2)	.0730
CU VEL	.07990	(3)	.0769
YZ CNC	.09204	(2)	.0876

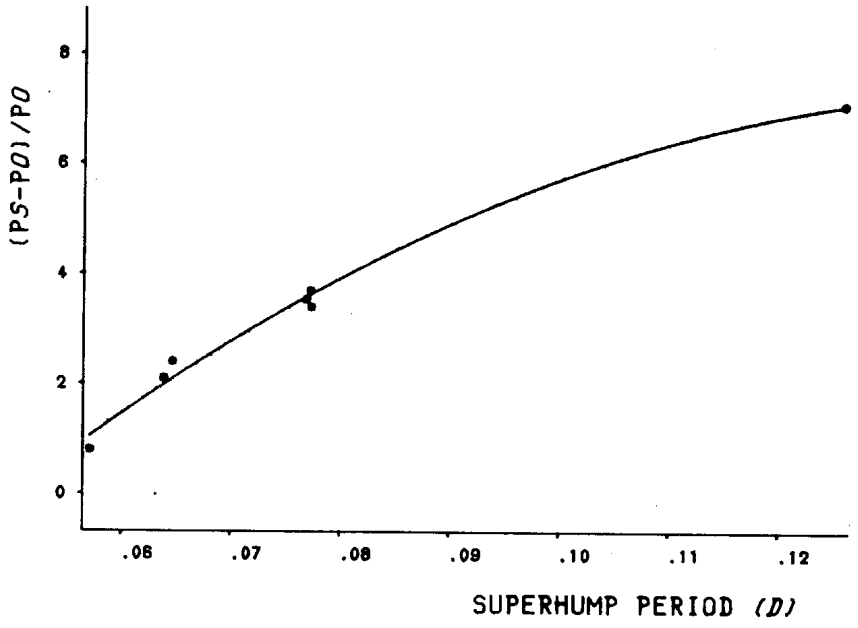

Fig. 2. $(P_s-P_o)/P_o$ versus P_o for seven objects with known orbital and superhump period.
The values for P_o and P_s have been taken from the following references:

WZ Sge - Patterson et al., 1981
V 436 Cen - Vogt, 1981; Semeniuk, 1980
CY Car - Vogt, 1981; Vogt et al., 1981
VW Hyi, WX Hyi, ZCha - Vogt, 1980

References

(1) Vogt and Semeniuk, 1980
(2) Patterson, 1979
(3) Vogt, 1981

The orbital period of TU Men and the calculated orbital period of YZ Cnc diminish the period gap of cataclysmic variables to 40 minutes.

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