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NOTE ON THE SEMI-REGULAR VARIABLE TT Scl

The star TT Scl (R.A. = $00^{\text{h}}11^{\text{m}}53^{\text{s}}$, Dec. = $-30^{\circ}47'.2$, 1900) is a semi-regular variable with an average period of $132^{\text{d}}.7$ (Kukarkin et al. 1958). From UBVR measurements Eggen (1970) found a somewhat shorter average period: 125^{d} . Furthermore, he has shown that the variation in V is correlated with those in the colour-indices R-I and U-B in the sense that if the star brightens it becomes bluer. As shown by Eggen the same behaviour is also found in other semi-regular variables like X Scl and R Aqr. Eggen further remarks that TT Scl is probably not an M-type variable; it is more closely associated with the Cepheid variables of the halo population.

In November 1982 I have noticed the variable behaviour of TT Scl when I compared my new observations with those of 1981, and have followed it photometrically in VRI (Cousins' system) during my whole observing run at the ESO on La Silla. The observations were made with the ESO 50 cm telescope, several also with the 1 m telescope. G. Alcaino observed the star on one night in November with the 1 m telescope. Later, in December 1982, S. van Amerongen observed the star again with the ESO 50 cm telescope. An IDS spectrum was taken by H.H. Loose and D. Schallwick on November 13, 1982, with the ESO 1.5 m telescope. Since it is not my intention to continue the study of this star, the results of the observations are presented in this note. The photometric data are given in Table I, and the IDS spectrum, which is reduced by M. Pizzaro, is shown in Fig. 1.

Table I. Photometric data of the semiregular
variable TT Scl

JD 2445200+	V	V-R	V-I	Date
	12.75	0.88	2.12	10-10-1981
	12.72	0.89	2.10	11-10
70.65	12.17	0.87	1.84	30-10-1982
77.66	11.97	0.88	1.75	03-11
79.60	11.86	0.85	1.66	05-11
80.52	11.83	0.85	1.62	06-11
81.70	11.75	0.82	1.57	07-11
82.57	11.71	0.82	1.56	08-11
83.53	11.69	0.83	1.55	09-11
84.65	11.65	0.83	1.50	10-11
86.53	11.57	0.83	1.46	12-11
87.53	11.53	0.81	1.42	13-11
88.68	11.52	0.79	1.42	14-11
89.52	11.54	0.81	1.45	15-11
90.54	11.48	0.83	1.40	16-11
91.53	11.45	0.82	1.37	17-11
108.66	11.36	0.81	1.37	05-12
109.62	11.39	0.82	1.36	06-12
110.64	11.35	0.83	1.43	07-12
111.61	11.38	0.84	1.44	08-12
113.56	11.40	0.84	1.46	10-12
114.63	11.36	0.83	1.45	11-12
116.62	11.39	0.85	1.48	13-12
121.53	11.54	0.92	1.61	18-12
122.55	11.52	0.90	1.59	19-12

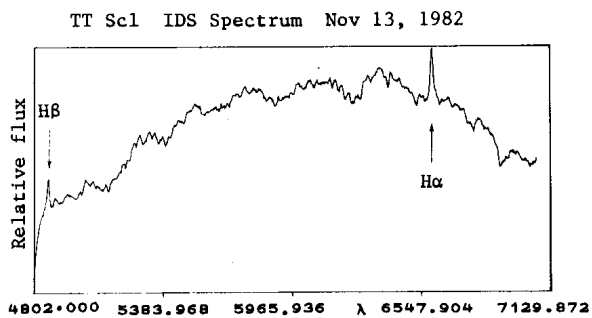


Fig. 1. The IDS-spectrum of TT Scl.

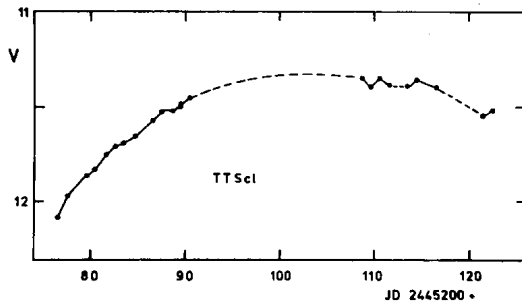


Fig. 2. The visual lightcurve of the semi-regular variable TT Scl.

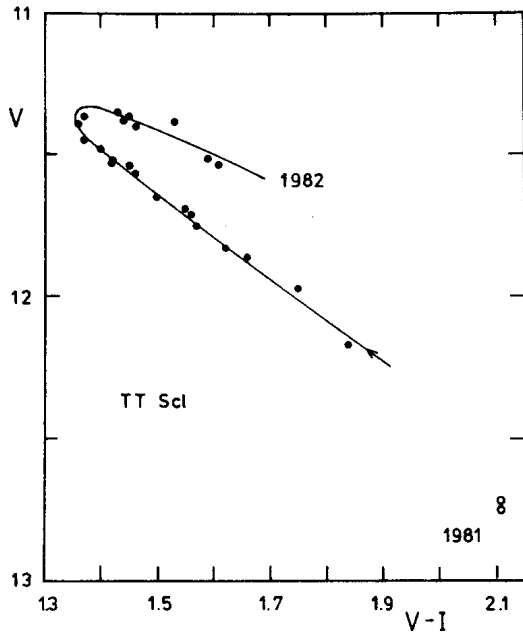


Fig. 3. The V versus V-I relation of TT Scl.

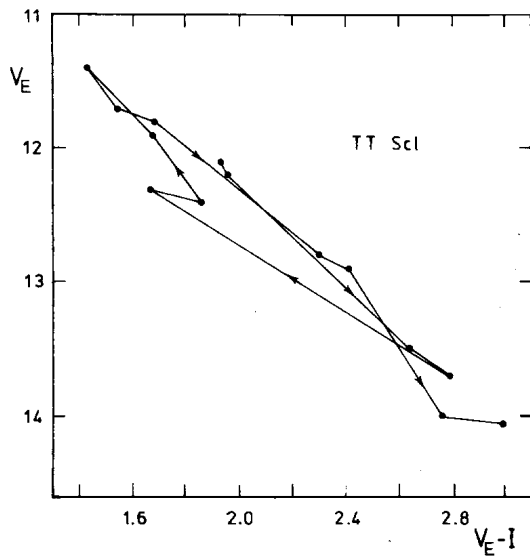


Fig. 4. The plot of V_E against V_E-I of TT Scl from data published by Eggen (1970).

The lightcurve of TT Scl, obtained in November and December 1982, is shown in Fig. 2. It went through a maximum around J.D. 2445340. In Fig. 3 the V versus $V-I$ relation is given. The two datapoints obtained in 1981 are also indicated. It is clear that when the star rises to a maximum in brightness it becomes bluer, and then redder again when it becomes fainter. The scatter around the curve giving this relation is quite small.

It is of interest to compare this relation with that which can be derived from the observations of Eggen (1970). From his V_E lightcurve the V_E values, corresponding to the dates of measurements of R and R-I can be read off. These V_E values are then plotted against V_E-I in Fig. 4. This figure shows a back and forth looping, similar to what is shown in Fig. 3. The direction of the loopings in Fig.'s 3 and 4 are about the same.

There are two conspicuous emission lines in the IDS spectrum of TT Scl due to H_{α} and H_{β} . This spectrum shows further that TT Scl is not of spectral type M, in agreement with Eggen's suggestion that TT Scl is not an M-type star.

I would like to thank Dr. H.H. Loose and Dr. D. Schallwick for obtaining the IDS spectrum of TT Scl, and Mr. M. Pizzaro for reducing it. I am also indebted to Mr. S. van Amerongen and Mr. G. Alcaïno for obtaining additional photometric observations of this variable star. I would also like to thank Dr. N. Vogt for pointing out to me that the variable star is TT Scl.

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