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ON THE CYCLE LENGTH OF THE CATACLYSMIC VARIABLE T LEONIS

T Leonis has one of the shortest orbital periods (1^h25^m) of the cataclysmic binaries with late type secondaries. To my knowledge, only the periods of the long cycle dwarf novae WZ Sge and SW UMa and of the polar EF Eri are shorter (around 1^h22^m). To estimate the cycle length of T Leo therefore seemed important. Up to now only four eruptions were explicitly mentioned in the literature, three of them of the past century plus the one of 1967 June 2, observed by Cragg of the AAVSO (Sky Telesc. 37, 128, Journ.R.Astron.Soc. Canada 62, 142). Five further maxima (1962 Febr. 10, 1971 May 29, 1982 Apr. 12 and June 23, 1983 March 24), detected by members of the AAVSO (Lowder et al.) and AFOEV (Verdenet, Candela, Minois, Bruno and Hanon), remained rather unnoticed.

A total of N = 807 suitable Sonneberg patrol blue plates were checked for maxima of the star. The exposures have been taken since 1929.5 mainly by P. Ahnert and H. Huth of fields centred at 12^h+10^o, 12^h-4^o, 12^h0^o, the declinations of which were chosen one after another and valid for several years each. n = 16 plates of this material show 14 reliable eruptions. Eight of these are represented also on overlapping neighbouring fields, or on simultaneous photovisual exposures on which the star is remarkably fainter in maximum than on the blue sensitive ones. Available records on regular visual series obviously started at 1955 (AAVSO Quarterly Report 22). Since then four maxima have been showing on our investigated exposures. Two of these eruptions are common to AAVSO findings, whereas four further visually detected maxima are not on the checked series because of moonlight or evening twilight.

Taking into account the sun and moonlight gaps in the photographic material of that region and the losses because of meteorological reasons we estimate that 30% of all eruptions are represented on the investigated plates. Therefore we get for the mean cycle length

$$\bar{c} \approx \frac{1983.3 - 1929.5}{14} \times 364 \times 0.3 = 420^d.$$

Another approach can be arrived at by considering the ratio N/n in combina-

tion with the mean duration $\bar{L}$ of maxima. The observations yield individual values of L lying between $< 6^d$ and $>11^d$. We take $\bar{L}$ = 5...10 days and have

$$\bar{C} \approx \bar{L} \cdot \frac{N}{n} = 250...500 \text{ days.}$$

At present it cannot be decided whether the star exhibits two sorts of eruptions (short ones and supermaxima). It should be mentioned that faint $14^m.5$ traces of the variable could occasionally be perceived on the plates. We are inclined to interprete them as due to fluctuations in minimum brightness and therefore we count only observations $< 12^m.6$ as belonging to real outbursts.

A cycle length near 400 days places T Leonis well to the vicinity of SW UMa, V 436 Cen, EK TrA and OY Car, not to speak of WZ Sge, all of them lying in the shortest orbital period domain. The only exception from this tendency recognizable so far is 3A 1148+719, which seems to have a mean cycle length of several years (Wenzel, I.B.V.S. No. 2262, Mitt.Veränd.Sterne Sonneberg 9, 141) at an orbital period of 3^h55^m.

A list of the observed eruptions and some further details will be published in Mitt.Veränd.Sterne Sonneberg 10, No. 2.

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