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ON THE CYCLE-LENGTH OF RZ LEONIS

According to Mattei (1985) and Christiani et al. (1985) RZ Leo, which has undergone a nova-like outburst in 1918, erupted again in the last days of 1984; its spectral behaviour suggests a membership of the WZ Sagittae subclass of dwarf novae. If this classification is accurate, then the object is the dwarf nova with the largest observed interval of 66 years between outbursts. For understanding the physics of the WZ Sagittae phenomenon the true cycle-length of RZ Leo is of great interest. To find an estimate, altogether 1461 plates of the Sonneberg sky patrol, taken by H. Huth and predecessors, of the fields $\alpha = 11^{\text{h}}$, $\delta = -4^{\circ}$, 0° , and $+10^{\circ}$ and $\alpha = 12^{\text{h}}$, $\delta = -4^{\circ}$, 0° , and $+10^{\circ}$ were inspected for eruptions. The time covered is from 1928 to 1984, with only 1 plate in 1928 and 3 plates in 1938. The limiting magnitudes of the plates are about 12^{m} to 14^{m} . But, being in the vicinity of a relatively bright star, RZ Leo could be followed up only to the brightness of 13^{m} .

In this time interval no certain outburst could be observed. On some plates there are impressions at the very plate limit, their reality, however, cannot be guaranteed. The dates of the plates with a suspected eruption are as follows:

Date	JD	Magnitude	Remarks
1934 Feb. 14	242 7483.541	12??	1
1935 Mar. 25	242 7887.345	12::	
1940 Apr. 6	242 9726.432	13::?	2
1950 Mar. 20	243 3361.487	13::?	3
1952 Apr. 16	243 4119.426	13??	1
Apr. 17	243 4120.417	13:?	4
1959 Feb. 5	243 6605.556	13	5
1967 Feb. 7	243 9529.611	13.5	6
1976 Mar. 1	244 2839.528	13	
Mar. 2	244 2840.475	13??	1
	40.475	13:	7

Remarks

- 1 very questionable
- 2 April 7 invisible [13^{m}]
- 3 March 23 invisible [13^{m}]
- 4 April 18 and 19 invisible [13^{m}]

Remarks

- 5 Probably not real (not exactly at the position of RZ Leo)
 6 Probably plate fault
 7 On two plates of February 29 invisible [12^m and on two plates of March 3 invisible [13^m

As can be seen from the table the only observations likely to be real are those from 1935 March 25, 1952 Apr. 17, and 1976 March 2. Provided those 3 dates are positive observations of RZ Leo, then from 1928 to 1984 there occurred 3 eruptions. Taking into account that no plates exist from the months June to September and making the assumption that half of the eruptions could not be detected on account of bad weather or moonlight (so, for example, the eruption of 1984 could not be followed up on Sonneberg plates), one may conclude that the cycle-length of RZ Leo could be as short as 6 years!

To sum up, it can be said that the cycle-length of RZ Leo must be somewhere between 6 and 66 years. The true value of the cycle-length will probably be near the smaller limit because of the relatively small brightness amplitude of about 6 mag.

The table given above is to prompt observers having access to plate collections to confirm the suspected outbursts and search for further ones.

G.A. RICHTER

Zentralinstitut für Astrophysik
 der Akademie der Wissenschaften
 der DDR
 DDR-6400 Sonneberg, Sternwarte

References:

- Mattei, J. (1985) IAU Circ. No. 4026
 Christiani, S., Duerbeck, H.W., and Seitter, W.C. (1985) IAU Circ. No. 4027