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MICROVARIABILITY OF RX CAS

RX Cas is a strongly interacting close binary system with an orbital period of $32^{d}.33$ and spectral type A2-5e + KO II-III.
Photometric monitoring observations were carried out between January 7 and February 12, 1986 with a one-channel WBVR photoelectric photometer attached to the 48-cm telescope of the Tien-Shan High Altitude Observatory of the Sternberg Astronomical Institute (Khaliullin et al., 1985). The observations were processed by a standard scheme: background - comparison star - variable - comparison star - background.
The comparison star was BD + $67^{\circ}248$ and check star - HD 6210. The integration time in each filter was 10-40 sec. It depends on both the filter and the orbital phase. Thus, the records from each filter were repeated every 1-2 minutes. The duration of each observational series and the number of records were changed in order to eliminate its influence on the periodogram analysis. Observing nights with high transparency and stability of seeing were chosen for the analysis. Khaliullin et al's (1985) method was used for primary processing of the data. The observational data in the W filter are listed in Table I.

Table I

JD 2446400+	ΔT	N	φ	σ_{int}	$\sigma_{\Delta T}$	p>90%	p>80%
49	.112	21	.31	.012	.013		49min
50	.151	133	.34	.016	.022	40min	
51	.158	137	.37	.016	.026		95min
52	.132	115	.40	.015	.026		
53	.094	79	.43	.012	.024		
62	.162	117	.71	.012	.023	42min	
64	.208	103	.77	.010	.017		
65	.101	55	.81	.010	.017		86min
67	.100	37	.86	.020	.020		29min

Column JD contains the date, column ΔT - the interval of observation, column φ - the orbital phase, column σ_{int} - internal error of one observation, $\sigma_{\Delta T} = \sigma/\langle I \rangle$ is the relative variation over the entire time interval.

The analysis was carried out by Deeming's (1975) method. Frequencies in the interval 1-100 cycles/day were searched for. In Figure 1 the periodograms of JD 2446450 and 2446462 in filter W are shown. They are the only ones that show peaks with a significance of more than 90%.

On some periodograms of other observations different variations with periods of 20-90 minutes can be supposed. All of them are listed in the last two columns of Table I where "p>90%" contains the period in minutes

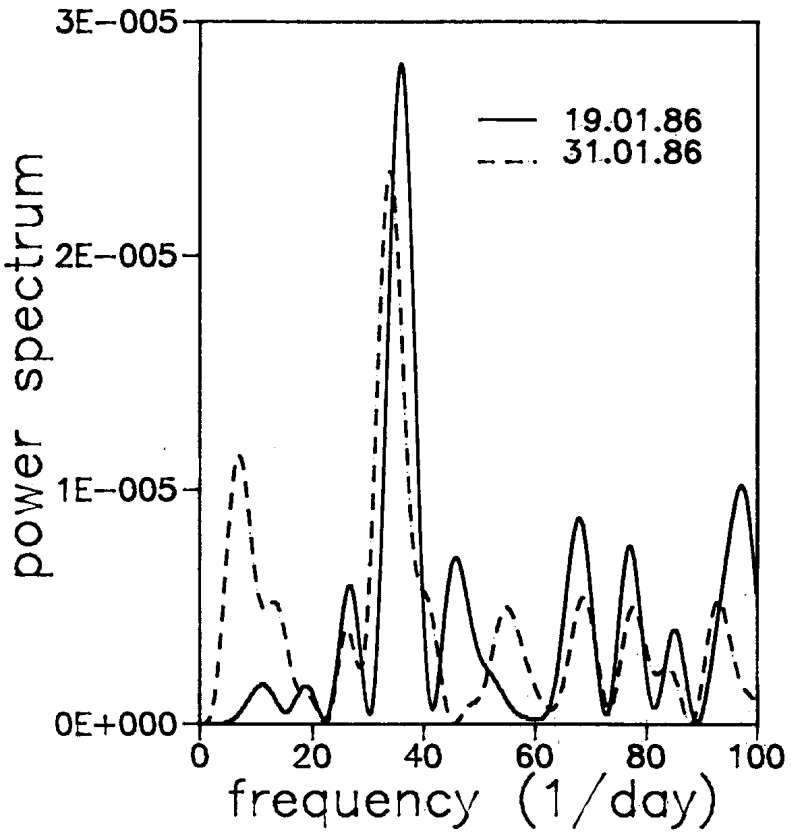

Figure 1

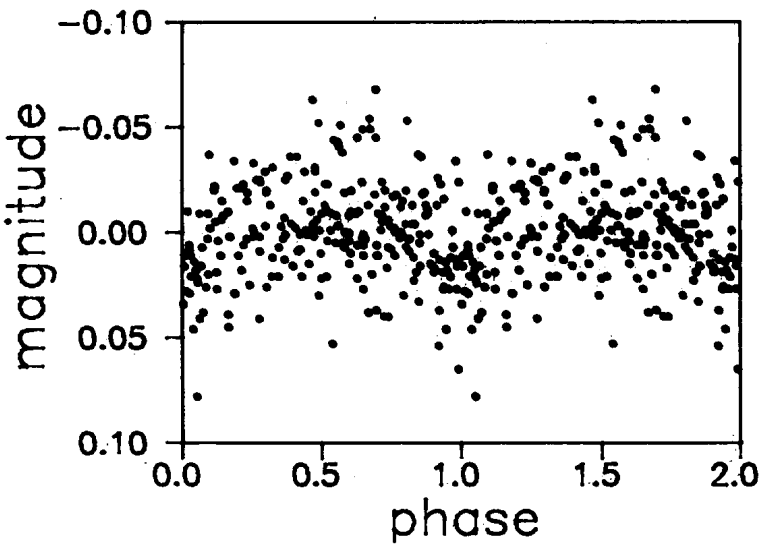

Figure 2

corresponding to the peaks on the periodogram with a significance of 90-95%, and "p>80%" - the respective periods with a significance 80-90%. The study of the comparison star does not show peaks with a significance of more than 20%.

The values of the periods are:

JD 2446450 $P_1 = 0^d.0278 \pm 0^d.0023$

JD 2446462 $P_2 = 0^d.0294 \pm 0^d.0023$

They coincide in phases and the following elements can be used:

$$T_{min} = \text{JD } 2446450.1534 + 0^d.0292 \cdot N$$
$$\pm 30 \quad \pm 25$$

The average curve of brightness computed with these elements for the data of the two nights is shown in Figure 2. The amplitude of the variation is approximately $0^m.04$. Microvariability in the other filters (B,V,R) is not yet suspected.

It is interesting to mention that the dates JD 2446450 and 2446462 coincide with maxima of the $11^d.007$ period (Todorova and Khruzina, 1989), i.e. when the line of sight crosses the supposed active areas on the accretion disc. These active areas are likely to be "spots" or zones of shock waves originated from a superposition of non-radial variations. Before these phases and after them toward to the minima of the 11^d period the observed variations vanish.

To adopt or reject the hypothesis of a non-uniform distribution of the brightness on the surface of the accretion disc (Todorova and Khruzina, 1989) more observations are necessary.

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