

QUASI-PERIODIC VARIATIONS OF BALMER LINE PROFILES IN SPECTRA OF THE  
T TAU-TYPE STAR RW AURIGAE

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RW Aur is one of the most active T Tau-type stars with essentially variable emission line spectrum. In order to study the nature of this variability, patrol spectroscopic observations of the star were carried out from November 1979 to March 1982 at the 2.6-meter telescope of the Crimean Astrophysical Observatory. The spectral region  $\lambda\lambda 3800-6700 \text{ \AA}$  has been observed with a dispersion of about  $40 \text{ \AA/mm}$ . All nights were supplied with simultaneous spectrophotometry of the star.

The  $H\beta$  and  $H\alpha$  lines in the spectra of RW Aur have a constant double peak structure with variable ratio of the blue to red component intensities. To define the shape of the lines we take the index  $j=(V-R)/(V+R)$  where  $V$  and  $R$  are, respectively, the blue and the red component intensities, expressed in units of the adjacent continuum.

We have searched for periodicity in the variations of the  $j$  index of the  $H\beta$  line ( $jH\beta$ ) applying the Jurkevich method, in the period interval 4 to 15 days. The dispersogram computed on the base of all 54 nights data is in Fig. 1a, showing the most probable period  $P=5.39$  days with the confidence level  $\approx 0.9$  according to the Jurkevich criterium. Using a somewhat shorter run of the data (37 nights) we have localized the time interval when the periodic variations of the line profiles were more pronounced. The dispersogram on Fig. 1b corresponds to this interval of time (October 1980 - January 1982) and shows the prominent peak of the period  $P=5.39$  days with the confidence level of 0.96. The variations of the  $jH\beta$  index with the period  $P$  are shown on Fig. 2. Apparently, the relatively stable periodic variations of the  $H\beta$  line profile last for about a year.

The  $jH\beta$  index varies because of the shift of the central absorption by  $H\beta$  over the radial velocity interval  $-70$  to  $+45 \text{ km/s}$  (heliocentric). The  $H\alpha$  line profile reveals similar changes with the same period. We have not found any relation between the  $jH\beta$  index and the brightness of the star.

The analysis of the data leads us to the assumption that local magnetic fields (about 1000 gs) exist on the surface of RW Aur and affect the gas envelope structure around the star. In this case the rotation of RW Aur would cause the effect of modulation of the Balmer lines profiles.

The complete paper will be published in the Soviet Astronomical Letters.

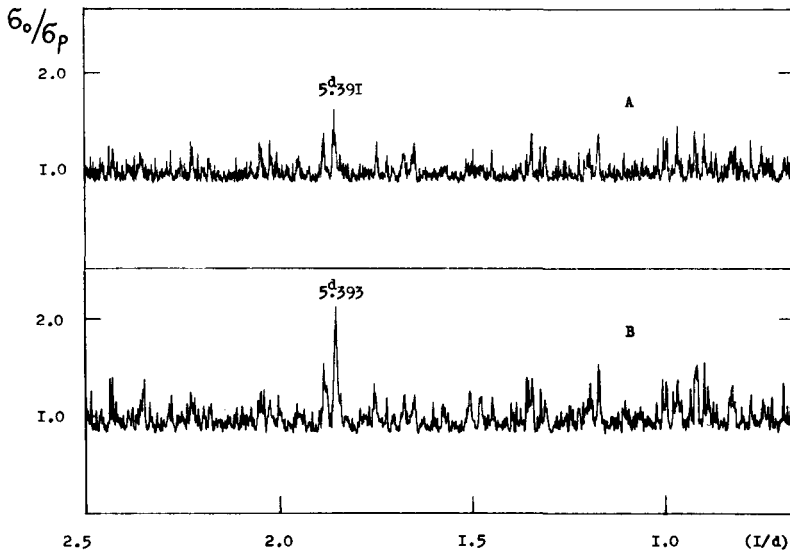


Figure 1. The dispersograms according to the Jurkevich method:  
 a) J.D. 2444180.65 - 2445045.28,  
 b) J.D. 2444526.49 - 2444994.37.

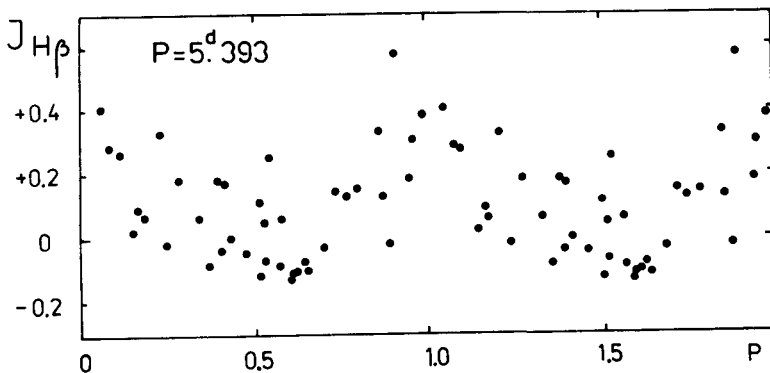


Figure 2. The periodic variations of the  $jH\beta$  index,  
 J.D. 2444526.49 - 2444994.37