CYCLE LENGTH CHANGES OF THE SRd VARIABLE UU HER ?

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ABSTRACT. Best fit periods for individual seasons show variations from 27^d to 101^d with a possible cycle $\approx 5500^d$. One – and multi– frequency sine approximations of 650 photovisual observations argue for a formal 2–component model with periods $P_1 = 44.92 \pm .06^d$, $P_2 = 70.37 \pm .16^d$ and semi–amplitudes $r_1 = 0.093 \pm .010^m$, $r_2 = 0.086 \pm .009^m$.

Key words: Stars: Semiregular: UU Her

UU Her was observed by A.I.P. on the archive plates of the Odessa collection obtained in JD 2436362–47716. Range of the brightness variations $8.46 - 9.23^m$ (pv), mean 8.88^m, r.m.s. deviation 0.20^m. The data were analyzed by I.L.A. by using the programs by Andronov (1994). The peak at the periodogram for $O - C$ (Fig. 1c) is statistically significant, thus a 2–frequency model was applied. Corresponding times of maximum brightness are HJD $2440651.3 \pm .7$ and 40701.53697 ± 1.4.

The period 71^d alternating with 90^d was noted by Beyer (1948). Latyshev (1966) published the value of 45^d. Both these periods are seen in our data. To study possible changes of P we subdivided the data into 29 "seasons" and computed the one–frequency periodograms. Dependence of the best fit periods in the range $20 - 100^d$ on time is shown in Fig. 2. Some values are apparently too small such as 20.7^d or even 10.6^d. Many times the peaks in the studied range are multiple. In this case primary and secondary peaks are shown. The value 80.1^d listed in GCVS (Kholopov et al. 1985) corresponds to the time interval 2443611–4161 with not sufficient number of our data. Fedotov (1987) obtained $P = 80^d$ for JD 2446170–6358. One may suggest both variations of the main period and the presence of at least two waves with different frequencies.

References

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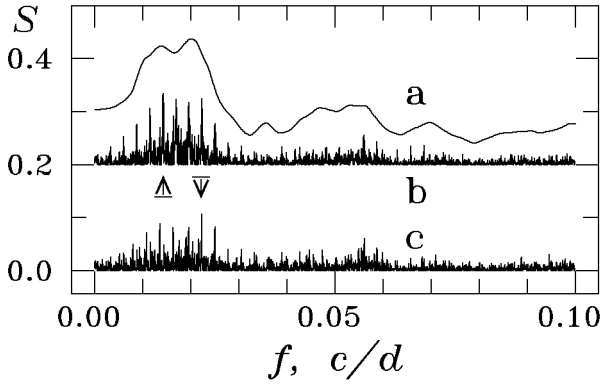

Figure 1. *a:* Weighted mean periodogram for 29 seasons scaled as $0.2 + 0.5\overline{S}(f)$; *b:* periodogram for all observations $0.2 + S(f)$; *c:* periodogram for $O - C$ (not shifted). Vertical arrows mark frequencies of the 2–component model.

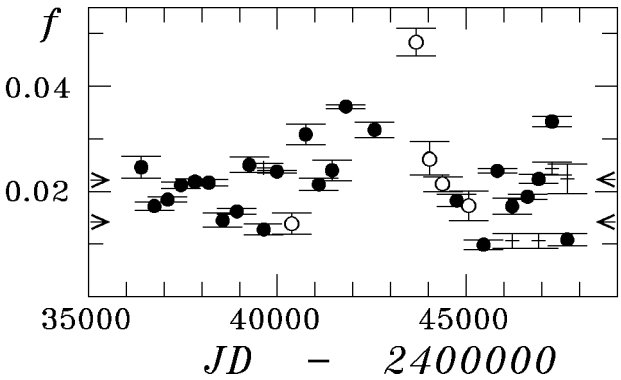

Figure 2. Best fit frequencies for individual seasons. Crosses correspond to second peaks, open circles to small $n < 10$. Horizontal arrows mark 2 "best" frequencies.