

# THE INVESTIGATION OF SEMI-REGULAR VARIABLE UV BOO

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**ABSTRACT** Periodogram analysis of the photographic observations of UV Boo based on Hipparcos data has showed two photometric periods:  $596^d \pm 47^d$  and  $11^d.74 \pm 0^d.01$  and the same high peak on the value  $10^d.60 \pm 0^d.02$ . On Odessa plates data have showed three periods:  $351^d.10 \pm 1^d.50$ ,  $196^d.14 \pm 0^d.41$ ,  $10^d.442 \pm 0^d.002$ .

**Key words:** Stars: semi-regular; stars: individual: UV Boo

The variable star UV Boo = BD+26°2559 = HD 126030 = SAO 083315 has been discovered in 1929 and had variations of the light  $7^m.4 - 8^m.6$ . In further, the different limits of light oscillations were showed:  $8^m.17 - 9^m.01$  (Kukarkin, 1930),  $7^m.8 - 8^m.4$  (Kopal, 1931, 1933),  $8^m.36 - 8^m.886$ ,  $8^m.5 - 9^m.2$  PG (Ahnert, 1947),  $7^m.95 - 8^m.25$  (Beyer, 1950),  $7^m.46 - 8^m.30$  Vis,  $7^m.1 - 8^m.0$ ,  $8^m.11 - 8^m.16$  V,  $8^m.1 - 8^m.5$  etc.

The star was classified different variable types:  $\delta$  Cep, Irr, Is (Kopal 1931, 1933, Kholopov, 1959),  $\delta$  Cep (Beyer, 1950), RW. The star has classified as constant by Zajtseva (1967) and other observers. Wenzel (1965) observed small oscillations about  $0^m.03$ . In Albireo (N25, 1973), were noted the sharp fluctuations  $7^m.6 - 7^m.9$ . In MVS (B.2, H.1, 4, 1963), the spectrum F5 V and slow 100 – 1000<sup>d</sup> oscillations with amplitude  $0^m.45$  are reported. Kholopov et al. (1985) report that the star is constant.

In our work, we have used the Hipparcos data and Odessa Plate Patrol Collection data. We have used the finding chart of variable star presented by Taylor (1987). Moreover, our systematic patrol observations since 1988 show the doubtless variation of this star.

The magnitudes of the comparison stars were determined in the BV-system (Kudashkina et al., 1989).

The periodogram analysis of the photographic observations of UV Boo based on Hipparcos data has showed two photometric periods:  $596^d \pm 47^d$  and  $11^d.74 \pm 0^d.01$ . The peak on the value  $10^d.60 \pm 0^d.02$  is also presented. The both peaks have the identical ratio signal/noise (more 5) and the imilar value of the test function  $S(x)$ . The periodograms for the Odessa data

have shown three peaks corresponding to the periods:  $351^d.10 \pm 1^d.50$ ,  $196^d.14 \pm 0^d.41$ ,  $10^d.442 \pm 0^d.002$ .

The value of test-function in every case is: (1) for  $196^d.14$ ,  $S(x) = 0.12$ ; (2) for  $351^d.10$ ,  $S(x) = 0.08$ ; (3) for  $10^d.442$ ,  $S(x) = 0.03$ . The period  $10^d.442$  is similar to the value corresponding to the Hipparcos' values. This period is the most interesting because this peak presents on all periodograms. However, it is necessary to assume the most certain the value of 196 days.

The periodograms of UV Boo are shown below.  $S(x)$  is the test-function (Andronov, 1994). The value of the period corresponding to a highest peak is shown at the vertical axis.

For the analysis, the programm FO.EXE by Andronov (1994) has been used.

Undoubtedly, the star UV Boo is a variable star. It is possible that UV Boo belongs to the type SRd, but for all that shows the multi-periodicity.

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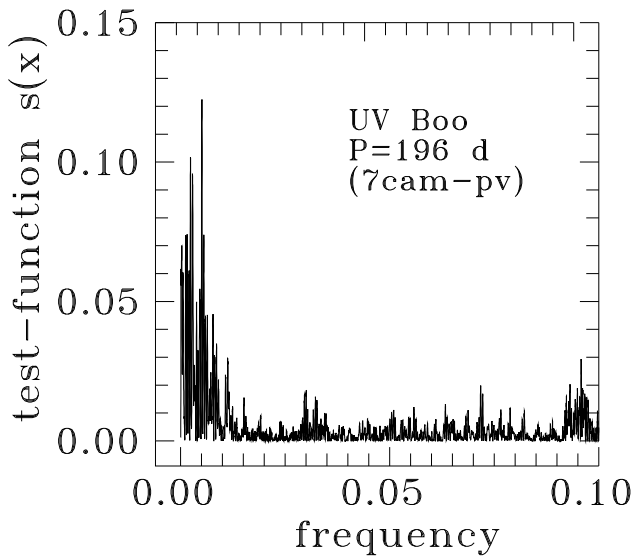


Figure 1: The periodogram of the UV Boo according to Odessa collection. The right peak corresponds to the period of about 10.442 days.

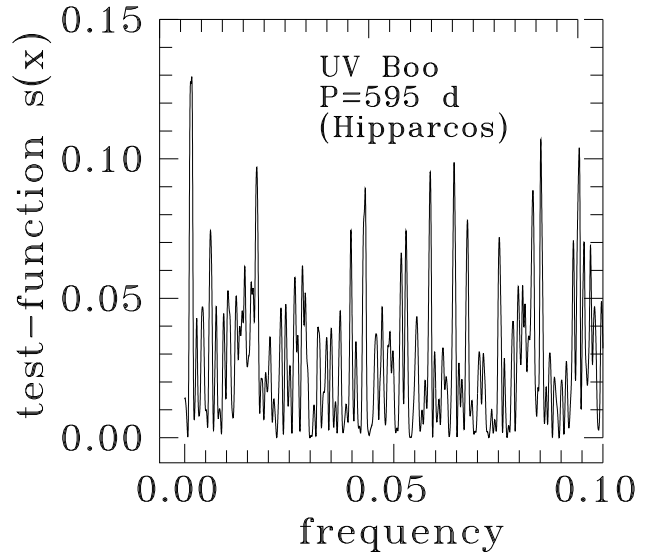


Figure 3: The periodogram of the UV Boo according to Hipparcos data. The right peaks correspond to the periods 11.74 and 10.60 days.

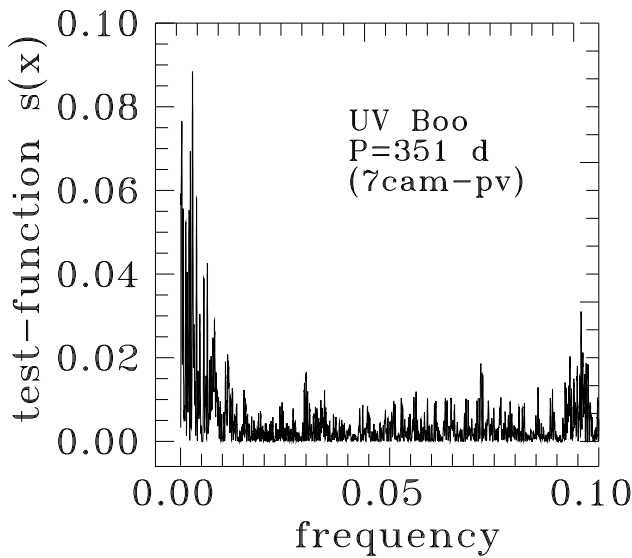


Figure 2: The periodogram of the UV Boo according to Odessa collection after subtraction of the value  $196^d$

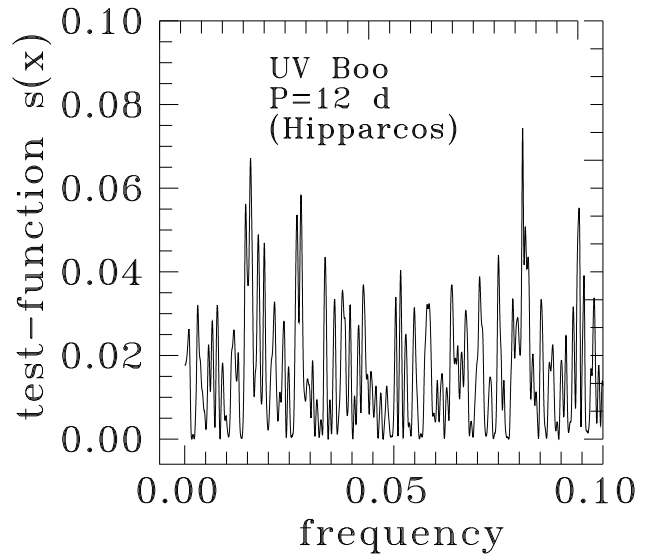


Figure 4: The periodogram of the UV Boo according to Hipparcos data after subtraction of the value  $596^d$