RESEARCH OF THE VARIABILITY OF λ BOOTIS STARS BY USING THE DUAL CHANNEL PHOTOMETER

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ABSTRACT. 3 bona fide λ Boo stars were observed by using the dual-channel photometer at the Mt. Dushak-Erekdag observational station. Two peaks at frequencies $f_1 = 15.85\,\mathrm{c/d}$ and $f_2 = 27.54\,\mathrm{c/d}$ were revealed in the amplitude Fourier spectrum of HD 221756. HD 204041 and HD 38545 proved to be constant. Probably, comparison star HD 204121 has low amplitude variability.

Keywords: Stars: Instability strip, λ Boo–type.

Recently interest in λ Bootis stars has arisen again. Up to 1992 about 20 unambiguously identified objects were known (see Gray & Corbally, 1993), now their number increases quickly (Paunzen & Gray, 1996).

In the HR diagram the λ Boo stars fall into the parameter space occupied by Ap, Am, δ Sct stars etc., but their evolutionary status is not yet cleared up.

Variability of some λ Boo stars with periods in the range from 0.5 up to 4 hours and extremely low amplitudes (from 0.004 mag to 0.07 mag) was revealed and intensively investigated by the Vienna working group *Asteroseismology - AMS* (Weiss et al., 1994).

During 1994-1995 we observed 3 stars from the list of Gray & Corbally (1993) by using the dual-channel photometer (Dorokhov & Dorokhova, 1994) attached to the 0.8m Ritchey-Chretien telescope at the Mt. Dushak-Erekdag station of Astronomical Observatory, Odessa State University, in Turkmenistan.

HD 221756 (A1Va+) and a comparison star HD 221903 were observed by using dual channel mode of the photometer. We revealed two peaks at frequencies f_1=15.85 c/d (P = 1.51 hour, A = 0.011 mag) and f_2=27.54 c/d (P = 52 min, A = 0.006 mag), which could be influenced by a 1 c/d aliasing. The article on these observations was published in IBVS (Dorokhova & Dorokhov, 1996).

Besides we observed two of λ Bootis stars in single channel by using 3-star mode (see Breger, 1992).

HD 204041 was observed in Strömgren v-filter two nights on 11 and 12 Oct., 1994, 2.3 hours a night.

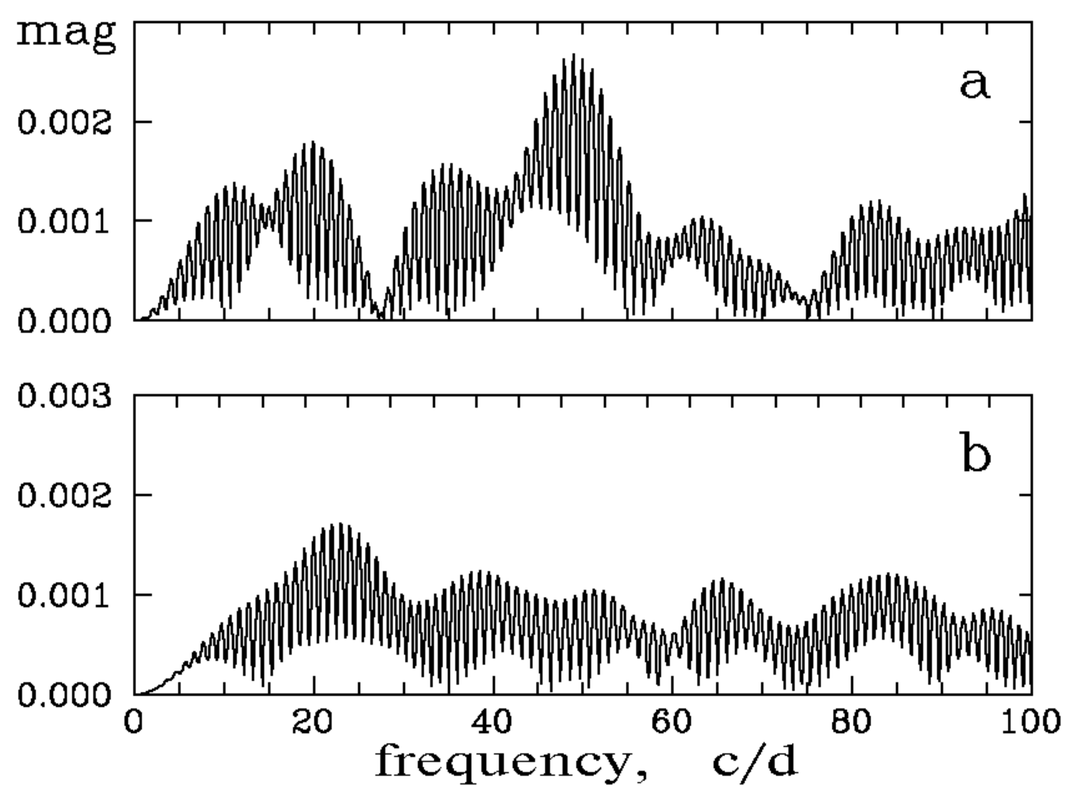

Fig.1 Amplitude spectra of differential data HD 204041 – HD 204121 (a) and HD 204041 – HD 203405 (b). The variability of C1=HD 204121 is likely to be evident.

From comparing Fig.1a, which shows Fourier spectra of the united differential data series with respect to C1 (HD 204121, m=6.4 mag, F5), and Fig.1b, with respect to C2 (HD 203405, m=6.8 mag, F2), it is seen, that, apparently, C1 has low amplitude variability. HD 204041 itself is constant within upper limits 0.003 mag (Paunzen et al. (1996a) indicated 0.002 mag).

HD 38545 (C1 HD 39098, C2 HD 39019), observed in Johnson B-filter in 20 and 22 Nov., 1995, may be constant, but the upper limit 0.005 mag is rather high (Kuschnig et al. (1996) presented 0.004 mag).

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