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HD 84800: A NEW δ SCUTI VARIABLE

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We present photometric data for HD 84800 establishing δ Scuti type variability for this star. Furthermore we solve the previous discrepancy of different spectral classifications (A4 V or A2 II) in the literature by using the Hipparcos parallax. As a result of the analysis the found periodicity is likely to be a high overtone f-mode.

HD 84800 (HIP 48129, V = 7.79) was originally used as one of the comparison stars for HD 84123 (HIP 47792, λ Boo spectral type, V = 6.81) during a photometric survey of pulsating λ Bootis stars (Paunzen et al. 1998). Our program star HD 84123 as well as the second comparison star HD 84388 (HIP 47934, F2 spectral type, V = 7.10) turned out to be constant.

Photometric observations were performed with one of the University of Vienna automatic photometric telescopes (APT) in the night of 06/07.02.1997 with an integration time of 30 seconds. For a detailed description of the APT see Strassmeier et al. (1997). Figure 1 shows the differential light curves for all three stars in Strömgren *b*. A preliminary Fourier analysis of these data results in a frequency of $42\,\mathrm{d}^{-1}$ ($= 486\,\mu$Hz), P = 34 min and a peak-to-peak amplitude of 6.3 mmag (Figure 2).

Using the Hipparcos parallax $\pi = 6.66 \pm 0.95$ mas, and assuming $E(B-V) = 0$ (Bartkevičius et al. 1992) we estimate an absolute magnitude $M_V = +1.91 \pm 0.32$ mag for HD 84800. This result confirms the spectral type A4 V (Bartkevičius et al. 1992) and rejects the A2 II classification by Bartaya (1979). Note that for an A2 II star the corresponding M_v is about -3 mag.

In order to estimate a Q-value for the detected pulsation, typical astrophysical quantities for an A4 V star were adopted from Schmidt-Kaler (1982) since neither Strömgren nor Geneva photometry is available: $\log g = 4.3$, $T_{\rm eff} = 8500$ K and $B.C. = -0.16$ mag. These parameters give a Q-value of 0.015 days based on López de Coca et al. (1990):

$$log\,Q = -6.456 + log\,T_{\rm eff} + 0.5\,log\,g + 0.1\,M_{\rm bol} + log\,P$$

A comparison with theoretical Q-values listed in Stellingwerf (1979) results in the exclusion of the fundamental and the first overtone mode for the detected variability. However, this conclusion remains preliminary since "tabulated" values for a "standard" A4 V-type star have been used.

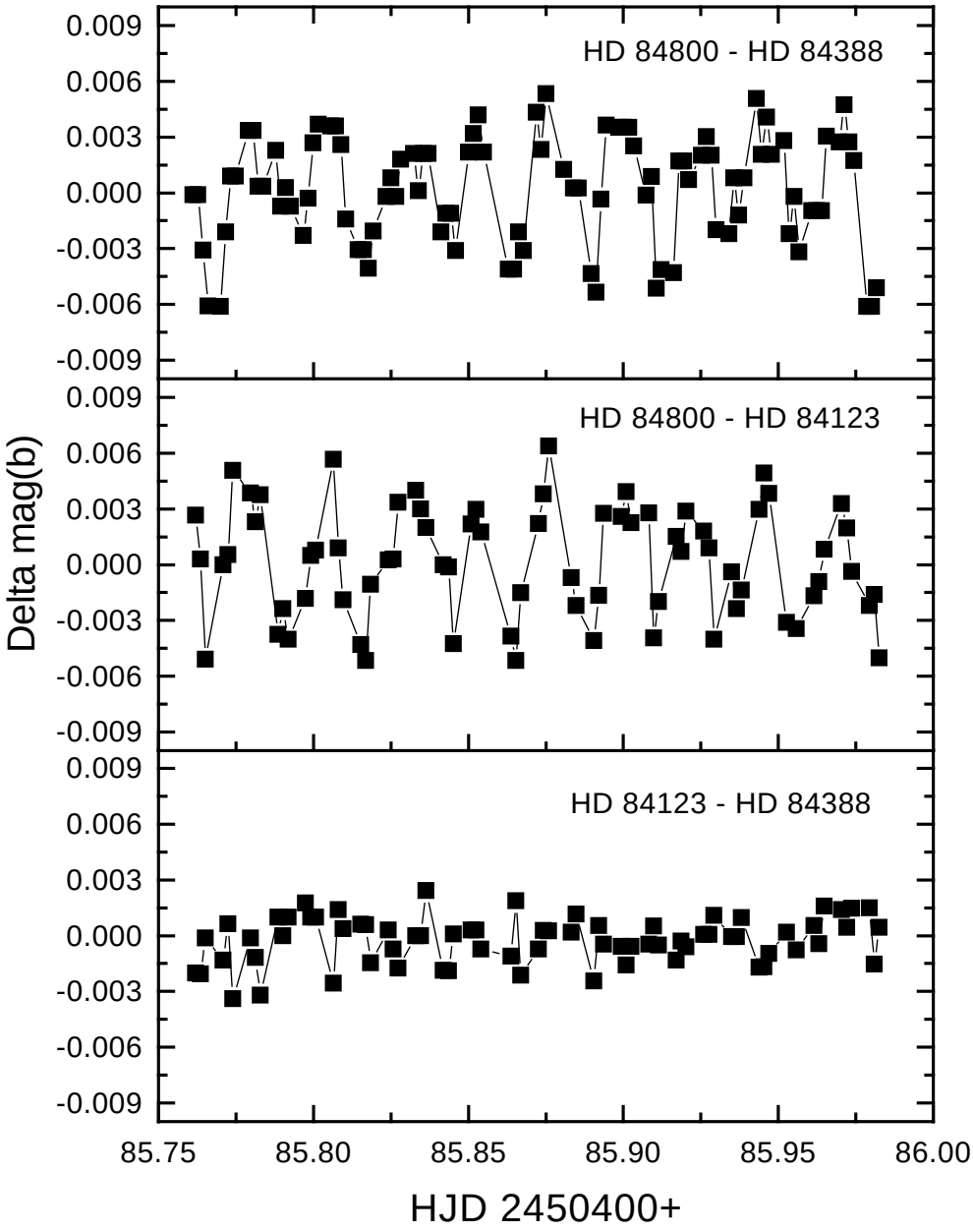

Figure 1. The differential APT light curves for HD 84123, HD 84388 and HD 84800 in Strömgren *b*

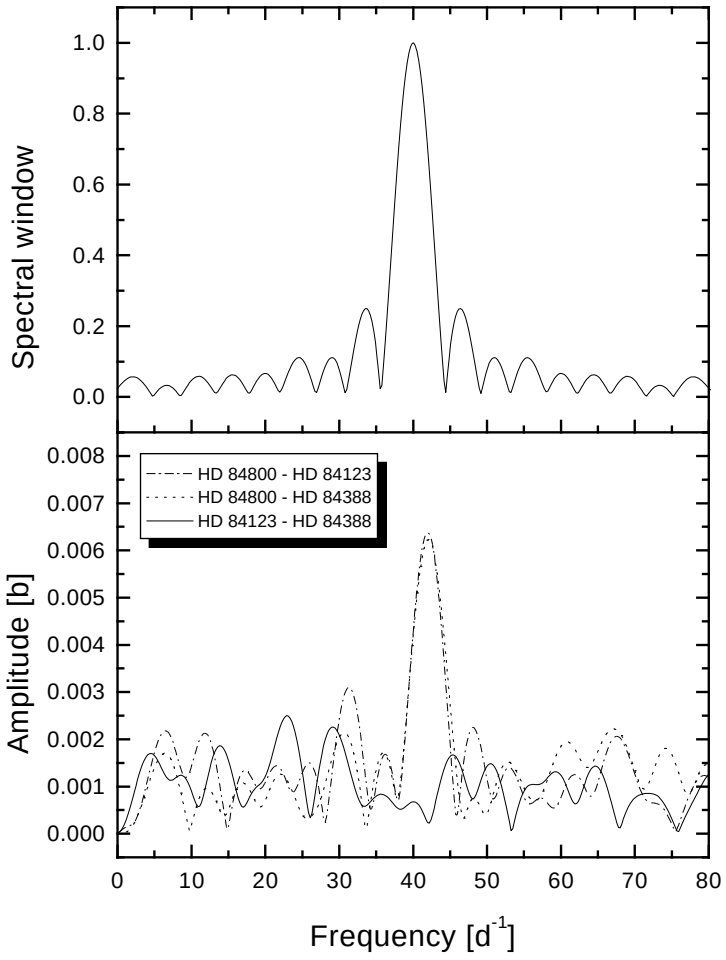

Figure 2. Amplitude spectra for all three stars

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References:

Bartaya R.A., 1979, *Bull. Abastumani Obs.*, No. 51
Bartkevičius A., Lazauskaitè R., Tautvaišienè G., 1992, *Baltic Astronomy*, Vol. 1, 216
López de Coca P., Rolland A., Rodríguez E., Garrido R., 1990, *A&AS*, **83**, 51
Paunzen E., Weiss W.W., Kuschnig R., et al., 1998, *A&A* (in press)
Schmidt-Kaler Th., 1982, in: Landolt-Börnstein New Series, group VI, vol. 2b, p. 453
Stellingwerf R.F., 1979, *ApJ*, **227**, 935
Strassmeier K.G., Boyd L.J., Epand D.H., Granzer Th., 1997, *PASP*, **109**, 697