

**DETECTION OF VARIABILITY IN HD 168947**

We obtained two nights of differential photometry of HD 168947. The observations were done at the 70 cm Swiss-telescope at ESO, La Silla. The observers were P. North and E. Paunzen. The measurements are in the Geneva photometric system (Rufener and Nicolet, 1988) and the integration time was 3 minutes. In one night (30.06./01.07.) we observed one comparison star (C1, HD 168287,  $m_V=7.3$ , A3m), in the second night (10.07./11.07.) we observed an additional comparison star (C2, HD 170149,  $m_V=7.6$ , F5IV). Both comparison stars proved to be constant within an upper limit of 0.003 mag in Geneva-V.

HD 168947 is a binary star with a B type companion in a distance of 5.5 arcminutes (Eggen, 1982). Eggen gives a spectral type of A3 II/III. The following calibrations have been adopted by Strömgren indices (Moon & Dworetzky, 1985):

$$T_{eff} = 7500 \text{ K}, \log g = 3.6, \delta m_0 = 0.064$$

Because of the decreased metallicity and the classification as luminosity-class II/III star, HD 168947 is a candidate for the  $\lambda$  Bootis group (Gray, 1991) which contains metal weak A type stars with broad and shallow hydrogen lines. The properties of this group are described in Weiss et al. (1994). The spectrum of HD 168947 shows a weak  $\lambda$  4481 Mg II line, but otherwise the characteristics are normal for early A type stars (Gray, 1994). Further observations have to prove the membership to the  $\lambda$  Bootis group.

The evolutionary status of this group is not clear. In one scenario these stars are at the end of the ZAMS, in another they are just arriving at the ZAMS. In the first case diffusion would be the mechanism determining the peculiar abundance pattern, in the other it would be accretion and/or mass-loss. It is interesting that Eggen suggested that this star has *not* yet arrived at the ZAMS.

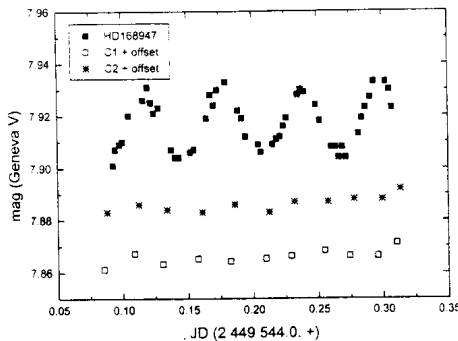


Figure 1. The light curve for HD 168947, C1 and C2 for the second night in Geneva-V

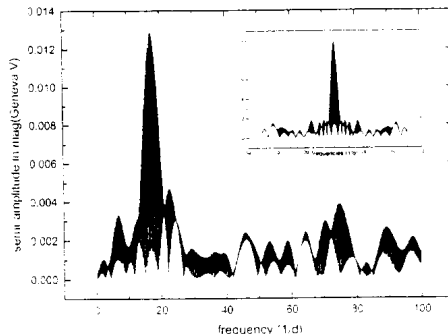


Figure 2. Amplitude spectrum for the differential data of HD 168947 and HD 168287, the spectral window is inserted

With the tools of asteroseismology it should be possible to derive the evolutionary status of stars. We started therefore a survey for pulsation among  $\lambda$  Bootis stars. Up to now we found 6 new pulsating stars. For HD 168947 we observed a period of 17.2 c/d (84 minutes) and an amplitude of about 0.026 mag in Geneva-V (see Figure 2). This period is consistent with an expected period of an A type star arriving at the ZAMS (Stellingwerf, 1979). Figure 1 shows the light curve for the second night for all three measured stars.

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#### References:

- Eggen, O.J., 1982, *ApJ*, **258**, 605  
 Gray, R., 1991, Precision Photometry, ed. Philip, page 309  
 Gray, R., 1994, private communication  
 Moon, T.T., Dworetzky, M.M., 1985, *MNRAS*, **217**, 305  
 Rufener, F., Nicolet, B., 1988, *A&A*, **206**, 357  
 Stellingwerf, R., 1979, *ApJ*, **227**, 935  
 Weiss, W.W., Paunzen, E., Kuschnig, R., Schneider, H., 1994, *A&A*, **281**, 797