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HR 3562 AND HR 3600, TWO NEW MULTI-PERIODIC B-TYPE STARS

HR 3562 (HD 76566, BD $-44^{\circ}4951$) is a 6th magnitude star classified B3IV by Houk (1978). The photometric classification by means of the stellar photometric boxes (Nicolet, 1982) confirms this spectral type since the following stars are found in the box of HR 3562: HD 32630 (B3V), HD 45321 (B2.5V), HD 46189 (B4IV), HD 57573 (B3V). In addition, the calibration of Cramer and Maeder (1979) for the B-type stars measured in the Geneva photometric system gives $M_V = -1.48$ and $\log T_e = 4.235$ for HR 3562, values which are in agreement with the B3IV type. On the other hand, note that the projected rotational velocity is low (vsini = 5 km/sec) and that the star is a visual binary with a separation of 35" and a difference of magnitude of $6^m.5$ (see Hoffleit, 1982).

HR 3600 (HD 77475, BD $-41^{\circ}4720$) is a 5th magnitude star. Its spectral classification by Houk, B5III, is not in agreement with the photometric classification by Nicolet, since the following stars are found in the box of HR 3600: HD 36267 (B5V), HD 39764 (B5V), HD 74071 (B5V), HD 186837 (B5V). For HR 3600, the calibration of Cramer and Maeder gives $M_V = -0.68$ and $\log T_e = 4.183$. These values confirm that the spectral type B5V is the correct one. Finally, note that this star is probably also slowly rotating since vsini = 0.

These two stars have been measured in the Geneva photometric system from the Swiss Station at La Silla Observatory, Chile, from November 1981 to February 1982. Both stars have shown small amplitude variations: in the case of the 69 measurements of

HR 3562, the peak-to-peak amplitude $2A_V$ in the V-filter is about $0^m.04$ and the standard deviation σ_V is $0^m.0097$; in the case of the 55 measurements of HR 3600, it is $2A_V \simeq 0^m.03$ and $\sigma_V = 0^m.0069$.

Fourier analysis of the measurements reveals three significant periods in both stars:

HR 3562:	$P_1 = 1.97$d.	$A_1 = 0^m.0089$
	$P_2 = 1.73$d.	$A_2 = 0^m.0066$
	$P_3 = 1.66$d.	$A_3 = 0^m.0037$
HR 3600:	$P_1 = 9.64$d.	$A_1 = 0^m.0083$
	$P_2 = 14.4$d.	$A_2 = 0^m.0073$
	$P_3 = 10.7$d.	$A_3 = 0^m.0030$

The residual dispersion around the light curves (with the three periods) fitted on the observation is $\sigma_{res} = 0^m.0038$ for HR 3562 and $0^m.0034$ for HR 3600. These fitted light curves and the photometric measurements are shown in Figures 1a and 2a. In Figures 1b and 2b are shown the residues (observation minus fitted curve). The dotted lines mark the levels $\pm \sigma_{res}$.

In the case of HR 3562, the determination of the periods is unambiguous because: 1) a photometric survey was organized during a second season and Fourier analysis reveals the same periods (however, the amplitudes are not conserved). 2) a continuous monitoring during several nights has shown that no variation of periods shorter than 6 h. can be detected. Thus, the peaks at $P \simeq 2$d in the Fourier spectrum are real and cannot be produced by the interference between periods shorter than 1d and the peculiar data sampling (1 measurement per night).

On the contrary, a doubt subsists in the determination of the periods of HR 3600. Indeed, the star was not measured continuously during several nights. Thus, it is not excluded that the correct periods are shorter than 1d and that the 3 periods given above

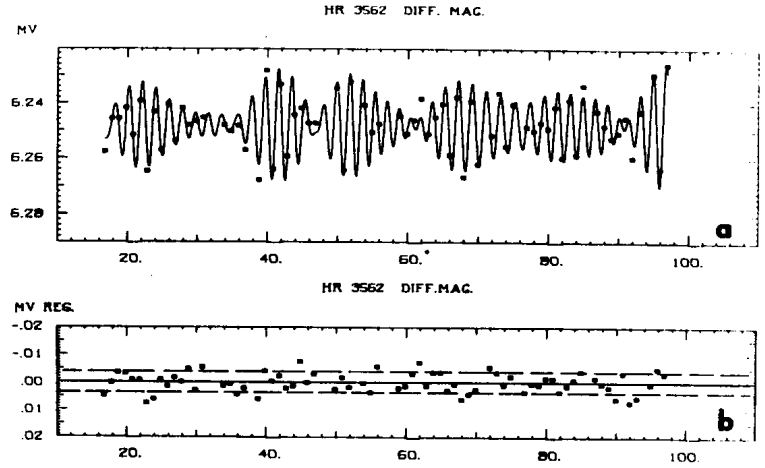

Figure 1

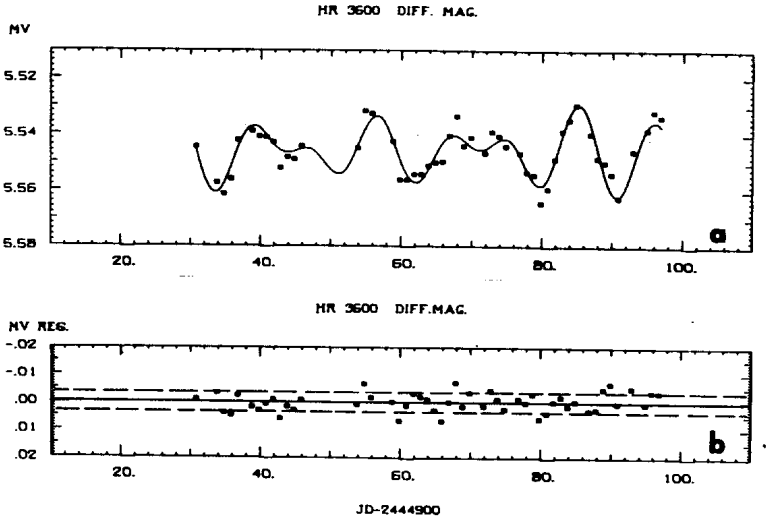

Figure 2

are spurious periods produced by the data sampling. A new monitoring is planned for the next season in order to resolve this problem of period determination.

Recall of the main characteristics of HR 3562 and HR 3600. They are main sequence stars of type B3 and B5. They are multiperiodic small amplitude photometric variables. The periods are larger than 1d (this must yet be confirmed in the case of HR 3600). They have small projected rotational velocities. Consequently, these two stars can be classified as slow variable stars (see Le Contel et al. for definition of this group of stars).

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References:

Cramer N., Maeder A.: 1979, Astron. Astrophys. 78,305

Hoffleit D.: 1982, The Bright Star Catalogue, 4th revised edition, Yale University Observatory, New Haven

Houk N.: 1978, Michigan Catalogue, vol. 2, University of Michigan, Ann Arbor

Le Contel J.-M., Sareyan J.-P., Valtier J.-C.: 1981, Intrinsic Variability in B-stars: Observational Facts, in Workshop on Pulsating B-stars, Eds. G.E.V.O.N. and C. Sterken, Observatoire de Nice, p. 45

Nicolet B.: 1982, Astron. Astrophys. Suppl. 48, 485