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HR 7308, A SHORT-PERIOD CEPHEID WITH VARIABLE AMPLITUDE

HR 7308, (=BD+27°3314) is a F6Ib-II star of 6th magnitude. Semi-regular photometric variations were detected by Breger (1969) and Percy et al. (1979) find that this star is a new small-amplitude cepheid. The radial velocity RV of HR 7308 was measured 132 times with the spectrophotometer CORAVEL (Baranne et al., 1979) between May 1977 and November 1979, and 10 photometric measurements in the Geneva system were obtained between October 1978 and May 1979. Figure 1 presents the RV data in function of the Julian Date. The measurement uncertainty, resulting from the photon noise, the scintillation and instrumental causes, is typically 0.43 km/sec in the case of HR 7308.

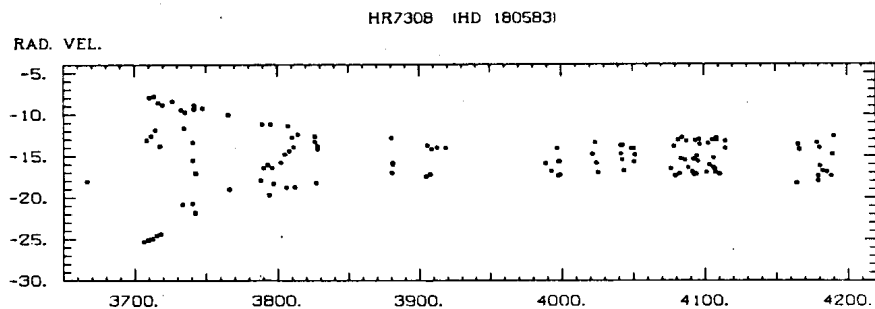


Figure 1 shows that the RV measurements are characterized by :

- 1) A short-period variability (RV=-9km/sec at JD 2443741.6 and -22 km/sec at JD 2443742.4)
- 2) An amplitude of variation which is variable with time. During the period of survey, the peak-to-peak amplitude has decreased from 18 km/sec at JD 2443710 to 4 km/sec at JD 2444000.

The search for the period of the short-term variability by a method of Fourier analysis (Burki and Rufener, 1978) reveals that a single period

$$P_0 = 1.49107 \text{ d.}$$

characterizes all RV data. Figures 2 and 3 show the RV curves calculated with P_0 and the phase origin JD 2440000, for 2 different epochs of survey.

JD 2443700-2443770

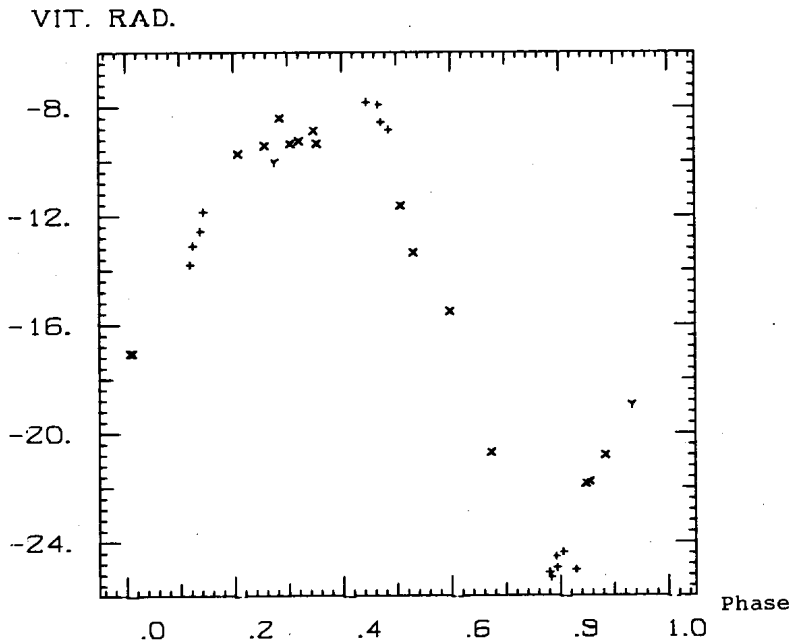


Figure 2

In Figure 2, the symbols plus refer to the data in the interval 2443706<JD<2443719 and the crosses to the data in the interval 2443726<JD<2443766. Figure 4 shows the light curve in magnitude V for the same period P_0 and the same phase origin. The squares refer to the data in the interval 2443788<JD<2443802 and the open circles to the data in the interval 2443971<JD<2444001. We see that the light curve is the mirror image of the RV curve.

VIT. RAD. JD 2444070-2444120

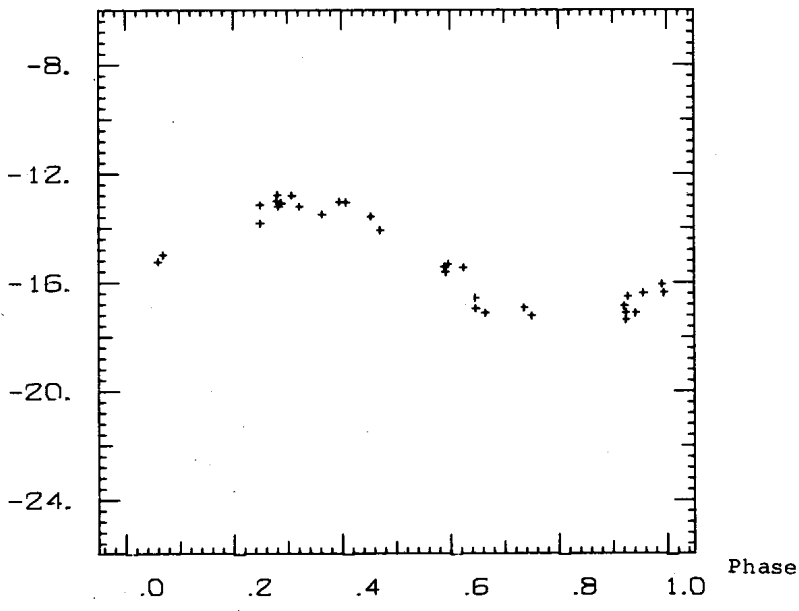


Figure 3

APP. MAG. JD 2443788-2444001

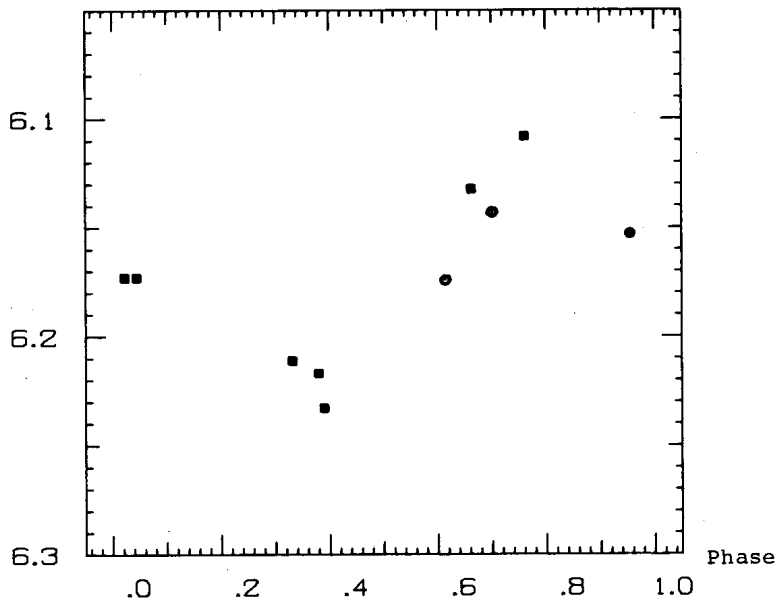


Figure 4

Thus, HR 7308 is a new short-period cepheid exhibiting a strongly variable amplitude. An analysis of the properties of this bright star reveals that it probably belongs to the population I. If this is really the case, HR 7308 would be the shortest classical cepheid known in our Galaxy. We shall continue to follow this star, both in radial velocity and photometry, in order to describe the future variations of the amplitude and, thus to determine its evolutionary status.

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