

A PRELIMINARY MODEL FOR HR 8752

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HR 8752 is a G5 hypergiant in the Cep OB1 association. It is an SRd variable according to the GCVS. The V and B-V curves of the star are plotted in Figure 1. One point in the figure is the mean of all measurements made in a ten-day interval. The circles contain the observations of Arellano Ferro (1985) which show large deviation in two cases. Neglecting these circles, it is clear from Figure 1 that HR 8752 has alternating brighter and fainter maxima, the difference between them being some hundredth of magnitude. A possible explanation will be outlined for this phenomenon.

Willson and Bowen (1984) proposed a close link between pulsation and mass loss in post-main sequence stars. This connection was investigated further in the case of nonradial pulsation (Abbott et al., 1986). In the case of P Cygni Lamers et al. (1985) and Markova (1986) observed periodic shell ejection which is triggered by nonradial pulsation (van Gent and Lamers, 1986).

HR 8752 pulsates (Lambert et al., 1981) with a rather large amplitude ($\Delta V \approx 0.2$ mag) which suggests radial pulsation. Shock waves, generated by pulsation, can enhance mass loss (Willson and Bowen, 1984). The proposed model for HR 8752 is the following. In every second cycle there is a sudden increase in mass loss arising from the above mechanism. It means, that a part of the circumstellar shell will have larger density and thus larger optical depth, which can cause the fainter maxima observed. This irregularity in the density structure of the shell may be smoothed out during the following minimum. There is, however, no spectroscopic evidence for this model. A long-term detailed spectroscopic study of HR 8752 would be highly desirable.

This scenario is similar to that of P Cygni. Van Gent and Lamers (1986) found a characteristic timescale of about 30 days for the pulsation of this star, while a shell ejection occurs approximately in every 200 days (Markova, 1986). There are, of course, differences between the two stars, but it is, however, an interesting similarity.

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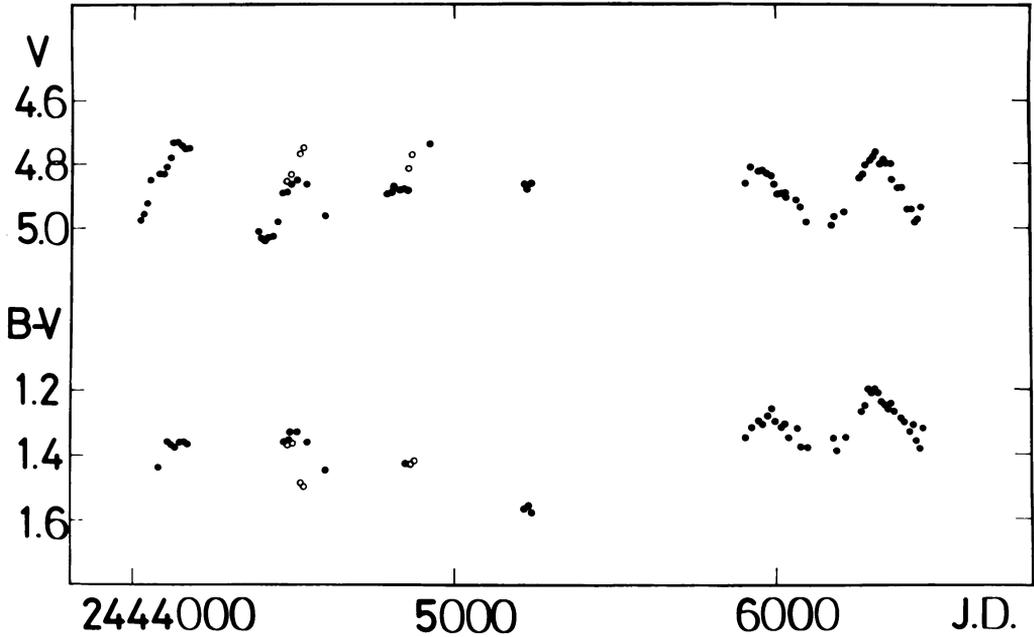


Fig. 1. V and B-V curves of HR 8752. Sources: Arellano Ferro, M.N. 216, 571; Halbedel, IBVS Nos. 2718, 2876; Parsons and Montemayor, Ap.J.Suppl. 49,175; Percy, unpubl.; Percy and Welch, P.A.S.P. 93,367; Walker, unpubl.; Zsoldos, unpubl.; Zsoldos and Olah, IBVS No. 2715.

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