

# UBV PHOTOMETRY OF THE WOLF-RAYET STARS WR137 AND WR140

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**Abstract.** Photometric observations between 1991 and 1993 of the Wolf-Rayet object WR137 show no evidence of an eclipse but some small intrinsic variability. The light-curve for WR140 shows a clear dip in this period, probably as a result of an eclipse.

**Key words:** photometry – Wolf-Rayet stars – stars, individual: WR137, WR140

We report on *UBV* differential photometry of the Wolf-Rayet objects WR137 and WR140. The observations have been obtained at Rozhen Observatory (Bulgaria) between 1991 and 1993 in the framework of the International Observing Campaign (Williams & van der Hucht 1989). We used the photon-counting, computer-controlled photoelectric photometer attached to the 60 cm telescope.

*WR137* (HD 192641, WC7+abs). Infrared observations by Williams *et al.* (1987) confirmed variable dust emission and a possible 12 yr interval between dust-formation episodes around this WR object. Anuk (1991) confirmed the binary nature of the star and determined a period of 4400 d (12.05 yr) from IR and RV data. — Our observations show no evidence of eclipses, but some small intrinsic variability ( $\Delta m \approx 0.01$  mag) is present in our data.

*WR140* (HD 193793, WC7+O4-5). This object has been extensively studied and found variable in all wavelength ranges (*e.g.*, Williams *et al.* 1990). Variable IR emission due to heated dust was studied by Williams *et al.* (1987, 1990). Comparison with earlier data suggested a period of 2900 d (7.94 yr) between episodes of dust condensations. Comparison with RV studies (*e.g.*, Williams *et al.* 1987; Moffat *et al.* 1987; Anuk 1991) revealed that these episodes coincide with periastron passages. Due to the high orbital eccentricity ( $e = 0.84$ ) both conjunctions should occur near the phase of periastron passage: at phase 0.955 the O-type star is in front of the WR star, and at phase 0.008 the WR star is in front of the O-type star.

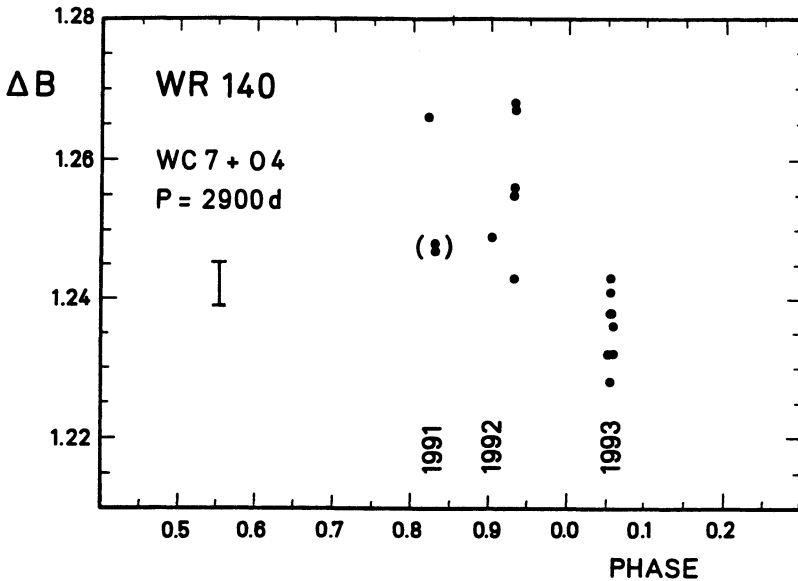


Fig. 1. Light-curve of WR140 in Johnson  $B$  (comparison star HD 193888 minus WR140). The phases are calculated from the ephemeris  $JD(\text{periastron passage}) = 2446160 + 2900 \cdot E$ . The bar indicates the observational error.

WR140 was observed from orbital phase 0.821 to phase 0.060, with a gap between 0.993 and 0.053. Fig. 1 shows a clear dip in the light of WR140; the decline of about 0.03 mag is the same in all three  $UBV$  filters. The dip occurs at phases 0.053 ... 0.060, when the O-type star is probably still behind the WR star. The light minimum may be the result of an eclipse of the O-type star by the extended atmosphere of the WR star (or, perhaps, the dust).

## References

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