3.5 HOUR PERIODIC VARIABILITY OF WR66 (HD 134877, WN8): THE FIRST EXAMPLE OF NON-RADIAL PULSATIONS AMONG WOLF-RAYET STARS?

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We report a first result from an extensive observing campaign for the WN8 star WR66 (HD 134877). We obtained 219 photometric observations of WR66 in a standard broadband V-filter during 61 nights, distributed in a $T = 83^{\rm d}$ interval. Details of observations and data reduction can be found in Antokhin *et al.* (1994). The power spectra of WR66–C1, WR66–C2 and C2–C1 are shown in Fig.1. Both the WR66–C1 and WR66–C2 spectra clearly show high frequency components. The overall structure of the peaks is evidently determined by 1-day aliasing. The highest peak in both spectra has frequency $\nu_1 = 6.828\ {\rm d}^{-1}$ (period $P = 3^{\rm h}.51$). Inspection of the power spectra shows that C1 is a low-amplitude variable, but luckily at low frequencies only. We conclude that WR66 is significantly variable with a period of $3^{\rm h}.5$. A phase plot of the data (WR–C2 and C2–C1) with this frequency is shown in Fig.2. Plausible scenarios which could potentially account for the observed variability are: (i) non–radial pulsations (NRP); (ii) rotational light-modulation by spots or (magnetic) loops at the stellar surface; (iii) spiral-in system (WR+c), like the massive X-ray binary Cyg X-3 (van Kerkwijk 1993).

References

Antokhin, I.I., Bertrand, J.-F., Lamontagne, R., Moffat, A.F.J. 1994, in preparation
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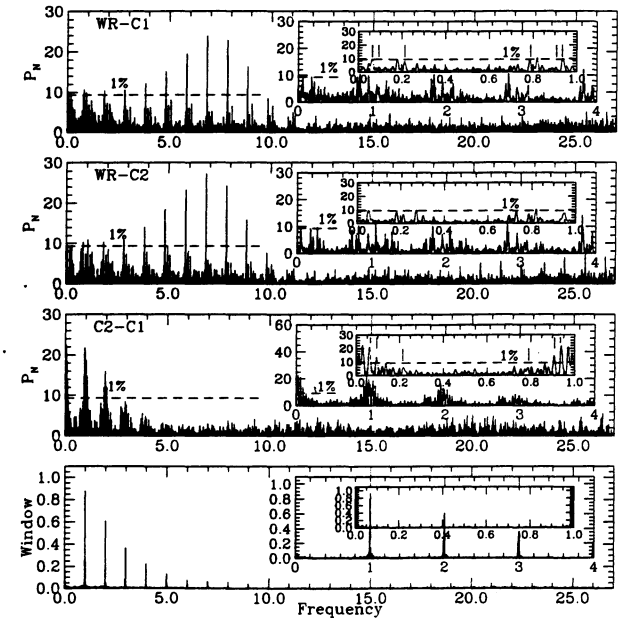

Fig. 1. Periodogram for WR66–C1, WR66–C2, C2–C1 based on the present data.

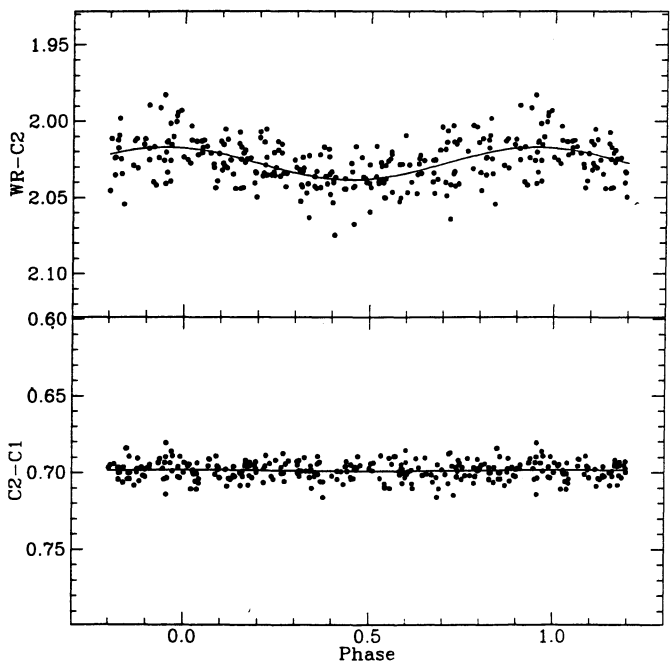

Fig. 2. Phase plot and sine-wave least square fit of WR66–C2 and C2–C1 with $\nu = 6.628\ d^{-1}$ fitted.

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