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PHOTOMETRY OF THE WOLF-RAYET STAR HD191765

The star HD191765 (WN6) is known to be a photometric and spectroscopic variable with a period of $7^d.44$ (Antokhin et al., 1982). It has been suggested that it is a binary system consisting of a WR and a neutron star (Antokhin et al. 1982) i.e. is one of the so-called WR+ compact companion (Moffat, 1983). In a recent paper one of us (Vreux, 1985) has drawn the attention on the peculiar distribution of the published periods of the members of that family and has suggested that some of these periods could be aliases of the true ones which would be much shorter and would have been missed due to the distribution of the observations. HD191765 is one of the candidate to be reinvestigated in search of shorter periods.

Observations spanning an interval of 14 days were carried out in August 85 at the 1 m. telescope of the Mont Chiran station of the Haute Provence Observatory (France). The photometer (PAM II) was used in a classical one-channel configuration. The photomultiplier was not cooled.

In an attempt to separate the respective contributions of the lines and of the continuum, three filters were used.

- 1 - central wavelength 4060 Å, $\Delta\lambda = 70$ Å (= IHW C₃ filter) isolating the NIV line (the reason for the choice of that line is given in Vreux et al., 1985);
- 2 - C.W. 4100 Å, $\Delta\lambda = 180$ Å (= Strömgren v) covering lines of HeII, NIV, NIII...;
- 3 - C.W. 4260 Å, $\Delta\lambda = 65$ Å (IHW CO⁺ filter) practically line free.

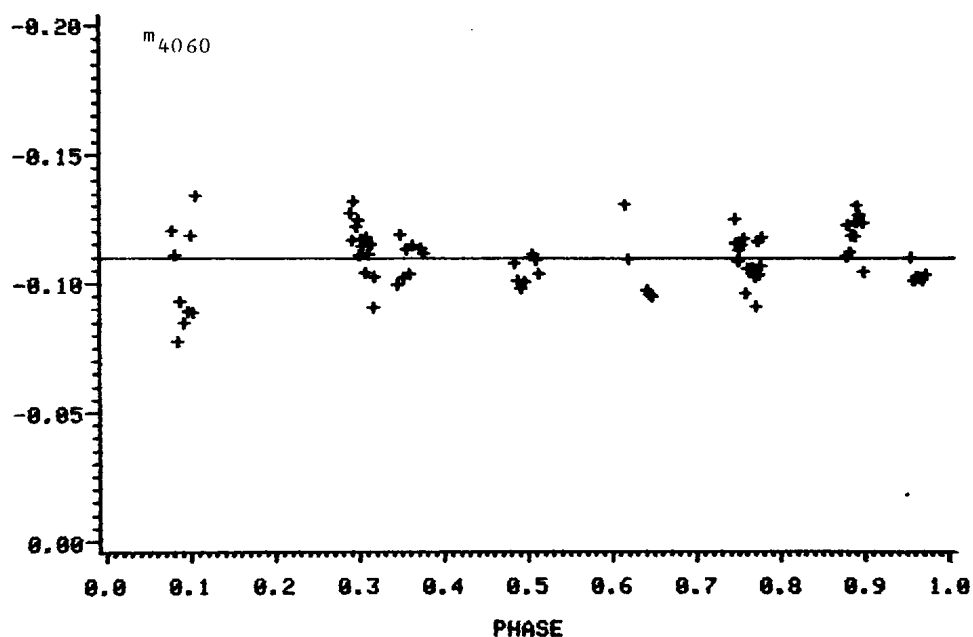


Fig. 1. Phase diagram of HD191765 with a period of 7.44 days. The comparison stars are HD192536 and HD192537. The y axis is m_{4060} .

3 comparison stars were observed: HD192020 (G8V), HD192536 (Am) and HD192537 (B8V) with the hope that at least the Am star would prove to be constant. The observations were made in rapid sequences so as to cancel as much as possible instrumental and atmospheric variations.

The comparison HD192020 has shown small variations. On the other hand, the pair HD192536, HD192537 remained quite constant.

All measurements were therefore compared to those stars in a differential manner.

Instrumental problems prevented us to observe more than five nights with all three filters. The remaining of the observing run

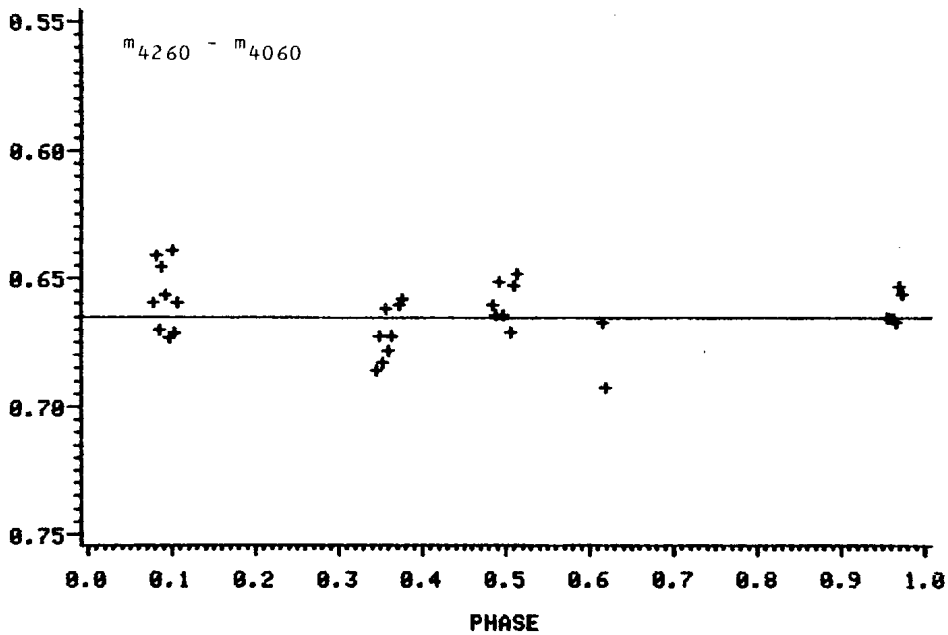


Fig. 2. Same as Fig. 1. for the color index $m_{4260} - m_{4060}$.

had to be done with the 4060 Å filter only. The residual noise of the data was much higher than expected, again because of instrumental reasons. Nevertheless, the data relative to the comparison stars demonstrated that night to night variations as small as 0.01 magn. could be detected.

The data presented in Figures 1 and 2 are plotted as a function of the phase for a period of 7.44 days. (Period suggested by Antokhin, Aslanov and Cherepashchuk, 1982).

Fig. 1 shows the 4060 Å (NIV) magnitude compared to 1/2 (HD192536 + HD192537). The magnitudes of the comparison stars were smoothed with a time scale of 30 minutes. The resulting differences were binned in intervals of about 30 minutes. If one forgets the noise within each night, our data suggest variations not larger than 0.01 or 0.02. The color index ($m_{4260} - m_{4060}$) plotted in Fig. 2, and based on only five nights, indicates variations of about 0.02 magn.

Although the sampling is less than complete, we have to conclude that our data do not support the light curve determined by Antokhin et al. (1982). Unfortunately we are not able to suggest another period: our time base is not sufficient due to the instrumental problems encountered.

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