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NEW PHOTOMETRY OF THE WOLF-RAYET STAR HD191765

A small photometric and spectral variability of the star HD191765 (WN6) with the period 7.44^d was discovered by Antokhin et al. (1982). The amplitude of the photometric variability was equal to 0.04^m . It was suggested that this is a binary system consisting of a WR star and a neutron star (so-called "WR+ compact companion" system, see Moffat, 1983). Antokhin and Cherepashchuk (1984) improved the value of the period of the light variability ($P = 7.483^d$) and reported about discovering the narrow, "eclipse-like", secondary minimum on a light curve. This argues for a binary nature of this star.

Recently the paper of Vreux and Manfroid (1985) has been published which is devoted to photometric observations of HD191765 during 14 days in August 1985. These observations have been made with the purpose of searching the fast variability of HD191765. Vreux and Manfroid report that no light changes greater than 0.02^m have been found in filters $\lambda 4060\text{\AA}$ ($\Delta\lambda = 70\text{\AA}$) and $\lambda 4260\text{\AA}$ ($\Delta\lambda = 65\text{\AA}$) from night to night.

Our observations of HD191765 were carried out at the 48-cm telescope of the Alma-Ata Station of the Shternberg State Astronomical Institute in October-December 1984, September-October 1985, April-May and June-July 1986. The UBV-photometer in the regime of photon counting was used. Two comparison stars were observed: HD 191917 ($V = 7.8^m$, B1) = C1 and the star K (Cherepashchuk, 1972) = C2.

Figures 1-4 show the results of these observations in B, V filters. Each point is the average value of 3-19 individual light observations.

The value $m_{c2} - m_{c1}$ is also shown. One can see that the value $m_{c2} - m_{c1}$ is stable within the accuracy $\pm 0.006^m$.

Our observations in a time interval 1984-1986 show that the character of the light variability of HD 191765 after 1983 changed significantly:

1. The average light of the star is variable on a long timescale.

In a time interval of ≈ 3 months in 1984 it changed by 0.02^m

(Fig.1, the straight line is drawn using the least-square method).

The average light in 1986 is also variable (Fig.3,4).

2. The shape of the light curve is also variable. The variability became less regular in 1984 (Fig.1) and irregular - in 1985 and probably 1986 (Figs.2 - 4).
3. The amplitude of the variability decreased to 0.02 in B,V filters in 1985 and increased again in 1986. It must be pointed out that the results of our observations in 1985 (Fig.2) being practically simultaneous with the observations of Vreux and Manfroid (1985) are consistent fully with their results.

Thus, light curves of HD191765 are variable in shape, amplitude and average light level on a long timescale. Similar variations in the light curve were observed in the case of another suspected "WR + compact companion" system, HD50896 (Lamontagne et al., 1986). Such variations can be explained by precession effects arising from a nonsymmetric SN-explosion in a binary system.

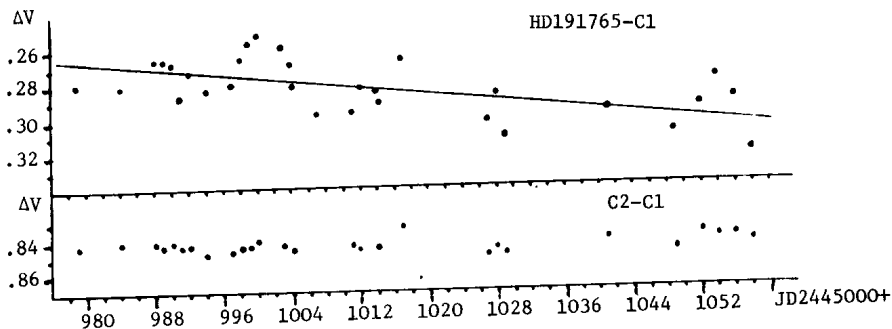


Fig. 1 V-observations of HD191765 in 1984.

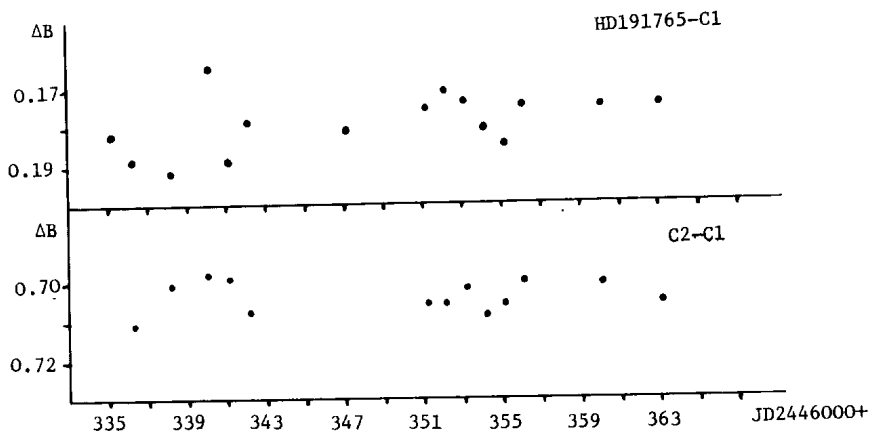


Fig. 2 B-observations of HD191765 in 1985

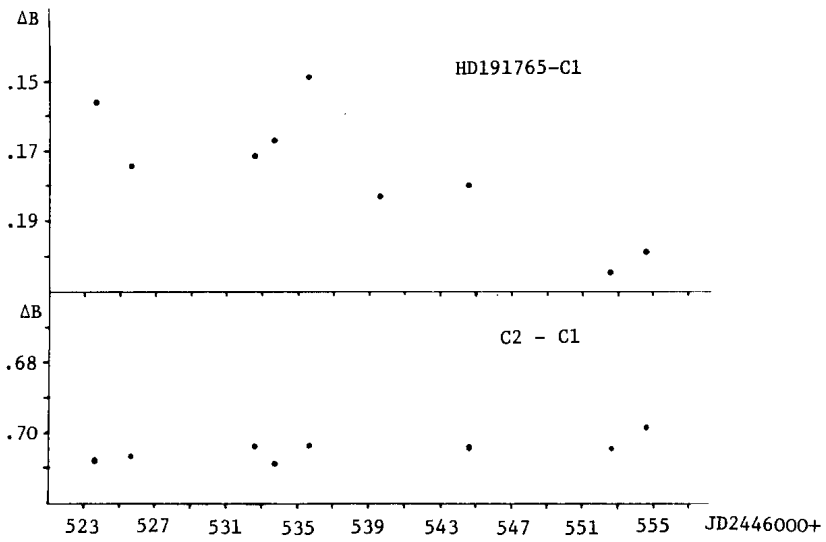


Fig. 3 B-observations of HD191765 in April-May 1986.

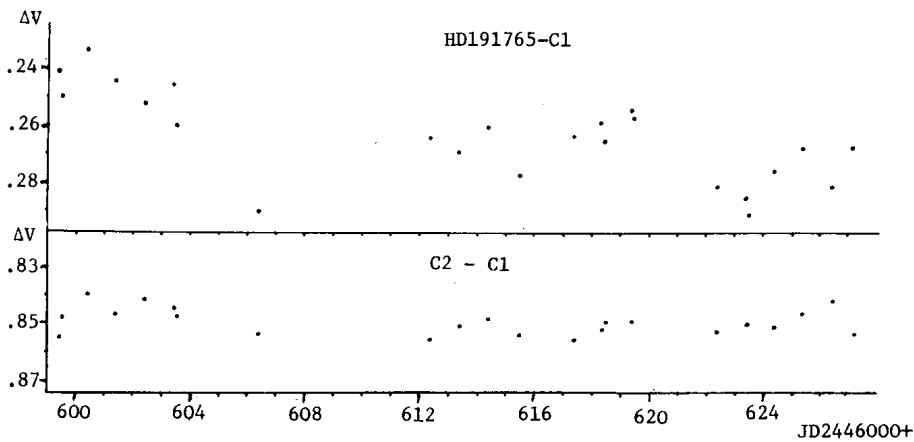


Fig. 4 V-observations of HD191765 in June-July 1986.

As a result of such explosion the rotational axis or the formed neutron star can align oblique to the orbital plane. Further observations of this interesting star are necessary.

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