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PHOTOELECTRIC OBSERVATIONS  
OF THE ECLIPSING BINARY STAR BD +2°1855

The star BD +2°1855 (discovered by Hoffmeister, 1934, observed by Soloviev, 1955) is suspected to be a W UMa-type variable star in the New Catalogue of Suspected Variable Stars (1982), as NSV 03867.

Observations were carried out between March 1 and April 24, 1989 at the Mt. Suhora Astronomical Observatory of the Pedagogical University in Cracow using the 60-cm Cassegrain telescope with a two-channel photometer and EMI 9865B photomultipliers. Observations were carried out through yellow and blue filters close to the UBV Johnson-Morgan system.

BD +2°1852 was chosen as the comparison star. After the first observations, made on March 1, it turned out that the light curve of BD +2°1855 was strongly deformed. By examining the observations separately in both channels, it was found that the disfigurement is caused by the star placed in channel B - the comparison star. Due to the above reason another comparison star (BD +2°1856) was chosen. Its constancy was occasionally checked against BD +2°1857.

All observations, except for those made during the first night, were corrected for atmospheric extinction using the mean extinction coefficients for the observatory:  $m_B = 0.35$  and  $m_V = 0.25$ . We were able to determine 3 moments of minima. They are given in Table I. All times of minima were found by determining the minimum of the parabola fitted to the observational points, making use of the least-squares method.

From the minima listed in Table I we calculated the tentative elements for BD +2°1855:

$$\text{Min I JD hel} = 2447587.3599 + 0.559355 E \quad (1)$$

$\quad \quad \quad \underline{+3} \quad \quad \quad \underline{+6}$

Table I. Observed moments of minima of BD +2<sup>o</sup>1855

Minimum	Comp. star	Moment of min. (JD <sub>hel</sub> )	Remarks
Pr.	BD +2 <sup>o</sup> 1852	2447587.3599 +3	*
Sec.	BD +2 <sup>o</sup> 1856	2447594.3611 +7	**
Sec.	BD +2 <sup>o</sup> 1856	2447641.3388 +5	**

\* - derived from observations in channel A only,

\*\* - derived from two-channel observations.

In deriving the elements we assumed that the secondary minimum falls in the phase = 0.5.

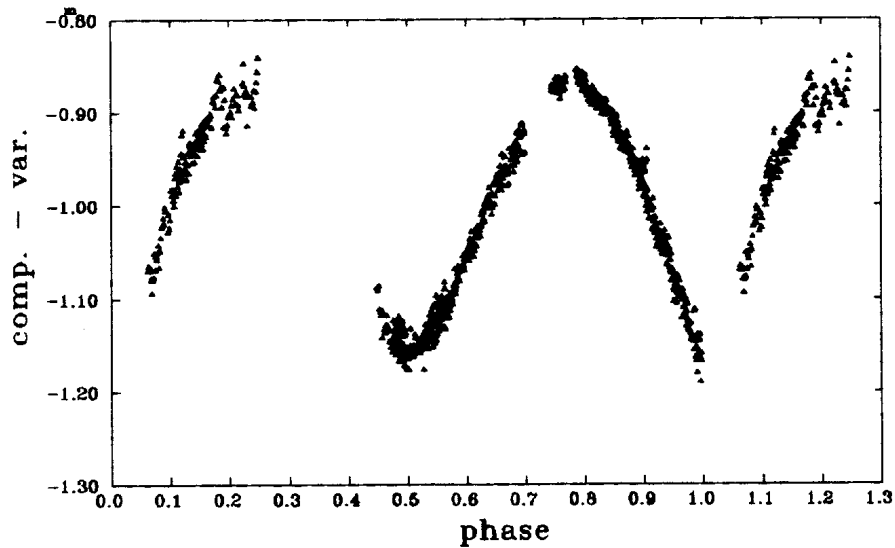


Figure 1. The light curve of BD +2<sup>o</sup>1855 in the yellow filter.

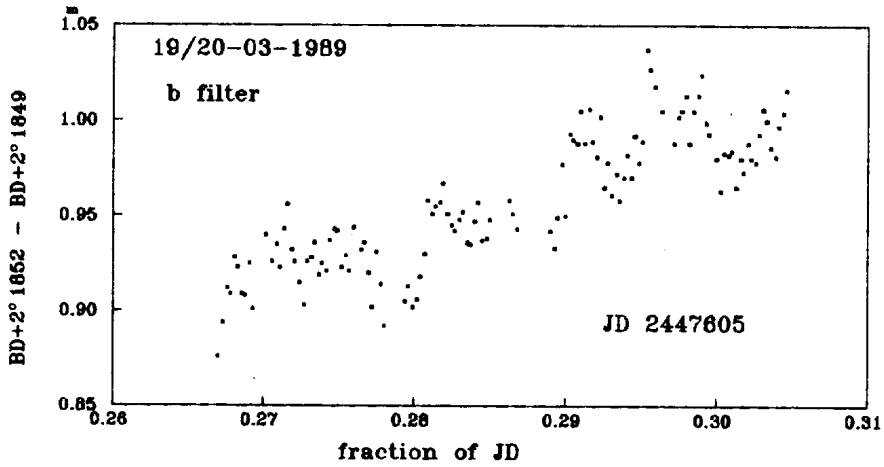


Figure 2. The observed light variation of BD +2°1852 during the night 19/20 March 1989.

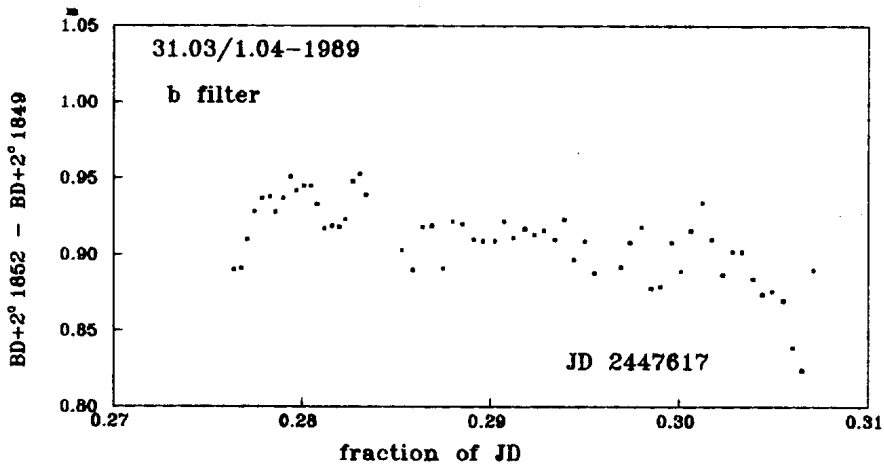


Figure 3. The observed light variation of BD +2°1852 during the night 31 March/1 April 1989.

The light curve of BD +2<sup>o</sup>1855 in the yellow filter is presented in Figure 1. Phases of the observational data collected after March 2 were calculated using the above elements. The light curve in the blue filter is not presented here because it covers only a small part of the orbital period. Although the light curve is not complete, its shape indicates that BD +2<sup>o</sup>1855 is a very close binary system, likely of W UMa type. The estimated depth of the secondary minimum (in the instrumental system) is about 0.<sup>m</sup>32 and 0.<sup>m</sup>30 in blue and yellow filters, respectively. The depth of the primary minimum in the yellow band should be larger by about 0.<sup>m</sup>07.

The variability of BD +2<sup>o</sup>1852 was confirmed during two nights, while the star was observed with BD +2<sup>o</sup>1849 as the comparison star and through the blue filter. The results are plotted in Figures 2 and 3. The star exhibited a light variation of about 0.1 magnitude during a one-hour observational run made on March 19 and about 0.06 magnitude on March 31.

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