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SUDDEN BRIGHTENING OF THE RECENTLY DISCOVERED Be STAR HR 7739

As a by-product of the on-going photoelectric observations of bright Be stars at the Hvar Observatory (carried out in the framework of the international IAU campaign by a group of Czechoslovak and Yugoslav astronomers) HR 7739 (HD 192685, BD+25°4165), a bright B3 V star, was discovered to be a variable star (Harmanec et al., 1982, Pavlovski and Božić, 1982). Until then, the star was used as a comparison star for the Be stars 20 Vul and 25 Vul. Following the discovery of the light changes, Barker (1982, 1983) announced that HR 7739 is a Be star, the only previous observation from September 20, 1980 shows the H alpha as a broad absorption line. The emission strengthened rapidly at the beginning of September 1982, reaching some 30 per cent above the continuum level in the period October-December 1982.

Our UBV observations of HR 7739 cover the period July 9, 1981 - December 4, 1982. They were reduced differentially to 17 Vul, which originally served as the check star for the group. Its UBV magnitudes, derived at Hvar and used here, are given, together with some other magnitude determinations, in Table I. Our standard observational and reduction technique (Harmanec et al., 1977) was used.

Table I
UBV data of 17 Vul

V	B-V	U-B	Source
5.07	-0.180	-	Haggkvist and Oja. (1966)
5.07	-0.18	-0.70	Eggen (1969)
5.06	-0.18	-0.68	Crawford et al. (1971)
5.066	-0.163	-0.685	this paper

Figure 1 shows the light curve (normals from 2-5 observations each night) in V, B-V and U-B, together with the peak intensity of the H alpha emission measured on Barker's (1983) profiles. A correlated behaviour of the light, colour, and the H I emission is clearly seen. The rapid strengthening of the H alpha emission was accompanied by the brightening of the object, reddening of the B-V, and blueing of the U-B index. It is notable, however, that the subsequent light decrease, observed on December 4, 1982, occurred at a time when the emission was still rather strong.

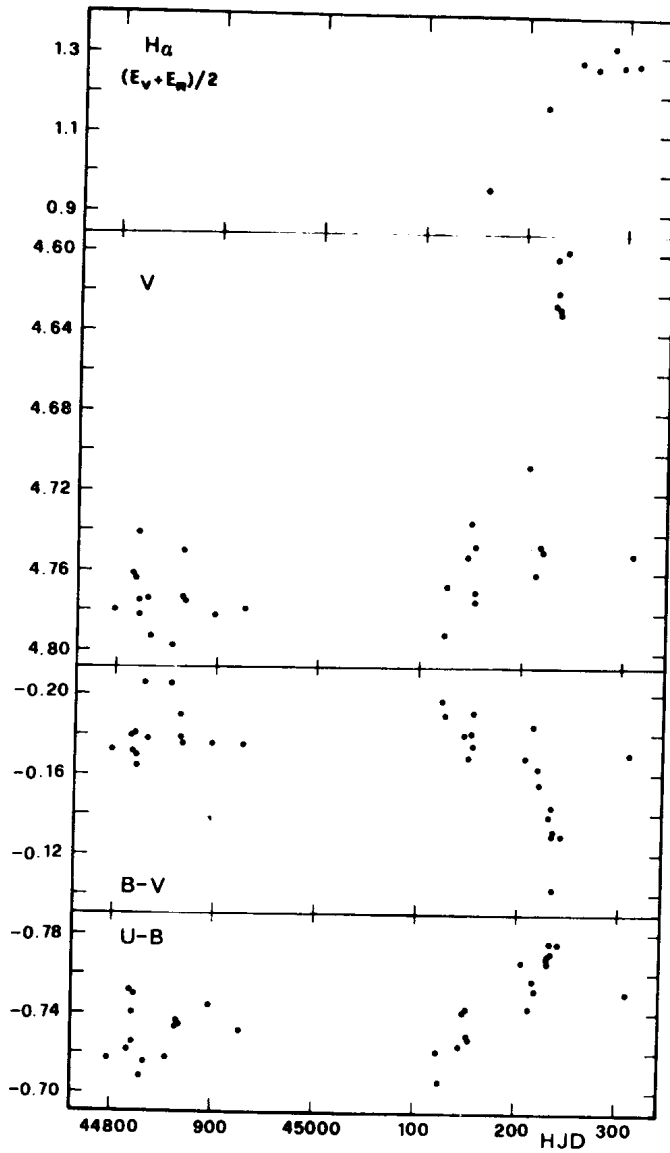


Figure 1

In principle, the observed behaviour is an example of the positive correlation between the emission strength and luminosity in V (c.f. Harmanec, 1983 and references therein), which seems to be statistically the most frequent behaviour of Be light variations (Nordh and Olofsson, 1977, Hirata and Hubert-Delplace, 1981).

A comparison of our observations with the previous published UBV measurements of HR 7739 (see Table II) indicates that the brightening we report was observed for the first time - all the previous values agree well with our 1981 values. It probably means that HR 7739 appeared as a normal B absorption star in the sixties and seventies - until July 1982.

Table II
Published UBV data of HR 7739

V	B-V	U-B	Source
4.77	-0.18	-0.73	Johnson et al. (1966)
4.79	-0.191	-	Haggkvist and Oja (1966)
4.80	-0.18	-0.71	Crawford et al. (1971)
4.82	-0.18	-0.72	Johnson and Mitchell (1975)
			Estimated from their 13-colour photometry
4.77	-0.18	-0.73	Mean of Hvar 1981 observations

HR 7739 was announced to be a spectroscopic binary with an 11.000-day period, by Kodaira (1971). However, Harmanec (1982, unpublished) analyzing all available RV data concluded that an 11-day period is not present in them. It seems that the characteristic time of the RV variations (if they are real at all) is short, probably near one day or so. A similar short-time scale is apparent in our UBV observations, too. We have not attempted any period analysis of the data as we feel that their number is still insufficient for such a purpose.

Further photometric and spectroscopic monitoring of the object from several distant stations, including the determination of new accurate radial velocities would clearly be of great interest.

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