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ON THE VARIABLE LIGHT CURVE AND PERIOD OF EM CEPHEI

The B1 IV star EM Cep (HD 208 392) was first discovered by Lynds (1959) to be a periodic variable with a photometric range of 0.15 magnitude and a period of 0.80624 d, and has since then been observed several times. Lynds himself obtained a rather regular UBV light curve, and concluded the variable to be a close-to-contact binary system.

According to the photometry of Johnston (1970), and the more recent observations of Bakos and Tremko (1975), both the maxima and minima seem to undergo considerable changes almost from cycle to cycle, which the latter authors consider to be the result of mass transfer between the components. Rather strong and rapid fluctuations are also found in the photometry of Rachkovskaya (1976). A considerable increase in the period has also been reported (Bakos and Tremko 1975).

The star was therefore reobserved in the fall of 1978. During a course of 8 nights between September 18 and November 20, a complete light curve could be secured with the 36 cm Cassegrain telescope, consisting of about 475 observations in U, B, and V respectively.

From a plot of these data (Fig. 1), it is immediately seen that the light curve has again undergone rather strong and rapid variations. The most obvious effect is a shift of the primary minimum in brightness by nearly $0^m.05$ during the observing time interval. The brightness fluctuations near maximum I and minimum II are of almost the same order of magnitude. There is a general impression that the light curve changes alternately between two different patterns.

The new minimum times determined from the present observations are given in Table 1. A combination of these data with the epochs of Bakos and Tremko (1975) gives, for the interval 1972-1978, a mean period $P = 0.80648$ d and, as an equally permissible choice, a second value $P = 0.80618$ d. Validity of the first result would indicate a further increase of the period. The latter value is in satisfactory agreement with Lynds' original period and the results

of Rachkovskaya, and therefore, by implying a constant period, seems to be at variance with the conclusions by Bakos and Tremko.

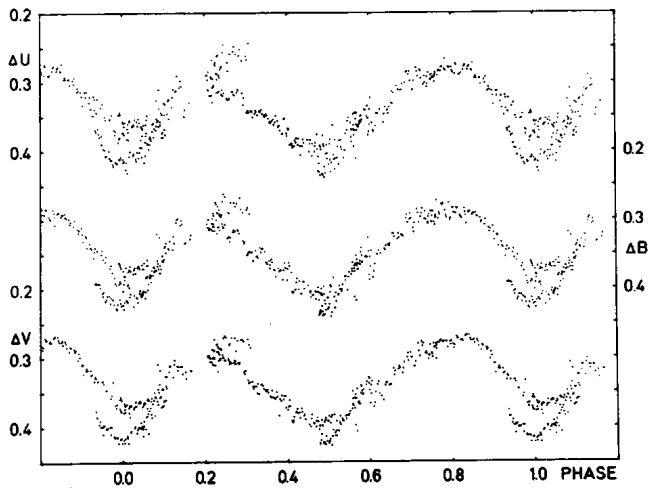


Fig. 1. UBV light curve of EM Cep, relative to HD 208 218

Table 1. Individual minimum times and mean values

J.D.hel. (2443800+)	RMS	Colour	Type of Min.
25.4319	+ 0.0018	U	II
25.4327	0.0016	B	II
25.4322	0.0014	V	II
25.4323	0.0009	mean	II
32.3152	0.0027	U	I
32.3130	0.0012	B	I
32.3136	0.0015	V	I
32.3138	0.0009	mean	I

It cannot be excluded, however, that because of the extremely strong brightness variations in the light curve of Bakos and Tremko as well as in the present observations primary and secondary minimum have been confused.

Under these circumstances the predicted increase of the period cannot be considered to be definitely established yet.

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