COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 1481

Konkoly Observatory
Budapest
1978 October 3

OBSERVATION OF THE PECULIAR ECLIPSING VARIABLE ER VULPECULAE

The peculiar eclipsing binary system ER Vul, HD 200391 = BD + 27°3952 ($\alpha_{1900} = 20^h58^m07^s$, $\delta_{1900} = +27°24.8$) was discovered as spectroscopic binary in 1946 at David Dunlap Observatory by Northcott and Bakos (1956) through an interval of two years. It was suspected as eclipsing binary by Bakos who carried out photoelectric observation and confirmed the light variation. The photometric observations are discussed by Northcott and Bakos (1967). Also Abrami and Cester (1963) have observed the star in B and V filters and presented a solution of the geometrical elements based on the dynamical equilibrium ratio relating stellar masses and radii. The star has been listed by Hall (1976) in the table of short period group of the RS CVn binaries, the spectral type GOV + G5V.The H and K emission lines were observed in the spectrum by Bond (1970) (see also Eggen 1978).

The light curve was obtained in two colours from 1000 photoelectric observations made with the 48 cm Cassegrain telescope of the Ege University Observatory. The telescope was equipped with an unrefrigerated 1P21 photomultiplier with B and V filters of the UBV system during a two-week period in July-August 1978. Two stars in the neighbourhood of the variable were selected as comparison and check star, HD 200270 and HD 200425, respectively.

The observations have been reduced in phase by using the light element Hel.J.D. Min.1 = 2440182.266 which is given by Battistini et al.(1974) and the period P=0.698096 days which was calculated by Northcott and Bakos (1967). Accordingly the O - C values derived for the primary and secondary minimum in the blue light are given in Table 1.

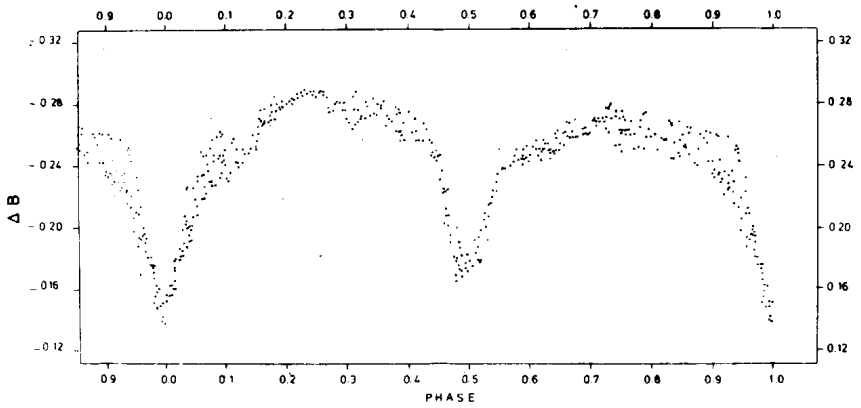

FIG.(1) B LIGHT CURVE OF ER VUL

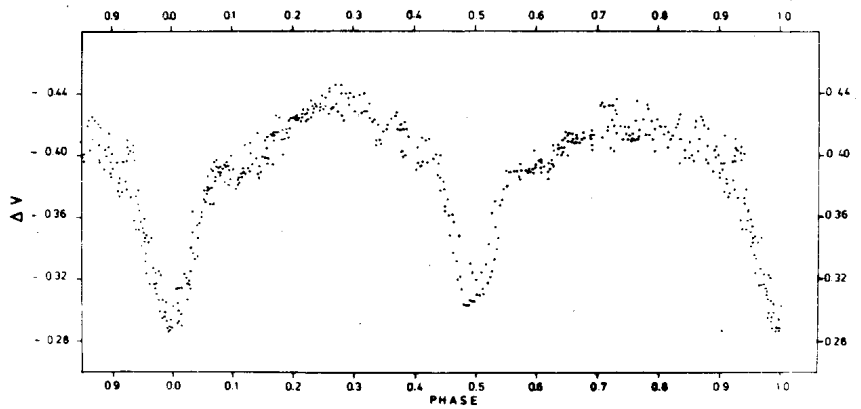

FIG.(2) V LIGHT CURVE OF ER VUL

Table 1

Epochs of minima of ER Vul

Type of Min.	J.D.Hel	O - C	Ref.
I	2438722.545	0.000	Northcott & Bakos
I	9029.705	-0.002	" (1967)
II	8672.629	-0.002	"
II	8700.555	0.000	"
I	2443724.3856	-0.0188	Present work
I	3731.3679	-0.0169	"
II	3718.4566	-0.0144	"
II	3730.3222	-0.0168	"

Our observation indicates irregular light curve variations. In Figures 1 and 2 the light curve of ER Vul in the two colours B and V respectively is represented as a function of phase (using the new calculated linear ephemeris from the O - C values (Table 1), namely; Hel.J.D.Min.I.= $2440182.3212+0^{d}.698082 \cdot E$. The peculiarities are mainly a great variability in the levels of the outside eclipses and in the depth of the secondary minimum, this phenomenon shown also in the light curve of RT And (Mancuso et al. 1978). It is remarkable that the maximum of ER Vul appears unsymmetrical which is confirmed also in the light curve of Northcott & Bakos (1967). The star will be observed again at Kottamia Observatory in the near future. In the forthcoming paper the light curve of the system will be analysed for determining the different physical and geometrical elements.

I would like to thank Professor Kizilirmak and his staff of Ege University Observatory particularly Dr.M. Kurutec for the continuous help and discussion during the observation time of ER Vul.

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