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PHOTOELECTRIC OBSERVATIONS OF THE ECLIPSING VARIABLE ER VULPECULAE

The eclipsing binary system ER Vul with the period of 0.6980960 days (Northcott and Bakos, 1967) was observed during four nights, 29 July-1 August, 1994, with the 51 centimeter Cassegrain telescope of Birouni Observatory (Iran, Shiraz, latitude=29°36' N, longitude=52°31'48" E) using a photoelectric photometer equipped with an unrefrigerated RCA 4509 photomultiplier tube. The observations were made through UBV filters which are approximately in the standard system. The probable errors of a single observation were estimated to be about ±0.01 in the three colours, i.e., corresponding to a measure of the observational scatter at a particular phase. The variable was observed differentially with respect to the comparison star HD 200270. The star HD 200425 was observed as check star.

Figures 1,2 and 3 show the UBV light curves for ER Vul, respectively.

The following light elements given by Ibanoglu et al. (1985) were used in computing the phases of the individual observations:

$$\text{Min. I=J.D. Hel. } 2440182.2621 + 0\overset{d}{.}69809409 \times E.$$

Table 1 indicates the photoelectric minimum times of ER Vul, in the three different filters.

Table 1

J.D. Hel. 2449000+	Filter	Min.
563.26074	U	II
563.25953	B	II
563.24449	V	II
564.29480	U	I
564.31173	B	I
564.28007	V	I

Table 2

Date	Phase
29 July 1994	0.9448-0.1319
30 July 1994	0.3403-0.5707
31 July 1994	0.7729-0.9826
1 August 1994	0.2146-0.4309

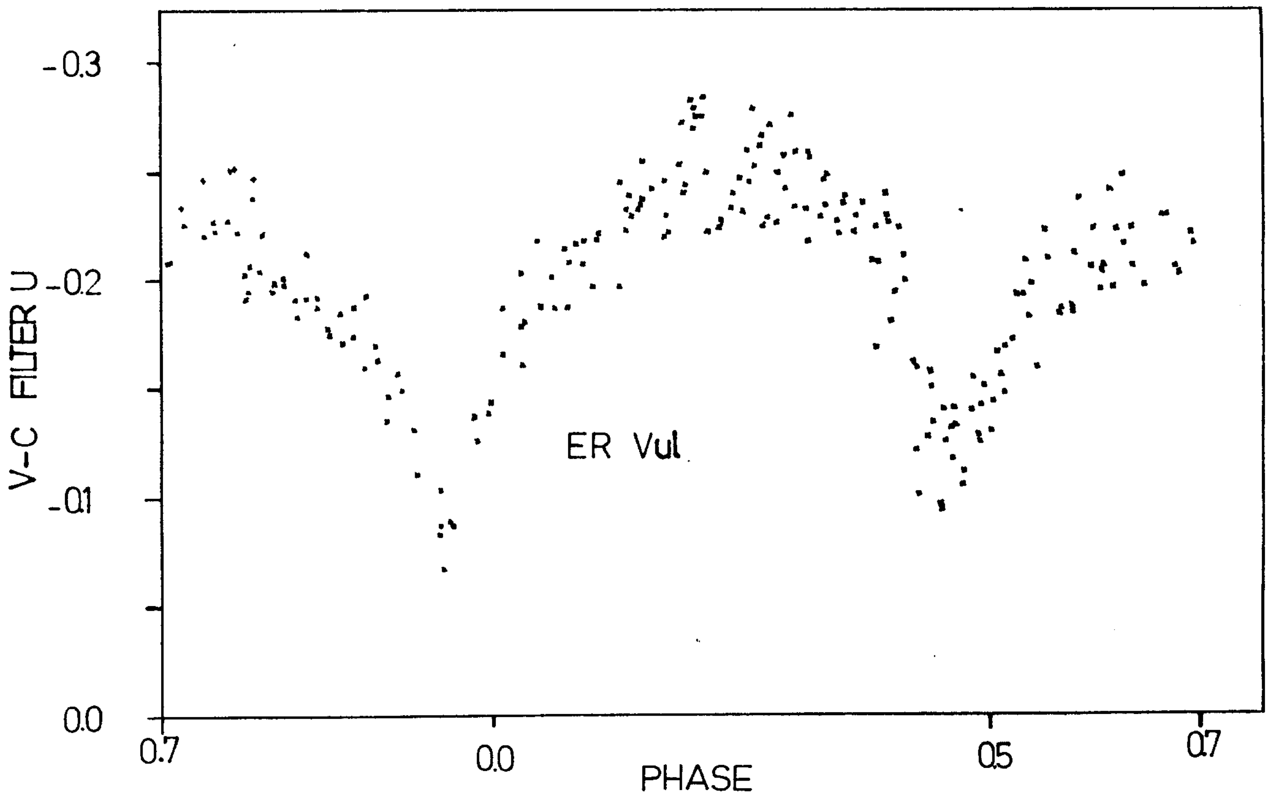

Figure 1

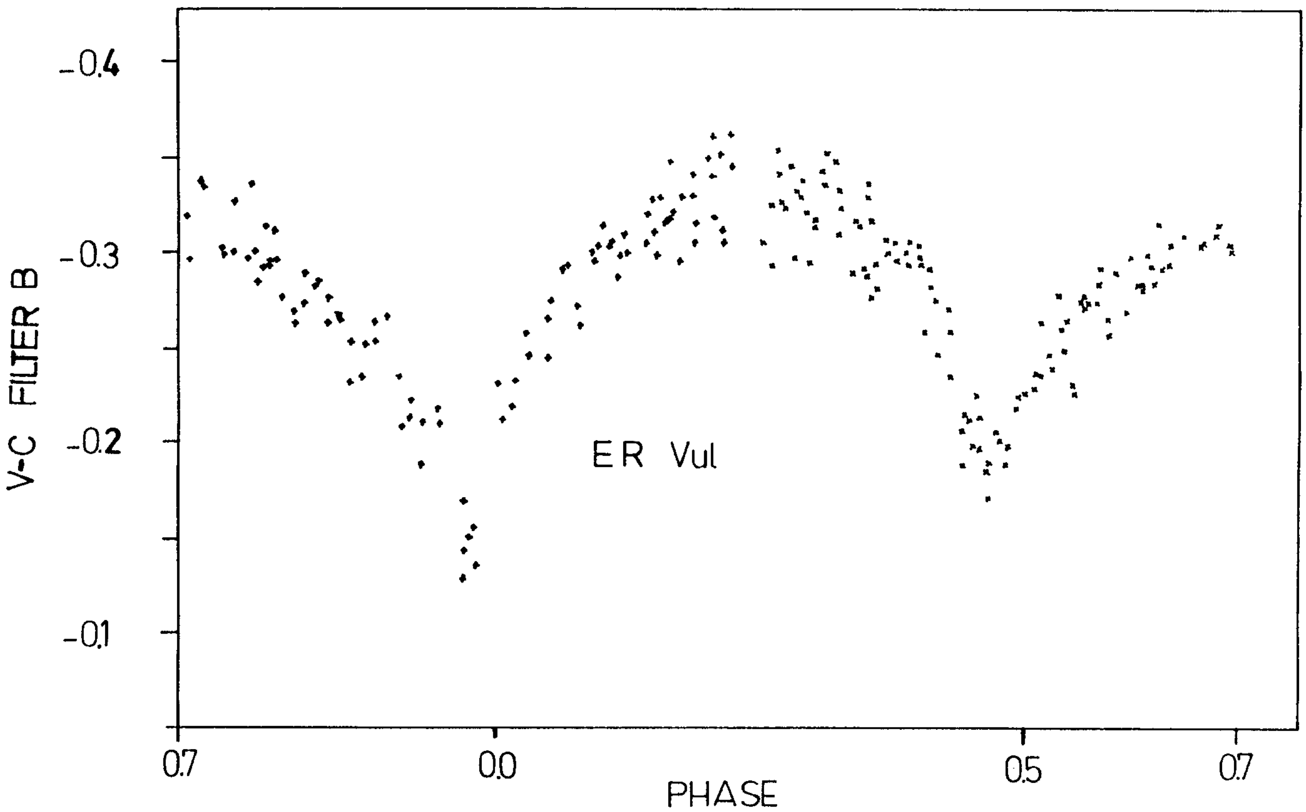

Figure 2

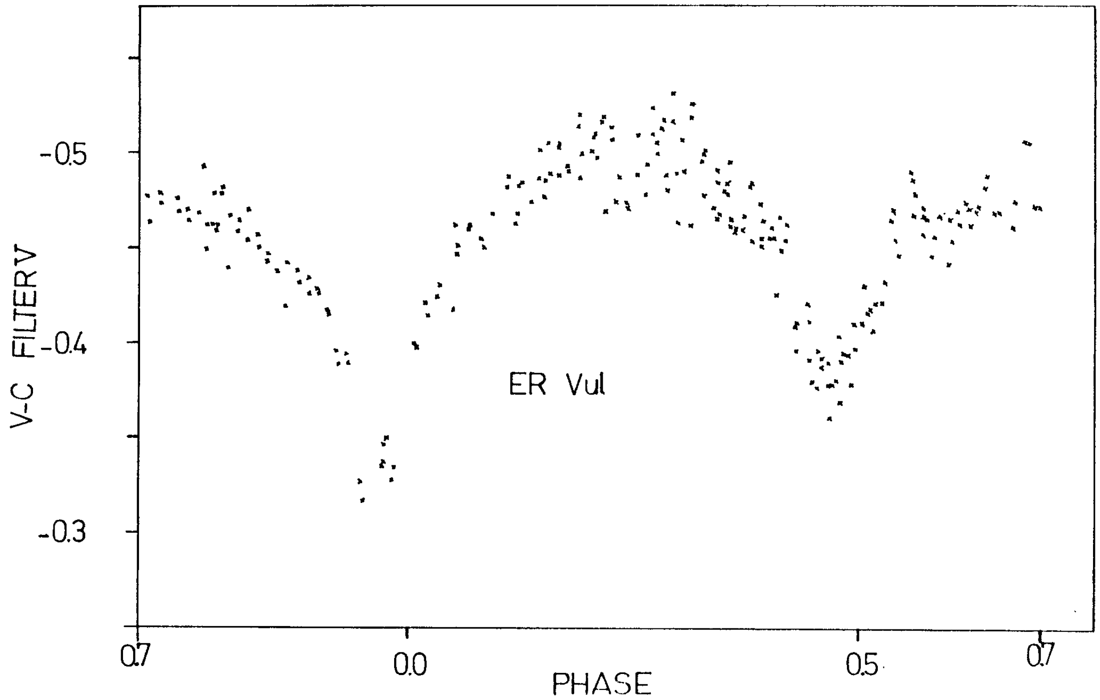

Figure 3

Our observations indicate the existence of asymmetry, especially in the beginning of the ascending part of the secondary minimum. These phenomena can be explained as a result of the presence of a gaseous stream flowing from the secondary to the primary component, starting off roughly in the inner Lagrangian point and falling behind the primary as that star moves round on its orbit (Struve, 1947). Also we see in our observations a shift for primary and secondary minima from phases zero and 0.5.

Table 2 lists the dates of observations and phases covered. The data has been folded so that both primary and secondary minima are clearly visible. These observations do indicate proximity effects, wave-like distortions, mutual eclipses and short-term light fluctuations (see Northcott and Bakos (1967)).

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