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1981 UBVR PHOTOMETRIC OBSERVATIONS OF ER Vul

ER Vul (BD+27°3952, HD 200391, SAO 989396), first observed spectroscopically by Northcott and Bakos (1946) and subsequently by them photometrically (1955), is one of the RS CVn binaries currently being observed at the University of New Mexico's Capilla Peak observatory. The object, an eclipsing binary at right ascension $21^{\text{h}}00^{\text{m}}16.4^{\text{s}}$ and declination $+27^{\circ}36'33.4''$ (1950) was observed from August through November of 1981 with the 61-cm telescope and its single-channel photon-counting photometer. The photometer employs a liquid cooled (-20°C) EMR 641A phototube and UBVR filters obtained from Kitt Peak; its output is fed directly to a microcomputer enabling rapid data access and reduction.

The data reduction method was standard: comparison star (BD+27°3946) minus source (ER Vul) minus sky. The data were obtained with an accuracy of ± 0.01 magnitude or less, checked in real time at the telescope.

Phase calculations were accomplished using $\text{HJD}=2440182.3212+0.62892990\text{E}$ (Al-Naimiy, 1978). Table I lists the dates of observation and phases covered. Figure 1 through 4 summarize the results.

Previously reported light curves by Northcott and Bakos (1976), Al-Naimiy (1978), Hrivnak (1982) and Kadouri (1981) show remarkable similarities, the most notable being the substantial difference in depth between primary and secondary minima (0.1 magnitude) and, by contrast, the similarity of the shoulders (no more than 0.02 magnitude difference).

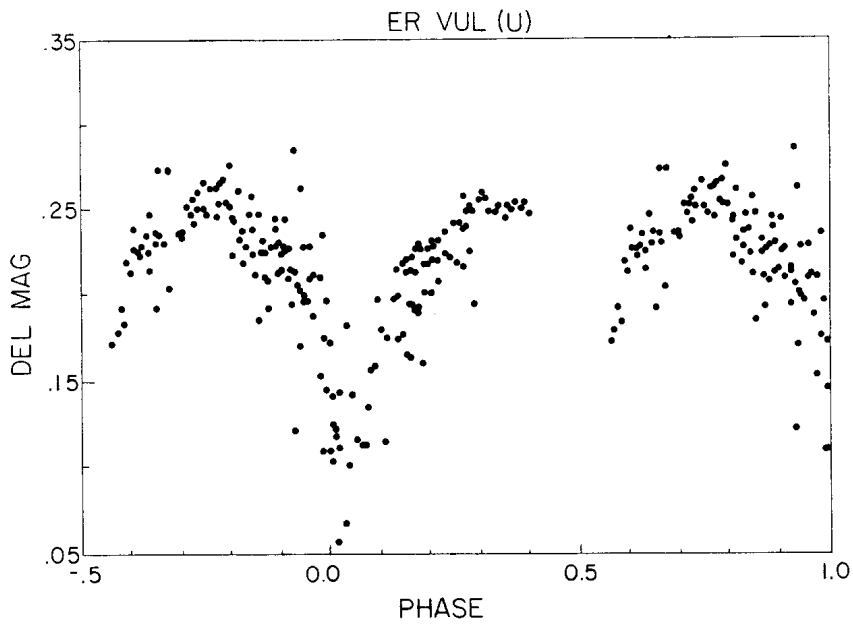


Figure 1

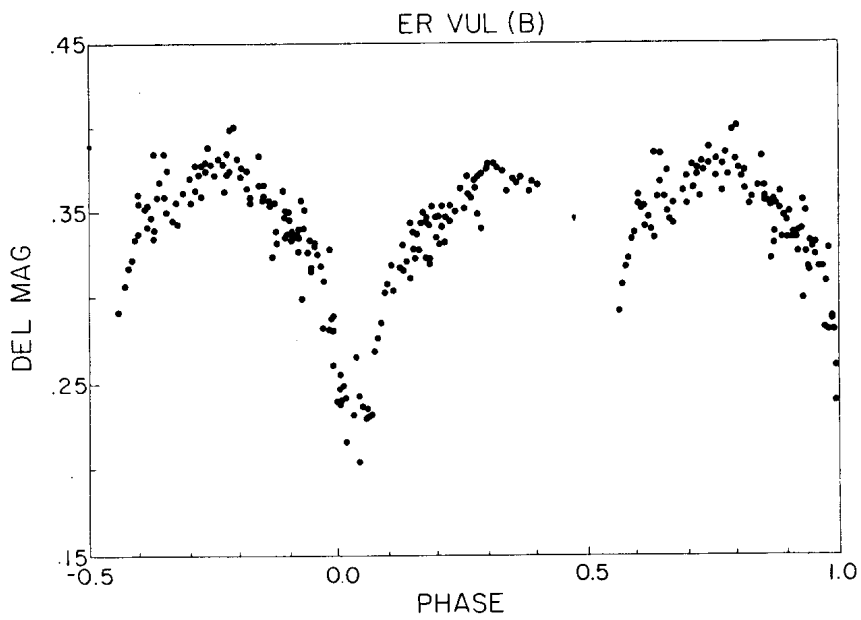


Figure 2

3

ER VUL (V)

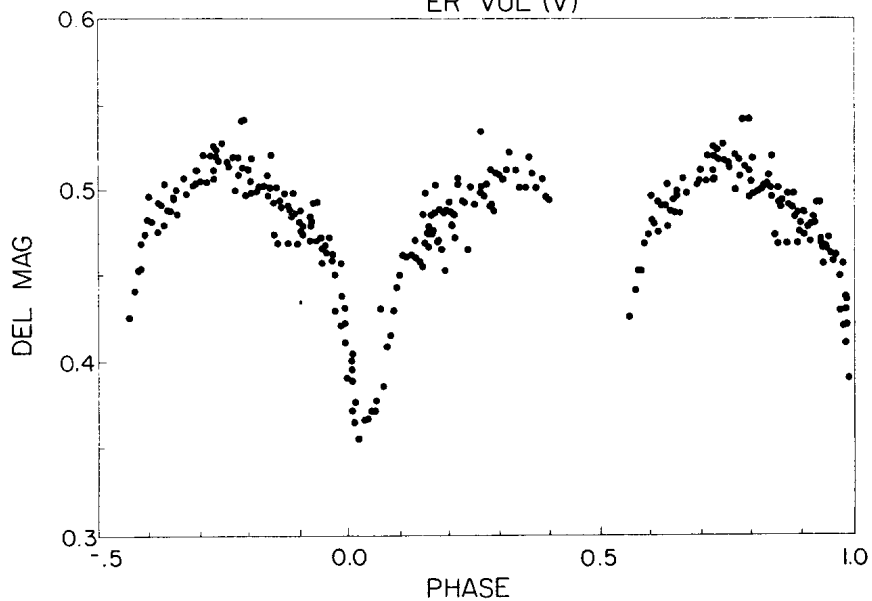


Figure 3

ER VUL (R)

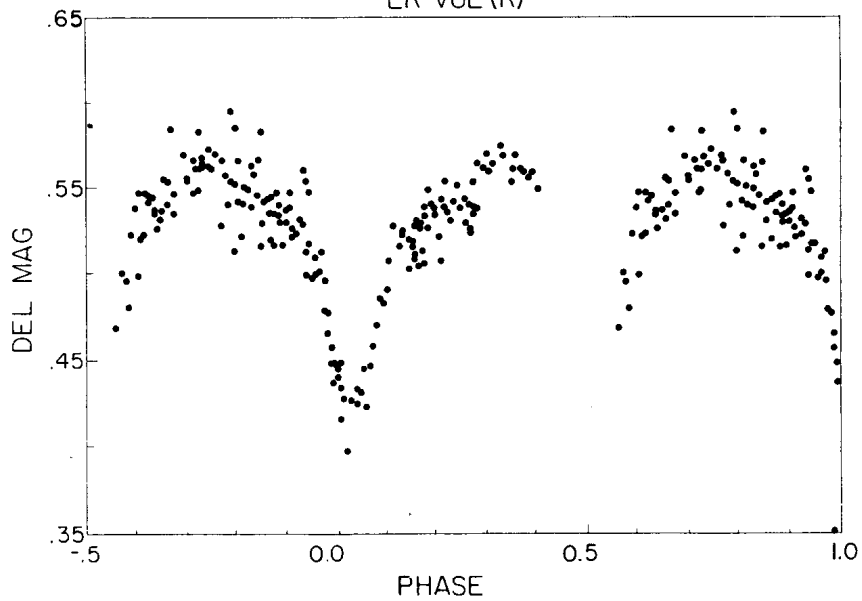


Figure 4

ER Vul 1981 Phase Log

Table I

Date	Phase	Date	Phase	Date	Phase
8-21	0.14→0.59	10-10	0.27→0.40	10-26	0.16→0.22
9- 3	0.60→0.70	10-18	0.70→0.13	11-10	0.63→0.73
9-20	0.37→0.53	10-21	0.99→0.03	11-19	0.56→0.66
9-27	0.91→0.04			11-25	0.13→0.29

Our data confirm these results. In addition, we note that (1) the intrinsic scatter in the system seems larger outside of eclipses (~ 0.04 mag) than during them, (2) variations in the light curve are noticeable over a time as short as a week. Both effects were also noted by Hrivnak (1982) and Zeilik et al. (1982).

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References:

- Al-Naimiy, H. M., 1978, IBVS #1481.
 Hrivnak, B. J., 159th meeting of the American Astronomical Society,
 Boulder, Colorado, 1982.
 Kadouri, T. H., 1981, IBVS #2057.
 Northcott, R. S. and Bakos, G. A., 1956, Astron. Journal, 61, p. 1238.
 Northcott, R. S. and Bakos, G. A., 1967, Astron. Journal, 72, p. 1.
 Zeilik, M., Elston, R., Henson, G., Smith, P., Schmolke, P., 159th
 meeting of the American Astronomical Society, Boulder, Colorado, 1982.