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1982 PHOTOMETRY OF ER VUL

We have completed a light curve for ER Vul (BD+27°3952, HD 200391, SAO 089396) within a one week period in October 1982 to minimize the effects of short-term, intrinsic variations. We carried out the observations at the Capilla Peak Observatory of the University of New Mexico. Our 61-cm Boller and Chivens telescope has a single-channel, photon-counting photometer with a cooled EMR 641A phototube and a Kitt Peak UBV filter set. A microcomputer controls the photometer (Elston and Zeilik, 1982); its on-line data reduction assures that observations obtain a statistical error of no more than  $\pm 0.01$  mag.

As for our 1981 observations (Zeilik et. al., 1982), we used BD+27°3946 as our comparison star. Observations of this star over a wide range of air masses resulted in a good determination of the UBV extinction coefficients. Phases were calculated from  $HJD=2440182.3212 + 0.62892990E$  (Al-Naimiy, 1978). Dates (UT) and phases covered were: 3 Oct., 0.17 to 0.50; 6 Oct., 0.47 to 0.73; 7 Oct., 0.82 to 0.19; and 9 Oct., 0.69 to 0.89. Figures 1 through 4 summarize the results in instrumental magnitudes; actual observational points are shown not normal points. Note that our data is comparison minus source, the opposite of the usual convention, so the y-axis lacks a minus sign.

We can compare these observations to those in 1981 by ourselves and Kadouri (1981), who used the same comparison star. First, the overall system brightness

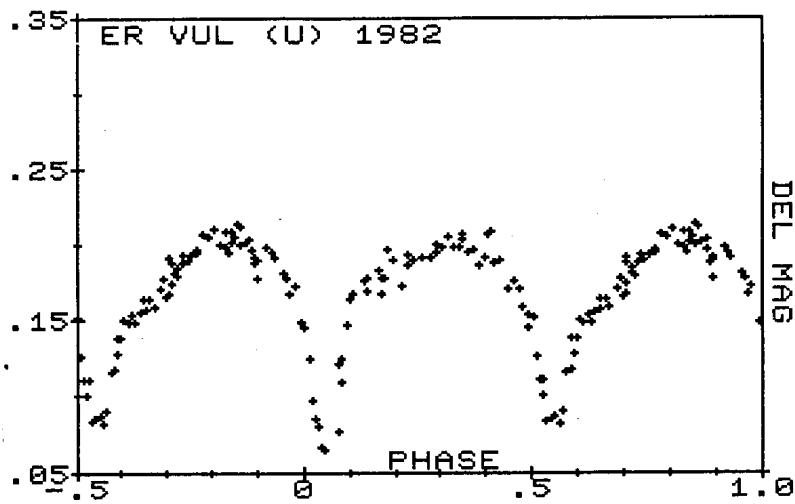


FIGURE 1

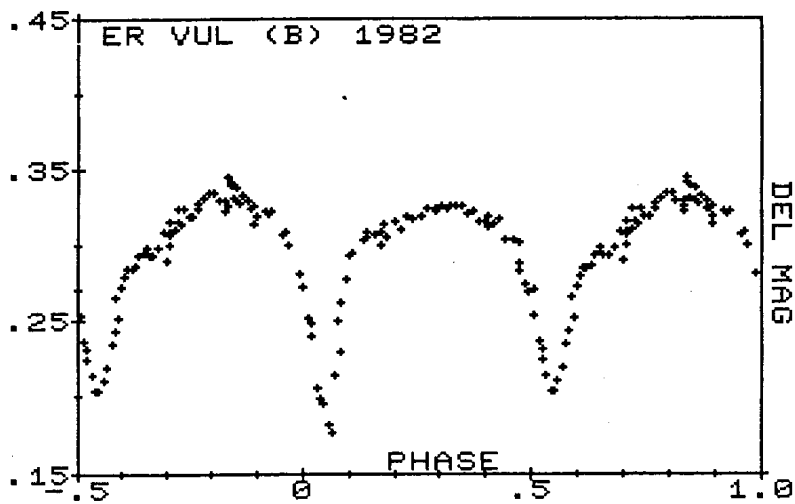


FIGURE 2

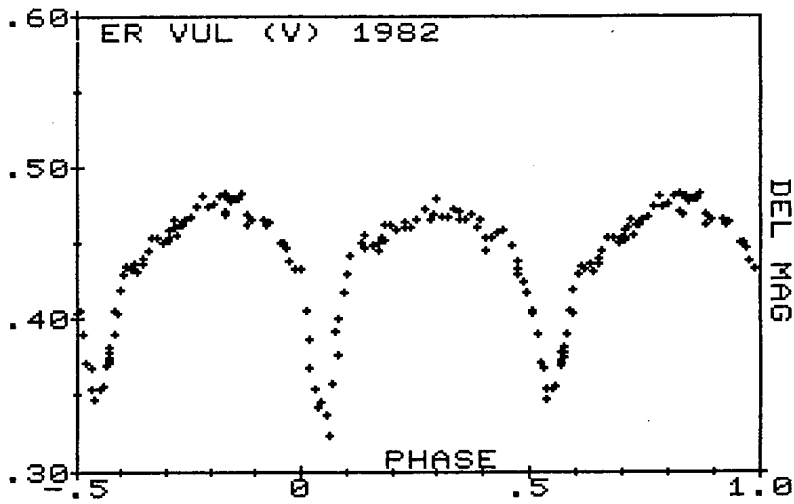


FIGURE 3

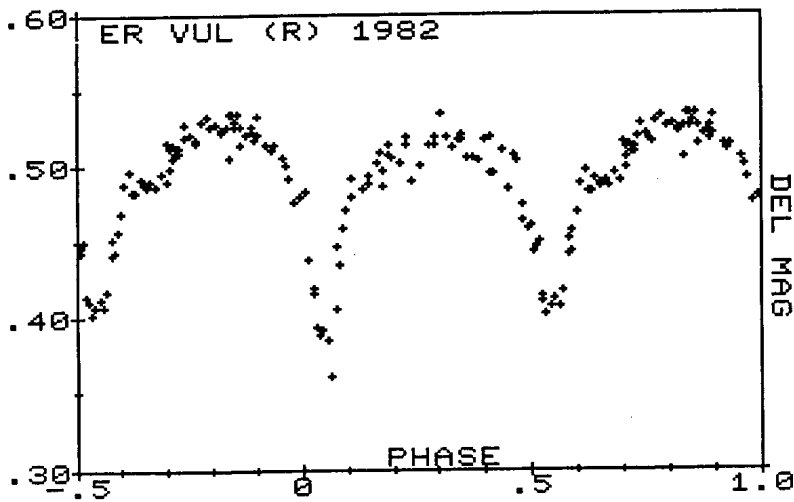


FIGURE 4

has decreased by 0.05 mag. at U, 0.04 mag. at B, 0.05 mag. at V, and 0.03 mag. at R. Second, the shoulder at phase 0.25 is still depressed and more symmetrical than that at 0.75. Third, the primary eclipse is still deeper than the secondary, but the difference has decreased a little -- by about 0.01 mag. at UBV. Fourth, both limbs appear flatter than before.

As noted by Kadouri (1982), the ephemeris from Al-Naimiy (1978) no longer gives consistent results; both the primary and secondary eclipses have shifted  $\sim +0.05$  phase with respect to that predicted from the earlier ephemeris.

We are planning to continue observations of this system at least once a year to track its variations.

M. ZEILIK, B. BACA, D. BATUSKI, S. BURKE, R. ELSTON, and P. SMITH

Capilla Peak Observatory  
Department of Physics and Astronomy  
The University of New Mexico  
Albuquerque, NM 87131  
U.S.A.

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