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LIMITS ON THE VARIABILITY OF EPSILON ERIDANI  
AND DELTA ERIDANI

The star  $\epsilon$  Eri (K2 V) has often been cited as an example of a single K star with moderate chromospheric activity (e.g., Linsky et al. 1978). However, D. S. Hall (1981) has pointed out that, according to the 3rd edition of the Bright Star Catalogue, the star is a 17-day spectroscopic binary. In retrospect this was probably a mistake, since the information has been omitted from the 4th edition of the catalogue, and since the range of radial velocities collected by Abt and Biggs (1972) is less than 2 km/s. Thus with its late spectral type, moderately high chromospheric activity, and purported membership in a binary system, we might expect it to be similar to the RS CVn-type variables (Hall 1976). For this reason we have observed it photometrically on two occasions with the No. 4 16-inch telescope at Kitt Peak National Observatory. HD 22799 (HR 1117) was used as the comparison star;  $\delta$  Eri as the check star. In 1983 the brightness in the V band of  $\epsilon$  Eri was measured on four nights (February 24, 26, 27 and March 9 UT), to give  $\Delta V = -2.452 \pm 0.010$ . Poor weather conditions during this run resulted in the low precision of the average brightness. In 1984 conditions were better, and the star was observed on 8 nights (in the range September 14-30). Data are being deposited in the IAU Commission 27 Archive for Unpublished Observations of Variable Stars (Breger 1979). Magnitude differences are plotted in the top panel of Figure 1. The star appears to have been relatively constant, varying at no more than the 0.01 mag level over this interval, and to have had the same mean brightness as in 1983 ( $\Delta V = -2.454 \pm 0.003$ ).

A further estimate of the constancy of  $\epsilon$  Eri is afforded by the photometry of Fisher et al. (1983). They were studying delta Eri (K0 IV) as a possible RS CVn variable (with  $\epsilon$  Eri as the comparison star) and found roughly a 2% light variation on a timescale of 10 days. The mean magnitude difference, delta minus epsilon, was  $\Delta V = -0.205$ . This may be compared with the difference for 1984 since we used  $\delta$  Eri as a check star. We find  $\Delta V = -0.199$  for September 1984, which suggests that both epsilon and delta have been constant to within about 1% in mean brightness over the interval that they were observed. It is also consistent with the photometry given in the 4th edition of the Bright Star Catalogue (Hoffleit and Jaschek 1982) for which  $\Delta V = -0.19$ . We have plotted the magnitude differences for  $\delta$  Eri in the lower panel of Figure 1. Again, the star

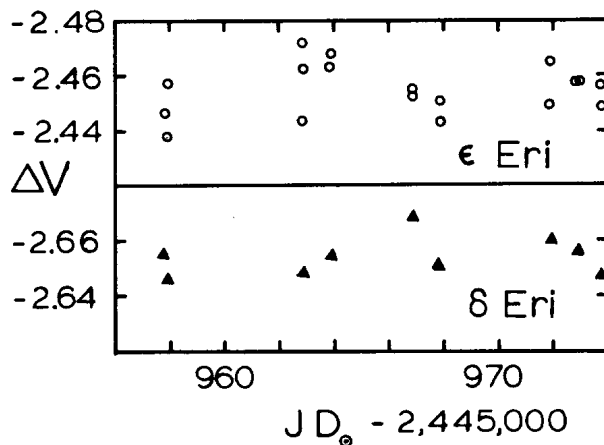


Figure 1. Differential photometry of  $\epsilon$  and  $\delta$  Eridani. In the top panel we plot the visual magnitude difference for  $\epsilon$  Eri minus the comparison star for observations obtained in September 1984; in the bottom panel,  $\delta$  Eri.

appears to have been constant to 1% over the interval and not to have had the 2% variation seen in 1981 by Fisher et alii.

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