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THE NATURE OF THE VARIABILITY OF HD 177559

While engaged in a photometric monitoring program of Be stars, it was soon noted by the author that one of the comparison stars used (HD 177559) was in itself a variable star (Halbedel, 1986). A literature search soon revealed that variability for the star had been previously suggested. HD 177559 is listed as BV 888 (Strohmeier, 1967) with a range in the photographic of 0.4 magnitudes. Also, it is NSV 11722 in the CATALOGUE OF SUSPECTED VARIABLE STARS (Kholopov, 1982) with a smaller range of 0.2 V magnitudes, information probably derived from Kilkenny & Hill (1975). The star's variability in radial velocity has long been known. Neubauer (1943) found a range of 200 km/sec from six plates and remarked that the lines were wide and shallow. Spectral types for the star range from B2/3 V(n) (Houk & Smith-Moore, 1988) to B5 I (Abt & Biggs, 1972) to B6 Vn (Hill et al., 1975). No emission has ever been noted in the spectrum.

Consequently, HD 177559 was determined to be sufficiently interesting to observe on its own merit. 382 BV observations on 21 nights over HJD range 2446313 - 7839 were made with the Corralitos Observatory 0.6-m. telescope and single channel photon-counting photometer which utilizes an EMI 9924A photomultiplier tube. The comparison stars used were HD 177290 (V = 8.33; B-V = +.18) and HD 177423 (V = 7.977; B-V = -.009). The average standard errors in V for the standard stars were 0.020 and 0.019 in B-V, not unreasonable for observations of southerly stars generally observed by necessity at high air masses.

It soon became evident that HD 177559 was an eclipsing variable of reasonably short period. Figure 1 shows that both minima are of approximately the same depth and that there is little or no color change throughout the orbital cycle. The preliminary elements found are:

$$\text{Min} = \text{HJD } 2447794.66258 + 0.7148 * E$$

Both stars are probably nearly identical in spectral type and luminosity. The orbit is likely to be circular since there is no displacement of the minima in phase. However, there are evidently non-sphericity or reflection effects since the minimum placed arbitrarily at phase 0.5 is definitely asymmetric. Unfortunately, few observations of the maxima were obtained. Therefore, the range in variability was tentatively assigned to be 0.6 V magnitudes for both minima.

The short period and relative brightness of the star as well as its large ranges in optical and radial velocity variations would seem to suggest that HD 177559 would be a profitable system to study both photometrically and spectroscopically in the future.

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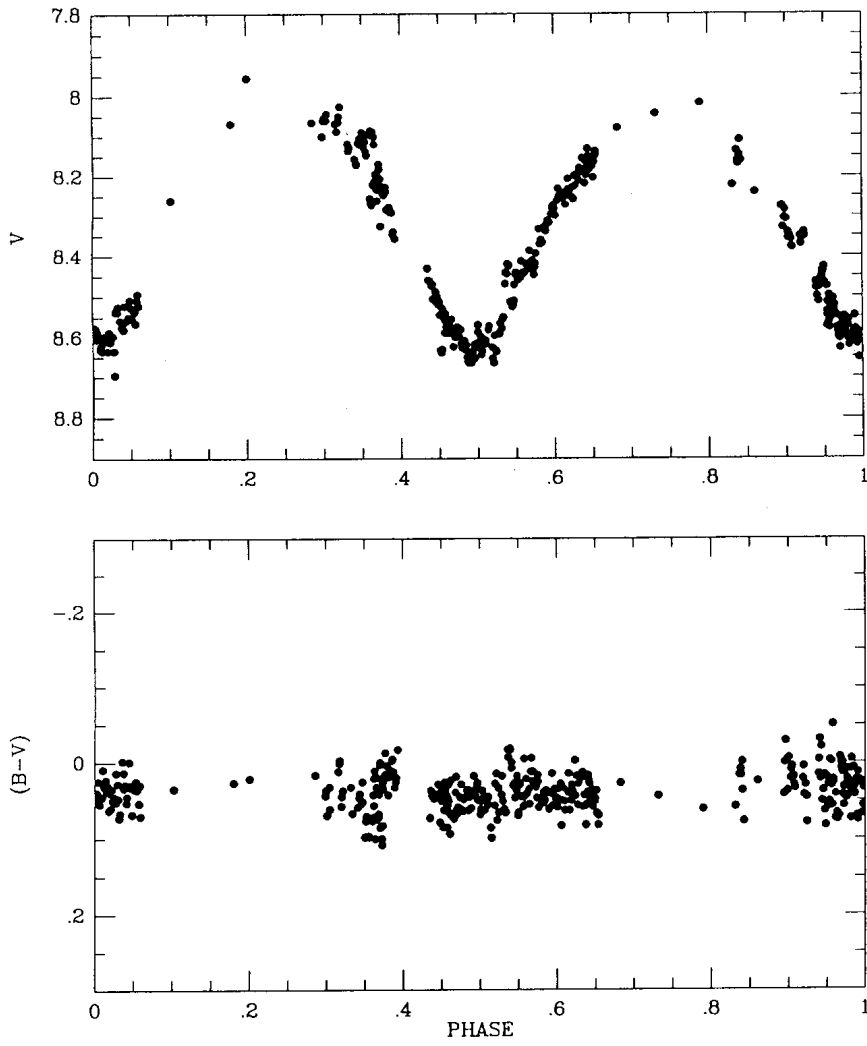


FIGURE 1: V and B-V Light Curves for HD 177559.

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