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THE VARIABLE STAR 42 PERSEI

Following the suggestion of Batten (1987), we have made photometric and spectroscopic observations of the photometrically variable single-lined spectroscopic binary 42 Persei = HR1177 = HD23848 = V467 Persei.

Differential V-filter photometry was carried out on ten nights between January and March, 1988, using the 0.5-m telescope at the Devon Astronomical Observatory. HR1164 was used as the comparison star.

A total of nine spectroscopic observations were made during five nights in February, 1988, using the Reticon detector and the Cassegrain spectrograph (reciprocal dispersion = 1.5 $nm.mm^{-1}$) on the 1.85-m telescope at the Dominion Astrophysical Observatory, Victoria. Radial velocities have been determined using a cross-correlation technique. (Additional spectroscopic observations were made in August, 1988, but those data have not been reduced as yet).

Analyses of both our new photometric and spectroscopic data sets support Batten's conclusion that the $1^d.765346$ spectroscopic orbital period found by Morbey and Brosterhus (1974) is correct and that it does fit the light, as well as the radial velocity, variations.

The raw -- not transformed to the standard UBV system -- v magnitude differences in the sense HR1164 - HR1177 are plotted in Figure 1. The Δv values have been phased from periastron passage, T = JD2437640.03, using $p = 1^d.765346$ as given by Morbey and Brosterhus, and have been averaged over phase intervals of 0.05 P. Minimum light occurs between phases 0.5 and 0.6 which, within the uncertainties of this limited data set, coincides with primary conjunction in the spectroscopic orbit. The large scatter in the plotted data is due, in large measure, to the observations having been made at large zenith distances near the end of the observing season.

Our new spectroscopic data suggest the need for a very small correction of $+0^d.000005$ to the orbital period, but no other significant changes to the previously published orbital elements.

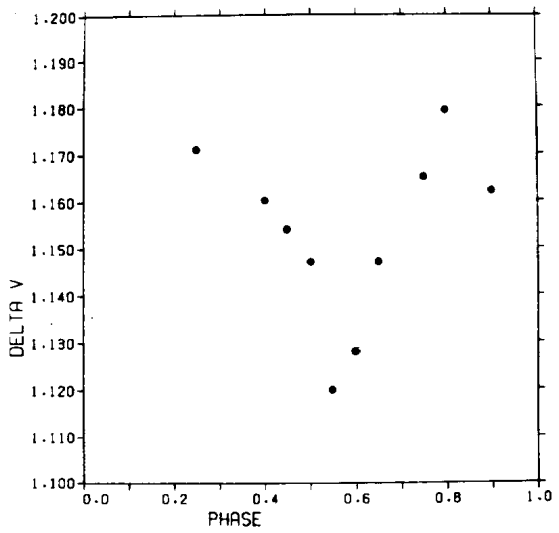

Figure 1. Visual magnitude differences between HR1164 and 42 Per.

Our results are consistent with Batten's conclusion that 42 Per is probably an ellipsoidal variable. During the coming observing season we intend to obtain complete, multi-colour light curves in collaboration with R. Wasson, Sunset Hills Observatory, California, and with W.S. Barksdale, Florida. A more detailed analysis and discussion of the combined spectroscopy and photometry will be published elsewhere.

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