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UBV OBSERVATIONS OF YY Eri

The 8th magnitude W UMa-type eclipsing binary system YY Eri appears to be a fairly representative example of the W subgroup of these stars (Binnendijk, 1965, 1970; Ruciński, 1973; Yamasaki, 1975) - possibly the first to be recognized as such (Struve, 1947). In keeping with this character is the tendency of period increase (Yamasaki, op.cit.) noted by Cillié (1951), Huruhata et al. (1953) and Kwee (1958), and taken to have constant retardation by the Purgathofers (1960), though Bhattacharyya (1967) indicates that this need not be the case.

The star was observed during five nights, over the period Jan. 22-Feb. 7 1983, at the Black Birch Outstation of Carter Observatory, using the 41cm Ruth Crisp telescope and optical filters which have characteristics close to standard UBV. The observations cover the primary minimum three times and part of the secondary on one night (see diagrams). Data in the phase range $\sim$ 0.45-0.7 were obtained on the night of Feb. 6 with less than perfect weather present (thin cirrus), which deteriorated somewhat during the observations. This is reflected in the increased scatter of the given points, and the "normalizing" (averaging) of later data from that night. The remaining data are individual points straightforwardly obtained by a standard DC amplifier/chart recorder system, with a minimum of reductional procedures applied through the University of Wellington's VAX computer. (The diagrams shown have been produced as part of the output from this computer).

The principle comparison and check stars were the same as those used by Bhattacharyya (op.cit.). The discrepancy between comparison and check (s.d. $0^{m}.022$ in B and U) is rather greater than one would like; it may be associated with some microvariability of the K-type check star.

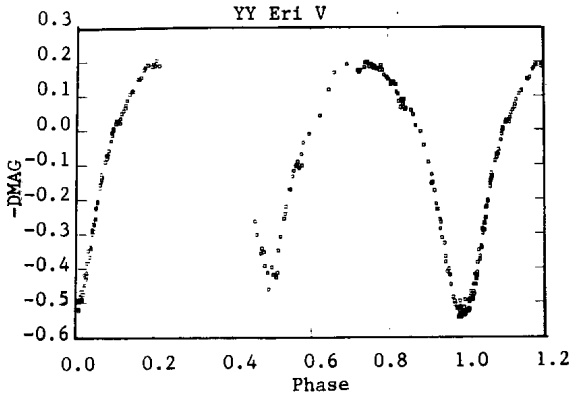

Figure 1

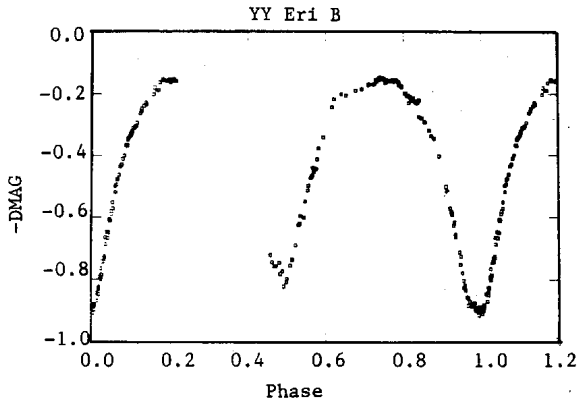

Figure 2

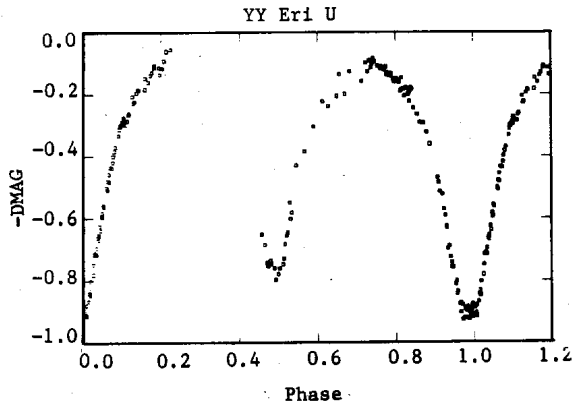

Figure 3

A preliminary epoch of minimum is given as HJD 2445356.9456. This will give an O-C of -0.0086 days when reckoned by the light elements of the Purgathofers, though this is reduced to -0.0045 days when calculated from Strauss' (1976) more recent light elements. While the residual is still rather large, it is less than that given by Strauss when comparing his own observed time of minimum with that calculated by the ephemeris of the Purgathofers. Strauss (op.cit.) concluded that the period was nonmonotonically varying, or that the Purgathofers did not estimate it accurately (though the error limit specified by the latter is much less than could explain the discrepancy).

Perhaps this period variation is related to the "exceptionally interesting phenomenon" of apparent spectroscopic luminosity variation emphasized by Struve (op.cit.), which in turn may be connected with the polarization effects considered by Oshchepkov (1974), (though the latter's interpretation of the sense of the supposed "stream" is surely at variance with other effects). In any case, the system merits close attention as a potentially informative member of this enigmatic class of object.

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