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CIRCULAR POLARIMETRIC OBSERVATIONS OF THE MAGNETIC CV 1H1752+081

1H1752+081 was discovered using the *HEAO-1* satellite and identified with an eclipsing CV whose period was 113 mins (Silber et al. 1994, Barwig, Ritter & Bärnbantner 1994). The eclipse is unusual in that the ingress to eclipse is more variable and twice as long as the egress. Silber et al. (1994) claim that the system has a small accretion disk with the possibility that it is an intermediate-polar (a close binary in which the primary is a mass accreting white dwarf with a magnetic field strength B=1–10MG). On the other hand, Barwig et al., (1994) suggest that their observations are consistent with the object being an AM Her system (a close binary in which the primary is a mass accreting white dwarf whose spin period is coupled with the orbital period and has a magnetic field strength B=10–70MG; sufficiently strong to prevent the formation of an accretion disc). The AM Her systems show strongly variable circular polarisation while the intermediate-polars have generally undetectable levels of circular polarisation, with the exception of BG CMi (Penning, Schmidt & Liebert, 1986) and RE0751+14 (Rosen, Mittaz & Hakala, 1993). These have detectable but lower values of circular polarisation than found in AM Her systems and inferred magnetic field strengths at the lower end of the range found for AM Hers. 1H1752+081 was observed spectroscopically during a low intensity state and was found to have a magnetic field strength B ∼7MG (Ferrario et al., 1994). Such a low magnetic field strength suggests that the object would exhibit low levels of circular polarisation. To confirm this we obtained circular polarimetry of 1H1752+081 covering two orbital cycles.

We made observations of 1H1752+081 at two separate epochs using the Anglo Australian Telescope. The Faint Object Polarimeter was used with a Tektronix CCD as the detector and an OG570 filter (∼5500–9500Å). Both photometry and circular polarisation data were obtained on 1994 July 3 for 113 mins and 133 mins the following day. The exposures were 30 sec in duration. The data were reduced as described by Cropper et al. (1990).

Figures 1 & 2 show the photometric and polarimetric data folded on the ephemeris of Barwig et al. (1994). The photometric light curve is similar in shape to that reported by Barwig et al. (1994) and Silber et al. (1994). However, the main point of interest is the very low level of circular polarisation. Although a positive level of circular polarisation was recorded on each night, the observations of unpolarised standard stars using the same instrumental configuration are inadequate for ruling out the possibility that this low level of polarisation is instrumental in origin. This view is strengthened by the fact that the phased circular polarisation is different on the two nights. We therefore conclude that any circular polarisation in 1H1752+081 is $\leq$1%.

These results coupled with the low magnetic field strength determined by Ferrario et al. (1994) suggest that 1H1752+081 is not in fact an AM Her star but is more likely to be an intermediate-polar.

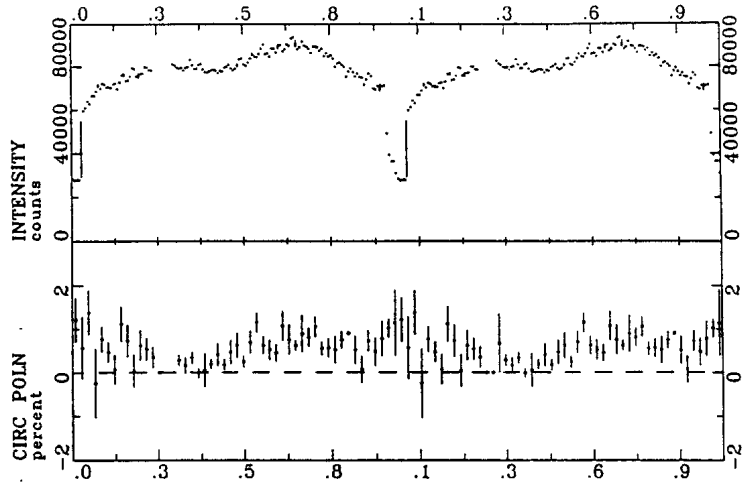

Figure 1. Circular polarisation and photometric data (folded on the ephemeris of Barwig et al., 1994) taken on 1994 July 3 with the OG570 filter.

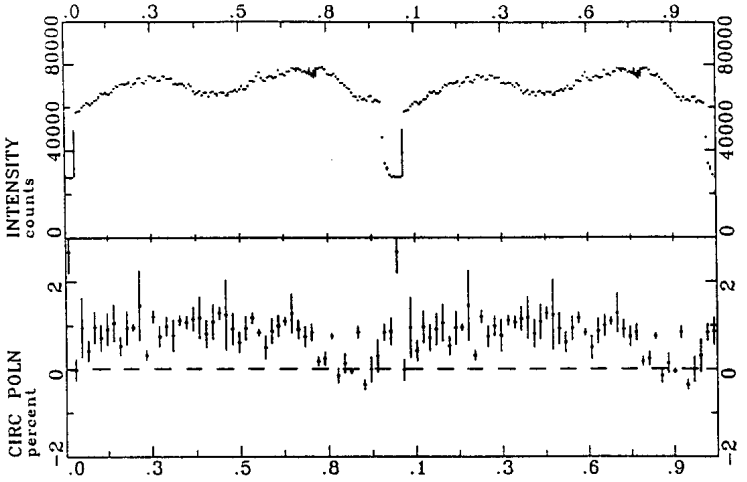

Figure 2. Circular polarisation and photometric data (folded on the ephemeris of Barwig et al., 1994) taken on 1994 July 4 with the OG570 filter.

Gavin RAMSAY
Mark CROPPER
Mullard Space Science Lab.,
University College London,
Dorking, Surrey, RH5 6NT,
U.K.

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