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**CCD LIGHTCURVES AND MINIMA TIMES
OF THE ECLIPSING BINARY RZ Cas**

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The bright eclipsing binary RZ Cas has been studied by many groups over the years, yet no completely satisfactory explanations for the system's odd behaviour have been presented.

Narrow band ($\sim 10 \text{ \AA}$ centred at 5300 \AA) CCD observations were made with the 0.94-m James Gregory Telescope at the University of St Andrews Observatory on the nights of 1997 December 2-3 (818 frames) and 1998 January 14-15 (471 frames). Relative magnitudes were determined via differential aperture photometry, using the star GSC 4317-1578 as a comparison. GSC 4317-1437 was used as a check star. Times of minimum light for the two primary eclipses observed were calculated via the method of bisecting chords and were found to be:

$$\begin{aligned} \text{JD } 2450785.37278 \pm 0.00103, \\ \text{JD } 2450828.40257 \pm 0.00050. \end{aligned}$$

The lightcurves obtained from our observations are shown in Figure 1. It is clear that RZ Cas displays both partial and "total" eclipses. Several researchers have shown that flat bottomed profiles are unlikely to be due to genuine total eclipses, as they do not meet the correct colour & depth criteria (Chambliss, 1974).

Ohshima et al. (1998) suggest that the flat bottomed profiles are due to superpositions of eclipses and δ Scuti type oscillations in the primary (A3V (e.g. Maxted et al., 1994)). The 20.6 minute "totality" observed in January 1998 can be explained as a δ Scuti maximum occurring near the time of minimum light. This is compatible with the 22.4 minute period Ohshima et al. (1998) give for the δ Scuti oscillations. Reports in previous literature of totalities up to 22 minutes (e.g. Arganbright et al., 1988) are also agreeable with this hypothesis. Unfortunately, our data are too noisy to allow a significant detection of the δ Scuti oscillations. It also proved difficult to obtain an accurate estimate of the relative depth of each eclipse due to a poor determination of the maximum light level in January 1998.

Further coordinated monitoring of both minima times and eclipse profiles is needed to establish whether the changes in the light curves are periodic, and if they are correlated with any other phenomena in the system.

Data were reduced at the St Andrews node of the PPARC Starlink project. This research made use of the SIMBAD database operated at CDS.

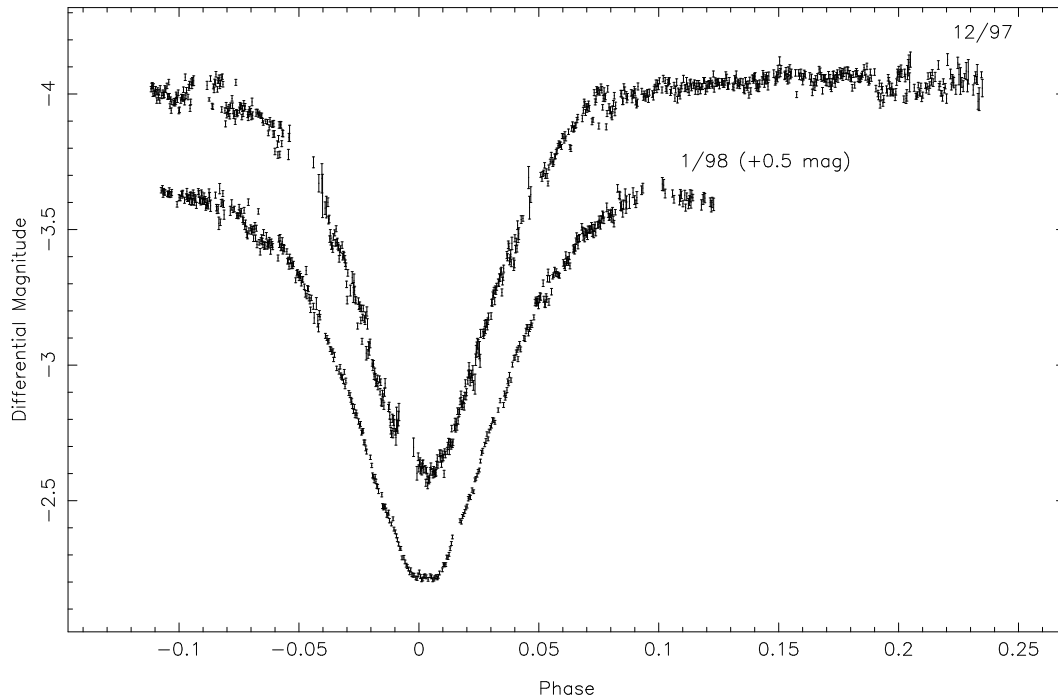


Figure 1. Eclipse lightcurves of RZ Cassiopeiae during 2-3 December 1997 (top) and 14-15 January 1998 (bottom). The lower (January) lightcurve has been shifted by 0.5 mags to make the diagram clearer. The change in profile between the the two data sets is apparent.

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