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1989 V-BAND LIGHT CURVE OF RT AND

We report on the continuation of our long-term project at Capilla Peak Observatory of photometry of the chromospherically-active RS CVn stars. We have previously made single-channel observations of RT And (= BD + 52° 3383A) at UBV_R in 1981 (Zeilik et al., 1982) and CCD observations in 1988 at BVRI (Zeilik et al., 1988). These latter data have been completely analyzed by Zeilik et al. (1989), who find a single spot group at longitude = 260°, latitude = 46°, radius = 9.7°, and a temperature difference relative to the photosphere of -1200 K. Our project aims at revealing how these starspot parameters change with time and hence the nature of any magnetic activity cycles.

We made V and I band observations on the 15, 17, 18, and 21 January 1989 UT of RT And (#163 in the catalog of Strassmeier et al., 1988). We used a CCD camera with an RCA SID501EX chip on our 61-cm telescope (Laubscher et al., 1988) in the mode of a multichannel photometer. The variable, sky, and comparison star (BD +52° 3384) were observed simultaneously and reduced with a software mask with an effective aperture of 34". We now have a new Schott glass filter set (Beckert and Newberry, 1989) in which the V-band filter has an effective wavelength of 551.1 nm and a bandpass of 74.2 nm; the I-band filter and effective wavelength of 815.1 nm with a 137.3 nm bandpass. Unfortunately, conditions of high and rapidly changing humidity rendered the I-band

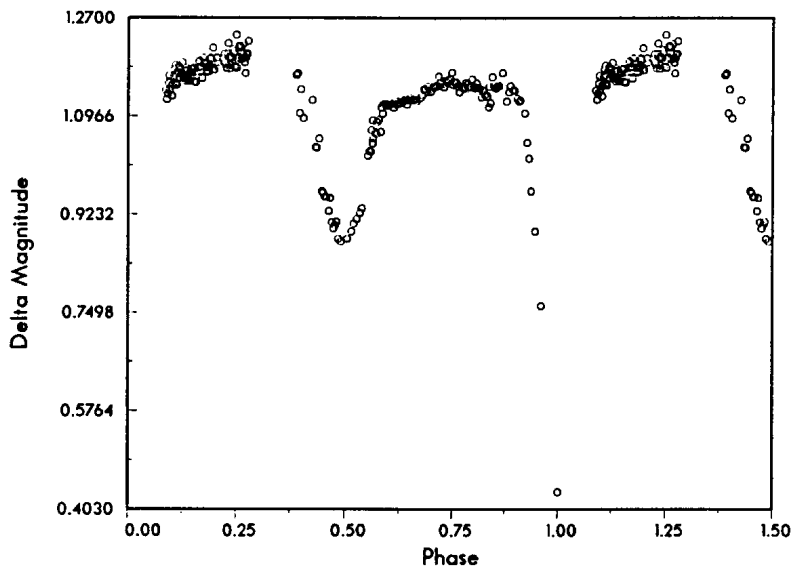


Figure 1. RT Andromedae, V-band, Capilla 1989

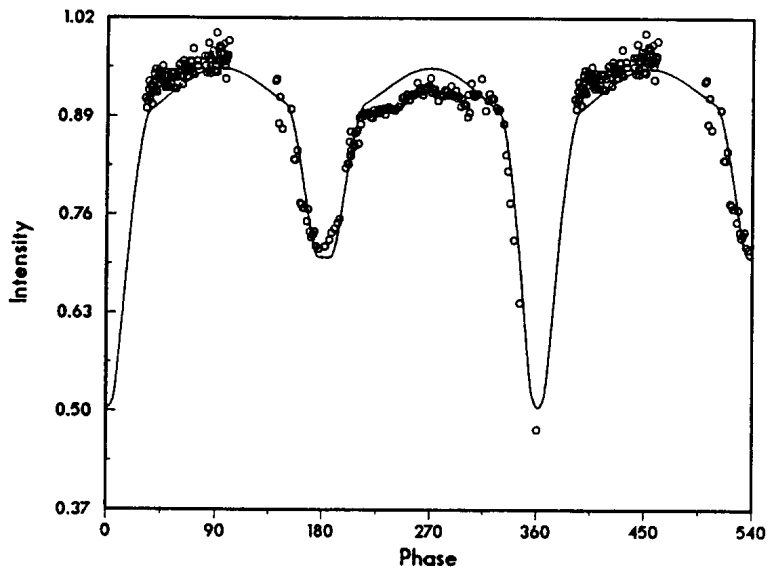


Figure 2. RT Andromedae, V-band, Capilla 1989

observations useless. The V-band data are acceptable, although the overall error is about 0.02 mag, about twice as large as we usually aim to achieve. Figure 1 shows the results in the instrumental system with the delta magnitude in the sense of (variable-comparison). Figure 2 shows an optimized model fit to the observations using the technique of Budding and Zeilik (1987). A fit of a single, black, circular spot to the distortion wave resulted in the following star spot parameters: longitude = 252°, latitude = 48°, radius = 16.5°. (The latitude optimization was barely acceptable by our curvature Hessian test.) We could not calculate a temperature because of the lack of the I-band data. We note that, compared to our 1987 data, the active region has not shifted significantly in position, but it has grown almost 3 times larger in effective area. Continuing observations will show if this trend continues.

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