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1989 BVR LIGHT CURVES OF RT And

We have observed the short-period RS CVn system RT And (= BD +52° 3383A = #163 in the catalog of Strassmeier *et al.*, 1988) at Capilla Peak Observatory since 1981. We have analyzed these and other observations in the context of a starspot model (Zeilik *et al.*, 1989a). These data indicate that a single, large spotted region at a latitude near 45° and at active longitudes of either 90° or 270° accounts for the maculation effects in the light curves. The active region had a lower temperature than the photosphere by about 1200 K in 1987. We have decided to monitor RT And from Capilla at least annually to track the evolution of its magnetic activity.

Our new BVR observations were made with the 61-cm telescope on clear and partially clouded nights of 10, 11, and 13 November 1989 and 12 December 1989 UT. the CCD camera (Laubscher *et al.*, 1988) is equipped with a new filter set that transforms easily to the Johnson UBV Kron-Cousins RI systems (Beckert and Newberry, 1989). The variable, sky, and comparison star (BD + 52° 3384) were observed simultaneously in a multichannel mode. Data were reduced with a software mask with an effective aperture of 30 arcsec.

Figures 1-3 show the data (in normalized intensity units calculated from the instrumental differential magnitudes). Here we display only the normal points (open circles) made by binning the data in 2° intervals outside of the eclipses. Also shown in the figures are optimized model fits (solid lines) for $i = 88.4°$, $T_1 = 6250$ K, and $T_2 = 4900$ K. RT And is peculiar in that it has an eccentric orbit. We use $e = 0.026$ and M_0 (mean

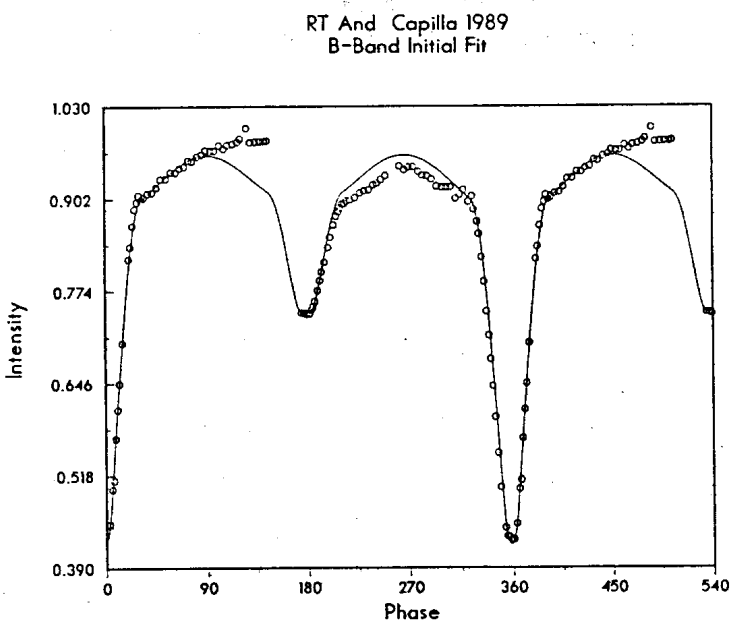

Figure 1.

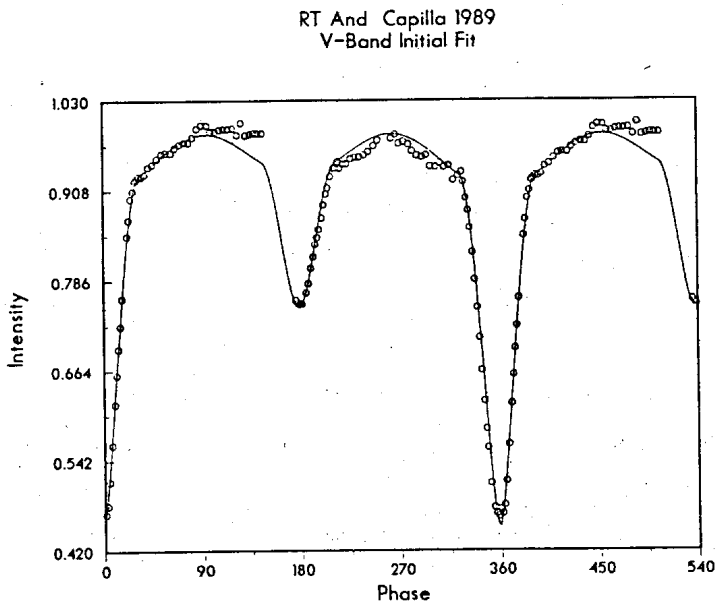

Figure 2.

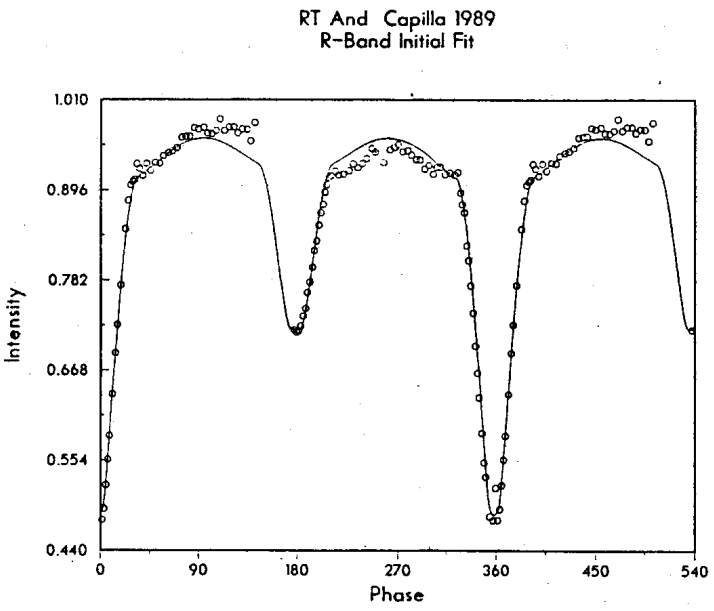

Figure 3.

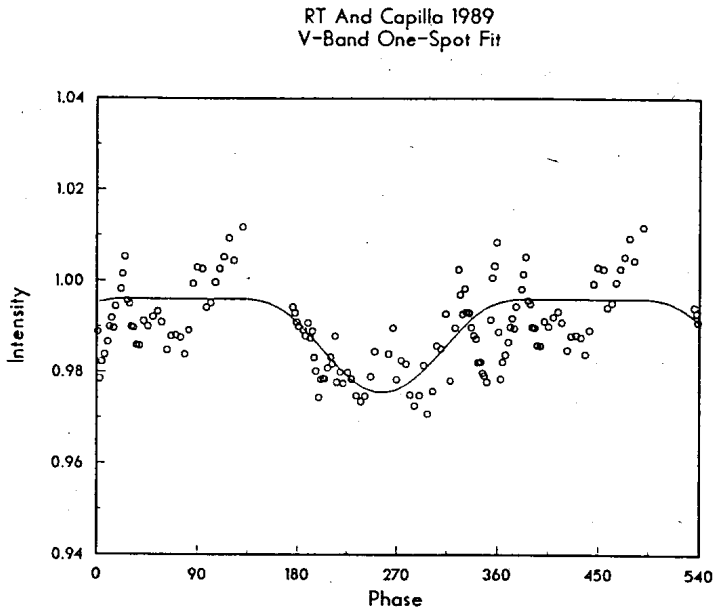

Figure 4.

anomaly at phase zero) = 3.03 (Zeilik *et al.*, 1989a) for the optimized fits. Figure 4 shows the maculation effect at V-band (open circles) with an optimized one-spot fit (solid line). The optimized starspot parameters are: longitude = 256.8° ± 8.0°, latitude = 63.1° ± 16.8°, and radius = 13.3° ± 4.8°. We can also use the difference in the depths of the maculation effects at B and R to calculate an average value of the temperature difference between the spotted region and the photosphere. For these data, we find ΔT_{spot} = 700K ± 370K. Within the errors, these values somewhat lower than those calculated from V/R-band observations in January 1989 (Zeilik *et al.*, 1989b). Hence, in a time span of a little less than a year, the only significant change has been a warming of the starspot region on the primary star.

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