1987 BVRI PHOTOMETRY OF RT And

In a return to our long-term program of BVRI photometry of RS CVn stars, we report here on our first CCD observations of RT And (=BD+52°3383A). The catalog of Strassmeier et al. (1988) lists RT And (catalog #163) as a short-period RS CVn system (P=0.6289 d) containing F8V and G5V stars, which show strong CaII H and K emission and a V-band distortion wave amplitude of about 0.06 mag. Milano et al. (1981) present light curves and solutions from 1949 to 1978 and Mancuso et al. (1979, 1981) discuss in depth the issue of a transit versus occultation solution for the light curves. They conclude that a transit solution is the better one for a pair of main-sequence stars, a result also found by Budding and Zeilik (1987).

We have previously reported on single-channel UBVR photometry of RT And (Zeilik et al., 1982). We have since installed a CCD camera with an RCA SID501EX chip on our 61-cm telescope (Laubscher et al., 1988). The results here are the first using the CCD camera as a multichannel photometer, in which we observe the variable, sky, and comparison star (BD+52°3384) on the same frame. The data were reduced with an effective aperture of 13"; observations were made on 11 and 12 Nov 1987 and 12 Dec 1987UT. The night of 11 Nov was partially cloudy but the results were still consistent (to within 1%) with the other night's data. The overall error in the data is 0.008 mag.

Figures 1-4 show the results in the __instrumental__ system, in which the effective wavelengths of the filters are: B, 463.6 nm ; V, 337.5 nm ; R, 667.0 nm ; and I, 806.4 nm ;. The phases were calculated from the ephemeris HJD = 2441141.888 + 0.628929843E. (Strassmeier et al., 1988, Table 4).

We analyzed the V-band light curve following the procedure of Budding and Zeilik (1987). The distortion curve amounted to only ~2% amplitude ; we fit this maculation effect with a single spot group at a latitude of 45°. The computed parameters of the fit were a longitude of 261 $\pm$ 7° and a spot radius of 9.0 $\pm$ 0.7^{o} for a black, circular active region. This contrasts with our 1981 results in which we found a longitude of 128 $\pm$ 8° and a radius of 8.3 $\pm$ 0.1^{o} for a single spot group (Budding and Zeilik, 1987 ; Table 4). The starspot
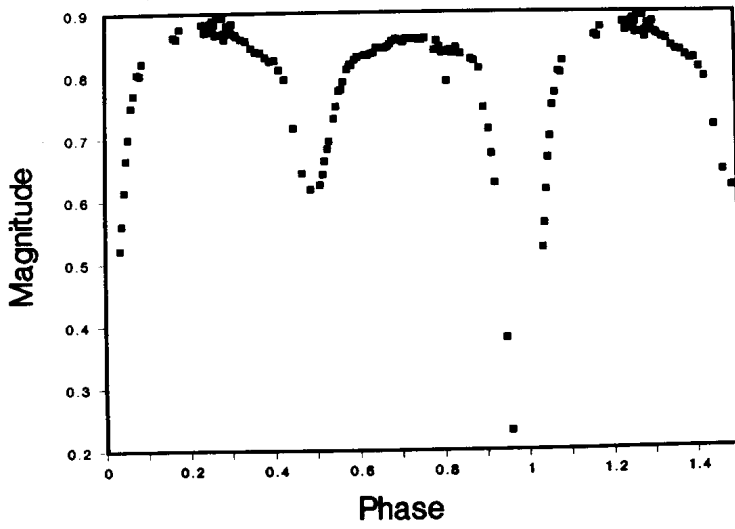
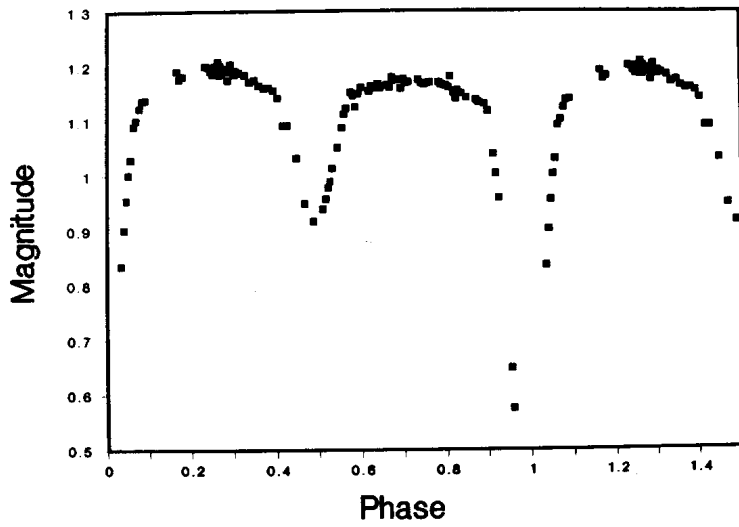## RT And B Band

Figure 1.

RT And V Band

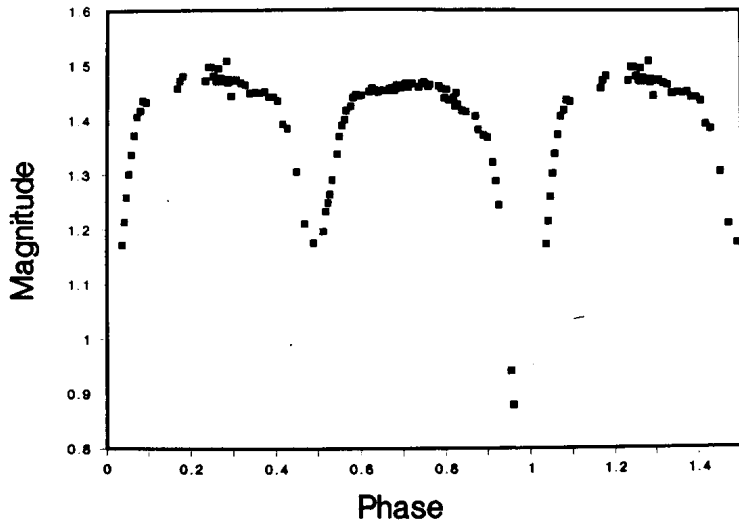Figure 2.

RT And R Band

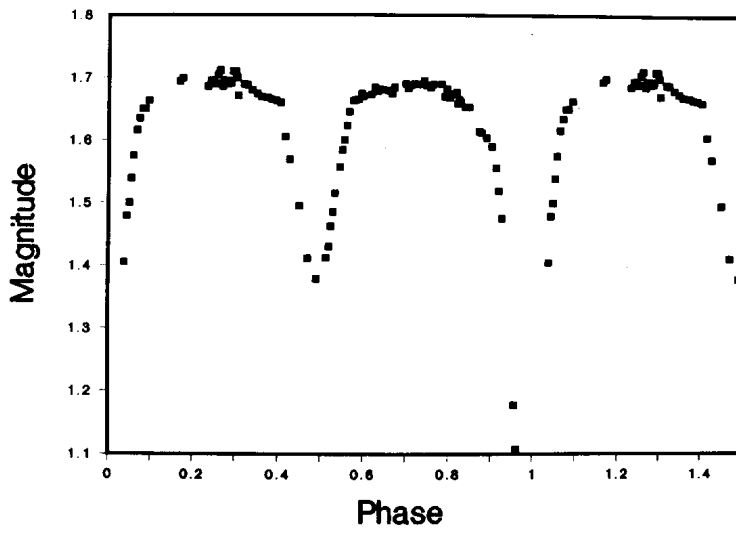Figure 3.

RT And I Band

Figure 4.

group has migrated in longitude but, as is typical for the short-period
RS CVn systems, shows up near the quadrature points.

M. ZEILIK, D. BECKERT, C. De BLASI, M. LEDLOW,

M. RHODES, T. WILLIAMS

Capilla Peak Observatory
Institute for Astrophysics
The University of New Mexico
Albuquerque, NM 87131 U.S.A.

References:

Budding,E., and Zeilik,M., 1987, Ap. J., 319, 827-835
Laubscher,B., Gregory,S., Bauer,T., Zeilik,M., and Burns,J., 1988, Pub. Astron.
        Soc. Pacific, 100, 131-136
Mancuso,S., Milano,L., Russo,G., Sollazzo,C., 1979, Astrophys. and Space Sci.
        66, 475-486
Mancuso,S., Milano,L., Vittore,A., Budding,E., Jassur,B.M.Z., 1981, in Photo-
        metric and Spectroscopic Binary Systems, edited by E.B. Carling
        and Z. Kopal, pp. 313-329
Milano,L., Russo,G., Mancuso,S., 1981, Astron. Astrophys. 103, 57-62
Strassmeier,K.G., Hall,D.S., Zeilik,M., Nelson,E., Eker,Z., and Fekel,F.C.,1988,
        submitted to Astron. Astrophys. Suppl. Series
Zeilik,M., Elston,R., Henson,G., Schmolke,B., and Smith,P., 1982, IBVS No.2090