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1989 V AND K-BAND PHOTOMETRY OF WY Cnc

We report on new V and K band light curves of the short-period RS CVn star WY Cancri (= BD 27° 1706; #68 in the catalog of Strassmeier et. al, 1988). Very few complete light curves are available for this system. Chambliss (1965) presents observations from 1964-65; Sarma (1976) from 1973-74; Awadalla and Budding (1979) from 1978, and Naftilan (1987) from 1982. Oliver (1974) also provides a fairly complete set of data from 1969-70. We decided to reobserve this binary as part of our long-term project to ascertain the activity cycles of RS CVn systems.

We made observations on the nights of 19, 21, 22 and 23 April 1989 UT and 20 February 1989 with the 1.3-m telescope at Kitt Peak National Observatory. The infrared detector was OTTO; the visual one, the Mark III Ga:As photometer mounted in the side port of the infrared photometer. All observations used SAO 80598 (= BD 27° 1708) as the comparison star; 39 Cnc served as the infrared standard star (K = +4.23 on the KPNO infrared system). For the infrared, the aperture size was 32" in the infrared; 34" in the visual. Standard beam-switching techniques were used, with the beam separation set at 60", for both visual and infrared observations. We aimed at a S/N ≥100 for each datum; occasional K-band points have S/N ≃ 50. Phases were derived from the ephemeris in Strassmeier et al. (1988).

Figure 1 gives the V-band magnitude differences (comparison-variable) in the instrumental system, which is very close to Johnson V. Figure 2 shows the same data in normalized intensity units (circles) compared to an optimized light curve (solid line) generated by our fitting program with a 5500 K primary star and a 3500 K secondary (Budding and Zeilik, 1987). A minimum in the distortion wave appears near phase 90°; the optimized spot parameters are longitude = 108° ± 3°, latitude = 39.4° ± 17.9°, and radius = 11.7° ± 2.4°. Figures 3 and 4 present the K-band data in the same way as for

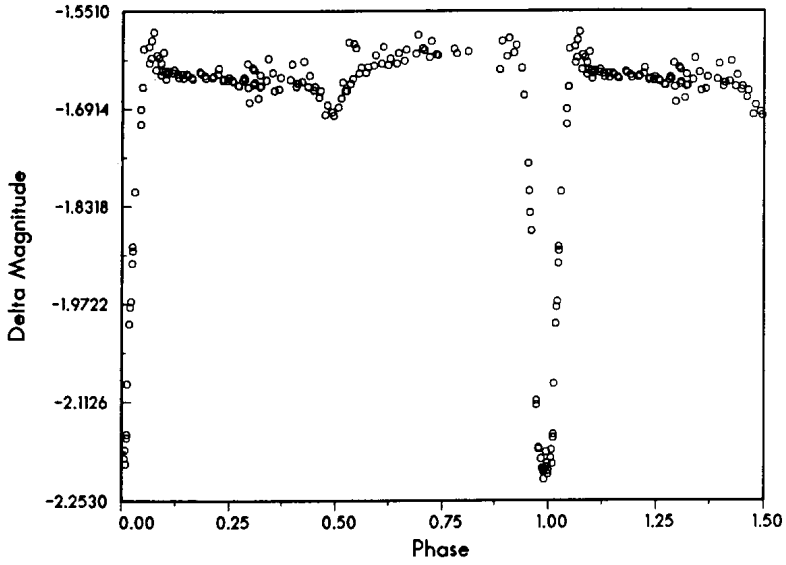

Fig. 1 WY Cnc Instr. V-Band KPNO 1989

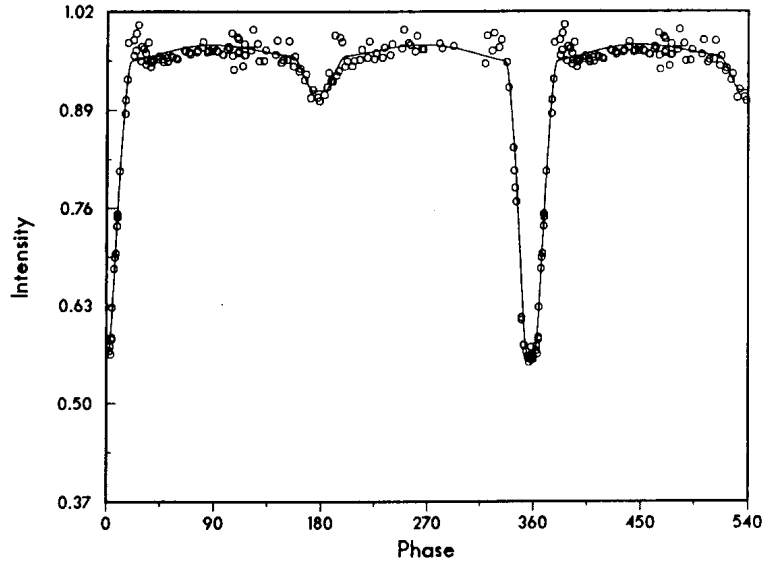

Fig. 2 WY Cnc Instr. V-Band KPNO 1989

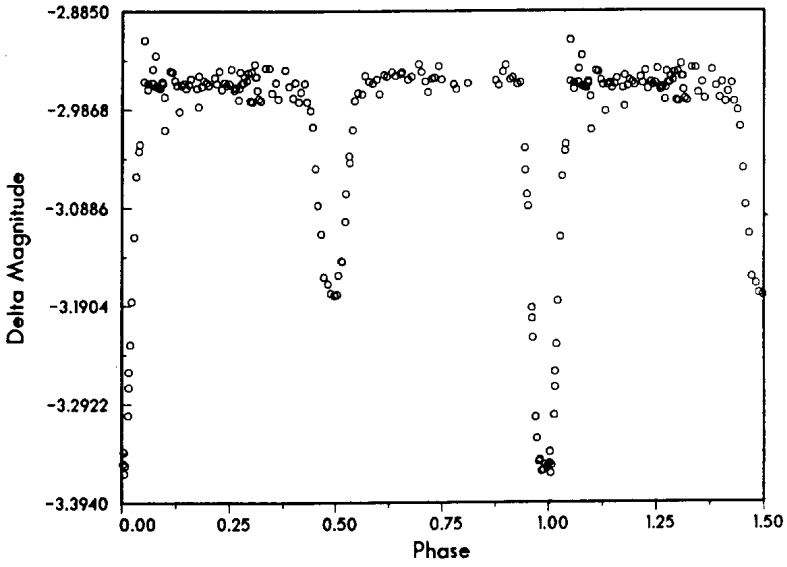

Fig. 3 WY Cnc Instr. K-Band KPNO 1989

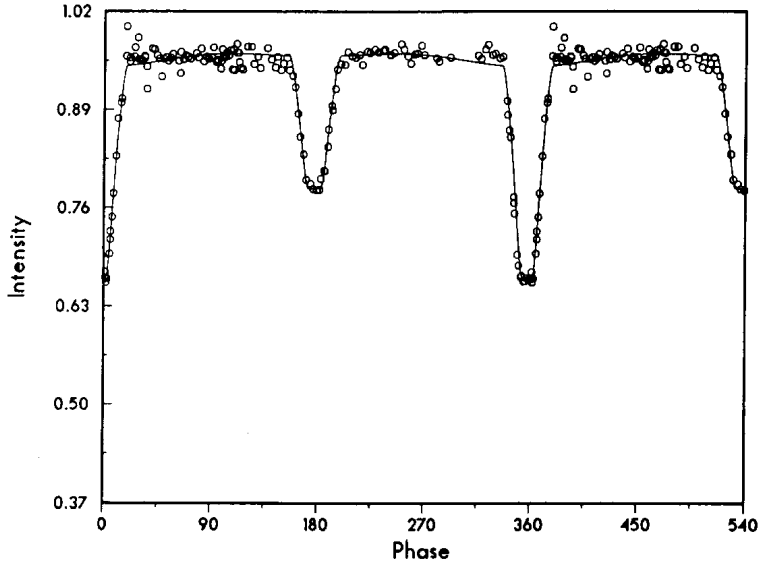

Fig. 4 WY Cnc K-Band KPNO 1989

the previous two figures. The trough of the distortion wave at this wavelength has the same longitude but only about half the amplitude as it does at V. Because the observations at V and K were simultaneous, we can directly infer a temperature for the dark, active region: 3970 ± 1550 K.

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