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1987 PHOTOMETRY OF CG Cyg

CG Cyg (= BD + 34°4217 = No.142 in the catalog of Strassmeier et al. 1988) is a member of the short period RS CVn group. The system has been observed at optical wavelengths since 1965. Sowell et al. (1987) solve the V band light curves for 1979 and 1980 and also reference prior observations. Bedford et al. (1987) and Davies et al. (1987) observed CG Cyg in the infrared during 1984 (BVJK) and 1986 (JHK). They found an infrared excess that they attribute to circumsystem material. Budding and Zeilik (1987) modeled the 1981 light curve of Zeilik et al. (1982) to infer two major spot groups centered at 121° and 219° longitude and 45° latitude.

We observed CG Cyg on the nights of 18, 19, 21, 23, and 26 August and 7-10 September 1987 using the 61 cm telescope operated by San Diego State University on Mt. Laguna California. The photoelectric photometer, which uses an EMI 6256 phototube operated at -1300 V and cooled to -23 C, was equipped with an OG-515 V band filter. Each observation consisted of 3 separate 60 second integrations through a 19" aperture. SAO 70 728 (= BD + 34°4216) was the comparison star for all observations. To obtain the maximum time resolution needed for an analysis of starspot activity, we observed only in the V band. Our reported data (Figure 1) are therefore in the instrumental V band system. These instrumental differential magnitudes (comparison - variable) are sufficient to model the geometrical starspot parameters; so, we made no attempt to use an average (B-V) to convert to the Johnson UBV system (as done by Sowell et al. 1987). Note that in Figure 1 the delta magnitudes have been normalized to unit intensity on the shoulders of the light curve. The open circles are the observed points. Statistical errors in a single set of data were rarely greater than 0.01 mag, with most between 0.005 and 0.008 mag. The solid line is a binary model fit for unspotted stars, following the techniques of Budding and Zeilik (1987).

Using the technique of Budding and Zeilik (1987), we fit the starspot parameters to the distortion wave. We find a single spot at longitude = 120° ±3° , latitude = 38° ± 17° , radius = 13° ± 2° but no evidence for the spot

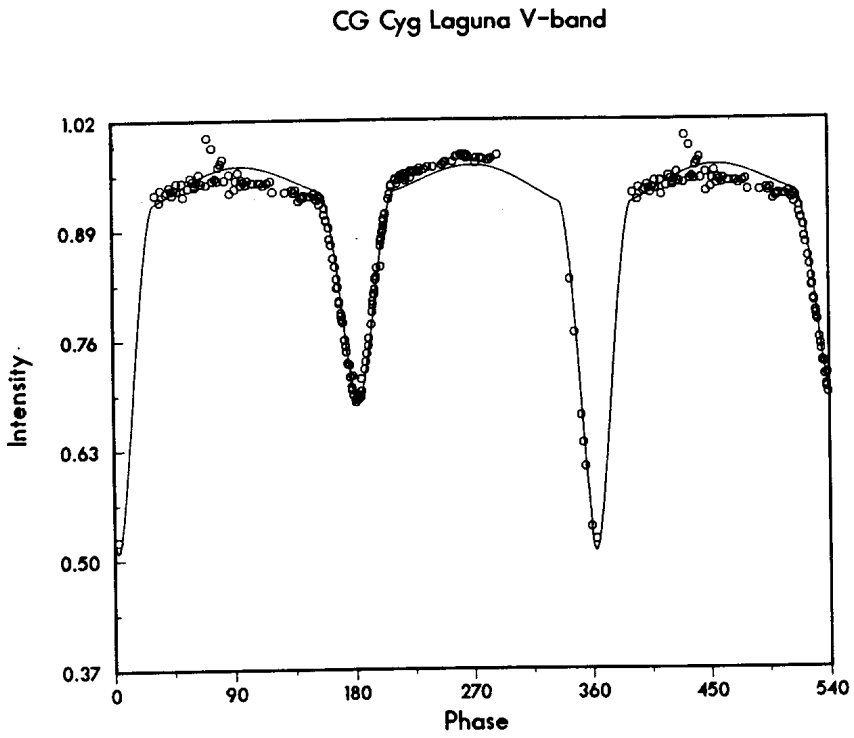

Figure 1

at longitude 219° observed in the 1981 data of Zeilik et al. (1982). In Figure 2, the open circles are the observed maculation wave and the solid line the single spot fit for a black (T = 0 K) spot area. We also observed a possible flare on 26 July at 5:50 UT at longitude 72°, going into the major distortion wave, as expected if the distortion wave is caused by a large active region (starspots). No flare was visible in the 19 July observations, which covered the phase range from 0.09 to 0.50. Unfortunately, weather conditions were less than perfect on the night of 26 July. Because we experienced some variable extinction, we cannot completely rule out the possibility that our apparent flare was caused by atmospheric variability. However, we observed our comparison and check stars often enough that we think the flare is real.

We would like to thank Ronald Angione for scheduling generous amounts of observing time at Mt. Laguna for this project.

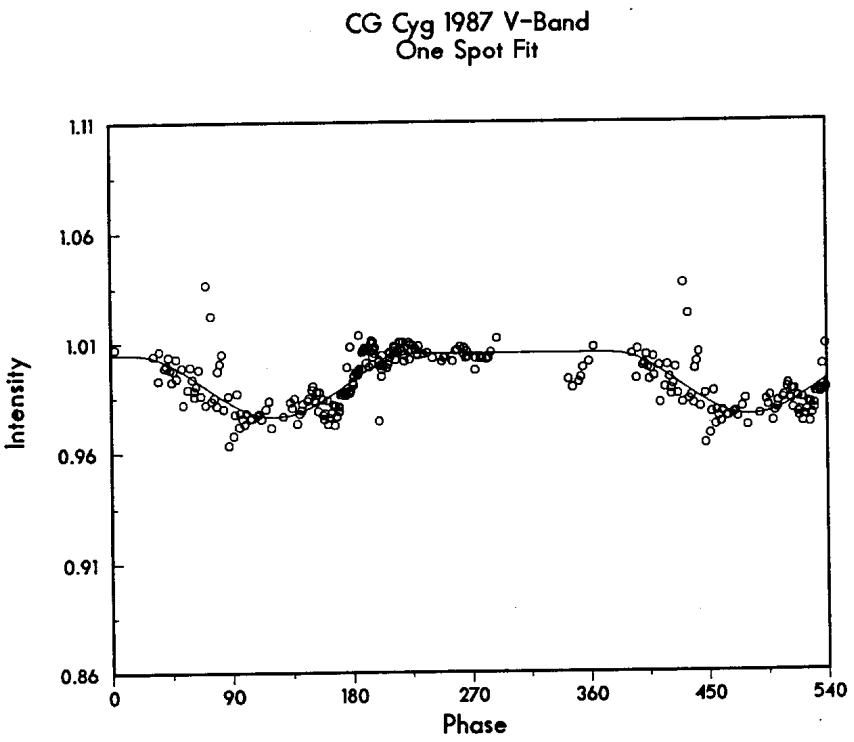

Figure 2

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