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INFRARED PHOTOMETRY OF HR 1099 DURING LATE 1979

The RS CVn type double-lined spectroscopic binary system HR 1099 (\equiv V711 Tau \equiv ADS2644A) was observed in the near infrared (mainly J, K and L) at the South African Astronomical Observatory from 1979 November 17 - December 31. The observations were made with the 0.75 m telescope, using the MkII Infrared Photometer similar to that described by Glass (1973).

The photometric measures included both the components of the visual pair ADS 2644 AB and were relative to the same comparison star (10 Tau) used for the visual and our previous infrared observations (Antonopoulou and Williams 1980, Paper I). The effects of atmospheric extinction were allowed for using mean coefficients, but were not significant because of the angular proximity of the comparison star to the variable. A total of 137 observations was obtained in each colour in 24 nights.

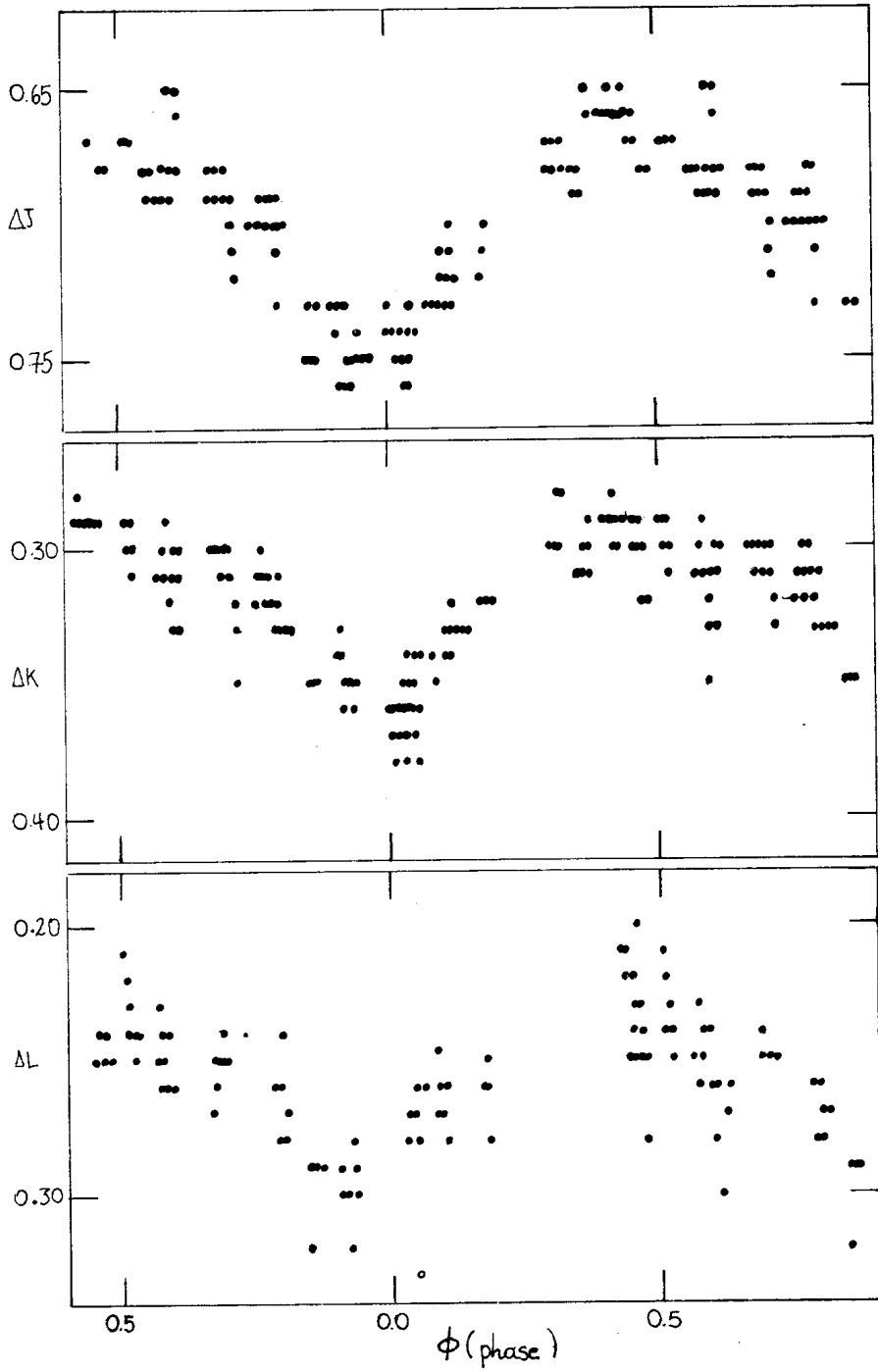
The phase of each observation was computed according to the elements:

$$T_0(\text{JD}) = 2442766^{\text{d}}.069 + 2^{\text{d}}.83782 \cdot E,$$

where the period is the spectroscopically determined orbital period (Bopp and Fekel 1976) and zero phase corresponds in conjunction with the more active component, believed to carry the spot complex, in front.

The differential observations, taken as variable minus comparison, are plotted against phase and are shown in the Figure.

It is clearly seen that the phase of the minimum is at phase 0.95 in agreement with the phase of the minimum given by the visual data taken at around the same time (Guinan et al. 1979). This means that the phase of the minimum has shifted by 0.055 forwards, comparing these observations with the ones we took one year earlier (Paper I).



The amplitudes of the light variation in J, K and L are about 0.09 mag, 0.07 mag and 0.06 mag, respectively.

Assuming the simplified spot model for HR 1099 as described in Paper I, our preliminary calculations, from the combination of the present infrared data and the visual data given by Guinan et al. 1979, give the results:

The spots are $1250\text{K} \pm 100\text{K}$ cooler than the surrounding photosphere and cover 0.16 ± 0.02 of the projected area of the two stars or approximately one third of the hemisphere of the active component assuming the two components to be the same size.

A full discussion will be published later elsewhere.

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References:

- Antonopoulou, E. and Williams, P.M.,:1980 Ap.and Sp.Sc. 67, 469
Bopp, B.W. and Fekel, F.: 1976 Astron. J. 81, 771
Glass, I.S.: 1973, M.N.R.A.S. 164, 155
Guinan, E.F., McCook, G.P., Fragola, J.L. and Weisenberger, A.G.:
1979, I.B.V.S. No. 1723