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INFRARED VARIABILITY OF HR 7275

Although Hall's (1976) original classification of the RS CVn stars included infrared excesses as one criterion, little work has been done to observe RSCVn stars in the infrared over complete orbital cycles. We report here infrared photometry of the long-period, non-eclipsing system HR 7275 that clearly shows phase-dependent infrared light curves.

All observations were carried out with the 1.3-meter telescope at Kitt Peak National Observatory during the day. We used the InSb photometer "Otto" with a 20" beam, chopping 60" in declination. Magnitudes were calculated relative to α Lyr, which was taken as 0.0 at JHKL. Because HR 7275 is bright ($V \cong 6$), statistical errors in each observation were small, no more than 0.01 mag. Our observations spanned December 1980 to February 1981; most were clustered in January 1981.

Figures 1-4 show the results, plotted as the difference (α Lyr - HR 7275) at each filter. The phases were calculated from the emphemeris given by Fried et al. (1982): HJD = 2431043.57 + 28.59E, which is based on spectroscopy. Note the clear drop from maximum at phase 0.1 to minimum at phase 0.8. The amplitude of this infrared distortion wave is 0.11 at J, 0.09 at H, 0.09 at K, and 0.06 at L.

The VB observations of Fried et al. (1982) from 1978-1980 show that the distortion wave of HR 7275 is quasi-periodic, with V amplitudes as large as 0.5 mag and as small as 0.28 mag. Percy and Welch (1982) reported V-band observations that showed an amplitude of 0.1 mag with minimum at phase 0.45. The photometric period, which varies, is roughly 27.8 days, significantly less than the spectroscopic orbital period of 28.59 days.

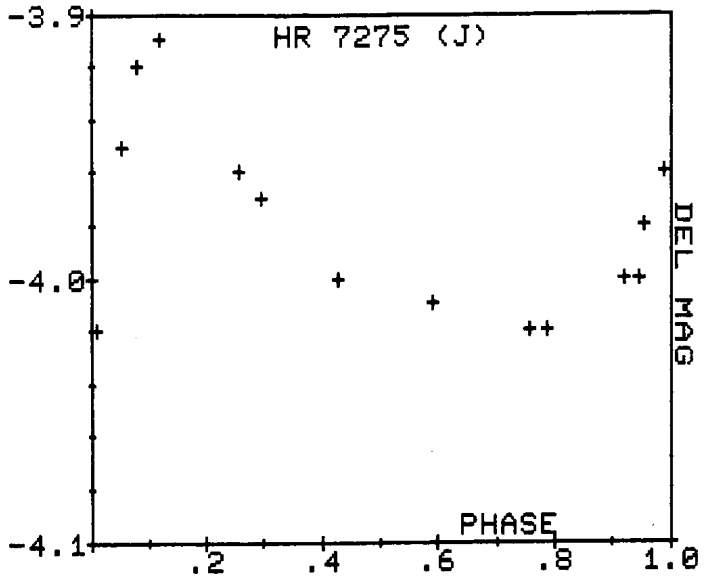

FIGURE 1

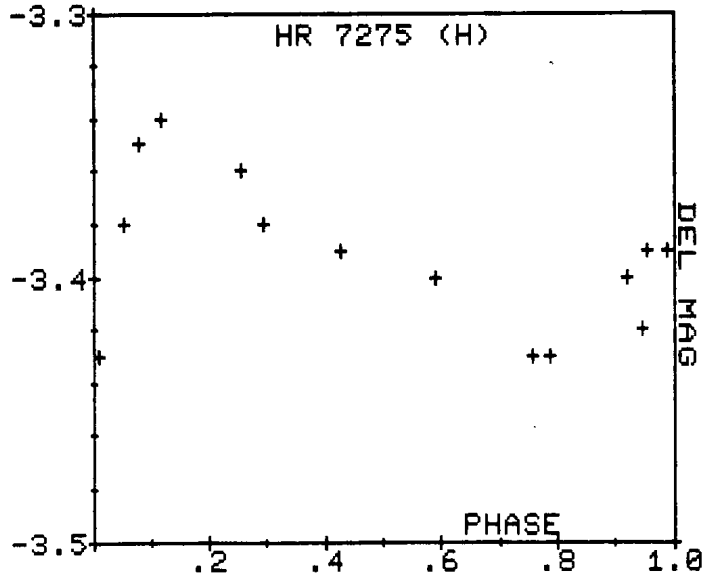

FIGURE 2

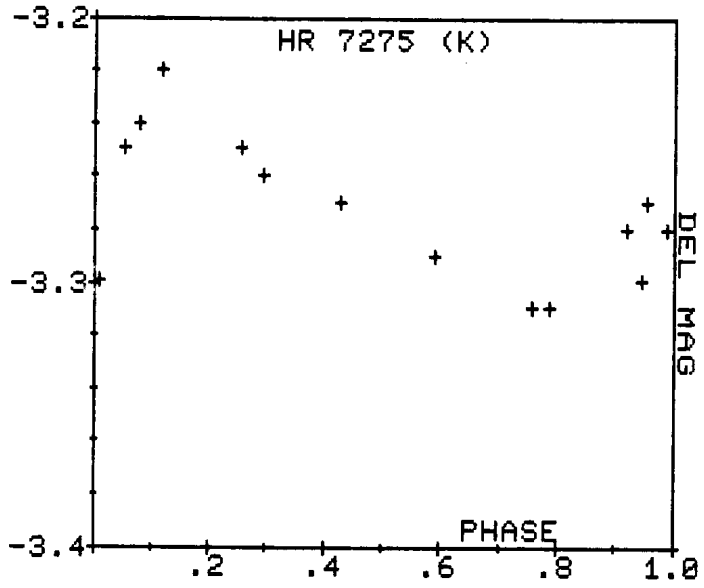

FIGURE 3

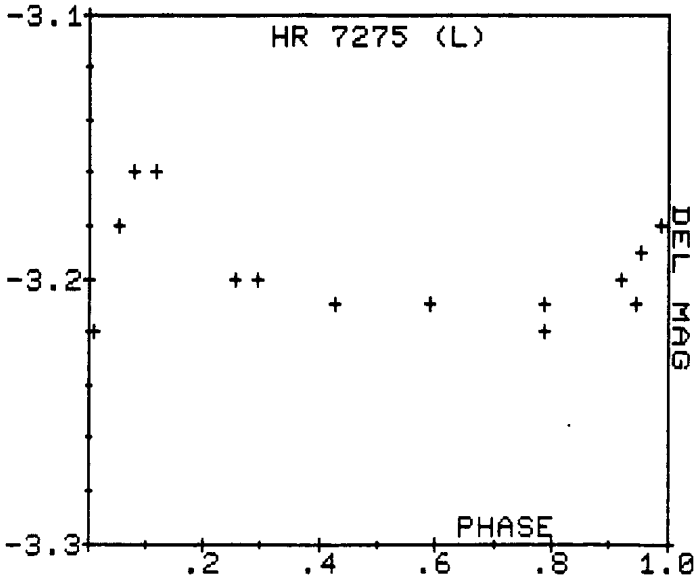

FIGURE 4

Our infrared observations started at about the same time that Fried et al.'s ended. Their results show that the amplitude was increasing, reaching about 0.25 mag at V at JD 2444550. Our results fit in well with their photometric period.

When combined with visual photometry, infrared observations provide the necessary data to fit simple starspot models. With visual photometry (UBVR) obtained at Capilla Peak in Fall 1980, we can model both the temperature and distribution of starspots. We are in the process of doing so for HR 7275, using the data reported here.

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