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# IDENTIFICATION OF HD 174429 AS AN RS CVn SYSTEM

We present 1982 photoelectric observations of the RS CVn candidate HD 174429.

HD 174429 (= SAO 245781 = CP -50 10862) is included in a list of southern RS CVn candidates by Weiler and Stencel (1979). Radial velocity measurements and H & K line profiles are given by Stacy et al. (1980). Optical variability was reported by Coates et al. (1980).

HD 174429 was observed in the Johnson B & V passbands on sixteen nights in the interval 1982 May to October at Monash Observatory, and at Siding Spring Observatory. The standard stars used were HD 176557 (= SAO 245894 = CD -50 12292) and HD 176664 (= SAO 245899 = CD -51 11893). The measurements showed that the magnitude differences between the standards were constant at 1.260 ± 0.005 in V, and 1.499 ± 0.004 in B.

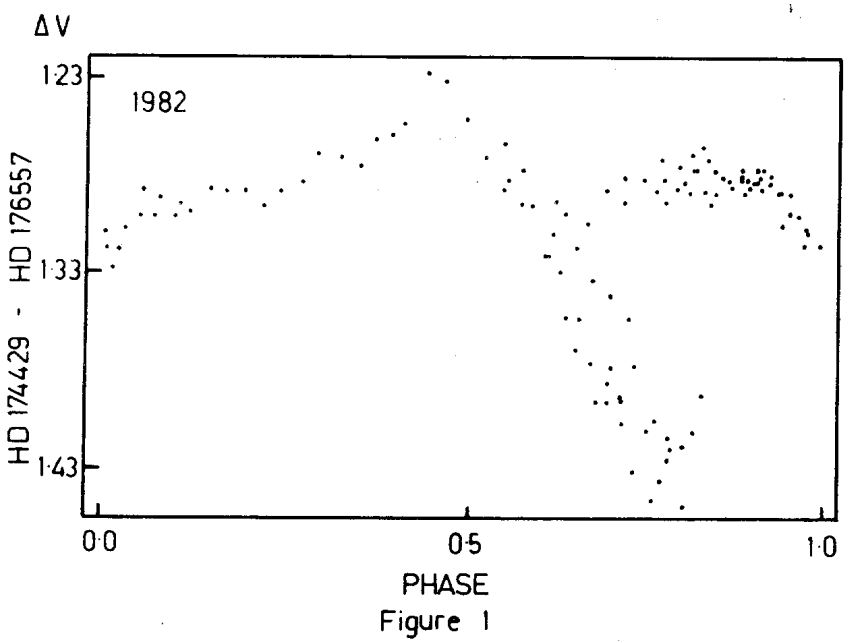


Figure 1

The V light curve obtained is shown in Figure 1. The primary epoch is HJD 2444443.0000, the period is estimated to be 0.943 days and ΔV is relative to HD 176557.

Minimum light is now about 0.09 magnitude fainter than that reported by Coates et al. (1980), while maximum light is about 0.01 magnitude brighter. Also the shape of the light curve has altered radically from 1980 (see Figure 2).

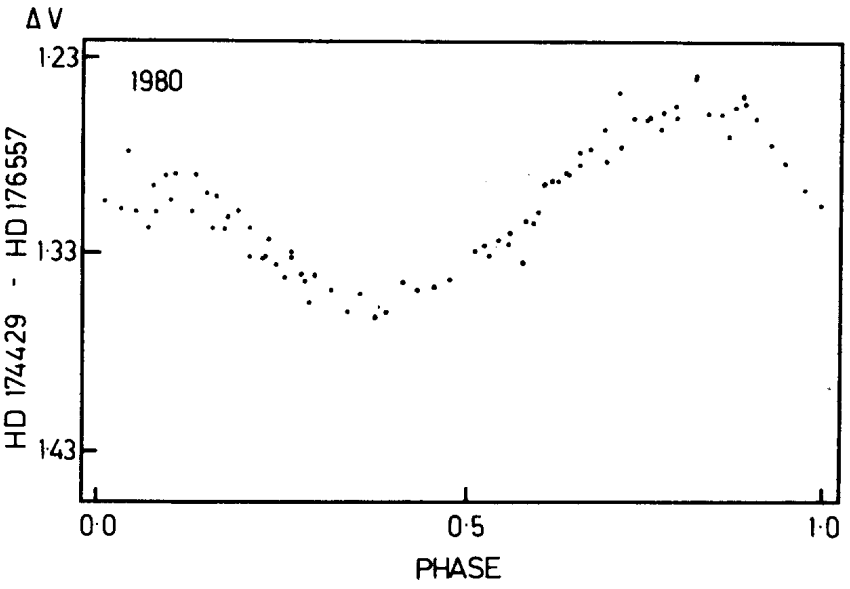


Figure 2

Plotting the 1982 V data in the intervals 1982 May to July, and August to October (Figures 3(a) and 3(b)) shows how the light curve has changed in form within the 1982 observing season. The minimum at phase approximately 0.8 observed early in the season was no longer present when observations were made at this phase in August. Such variation is typical of the RS CVn class of stars.

A plot of the colour index B-V versus V is shown in Figure 4. A least squares straight line fitted to these data (solid line in Figure 4) was found to be of negligible gradient, indicating that B-V for this system was constant within the accuracy of our measurements at +0.77 ± 0.01.

Houk (1978) gives HD 174429 as spectral type KO Vp. The B-V value obtained from our observations is significantly bluer than would be expected if the system was a single KO V star. Using these colour data and assuming

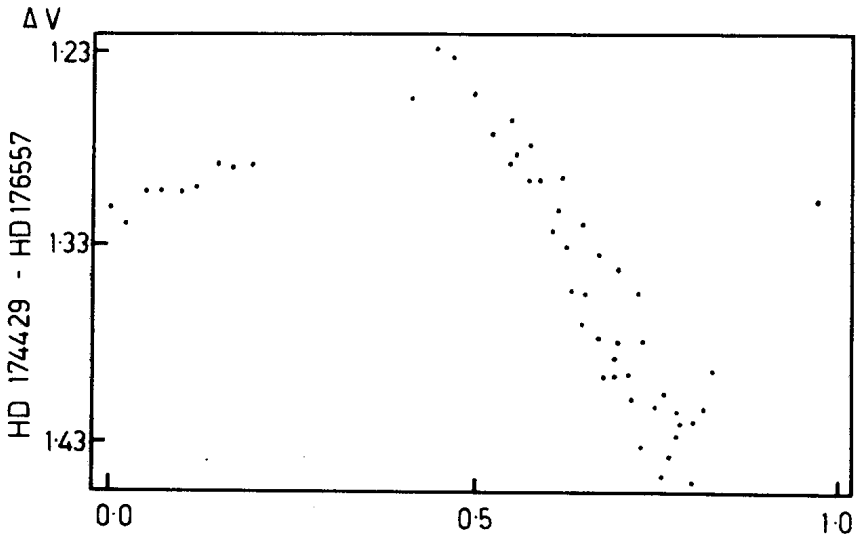


Figure 3 (a)

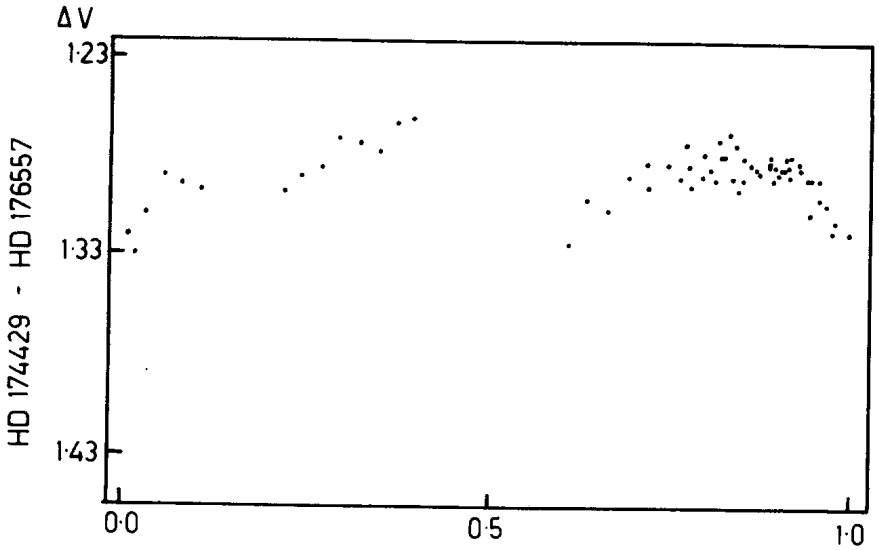


Figure 3 (b)

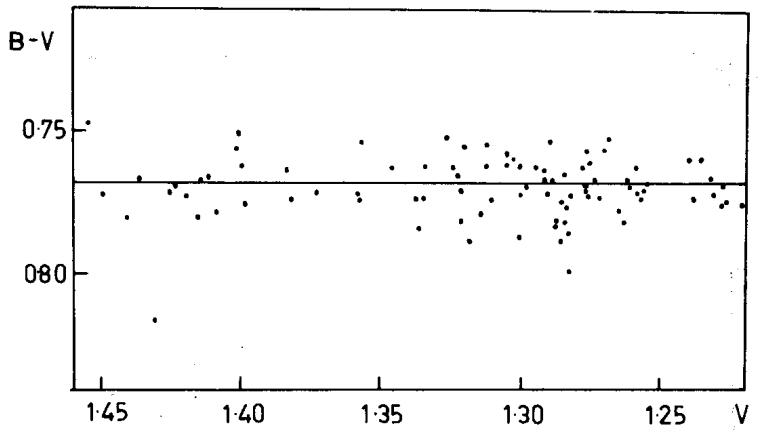


Figure 4

that the system is a binary, with both components on the main sequence, calculations indicate that the primary is near G5.

Preliminary analysis suggests that if the variability of the system is solely due to the presence of cooler active regions on the surface of the secondary, then these regions need to be around 3000 K cooler than the KO V photosphere, and cover approximately 50% of the effective area of its surface, in order to reproduce the observed V range without a detectable colour change. This suggests an extremely high amount of activity on the surface of the KO star. However, we stress the tentative nature of our conclusions about the sizes and temperatures of these regions.

On the basis of these observations we identify HD 174429 as a member of the RS CVn class. More observations are required to investigate this system further.

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