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B AND V PHOTOMETRY OF THE SOUTHERN RS CVn CANDIDATE HD 196818

The star HD 196818 (KO III p: Houk and Cowley, 1975) has been included in several recent lists of stars with Ca II H and K emission, and has been suggested as a candidate RS CVn system (Weiler and Stencel, 1979). Hearnshaw (1979) reports very strong H and K emission in six spectra obtained on this object, and notes that the emission is even more intense than in the very active RS CVn star HR 1099 (V711 Tau). He also reports that radial velocity variations may be present. HD 196818 is a known variable star, with the Bamberg number BV 893. Collier et al (1982) in an optical and radio survey of southern RS CVn systems and related objects observed HD 196818 on five of the eight days of the radio survey but did not detect any radio emission at 5 GHz. They also obtained a high dispersion H α line profile of this system, which showed a broad shallow absorption.

We have obtained photoelectric B and V measurements of HD 196818 on fourteen nights from 1982 August to 1983 July with the 0.4m telescopes at Monash Observatory and at Siding Spring Observatory. Comparison stars used were HD 193721, HD 194612 and HD 196520. For the data taken at Monash the instrumental system very closely approximates the standard UBV system and no corrections were necessary. For the data taken at Siding Spring, transformation equations were determined from observations of UBV standard stars and the appropriate corrections applied. The B and V magnitude differences between the comparison stars are given in Table I.

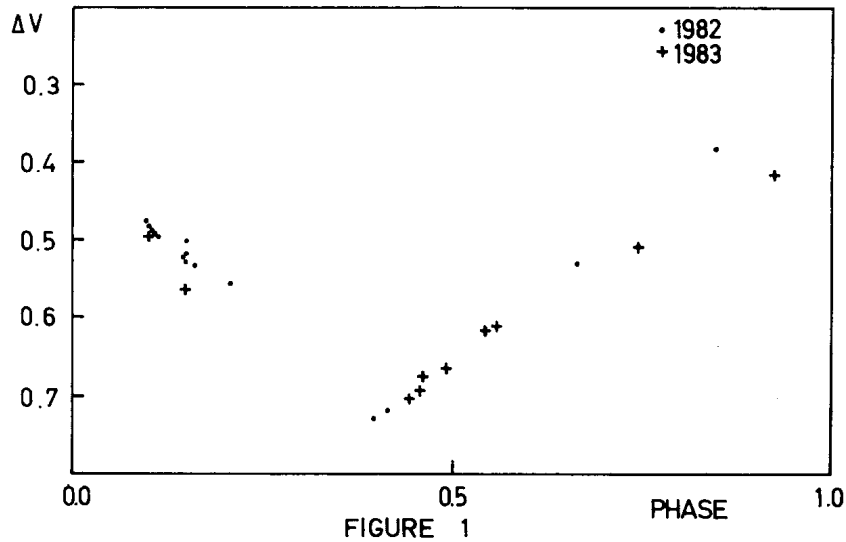
Table I

	ΔV	ΔB
HD 193721 - HD 194612	-0.139 ± 0.010	-0.701 ± 0.008
HD 194612 - HD 196520	-1.701 ± 0.011	-1.070 ± 0.008
HD 196520 - HD 193721	1.840 ± 0.008	1.771 ± 0.008

A total of 65 V and 17 B measurements were obtained. Inspection of the data showed that brightness variations over a few hours were small compared with the changes observed over several days, so for a given night's data, two or more individual measurements were combined to form the mean points plotted in the accompanying diagrams.

Figure 1 shows the V light curve of HD 196818 relative to HD 196520. The epoch is arbitrarily chosen to be HJD 2445200.000, and the period is estimated to be 20.31 days. The range in V is about 0.3 magnitudes.

HD 196818 - HD 196520



Although complete phase coverage has not been obtained, it appears that the light curve is characterized by an almost linear rise and fall, resembling a "sawtooth" wave. A plot of B-V versus V (Figure 2) shows a definite colour change of about 0.05 magnitudes, the star

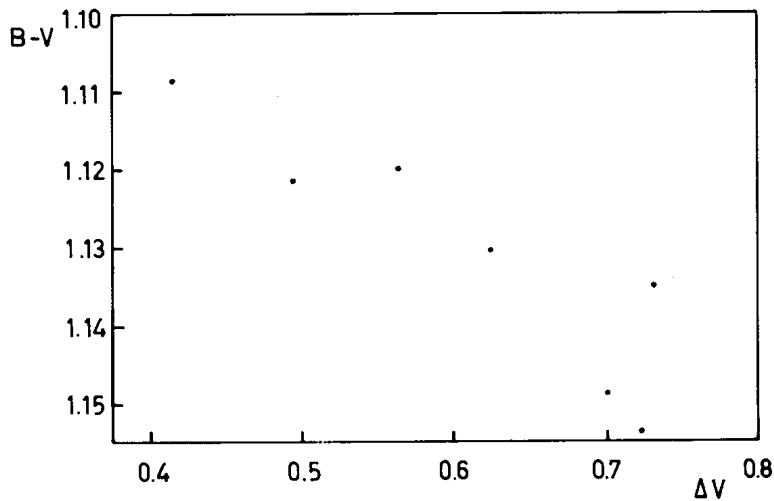


FIGURE 2

being redder when fainter. This would be consistent with the light variations being due to cooler active regions on the surface of the star, as seems to be the case for many related systems. For example, the colour change of this star and the range and shape of its V light curve are similar to those for HD 32918 found by Collier (1982) to be a member of the FK Comae class of single rapidly rotating late type giants.

We note that the light curve obtained here was determined from data taken over almost one year. We have assumed that the light curve has remained stable over this time. If this assumption is invalid then the estimate of the value of the period may also be in error.

We are planning to continue our observations of this star.

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