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**PHOTOELECTRIC OBSERVATIONS OF AB DORADUS**

AB Doradus is a chromospherically active rapidly rotating single star that has been extensively observed for over 16 years. Photoelectric measurements were made at Mt Molehill in November 1993 (13 & 22) and in January 1994 (5, 19, 27, 28 & 30). A 200mm f10 Schmidt-Cassegrain Telescope, an RCA 931b P.M.T., standard Johnson B & V filters and DC electronics were used to make the observations. AB Doradus was monitored continuously in two colours, using differential photometry. Measurements of the comparison star and check were made regularly at about 15 minute intervals.

Reductions to the UBV standard system were carried out in accordance with the methods described by Henden and Kaitchuck (1982).

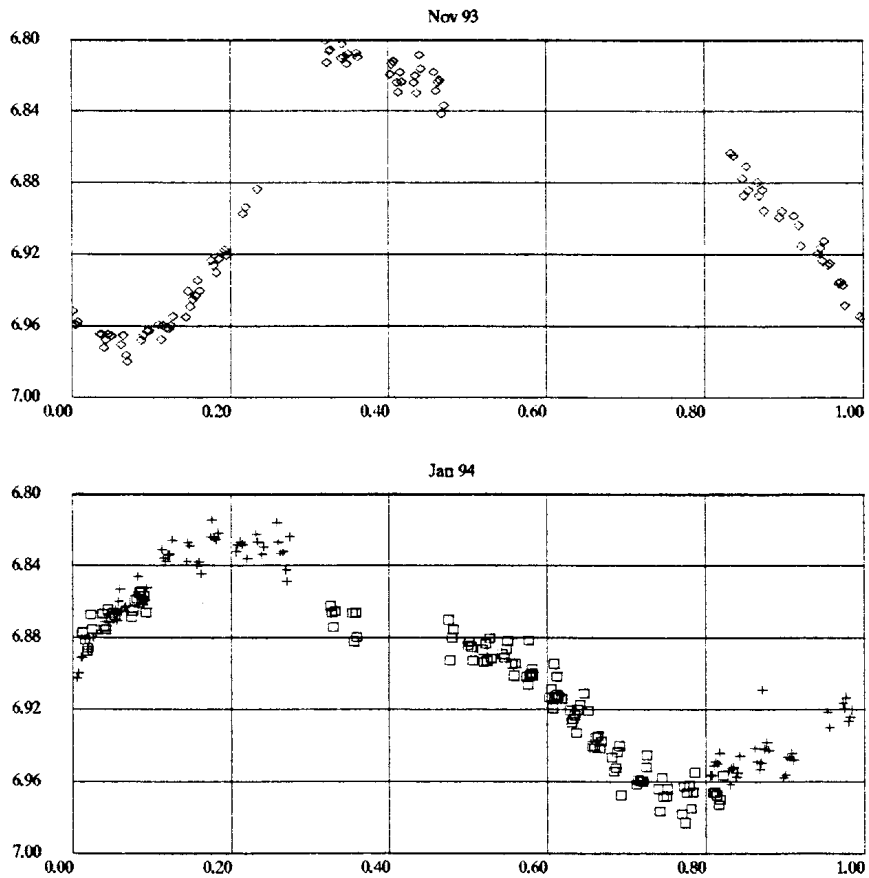


Figure 1. The two light curves collected in November 1993 (top) and in January 1994 (bottom). The square symbols are January 27, 28 & 30

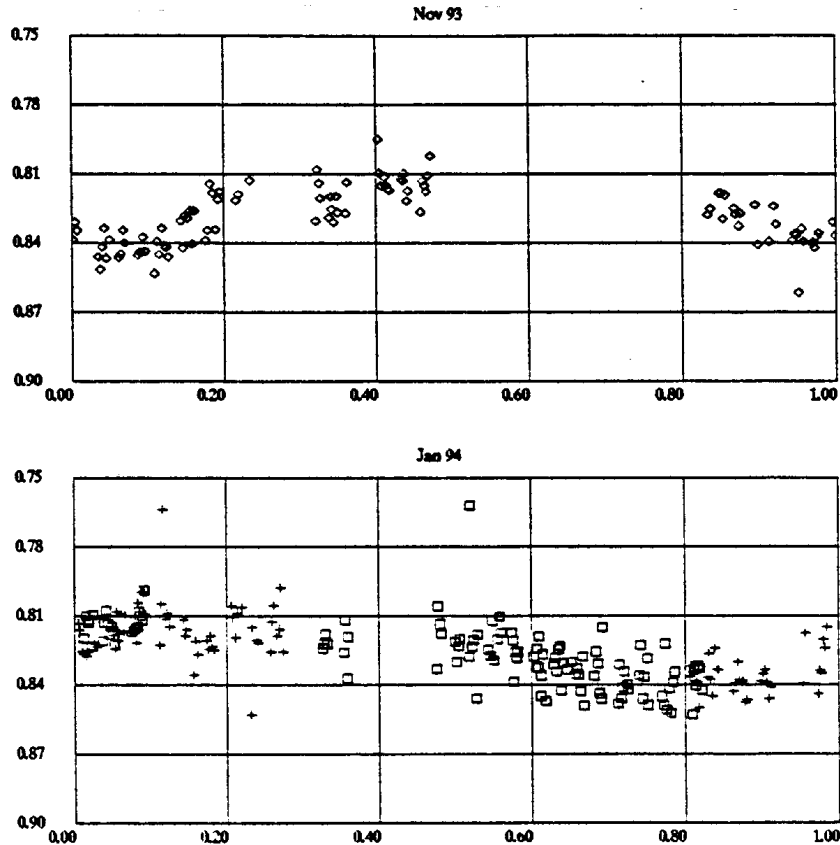


Figure 2. The  $B-V$  plotted against phase, November 1993 (top) and January 1994 (bottom). The square symbols are January 27, 28 & 30

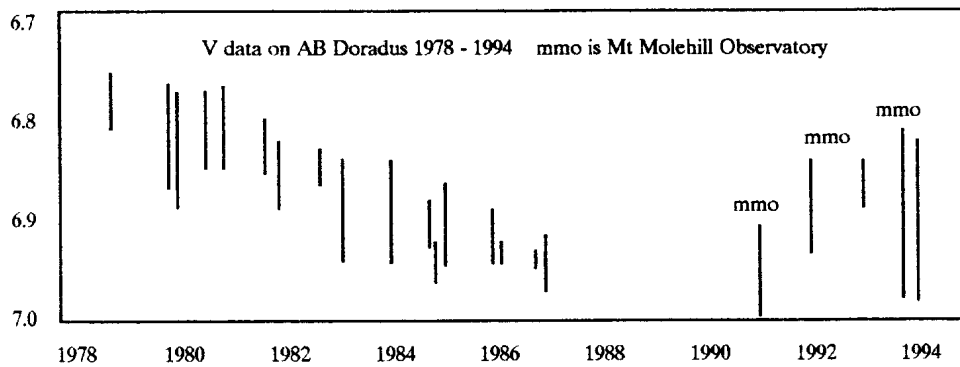


Figure 3. Overall light level and range of  $V$  light plotted against year. Each bar gives the range and light level at the observed epochs.

Table 1. Check Star HD 37279

Date	n	V mag	S.D.	$B-V$	S.D.
individual nights					
J.D. 2449304	9	7.425	.009	0.263	.009
J.D. 2449313	7	7.425	.005	0.275	.008
J.D. 2449357	9	7.433	.011	0.261	.011
J.D. 2449371	6	7.438	.004	0.254	.008
J.D. 2449380	11	7.429	.005	0.260	.010

S.D. = standard deviation

The observing sequence was sky-comp-var-comp-sky-var-check-comp-sky etc. Check star measurements (Table 1) had a standard deviation of 0.011 or less. Each data point on the light curve is the sum of three 10 sec integrations. Both the November and January light curves have amplitudes of approximately 0.14 magnitudes (Figure 1). The more complete light curve for January 1994 (Figure 1b) shows what appears to be a second spot at phase 0.37. Figure 1 shows the amplitude of the light curves and the phase angle of the spots in relation to each other. There is a three hour phase shift between the November 1993 and January 1994 light curves. This corresponds to a linear phase shift of  $1^{\circ}7$  per day when using the period of 0.51479 days derived by Innis et al. (1988). By changing the period to 0.5138 days the two data sets can be brought back into phase. The January 1994 (Figure 1b) light curve is a composite of five nights. The rise was observed on January 5 and the fall on January 28, thirteen days apart, and the resulting light curve is distorted. The rise and the fall on November 13, 1993 (Figure 1a) were observed during one observing session, and therefore would be more accurate. The B–V (Figures 2a & 2b) shows an apparent drop from 0.82 to 0.84 coinciding with the minimum of the V light curves. (Figure 3) is a plot of the overall brightness and amplitude of AB Doradus since 1978. Each bar gives the range and light level at the observed epochs.

Since observations started at Mt Molehill in December of 1990 AB Doradus has been steadily increasing in brightness, the light curves for November 1993 and January 1994 are in agreement with this.

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#### References:

- Henden, A. A., Kaitchuck, R. H., 1982, *Astronomical Photometry*, Van Nostrand Reinhold  
 Innis, J. L., Thompson, K., Coates, D. W., Lloyd Evans, T., 1988, *Mon. Not. R. Astr. Soc.*, **235**, 1411