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UBV OBSERVATIONS OF AB Dor, LATE 1995

Monitoring of the rapidly rotating, cool (early K type) and relatively bright dwarf AB Dor (= HD 36705, SAO 249286) is needed for a fuller account of the properties of electrodynamically active stars (cf. Vilhu *et al.*, 1993; Collier Cameron, 1995; and references cited therein). The ephemeris of Innis *et al.* (1988), Min = 2444296.575 + 0.51479 × E, is usually used to calculate phase values for reference purposes.

The star was observed in B and V ranges on 5 good nights in 1995: Sep 9 and 12, and Dec 18 and 27, with the 20 cm F10 S-C telescope and DC photometer of the Mt Molehill Observatory (cf. Bos, 1994); and Oct 22 with the automated photometer ('APT') at the Kotipu Place Observatory (KPO), using the UBV filters provided with the SSP 5 'Optec' photometer (cf. Hudson *et al.*, 1993).

Standard reduction procedures have been followed (cf. e.g. Budding, 1993). The main comparison star was again HD 37297 ($V = 5.34$, $B - V = 1.04$, $U - B = 0.85$, spectral type K0III — cf. SIMBAD). This comparison was regularly checked against HD 36876 at Mt Molehill (Table 1). Measurements were made every 15-20 minutes, depending on conditions. At KPO HD 37297 was checked against HD 35537, also a K0III star (Budding *et al.*, 1994). The vagaries of the check against comparison are typically ∼0.01 mag in the data sets presented, although sometimes reaching 0.02. The scatter of individual points is somewhat greater for the KPO data, and also greater in B than in V data.

These data sets are shown in Figures 1 and 2. Figure 1 combines the Mt Molehill (Bos) and KPO data, since there appears to be a general continuity for the September-October period. Figure 2 shows the December data. The U-data from KPO for Oct 22 follows the trend of the other two (B, V) data sets, but it is not plotted here. The U magnitude ranges from about 7.98 at phase 0.5 to 8.07 at phase 0.32, with a typical scatter of 0.02 mag.

Table 1. Variability of AB Dor — amplitude and minimum phase

	Max.	Min.	Amplitude	Phase
Figure 1a	6.77	6.88	0.11	0.08
Figure 1b	7.60	7.71	0.11	∼0.1
Figure 2a	<6.81	6.88	>0.07	∼0.0, 0.7
Figure 2b	<7.62	7.70	>0.08	∼0.0, 0.7

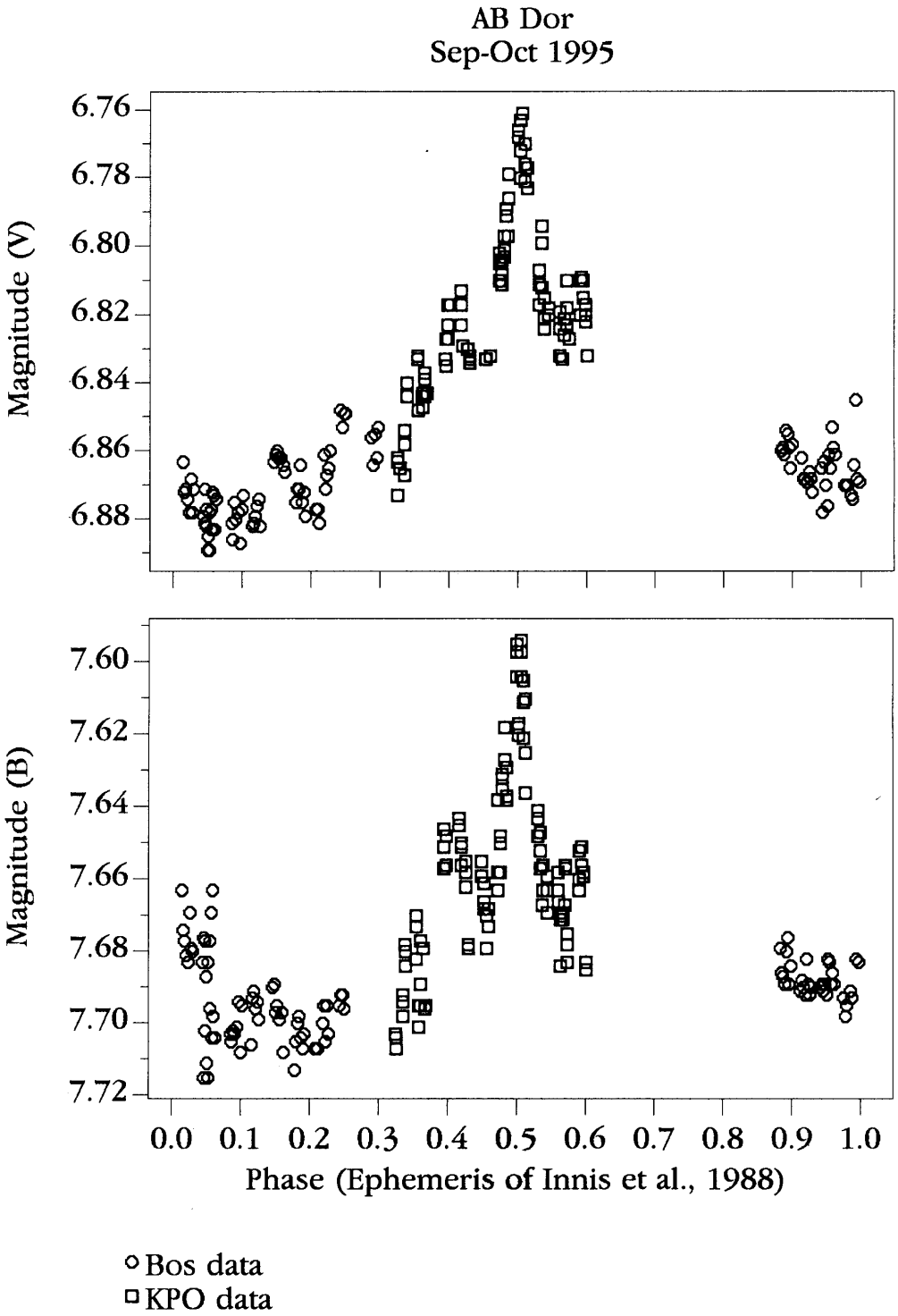

Figure 1. AB Dor: B, V light curves for Sep-Oct, 1995

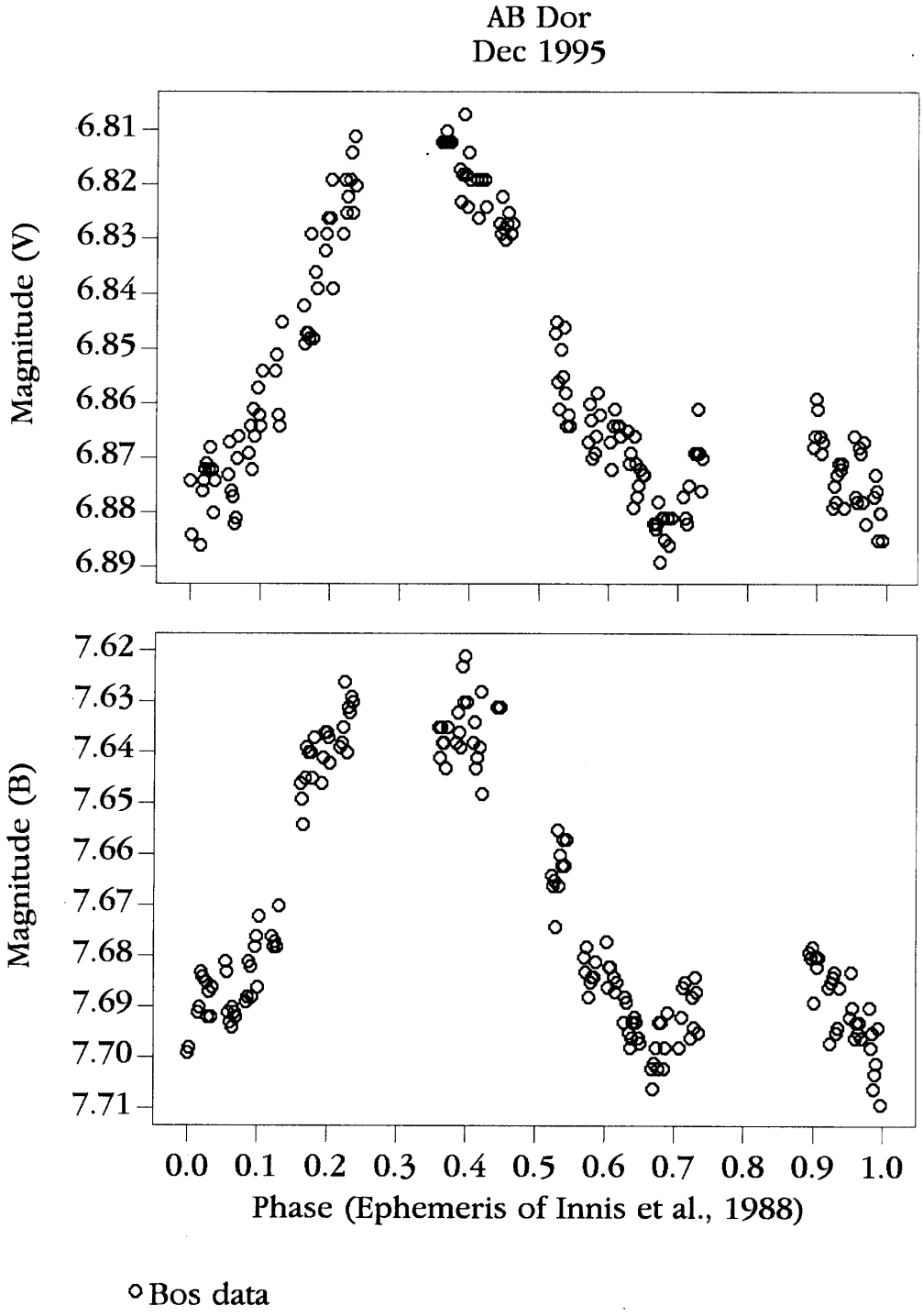

Figure 2. AB Dor: B, V light curves for Dec, 1995

The observed minima may be related to spot A of Innis *et al.* (1988), rather than spot B, but in view of the apparent tendency of the minima to move downward in phase, reported before (Bos *et al.*, 1995), and evident in the trend for late 1995 indicated in this article, the old scheme of Innis *et al.* is rather placed in doubt. One possibility is that another value of the period will give a better general representation of the variation resulting from maculæ which would be at fixed longitudes. A shorter period of 0.5138d has been suggested by Bos (1994). This period produces a well repetitive light curve, with a steady minimum at phase 0.5 through 1995.

The maximum brightness of AB Dor increased slightly (up to 6.77 in V) since the 1993 and 1994 observations. The relatively longer proportion of darkened time on the 1995 data sets cannot be reproduced with just one large starspot, however. Spottedness must cover an appreciable range of longitude in the September-October period, though the relatively unspotted, cusp-like phase range has widened out somewhat by December.

Observations have continued from late 1995 into 1996, and the more recent data retains a consistent phasing of the minima with 1995, using the shorter period of Bos (1994). These newer data will be reported separately later.

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