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VARIABILITY IN THE Be STAR SB 357 (=CD -37°316)

Star number 357 in the survey of Slettebak & Brundage (1971) was classified 'B' type by them and B2 pec by Graham and Slettebak (1973) who also made observations in the Strömberg (uvby) system. Graham & Slettebak (1973) note that H β is not visible in their low dispersion spectrograms and that the star may have emission. This was confirmed by Heber & Langhans (1986) who found central reversal in all the Balmer hydrogen lines, HeI 4922, and possibly other helium lines. From uvby photometry and fitting the wings of H γ , they find $T_{\text{eff}} = 17900$, $\log g = 4.0$, $V \sin i = 130$ km/sec, and a distance from the galactic plane of nearly 6 kpc, which is quite remarkable.

SB 357 (=CD -37°316) has been observed with the SAAO 1m telescope in the 'faint blue' star programme (see e.g. Kilkenny 1987) and is clearly variable. Strömberg photometry from this programme is given in Table 1; the colours are typical of a B2-B3 star reddened by $E(b-y) \sim 0.05$, though there may also be variability in colour. Heber & Langhans (1986) give $E(B-V) = 0.055$ derived from Strömberg photometry.

Some short sequences of almost continuous monitoring of SB 357 were made using Johnson B and V filters, also with the SAAO 1m telescope; these are listed in Table 2 and shown in Fig. 1. There is no evidence for any short period variability as big as 0.01 mag, on a timescale of less than 2-3 hours. The mean values given in Table 2 have standard deviations in the range 0.003 - 0.006 mag; I am grateful to Mr F. Marang who made the last two single observations with the SAAO 0.5m telescope. The

observations on HJD 2447073 were tied to regular observations of the E-region standard E1/46 (Menzies, Banfield & Laing 1980) whilst those on HJD 2447119 and 7120 were corrected to the much nearer HD 5061 (= SB 352) which was classified ADVn by Slettebak & Brundage (1971) and appears constant from SAAO observations tied to E-region standards ($V = 8.640 \pm 0.004$, $B-V = +0.011 \pm 0.002$; 17 observations on 3 nights).

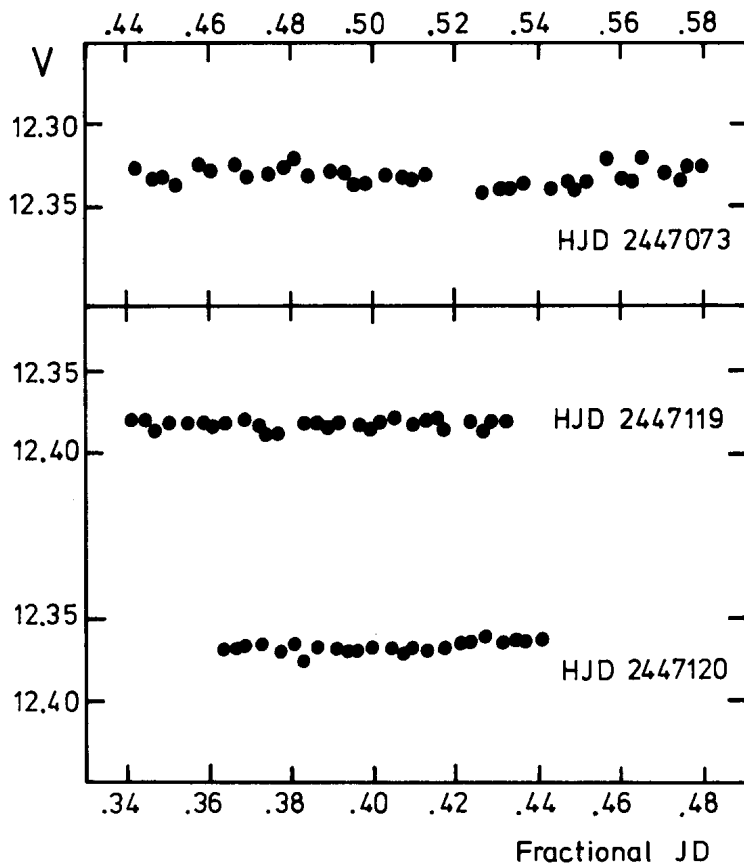


Figure 1. V magnitudes from three short BV sequences of observations of SB 357 (= CPD-37316). The Julian date of each run is noted and all observations are corrected to E1/46 or HD5061 (see text).

Table 1 Strömgren photometry of SB 357

HJD	V	(b-y)	m ₁	c ₁	Date
2446682.592	12.536	-0.063	+0.093	+0.251	8 Sep 86
6768.398	12.494	-0.043	+0.079	+0.193	3 Dec 86
6769.400	12.479	-0.030	+0.059	+0.202	4 Dec 86
6772.386	12.531	-0.071	+0.116	+0.208	7 Dec 86
7071.495	12.325	-0.017	+0.063	+0.210	2 Oct 87
7072.385	12.325	-0.017	+0.075	+0.186	3 Oct 87
.443	12.320	-0.017	+0.069	+0.197	
.554	12.328	-0.027	+0.072	+0.187	
7121.368	12.341	-0.020	+0.071	+0.177	21 Nov 87
.463	12.365	-0.042	+0.090	+0.192	
7122.365	12.362	-0.029	+0.066	+0.222	22 Nov 87

Table 2 BV photometry of SB 357

HJD	V	(B-V)	n	Date
2447073.44 to .58	12.331	-0.091	36	4 Oct 87
7119.34 to .43	12.382	-0.125	28	19 Nov 87
7120.36 to .44	12.367	-0.127	24	20 Nov 87
7123.39 to .40	12.351	-0.107	4	23 Nov 87
7127.344	12.382	-0.096	1	27 Nov 87
7128.337	12.377	-0.075	1	28 Nov 87

Considering all the data, there is weak evidence from the 1987 results around HJD 2447120-30 for variability on a time scale of $\gtrsim 10$ days and with amplitude $\gtrsim 0.04$ mag, but comparing 1986 and 1987 photometry indicates that variations of up to 0.2 mag are possible over a year or less. Given the unusual location of this apparently normal Be star, some 6 kpc from the Galactic plane, sustained monitoring would be worthwhile.

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