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VARIABILITY OF THE RECENTLY DISCOVERED Be STAR NGC 6871-8

The star BD+35°3956 (star number 8 in NGC 6871) has recently been shown to be undergoing an emission phase by Grigsby & Morrison (1988). They reported that this B0.5 V star was highly variable in H-Alpha profile, changing from emission to absorption in approximately ten days time. Previous to their announcement, the star had not been known to undergo a Be phase. Its photometric history appears to reflect constancy (Delgado et al., 1984).

BD+35°3956 was added to the photometric monitoring program of Be stars of the Corralitos Observatory immediately upon its nature as an emission-line object having been noted. Twelve observations in BV colors were made utilizing the Corralitos 0.6-m. telescope and single channel photon-counting photometer (an EMI 9924A photomultiplier tube) and also the Kitt Peak Observatory #2 0.9-m. telescope and automated filter photometer (a 1P21 photocathode). Comparison stars used for the differential photometry included stars 1 - 9 of NGC 6871. The values of V and B-V for these stars were taken from Hoag et al. (1961) and verified using all-sky photometry at the Kitt Peak telescope. Star #1 was found to have a V magnitude brighter than that published by Hoag et al. (as well as being possibly variable?) and hence, was dropped from further analysis of Star No. 8. All the remaining magnitudes were consistent with Hoag et al.'s values with the exception of the star considered here, number 8, whose mean magnitude is now brighter than theirs and B-V color redder. There was excellent consistency in colors between the Kitt Peak and Corralitos telescopes with their being a magnitude difference of less than 0.003 in delta V and delta B-V between the values obtained at the two observatories. The magnitudes arrived at for Star No. 8 are simple means of those derived from the observed differences with all the remaining stars. The average standard errors in V for the standard stars were 0.029 and 0.025 in B-V.

Table I

JD	V	SE	B-V	SE
7303.89444	8.830	.024	+.261	.027
7312.92014	8.980	.010	.203	.013
7320.89513	8.615	.015	.217	.017
7321.86875	8.792	.017	.167	.005
7322.82916	8.403	.032	.231	.016
7412.75938	8.793	.028	.243	.023
7435.68160	8.847	.036	.202	.026
7436.63368	8.866	.010	.174	.025
7439.62569	8.846	.017	.218	.033
7441.63264	8.798	.030	.243	.028
7473.59965	8.800	.026	.235	.020
7478.57569	8.821	.025	.223	.028
MEAN	8.783	±.145	+.218	±.028

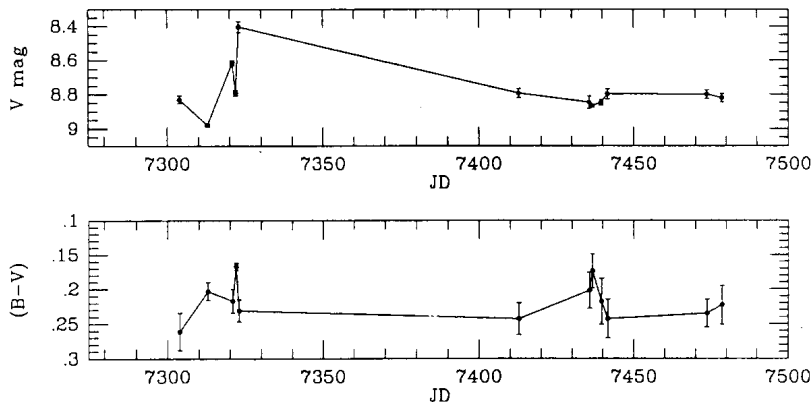


Figure 1

It soon became obvious that BD+35°3956 is highly variable in V magnitude over relatively short time periods. It was seen to undergo an overall range of variation of 0.577 magnitudes in V and 0.094 in B-V. The variation noted in B-V may not be significant. The difference in magnitudes reflected by its behavior on JD 2447312-22 reflects great activity, which became more quiescent in the second season after JD 2447412. A periodicity search of the data represented in Table I and Figure 1 over a range of periods of 0.9 - 87 days utilizing the Discrete Fourier Transform Method of Deeming (1975) revealed no likely periods. It is most likely that the photometric activity shown here is connected with shell activity rather than pulsation.

It is also of interest to note that Star No. 6 (also classified in the past as a Be star) has been constant in magnitude in the immediate past.

Further studies of the spectroscopic variations of this star would seem to be called for. It will be photometrically followed at the Corralitos Observatory in the future.

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