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A NEW VARIABLE Be STAR : HD 218 393

HD 218 393 (MWC 397, BD+49°4045) is a well-known Be star exhibiting very pronounced spectral variations. Struve (1944), Halliday (1950) and Doazan and Peton (1970) observed cyclic appearance and disappearance of the metallic shell lines, repeating every 35 - 40 days. Because these variations were not strictly periodic, they interpreted them invariably as a consequence of some sort of atmospheric oscillations. Kriz and Harmanec (1975) analyzed all available velocities of the star and suggested that the object may be a strongly interacting spectroscopic binary, with a possible orbital period of 38.873 days. Polidan (1976) proved the binary nature of the star by the discovery of some lines of the secondary component in the infrared part of the spectrum. According to him, the system consists of a B3e primary and a gK1 secondary.

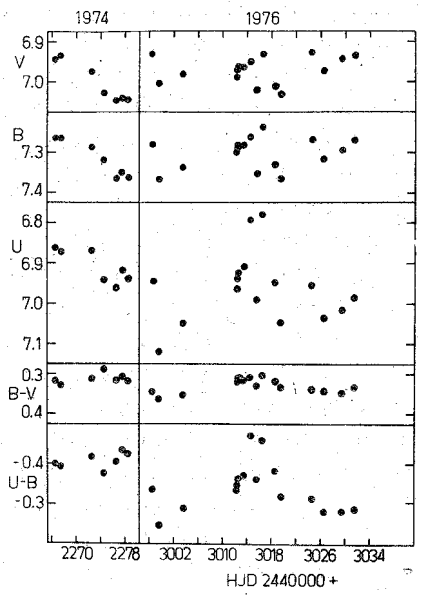
We observed the star photoelectrically, in the UBV system, at the Hvar Observatory (Jugoslavia) during two summer periods: in 1974 and in 1976. All the measurements were carried out differentially, using 5 And as the primary comparison star, and transformed to the international UBV system (for the description of measuring technique and reduction see Harmanec et al. (1977)). From absolute photometry, using a set of standard stars, we derived the following values for 5 And: $V=5^{m}.682$, $B-V=0^{m}.434$ $U-B=0^{m}.011$. These values give an estimate of the spectral type of 5 And to be F4V which well agrees with the spectroscopic classification F5V.

All the UBV measurements of HD 218 393, which we present in Table 1, were derived differentially, using the above (fixed)

Table 1

HJD	V	B	U	B-V	U-B	N
42266.551	6.945	7.265	6.864	0.319	-0.401	5
42267.512	6.935	7.265	6.873	0.330	-0.392	2
42272.489	6.974	7.288	6.872	0.314	-0.416	6
42274.506	7.028	7.318	6.943	0.290	-0.375	3
42276.476	7.047	7.366	6.963	0.318	-0.403	6
42277.487	7.041	7.351	6.919	0.310	-0.432	4
42278.494	7.044	7.363	6.941	0.320	-0.423	4
42998.520	6.933	7.280	6.947	0.347	-0.334	4
42999.486	7.004	7.368	7.122	0.364	-0.246	2
43003.527	6.983	7.338	7.049	0.355	-0.289	7
43012.401	6.989	7.300	6.965	0.312	-0.336	4
43012.437	6.972	7.284	6.938	0.312	-0.346	4
43012.517	6.966	7.287	6.925	0.322	-0.362	3
43013.388	6.965	7.282	6.911	0.316	-0.371	3
43014.469	6.952	7.263	6.794	0.311	-0.469	4
43015.484	7.022	7.355	6.993	0.332	-0.361	3
43016.559	6.934	7.238	6.781	0.304	-0.457	4
43018.490	7.012	7.331	6.950	0.319	-0.381	2
43019.374	7.032	7.367	7.048	0.335	-0.318	5
43024.497	6.928	7.269	6.955	0.341	-0.313	4
43027.477	6.973	7.317	7.037	0.343	-0.280	4
43029.442	6.946	7.296	7.017	0.349	-0.279	6
43031.405	6.937	7.271	6.986	0.334	-0.286	2

Fig. 1



values for 5 And. Extinction was measured every observing night.

Measurements in all three colours are plotted in Fig. 1. It is apparent that the brightness of the star varies for at least $0^m.1$ in V and B, and $0^m.3$ in U colour. In 1974, we observed a gradual decline taking place during about ten days. The minimum corresponds roughly to the phase of maximum velocity (if the 38.9 day period is assumed). In contrast to is, more rapid variations prevail in 1976. Clearly, our data are insufficient for some more detailed analysis. We continue with the observations and appeal also to other observers interested in the field to secure more data about this extremely interesting Be star.

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