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LIGHT CURVE PECULIARITIES OF AS 442=NSV 13308

Herbig Ae/Be star AS 442=NSV 13308 lies close to V517 Cyg, AS 441, LkH α 134, 135 and other Herbig Ae/Be stars in the extensive star forming region RSF 4 Cyg B associated with NGC 7000/IC 5070 (Shevchenko et al., 1988).

The spectral type of B3-A0 was assigned to AS 442 (Finkenzeller, 1985; Shevchenko, 1989), H α emission line EW=18–23 Å, double peak type (Finkenzeller and Mundt, 1984) and strong polarization near light maximum, $P_v=3\%$ (Petrova and Shevchenko, 1987) are present.

Our observations of AS 442 were made in 1984-1991 on Mt. Mairanak using a 0.5 m reflector with UBVR pulse counting photometer. Two 100 Å/mm spectrograms were obtained in June 1990 using the Byurakan 2.6-m reflector "ZTA" with UAGS spectrograph equipped with an image tube.

800 UBVR-magnitudes were measured during 8 years of observations. Observational data are listed in Table 1. The summary light curve is plotted in Figure 1. Figure 2 shows the annual light curves for 1988-1991. The same data for 1984-1985 can be found in Shevchenko (1989). The annual light curves for 1986-1987 are similar to the light curve for 1988.

The light curves contain Algol-like nonperiodic minima and waves of different durations. The periodicity of AS 442 light curve is analysed by modern methods of digital spectral analysis (Marple, 1987). A reliable period is not found but there are a number of low possibility (Π) periods, e. g. $P=16.2$ day, $\Pi=0.76$, $V=0^m2$, on 1984-1985 epoch.

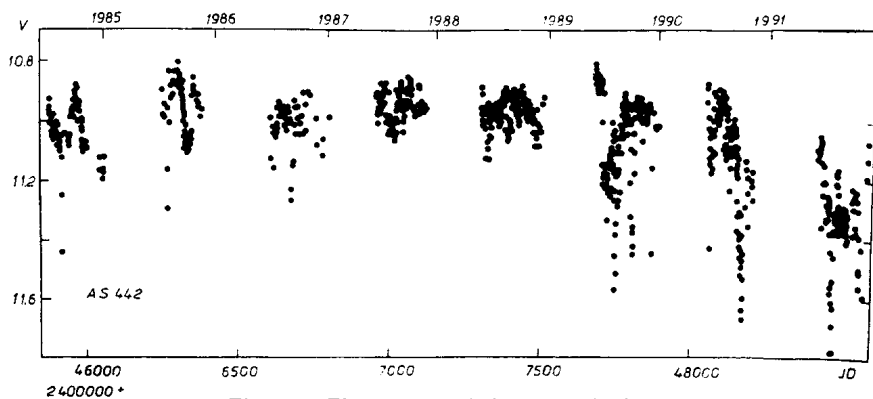


Figure 1. The summary light curve of AS 442

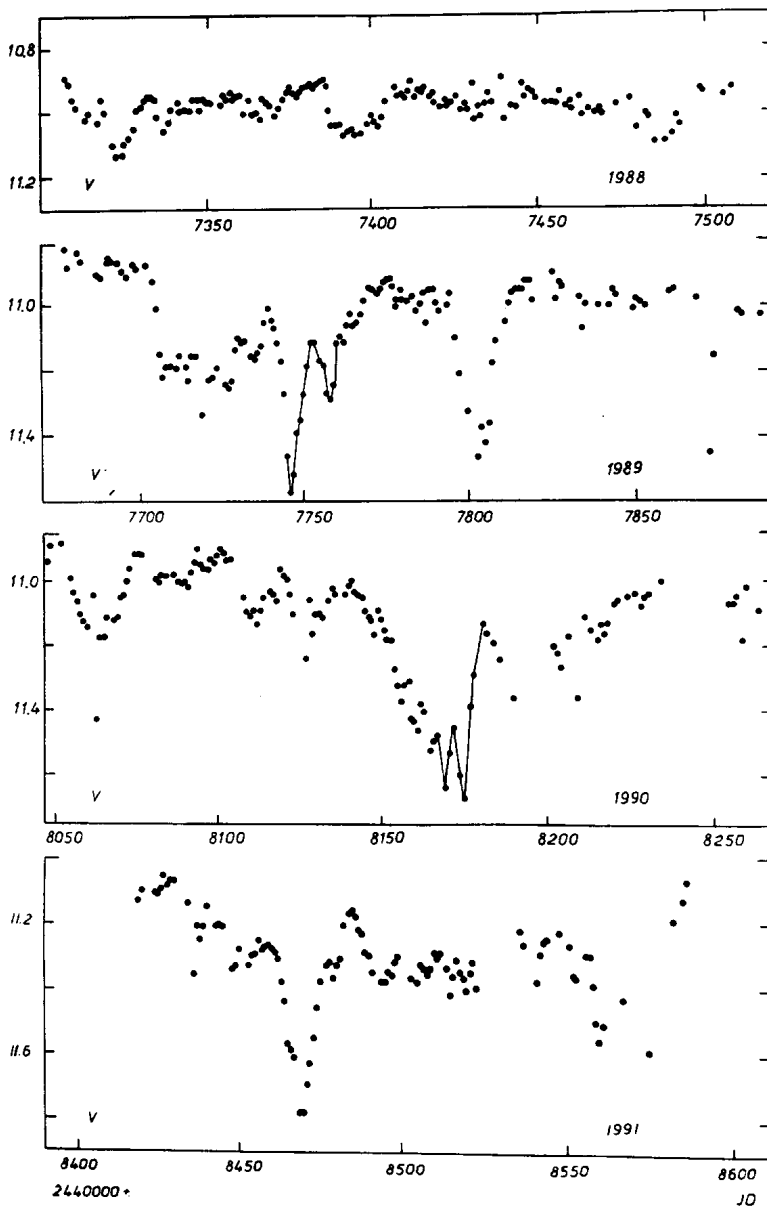


Figure 2. The light curves of AS 442 for 1988-1991

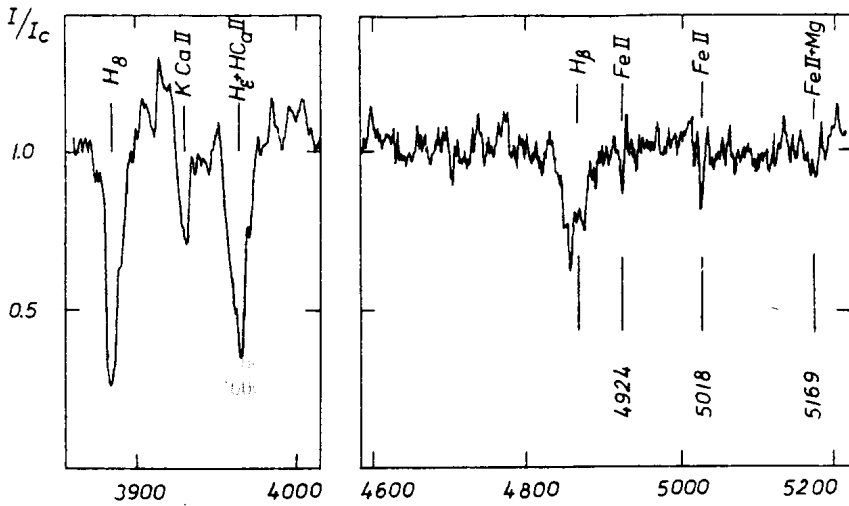


Figure 3. Fragments of the spectra of AS 442.

Table 1. AS 442 photometry data for 1984-1991.

Year	Epoch JD 2440000+	n	V	$\langle V \rangle$	$\langle U-B \rangle$	$\langle B-V \rangle$	$\langle V-R \rangle$
1984	5879-6061	69	10.89-11.44	11.03	0.35	0.67	0.72
1985	6255-6383	63	10.81-11.30	10.96	0.34	0.67	0.73
1986	6613-6802	54	10.91-11.28	11.01	0.32	0.68	0.74
1987	6958-7124	90	10.87-11.07	10.96	0.31	0.65	0.72
1988	7307-7507	147	10.89-11.13	10.96	0.29	0.66	0.72
1989	7677-7887	136	10.82-11.57	11.07	0.31	0.68	0.74
1990	8048-8271	138	10.88-11.67	11.12	0.34	0.69	0.75
1991	8419-8586	103	11.07-11.78	11.32	0.33	0.72	0.78

The annual average and minimum V values decreased from 1989 to 1991. No analogous case was found in the photometric history of AS 442.

The spectral fragments are plotted in Figure 3. It shows the relative intensity of CaII K-line and complex line H ϵ +CaII H, H β line with emission component and three strong FeII-lines: 4924, 5018 and 5169.

The spectral type of AS 442 on 28 June 1990 was A2-3 IV-III, $E_{B-V} = 0^m60$, $E_{V-R} = 0^m65$, $A_V = 2^m0$. Intrinsic stellar excess (without interstellar extinction) $E^*_{U-B} = -0^m3$, seems to be caused by circumstellar dust scattering. The light curve of Herbig Ae-star AS 442 is similar to that of V517 Cyg (Abramian et al., 1990) and V373 Cep (Shevchenko et al., 1991).

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