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PERIODIC PHENOMENA ON V373 Cep = LkHa 234 LIGHT CURVE

Herbig Ae/Be star V373 Cep = LkHa 234 lies in the compact star forming region MR LkHa 234 associated with NGC 7129, which contains a number of T Tau stars, Herbig Ae/Be variables, Herbig-Haro objects, IR-sources and related objects (Shevchenko, Yakubov, 1989). The spectral type of O8 - A7 was assigned to V373 Cep (Shevchenko, 1989); strong and asymmetrical H α emission is present, $EW_{\lambda} H\alpha = 25 \text{ \AA}$ (Finkenzeller and Mundt, 1984) as well as a few faint emission lines including IR-triplet CaII, OI 8446, Paschen lines (Andrillat and Swings, 1976). V373 Cep is identified with an H $_2$ O-maser, bipolar mass-loss source (Edwards and Snell, 1983). The light curve appears to be close to that of an irregular variable with non-periodic minima (Shevchenko and Yakubov, 1989).

Our own observations of V373 Cep were made in 1983-1990 on mt.Maidanak using 0.5-m reflector with UBVR pulse counting photometer. Three 100 $\text{\AA}/\text{mm}$ spectrograms were obtained using the Byurakan 2.6-m reflector with UAGS-spectrograph equipped with an image tube.

Observational data are listed in Table I. 560 UBVR magnitudes were obtained for 8 years observations. The summary light curve is plotted in Figure 1. Figure 2 shows the annual light curves for 1986-1990. The same data for 1983-1985 can be found in Shevchenko and Yakubov (1989).

The light curves contain waves of different duration. They were studied by means of Fourier-analysis, dispersion curve analysis and Kurochkin - Yurkevich method. Adding the measurements made by Cohen and Kuhl (1979), Racine (1968) and some other authors, the period can be suspected of 7.43 years (2720^{d}), that is comparable with our own observational epoch. According to Shevchenko (1989) a close period (2200^{d}) is derived from 120-yrs photographic and photoelectric observations of Herbig Ae/Be star BF Ori.

The light curve of V373 Cep shows 110^{d} waves, the first epoch being JD 2447043. The cycle of $22 \pm 2^{\text{d}}$ can be also seen in Figure 2, especially in 1987 and 1989. Figure 3 shows the light curve folded with the period of 110^{d} for 1984-1990.

It appears from the average of three spectra taken on Sep. 20, 1988 in

Table I.

Year	Epoch	n	V	<U-B>	<B-V>	<V-R>	<V-I>
: JD 2440000+	:	:	:	:	:	:	:
1983	5505 - 5701	49	12.11 - 12.89	0.14	0.88	0.98	1.65
1984	5868 - 6000	70	11.96 - 12.58	0.15	0.86	0.97	
1985	6263 - 6386	49	12.00 - 12.46	0.18	0.87	1.00	
1986	6617 - 6805	80	11.87 - 12.29	0.15	0.90	1.01	1.64
1987	7020 - 7175	82	11.94 - 12.49	0.16	0.90	1.02	1.68
1988	7307 - 7518	91	12.04 - 12.37	0.15	0.94	1.02	1.65
1989	7688 - 7887	116	12.07 - 12.47	0.22	0.96	1.01	
1990	8049 - 8279	108	12.15 - 13.14	0.16	0.89	1.01	

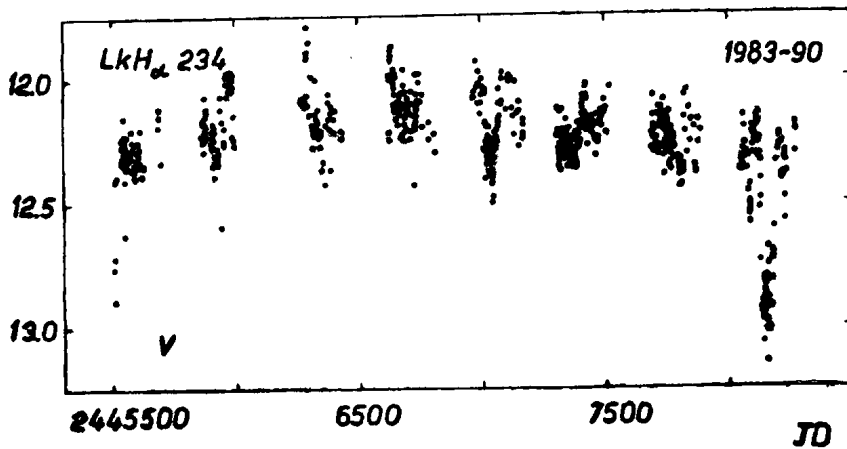


Figure 1

Byravan that $I_{H\alpha}$ and $EW_{H\alpha}$ for the star is close to those found by Cohen and Kuhl (1979) and Garrison and Andersen (1978). Strong $H\beta$, FeII 4556, 4923.9, 5018.4, 5197.6, 5316.7, FeII+MgI 5169, FeII+CrII 5234.6, 5276 emissions are present. The strength of the $H\gamma$ absorption line corresponds to type B3 that yields good agreement with the two-color diagram. But weak emission in this line can also be suspected. From the emission lines one expects that V373 Cep is between V380 Ori and BF Ori.

We suggest that the periodic phenomena in V373 Cep system are caused by Keplerian rotation in the circumstellar disc accreting on the star. The 110^d

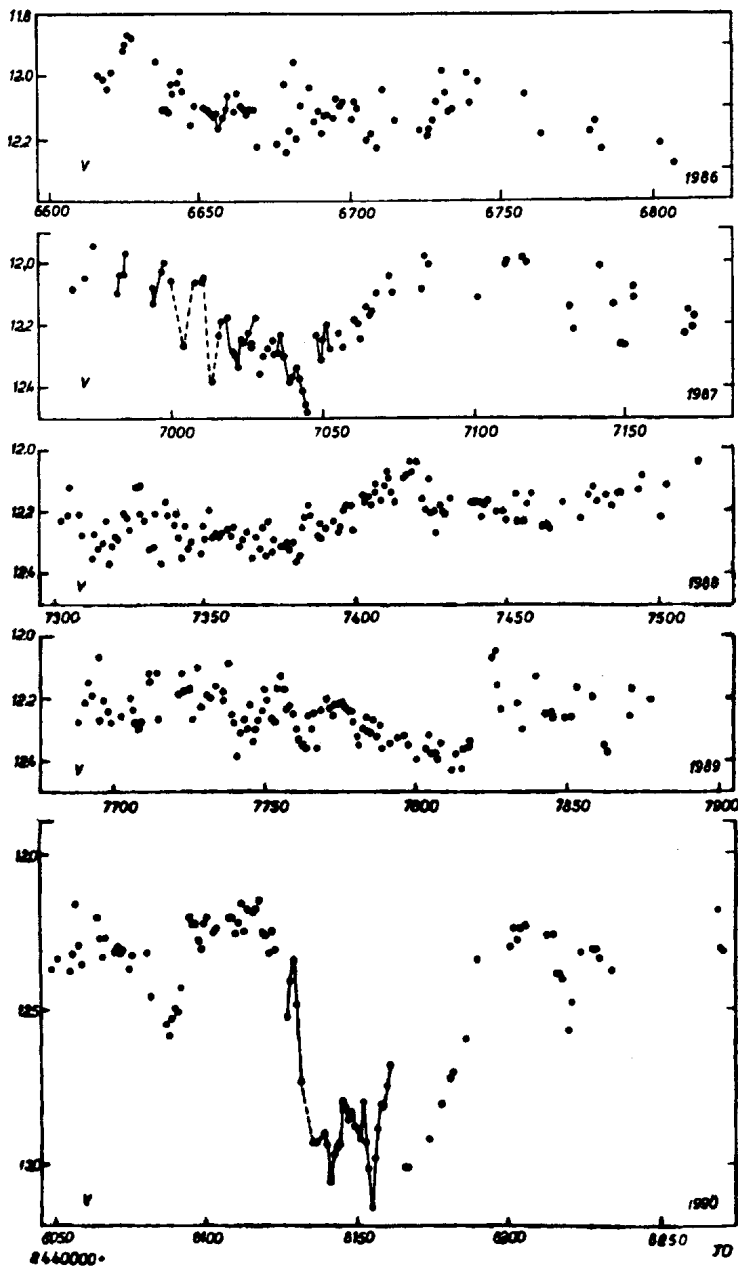


Figure 2

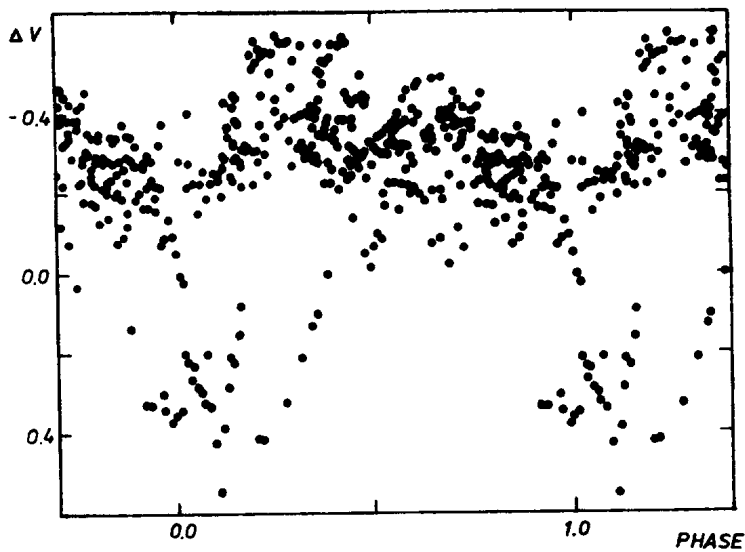


Figure 3

and 2720^d periods seem to appear due to a giant protocomet and related formations moving in the protoplanet disc that leads to opacity changes in the circumstellar envelope.

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