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CH CYGNI: A VERY DEEP MINIMUM ACCOMPANIED BY AN EPISODE OF ACTIVITY

CH Cygni is known as a semiregular variable star of spectral type M6 - M7III (Kholopov, 1985), occasionally exhibiting symbiotic features. The last conspicuous active phase, which took place from 1977 to 1987, has been extensively studied (e.g. Luud et al., 1986, Mikolajewska et al., 1987, Mikolajewski et al., 1990a,b etc.). Since 1987 the star has been in an inactive state showing semiregular variations in V magnitude and color index B-V about  $1^{\text{m}}.5 - 1^{\text{m}}.8$ . A short-time episode of activity occurred in summer 1989 with the appearance of flickering in U filter and changes in the spectrum (Skopal, 1989, Tomov et al., 1989, Mikolajewski et al., 1990b).

Photoelectric UBV observations of CH Cyg with a 0.5m telescope have been carried out at Tartu Observatory since 1968 (see Luud et al., 1977 for the description of observational equipment and methods). Latest observations in 1990 have revealed that the star has become fainter than ever in this century. There is no evidence of V brightness below the 9th magnitude (Mikolajewski et al., 1990a), but now, on JD 2448025 we have measured  $V=9^{\text{m}}.19$  and on JD 2447941, with some uncertainty  $V=9^{\text{m}}.21$ . In the table we present our UBV observations since September 1989. U, B and V magnitudes are presented in the figure as well. HD 182691 is used as a comparison star with  $V=6^{\text{m}}.54$ ,  $B-V=-0^{\text{m}}.05$ ,  $U-B=-0^{\text{m}}.24$ . For every night the mean of 4-8 measurements is given. Errors of those mean values may be about  $0^{\text{m}}.02 - 0^{\text{m}}.05$  (increasing from V to U).

TABLE I

UBV observations of CH Cyg at Tartu Observatory

JD	V	B-V	U-B
2447791.340	7.53	1.68	0.83
806.255	7.71	1.68	0.81
814.349	7.92	1.79	0.90
815.313	7.96	1.72	0.91
851.417	8.50:	1.44:	0.32:
858.292	8.48	1.52	0.27
864.166	8.34:	1.60:	0.42:
866.210	8.30	1.60	0.57
876.319	8.14	1.76	0.66
895.251	8.30	1.73	0.69
906.193	8.58	1.67	0.76
941.238	9.21:	1.56:	-
945.242	9.15	1.59	0.56
957.428	9.06	1.61	0.32
964.423	8.95	1.64	0.38:
969.574	8.81	1.69	0.68
978.564	8.69	1.71	0.63
987.435	8.73	1.70	0.49
990.539	8.79	1.71	0.52
994.424	8.82	1.56	-0.01
999.417	8.80	1.38	-0.19
8005.425	8.80	1.22:	-0.34:
006.417	8.93	1.43	-0.20
010.447	9.06	1.56	0.00
014.407	9.15	1.46	-0.05
018.419	9.16	1.28:	-0.24:
021.435	9.18	1.35	-0.33
025.427	9.19	1.34	-0.45

In the figure variations in V magnitude can be detected with a characteristic time of about 100 days. This time coincides with the dominant period which has been observed over the whole photometric history of CH Cyg (Muciek and Mikolajewski, 1989, Mikola-

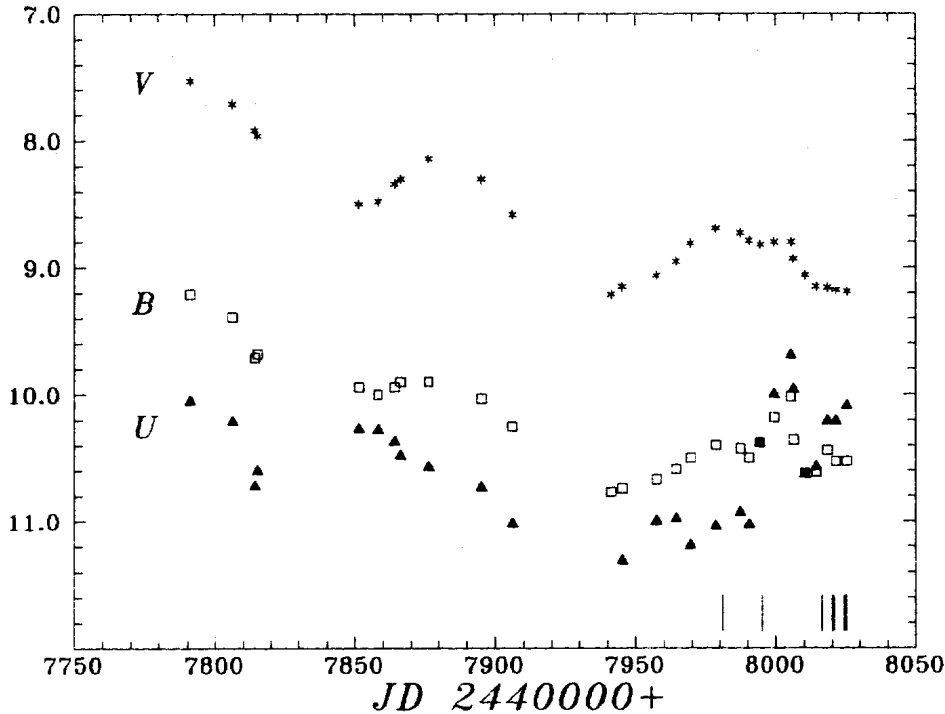


Figure 1. U, B and V magnitudes of CH Cyg from September, 1989 to May, 1990. Vertical bars mark moments when spectra with emission lines have been obtained. Thin bars mark emission line of  $H_{\alpha}$ , thick bars -  $H_{\beta}$  and  $H_{\gamma}$ .

jewski et al., 1990a), but now variations take place on a very low level of brightness. Variations in B are similar to those in V, but not so prominent. In U we can find a rapid brightening by  $\sim 1^m$  at about JD 2447992. After a short-time decrease the U brightness has again attained the 10th magnitude. There are some hints that flickering in U filter may be present, but our equipment does not enable to fix it firmly. At the same time emission lines have reappeared in the spectrum of CH Cyg. Our observations with a 1.5m telescope and a Cassegrain spectrograph have revealed one-component emission lines of  $H_{\alpha}$ ,  $H_{\beta}$  and  $H_{\gamma}$ . The moments of spectroscopic observations are shown in the figure.

Hence, CH Cyg has again surprised observers. Further analysis of the described events remains for forthcoming papers. Continuing observations of CH Cyg in all spectral regions are urgently needed.

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