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GREAT OPTICAL OUTBURST OF A0535+26=V725 TAURI

The recurrent transient X-ray source A0535+26 (HDE 245770, identical to V725 Tau optical variable, was first detected by the satellite Ariel V (Rosenberg et al., 1975). This Be and neutron star binary system is actively observed in frequency range from X-ray to infrared (see, for example, Giovannelli & Graziati, 1992; Gnedin et al., 1988, Motch et al., 1991). Photometric behaviour of HDE 245770 was traced in detail in the paper by Lyutiy et al., 1989). Hao et al. (1986) investigated the semiregular secular variation of brightness of the system by using Fourier analysis. They noted also some evidence of low amplitude (less than $0\overset{m}{.}01$) variation of the brightness on hours' time scale. Besides observers mentioned sudden short-time rises in brightness (the so called "blue flares") with large ($\Delta V = 0\overset{m}{.}15$) amplitudes: Rössiger (1978) in December 1977, Gnedin et al. (1988) in April 1983, Maslennikov (1986) in April 1985, Berdnik et al. (1990) in November 1986.

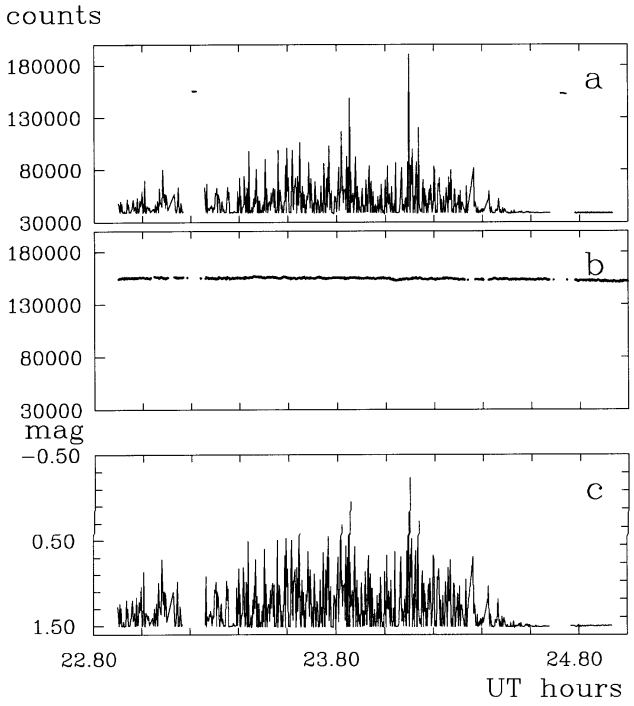

Figure 1. The data of dual-channel observations on 28/29 Oct. 1995 in Johnson's B filter: a - the counts of A0535+26 in channel 1 (comparison star counts obtained for the channel reduction, are seen at UT=23.2 and 24.7 hours); b - the count of the comparison star in channel 2, reduced to the sensitivity level of channel 1; c - V−C data in relative magnitudes

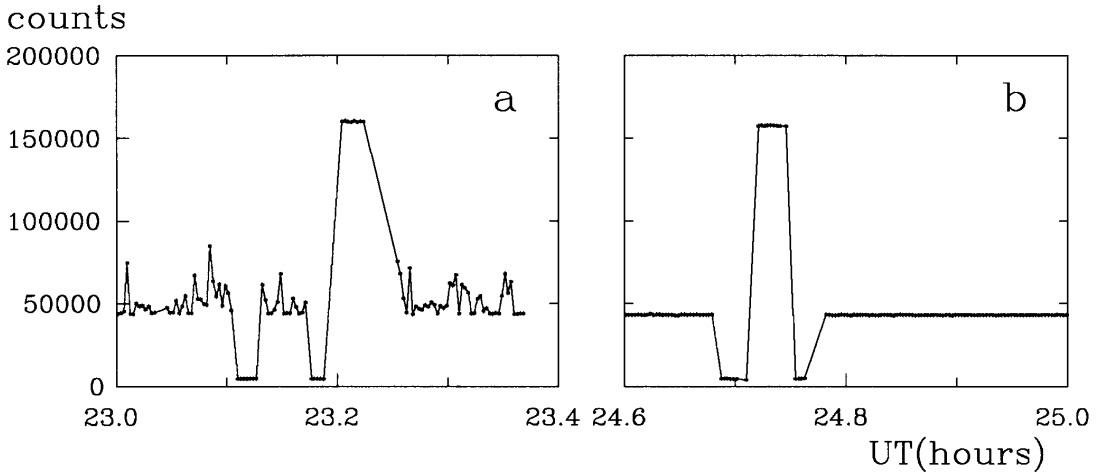

Figure 2. Observations in channel 1 which demonstrate stability of the photometer's work (a - during the outburst; b - after the outburst). The sky background counts are seen below, and the comparison star's count above. The points are linked by a connecting line

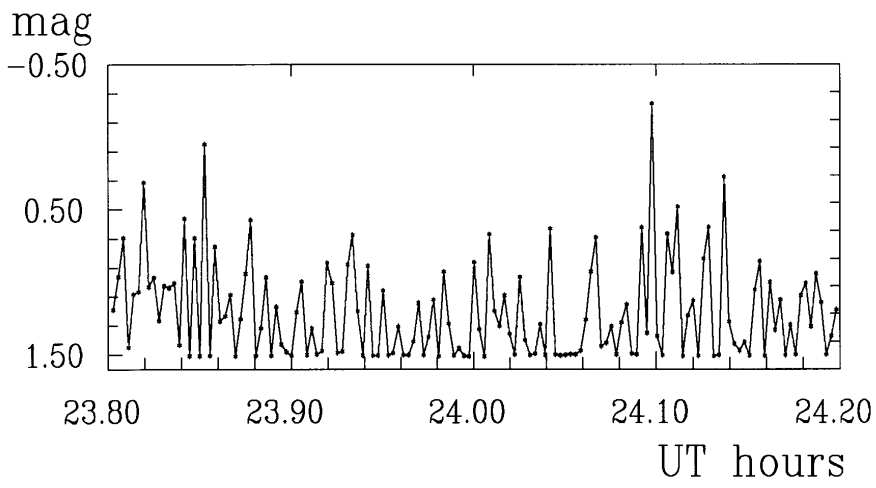

Figure 3. An enlarged part of Figure 1c between two of the brightest individual pulses

Our observations in the nights 27/28 (V filter), 28/29 October (B filter) and 20/21 November 1995 (B filter) were the part of the Program "Monitoring of Unique Astrophysical Objects" of the Russian Ministry of Science. The 2-3 hours' observational runs were done with dual channel photometer attached to 0.8 m Ritchey-Chretien telescope at the Mt. Dushak-Erekdag observational station of Odessa Astronomical Observatory (Dorokhov et al., 1985). The integration time was 10 seconds. HD 37170 (m=8.4 mag, A2) was used as a comparison star. Then the data were reduced to 1 sec. integration time.

The great outburst was recorded in the night 28/29 Oct. 1995 (JD 2450019) from UT=22.90 to 24.61 hours. The date of the outburst is close to periastron passage of the pulsar within the error limits if the orbital parameters by Margoni et al. (1988) are adopted: T_0=2443056 $\pm$ 3 days; P=55.73 $\pm$ 0.31 days. But when we used more recent orbital solution (Finger et al., 1994) derived from X-ray observations, such a coincidence was not revealed.

The data of two channel mode are presented in Figure 1. The observations started after the outburst had begun. The outburst consists of a great number of transient individual pulses. The intensity at the burst's peak was about five times as large as that on the bottom level this night (Δm=1$^{\rm m}$.73).

In Figure 2 the stability of the photometer's primary channel work is shown in two parts of the observational run. The detailed character of the outburst is better seen in Figure 3 which is an enlarged part of Figure 1. Duration of one fast brightening amounts to 10-20 sec. only which is comparable to the integration time. The bottom brightness level between the pulses was stable during the outburst. The observed "undisturbed" magnitude difference variable–comparison was 1.49 mag in 28 Oct. 1995, the system became brighter by 0.1 mag in 20 Nov. 1995 in filter B.

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References:

Berdnik,, E.V., Gorshanov, D.L., Maslennikov, K.L., Somsikov, V.V., 1990, *Pis'ma Astron. Zh.*, **16**, 1099

Dorokhov, N.I., Dorokhova, T.N., Komarov, N.S., Mkrtichian, D.E., Mukhamednazarov, S., 1995, *Astron. and Astrophys. Trans.*, **8**, 263

Giovannelli, F., Graziati, L.S., 1992, *Space Sci. Rev.*, **59**, 1

Gnedin Yu.N., Zaitseva, G.V., Larionov, V.M., Lyutiy, V.M., Khozov, G.V., Sheffer, E.K., 1988, *Astron. Zh.*, **65**, 1196

Hao, J.-X., Huang, L., Guo, Z.H., 1996, *A&A*, **308**, 499

Finger, M.H., Wilson, R.B., Hagedon, K.S., 1994, *IAU Circ.*, No. 5931

Lyutiy, V.M., Zajtseva, G.V., Latysheva, I.D., 1989, *Pis'ma Astron. Zh.*, **15**, 421

Margoni, K., Ciatti, F., Mammano, A., Vittone, A., 1988, *A&A*, **195**, 148

Maslennikov, K.L., 1986, *Pis'ma Astron. Zh.*, **12**, 458

Motch, C., Stella, L., Janot-Pacheco, E., Mouchet, M., 1991, *ApJ*, **369**, 490

Rosenberg, F.D., Eiles, C.J., Skinner, G.K., Wilmore, A.P., 1975, *Nature*, **256**, 628

Rössiger, S., 1978, *IBVS*, No. 1395