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**THE 2004 OPTICAL OUTBURST OF V635 Cas USING
ROTSE3D OBSERVATIONS**

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V635 Cas (B0.2Ve spectral type as adopted by Negueruela and Okazaki (2001)) is the optical counterpart of the X-ray transient 4U 0115+63. The optical outbursts reported by several observers (Kriss et al. 1983, Mendelson & Mazeh 1991) were thought to be connected with mass loss from the Be star. The optical outbursts usually precede the X-ray outbursts. A viscous circumstellar disc around the Be star and an accretion disc around the neutron star are proposed to explain the optical outbursts and the X-ray behaviour of the system (Negueruela and Okazaki 2001, Negueruela et al. 2001, Kriss et al. 1983).

Optical observations of V635 Cas were obtained between MJD 53180 (June) and MJD 53360 (December) using ROTSE3d telescope located at Bakırtepe, Turkey. ROTSE3 systems were described in detail in Akerlof et al. (2003). It operates without filters and has a wide passband which peaks at 550 nm.

A total of about 1700 CCD frames were analysed. After finding the instrumental magnitudes (Bertin & Arnouts, 1996) ROTSE magnitudes were calculated by comparing all the field stars to the USNO A2.0 R-band catalog. All the processes were done in sequential automated mode. Barycentric corrections were made to the times of each observation by using JPL DE200 ephemerides.

Fig.1 shows the data for V635 Cas obtained with ROTSE3d telescope. The difference in ROTSE magnitudes of V635 Cas and comparison star ($RA = 01^{\text{h}}17^{\text{m}}35^{\text{s}}.7$, $\delta = +63^{\circ}41'44''$) were plotted. As a check star we used the one with $RA = 01^{\text{h}}18^{\text{m}}31^{\text{s}}.3$, $\delta = +63^{\circ}47'30''.4$. On the same figure August 2004 X-ray outburst data (daily averages in counts per second) of this binary system obtained with the All Sky Monitor on board RXTE, were plotted. In the figure, the periastron passage time is also indicated with its uncertainty (Bildsten et al., 1997). A sinusoidal fit to the optical light curve gives a period of almost 300 days. Its amplitude is nearly 1 magnitude. The X-ray activity seems to appear about 180 days after the onset of the optical outburst, when V635 Cas light output reaches its maximum value. There is a gap in the ASM light curve between MJD 53223-53251. Interpolation of this gap suggests that X-ray outburst starts right after the sudden decrease of optical light without any significant delay. This decrease of the optical luminosity may be related with episodic mass transfer events from Be star to the compact object accompanied by

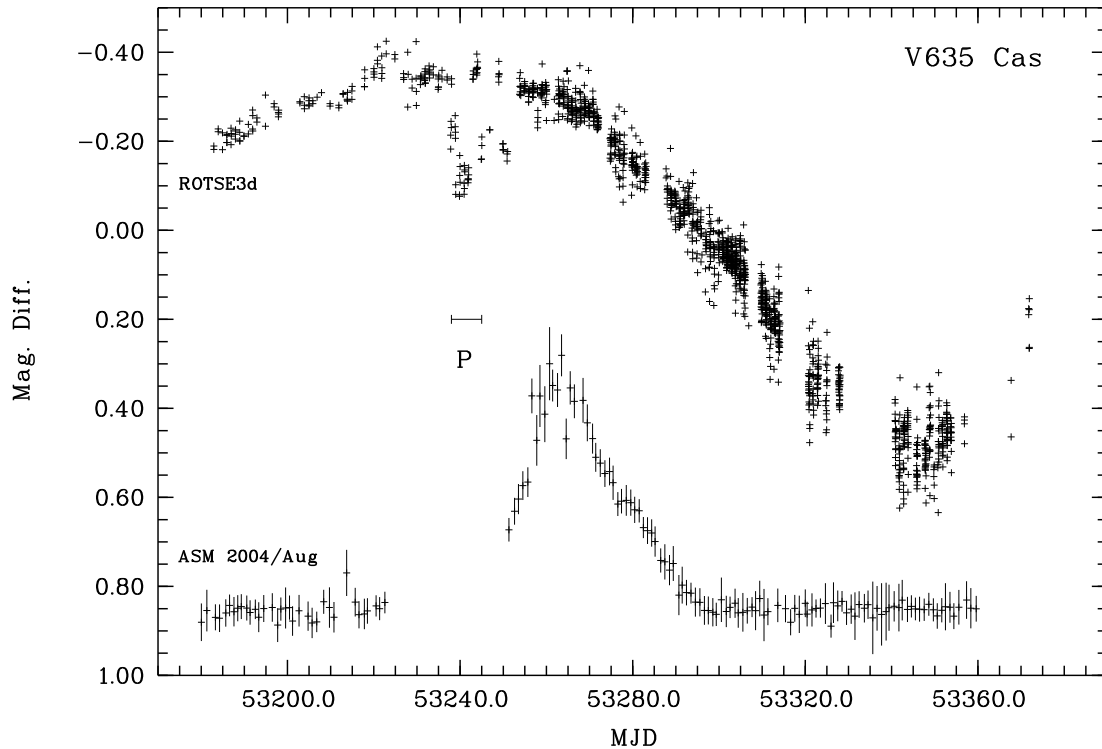


Figure 1. ROTSE3d light curve for V635 Cas and X-ray light curve of this binary system taken with ASM (points represent daily averages, MJD = JD - 2400000.5).

triggering X-ray outburst. Afterwards the optical counterpart begins to fade. At about MJD 53350 there seems a beginning of a new period of optical outburst.

Further ROTSE observations of this source is in progress.

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