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OUTBURST CYCLE OF V363 Lyr

KATO, TAICHI¹; NOGAMI, DAISAKU^{2,1}; BABA, HAJIME^{3,1}; MASUDA, SEIJI¹

¹ Dept. of Astronomy, Kyoto University, Kyoto 606-8502, Japan,

e-mail: tkato@kusastro.kyoto-u.ac.jp, masuda@kusastro.kyoto-u.ac.jp

² Hida Observatory, Kyoto University, Gifu 506-1314, Japan, e-mail: nogami@kwasan.kyoto-u.ac.jp

³ Astronomical Data Analysis Center, National Astronomical Observatory, Mitaka, Tokyo 181-8588, Japan, e-mail: hajime.baba@nao.ac.jp

V363 Lyr (= S 9653) is a dwarf nova discovered by Hoffmeister (1967). Although the report by Hoffmeister (1967) suggested relatively frequent outbursts, only a few studies have been made since the discovery. Galkina and Shugarov (1985) studied the variable photographically, and generally confirmed the high outburst frequency suggested by Hoffmeister (1967). However, the lack of dense coverage and non-detectability at minimum made exact characterization of its outburst properties difficult. We therefore made systematic CCD runs to clarify its outburst pattern.

The observations were done on 57 nights between 1995 March 19 and 1996 September 5, using a CCD camera (Thomson TH 7882, 576 × 384 pixels, on-chip 2×2 binning adopted) attached to the Cassegrain focus of the 60-cm reflector (focal length = 4.8 m) at Ouda Station, Kyoto University (Ohtani et al. 1992). An interference filter was used which had been designed to reproduce the Johnson V band. The exposure time was 60–180 s, depending on the brightness of the object. The frames were first corrected for standard de-biasing and flat fielding, and were then processed by a microcomputer-based PSF photometry package developed by one of the authors (TK). The magnitudes were determined relative to GSC 3128.123 (V = 14.26, VSNET chart), whose constancy during the run was confirmed using GSC 3128.751. Barycentric corrections were applied to the observed times before the following analysis. A total of 604 useful frames were obtained. Since most of observations are nightly snapshots, the log of observations is omitted.

Figure 1 shows the overall light curve of V363 Lyr. The high frequency of outbursts and the high outburst duty cycle is already apparent. The observed brightest maximum and faintest minimum was V = 15.83 and $V = 19.5 \pm 0.2$, respectively. The maximum is in good agreement with the GCVS value (15^m7), but the minimum can become slightly fainter than was previously thought (18^m6).

Figure 2 shows a typical, and the best observed, outburst of V363 Lyr, which occurred in 1995 July–August. The almost symmetrical rise and fade are rather unusual for a dwarf nova. Table 1 lists the observed date of maxima.

The shortest interval between outbursts was 22 d, which is in good agreement with the interval observed in Hoffmeister (1967) and Galkina and Shugarov (1985). Although there is an ambiguity of cycle counts between JD 2449972 and 2450292, all the observed



Figure 1. Overall light curve of V363 Lyr



Figure 2. Typical outburst V363 Lyr

Table 1: Outbursts	of V363 Lyr
JD (maximum)	magnitude
2449796	16.12
2449843	15.92
2449932	16.01
2449972	16.18
2450292	15.83
2450314	15.96

maxima are well represented by $JD_{max} = 2449799.7 + 21.446 \times E$ with |O - C| < 4 d. A light curve folded by this period is shown in Figure 3. This figure shows that the outburst pattern is relatively stable for a long time. The existence of a number of scattered points deviating from the general trend shows intrinsic variation from the semi-regular outburst pattern.



Figure 3. Light curve of V363 Lyr folded by P = 21.446

Such a stable light curve is rather unusual for a dwarf nova. However, spectroscopic observation by Liu et al. (1999) confirmed the dwarf nova-type nature of the object. The object may be a system with high mass-transfer rate, showing regular outbursts and a slow rise to outburst. Short-term variability was searched for on 1995 March 20, August 1–3 and 1996 July 27 (around maximum), and 1995 July 25–28 (near minimum), but the search did not yield a firm periodicity. A sample of time-series observations (1996 July 27) is shown in Figure 4, which did not reveal large-amplitude oscillations.



Figure 4. Light curve of V363 Lyr on 1996 July 27

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