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OUTBURST PHOTOMETRY OF IS Del

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IS Del (= S 10699) was discovered by Richter (1970). Kazzenova and Shugarov (1993) performed extensive photographic observations and found that this dwarf nova undergoes outbursts very frequently. The observation by Kazzenova and Shugarov (1993) also showed the existence of long outbursts. The above features are in part reminiscent of an active SU UMa-type dwarf nova, like YZ Cnc. The author started CCD photometry in order to test this possibility, and found that the object entered a long outburst on 1996 September 11.

The observations were done on seven nights between 1996 September 8 and 18, 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 90–120 s depending on the transparency. 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 the author. The magnitudes were determined relative to GSC 1632.1157 (Tycho-2 magnitude: $V = 12.04 \pm 0.29$, $B - V = +0.29 \pm 0.28$), whose constancy during the run was confirmed using two check stars GSC 1632.2126 and GSC 1632.1243. Barycentric corrections to observed times were applied before the following analysis. Table 1 lists the log of observations, together with nightly averaged magnitudes.

The light curve drawn from these data is presented in Figure 1. The outburst lasted at least for seven nights, and is comparable in duration to long outbursts listed in Kazzenova and Shugarov (1993). The outburst was flat-topped, which is not characteristic of a superoutburst of an SU UMa-type dwarf nova. Time-series photometry on JD 2450341 and 2450342 did not show any hint of periodic modulations attributable to superhumps (Figure 2). An analysis using the Phase Dispersion Minimization (PDM) method (Stellingwerf 1978) did not yield any significant signal below $0^{\text{d}}.1$. Since the maximum length of each run was $0^{\text{d}}.16$, the possibility of a longer period could not be excluded. All the available observations supports that IS Del is an SS Cyg-type dwarf nova (UGSS-type in the GCVS classification), with occasional long outbursts. The observed amplitude of outburst was $2^{\text{m}}.9$, which corresponds to the range of 15.6–18.4 V , by adopting the Tycho-2 magnitude for the comparison star.

Table 1: Nightly averaged magnitudes of IS Del

start ^a	end ^a	mean mag ^b	error ^c	N^d
50334.942	50334.944	6.430	0.152	3
50337.981	50337.982	3.821	0.037	2
50340.986	50341.149	3.556	0.102	75
50341.951	50342.112	3.689	0.143	85
50343.037	50343.058	3.593	0.142	15
50344.095	50344.096	3.668	0.061	2
50345.031	50345.033	4.263	0.028	2

^a BJD - 2400000

^b Magnitude relative to GSC 1632.1157

^c Standard error of nightly average

^d Number of frames

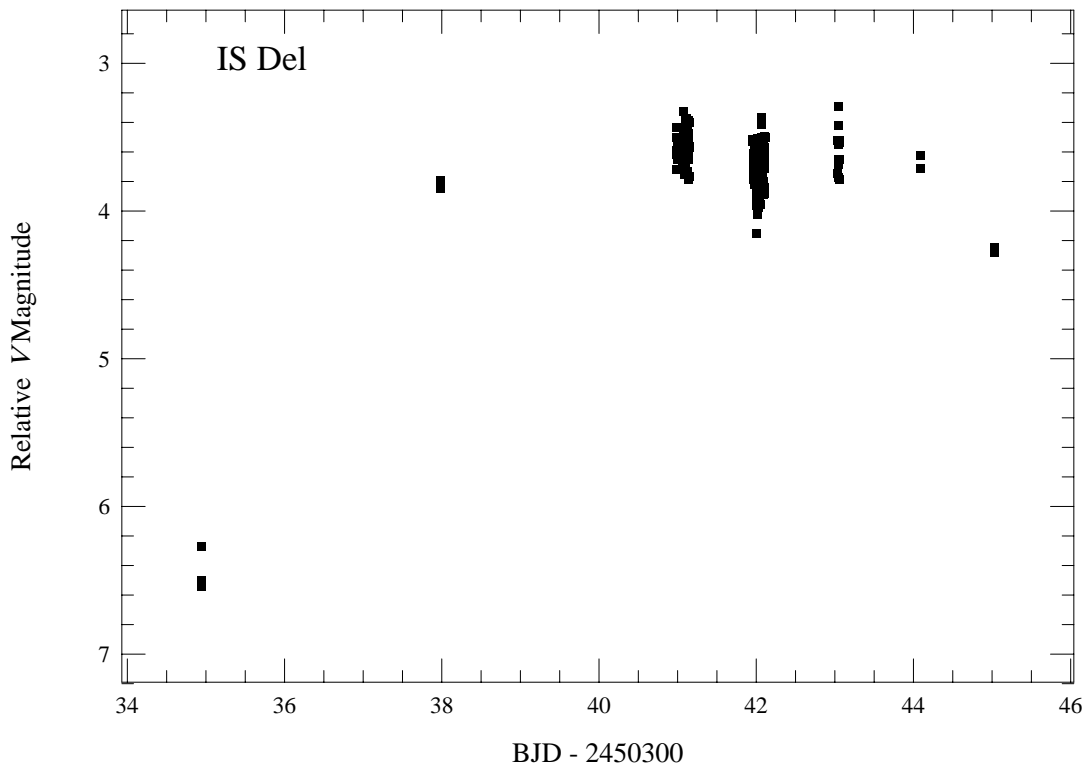


Figure 1. Light curve of the 1996 September outburst of IS Del

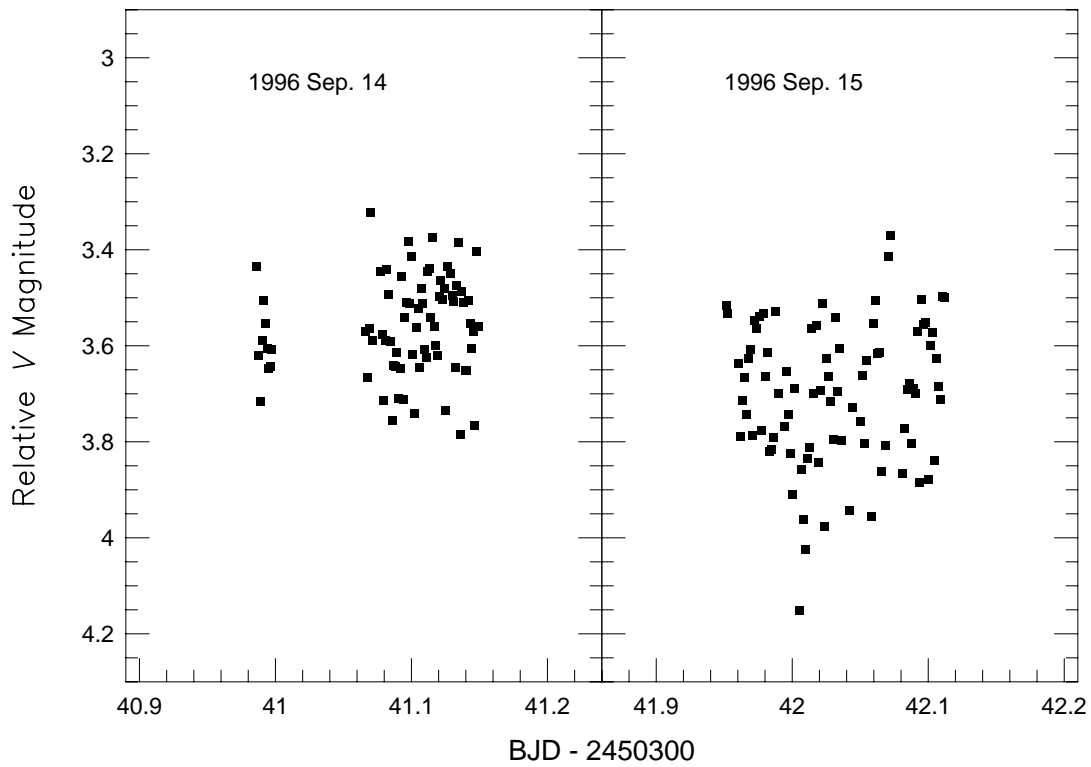


Figure 2. Enlarged light curve near maximum

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