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OUTBURST PHOTOMETRY OF TmzV34

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TmzV34 is a variable star discovered by Takamizawa (1998). The J2000.0 coordinates are $09^{\rm h}15^{\rm m}51\overset{\rm s}{.}69$, $+09^\circ00'49\overset{''}{.}9$. Although Takamizawa's initial observations suggested rather irregular variations, a noticeable brightening to $13\overset{\rm m}{.}1$ was recored on films taken on 1994 November 30. The star was also likely identified with the ROSAT source 1RXS J091552.3+090056 = RX J0915.8+0900, which led to a possible classification as a cataclysmic variable. The ROSAT source was independently identified with the same star through the Hamburg/RASS Optical Identifications (Bade et al. 1998). The star was also recorded bright ($V = 12.99$) in GSC, which made the dwarf nova-type variability likely. Since then, the star has been monitored as a part of VSNET Collaboration (http://www.kusastro.kyoto-u.ac.jp/vsnet/). The first outburst since the discovery was detected by T. Watanabe (Watanabe and Kato 1999) at visual magnitude 13.6 on 1999 April 8, which made the secure identification of the variable as a dwarf nova. This outburst, however, was not fully followed because of unfavorable observing condition.

The next outburst detection was made by one of the authors (P. Schmeer), who observed the object using the Iowa Robotic Observatory (IRO) 0.5-m telescope and an AP-8 CCD, and found it slowly brightening from unfiltered CCD magnitude of 15.4 on 2000 February 3.444 UT to 14.2 on February 8.319 UT (Schmeer 2000). Upon this detection, we started time-resolved CCD photometry. The CCD observations at Kyoto University were done using an unfiltered ST-7 camera attached to the Meade 25-cm Schmidt-Cassegrain telescope. The exposure time was 30 s. The images were dark-subtracted, flat-fielded, and analyzed using the Java$^{\rm TM}$-based aperture photometry package developed by one of the authors (TK). The CCD observations at Conder Brow Observatory were done using an SXL8 CCD attached to a 33-cm reflector. The exposure time was 45 s. The Kyoto and Conder Brow observations used different comparison stars, GSC 819.542 (GSC magnitude 13.07) and GSC 819.281 (GSC magnitude 13.41), respectively, because of the different field-of-view of the images. We therefore treat these observations separately. Barycentric corrections were applied to the observed times before the following analysis. Table 1 lists the log of observations, together with nightly averaged magnitudes. Table 2 lists the snapshot observations by P. Schmeer.

Table 1: Log of time-series observations of TmzV34

start[a]	end[a]	mean mag[b]	error[c]	N[d]	Observatory
51584.228	51584.296	0.234	0.014	82	Kyoto
51585.195	51585.335	0.611	0.012	221	Kyoto
51585.388	51585.517	0.320	0.006	168	Conder Brow (CB)

[a] BJD − 2400000
[b] Magnitude relative to GSC 819.542 (Kyoto) or GSC 819.281 (CB)
[c] Standard error of nightly average
[d] Number of frames

Table 2: Snapshot observations of TmzV34

BJD − 2400000	unfiltered CCD mag
51577.949	15.4
51578.797	15.2
51579.824	15.1
51581.938	14.4
51582.824	14.2
51584.811	14.0

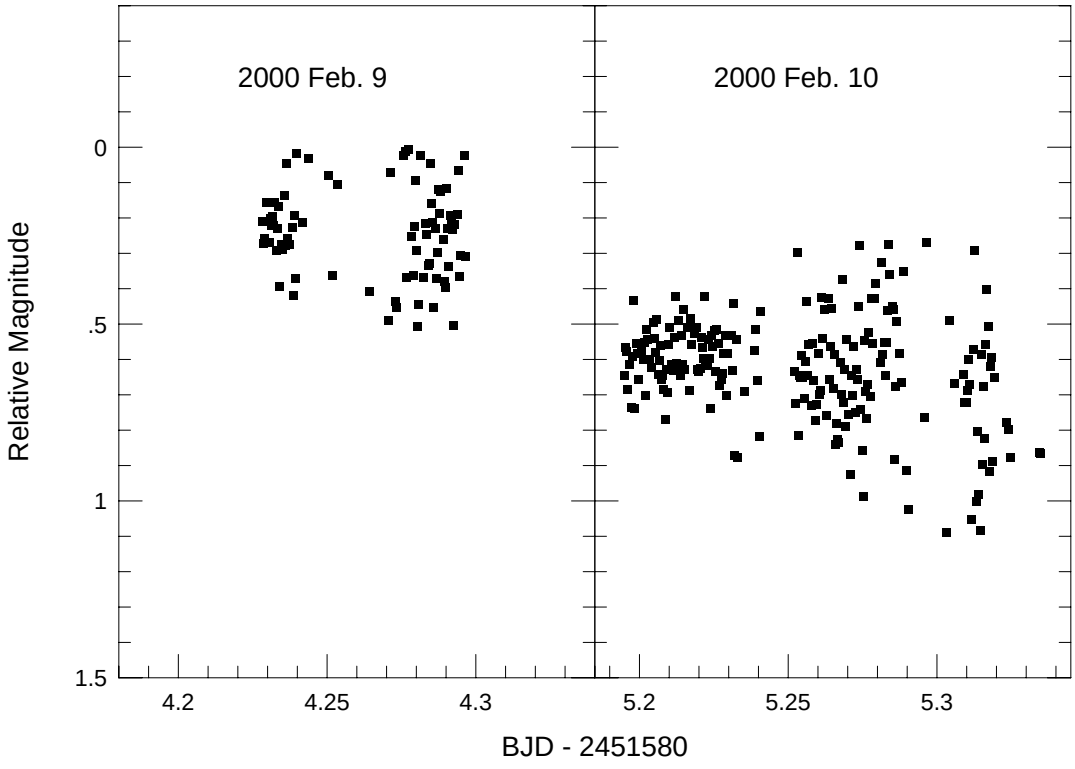

Figure 1. Light curves of Kyoto Observations. The relatively large scatter was due to passing clouds

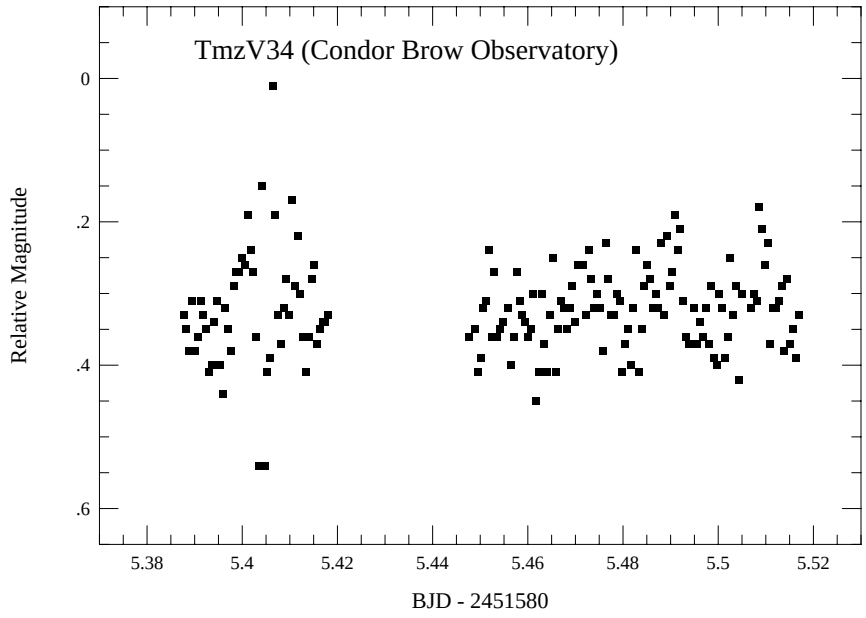

Figure 2. Light curves of Conder Brow Observations

Figures 1 and 2 show the result of Kyoto and Conder Brow Observations, respectively. The Kyoto observations show only slow fading, and the fading almost stopped in the Conder Brow Observations. No apparent superhumps were detected. The Kyoto observations having been affected by clouds, the Conder Brow observations (Figure 2) more adequately represent the absence of regular superhump-type oscillations. These observations qualifies TmzV34 as an SS Cyg-type (UGSS in GCVS) dwarf nova. The slow rising at an almost constant rate of 0.22 mag d^{-1} (as calculated from Table 2) also supports the SS Cyg-type classification. The low outburst amplitude and the slow rise make TmzV34 as a good candidate for a dwarf nova with a long orbital period.

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References:

Bade, N., Engels, D., Voges, W., Beckmann, V., Boller, Th., Cordis, L., Dahlem, M., Englhauser, J., Molthagen, K., Nass, P., Studt, J., Reimers, D., 1998, *A&AS*, **127**, 145

Schmeer, P., 2000, *VSNET alert circulation*, No. 4160 (available from http://www.kusastro.kyoto-u.ac.jp/vsnet/Mail/alert4000/msg00160.html)

Takamizawa, K., 1998, *VSNET observations*, No. 10504 (available from http://www.kusastro.kyoto-u.ac.jp/vsnet/Mail/obs10000/msg00504.html)

Watanabe, T., Kato, T., 1999, *VSNET alert circulation*, No. 2854 (available from http://www.kusastro.kyoto-u.ac.jp/vsnet/Mail/alert2000/msg00854.html)