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FT Cam: OUTBURST PHOTOMETRY AND PROPER MOTION

KATO, TAICHI[1]; UEMURA, MAKOTO[1]; YAMAOKA, HITOSHI[2]

[1] Dept. of Astronomy, Kyoto University, Kyoto 606-8502, Japan, e-mail: tkato@kusastro.kyoto-u.ac.jp, uemura@kusastro.kyoto-u.ac.jp

[2] Faculty of Science, Kyushu University, Fukuoka 810-8560, Japan, e-mail: yamaoka@rc.kyushu-u.ac.jp

FT Cam (= Antipin Var64) is a dwarf nova discovered by Antipin (1999). Antipin (1999) reported two outbursts on Moscow plates, indicating that the outbursts are relatively rare. The next outburst was detected by Pietz (1998) on 1998 September 23.91 UT at magnitude 14.7. Visual observations by Kinnunen (1998) suggested the possible presence of short-term variations. This outburst faded relatively quickly. In spite of intensive monitoring by VSNET observers, no further outburst had been detected until Schmeer (2000a) reported another one on 2000 February 27.166 UT at unfiltered CCD magnitude 14.4. A later announcement by Pietz (2000) tells that the outburst started on February 26.8 UT, at unfiltered CCD magnitude 13.85. Pietz (2000) reported that the star was fainter than 15.5 on the previous night. The large observed interval (521 d) between outbursts supports the low outburst frequency reported by Antipin (1999). We started CCD time-resolved photometry to test the presence of short-term variations.

The CCD observations 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$^{\mathrm{TM}}$-based aperture photometry package developed by one of the authors (TK). The magnitudes were determined relative to GSC 4049.90, whose Tycho-2 magnitude is $V = 11.08 \pm 0.08$ and $B - V = +0.30 \pm 0.11$. The constancy of the comparison star during the run was confirmed using several anonymous fainter stars. We obtained 228 useful frames on 2000 February 27, covering $0\overset{\mathrm{d}}{.}126$. The light curve drawn from these data is presented in Figure 1.

The light curve shows a rather monotonous decline at a rate of 0.82 mag d^{-1}. No apparent large-amplitude modulations nor periodic waves were detected. The lack of apparent superhumps was also confirmed by independent observations by Pietz (2000). The relatively rapid decline was confirmed by G. Poyner who observed the star at $14\overset{\mathrm{m}}{.}7$ on 2000 February 28.810 UT. Schmeer (2000b) further reported that the star had returned to quiescence on 2000 March 1.140 UT. These observations suggests that all known (including Antipin's detections) outbursts of FT Cam only last 2–3 d. Although the lack of apparent superhumps may be suggestive of an SS Cyg-type star, it may be that we have only observed normal outbursts of an SU UMa-type star. Further monitoring for outbursts, and detailed observations during outbursts are strongly encouraged.

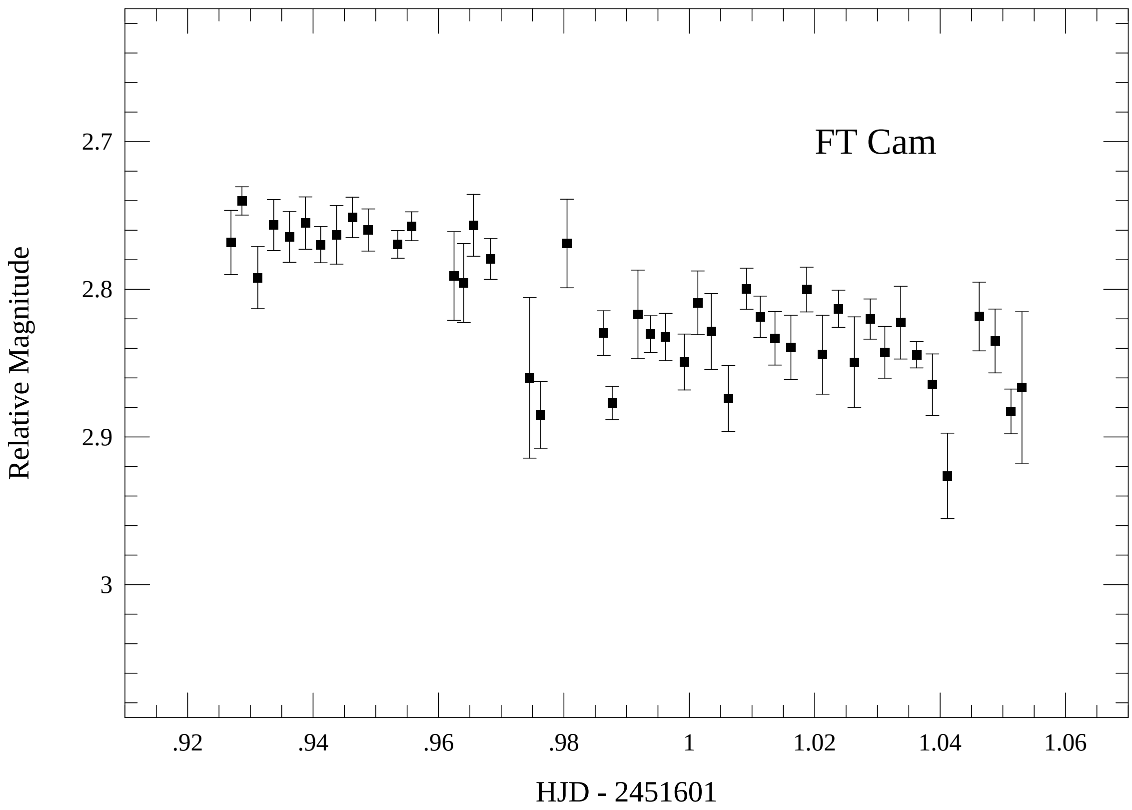

Figure 1. Light curve of FT Cam. Each point represents an average of $0\overset{d}{.}0025$ bin

Astrometry of FT Cam from our outburst images has yielded the J2000.0 position of $03^{h}21^{m}14\overset{s}{.}33$, $+61^{\circ}05'26\overset{''}{.}3$ (based on 13 GSC-ACT stars). This value is pretty close to other reported astrometry of $03^{h}21^{m}14\overset{s}{.}33$, $+61^{\circ}05'26\overset{''}{.}0$ (Antipin 1999) and $03^{h}21^{m}14\overset{s}{.}35$, $+61^{\circ}05'26\overset{''}{.}1$ (Schmeer 2000a), but our result is considered as more accurate because we used the ICRS-based astrometric grid, GSC-ACT. The corresponding USNO A2.0 star (on the same astrometric grid) has end figures of $14\overset{s}{.}415$, $25\overset{''}{.}73$, which is $0\overset{''}{.}8$ different from the current measurement. The comparison of DSS 2 plate taken on 1993 December 11 with DSS 1 (epoch 1954.074) further confirms the noticeable proper motion between them. The observed proper motion $0\overset{''}{.}02$ yr^{-1} is relatively large among dwarf novae (cf. Harrison et al. 2000; Thorstensen 1999). The observed proper motion suggests that FT Cam is a relatively nearby object, likely located within 1 kpc from us, corresponding to the maximum tangential velocity of 100 km s^{-1} (for a discussion on velocity dispersions of cataclysmic variables, see Harrison et al. 2000). The inferred conservative upper limit $M_V = +4$ mag of the absolute magnitude in outburst is marginally consistent with known absolute magnitudes of dwarf novae (Warner 1987). However, many of observed maxima having been fainter than 14.5, the object may be intrinsically fainter than usual dwarf novae. This possibility may be strengthened by the low outburst frequency and shortness of outbursts, which are relatively unusual for dwarf novae, but are more typical for outbursts of intermediate polars (IPs). Since the accretion disks in IPs are magnetically truncated, this may explain the low luminosity and short duration of outbursts. The identification of FT Cam with a relatively hard ROSAT source 1RXS J032114.1+610535 may be a further support for the IP interpretation. Further observations in quiescence in order to search for possible coherent oscillations are encouraged.

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