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Swift/XRT imaging finds no new transient near MAXI reported burst position

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Swift/XRT imaging finds no new transient near MAXI reported burst position

ATel #8189; *C. O. Heinke, A. Bahramian (U. Alberta), J. Kennea (Penn State), R. Wijnands (Amsterdam) & N. Degenaar (Cambridge)*
on 19 Oct 2015; 16:48 UT
Credential Certification: *Craig Heinke (cheinke@virginia.edu)*

Subjects: X-ray, Binary, Neutron Star, Transient

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On Oct. 15, at 1:22 UTC, the MAXI all-sky monitor detected an X-ray burst (likely part of a Type 1 X-ray burst) from near the Galactic Center at 5 sigma significance, with an observed flux of 83+-15 mCrab in the 3-10 keV band (MAXI Nova ID=7310899999). The reported position was RA=266.9, Dec=-29.6. Typical MAXI detections of new transients have positional uncertainties of roughly 0.3 degrees (e.g. Atel #6991), but since X-ray bursts may show variability during the scan the positional uncertainty can be significantly larger (Atel #5041).

Swift/XRT observed the region on Oct. 15, starting at 15:44 UTC, with seven overlapping tiles, with exposures of 350 to 520 seconds each. The observations were centered at (J2000) 17:47:31.4, -29:35:51 with complete coverage out to a radius of 25 arcminutes, and some coverage out to 33 arcminutes. Three active sources were identified in this region, the known persistent low-mass X-ray binaries 1A 1742-294 (count rate cts/s, heavily piled-up), SLX 1744-299 (count rate 1.0 cts/s, slightly piled-up), and SLX 1744-300 (count rate 0.43 cts/s). No new transient was identified, down to a limiting X-ray luminosity (0.5-10 keV) of 4×10^{34} erg/s, for an 8 kpc distance, photon index of 1.7, and N_H of $1e22$ (estimated from Dickey & Lockman 1990, ARAA, 28, 215). For these same assumptions, we estimate the 0.5-10 keV luminosities for SLX 1744-299 and SLX 1744-300 as 9×10^{35} and 4×10^{35} respectively. Extracting an annular spectrum for 1A 1742-294 to compensate for pileup, and fitting an absorbed power-law, we find $N_H = 1.0 \pm 0.2e23$, photon index $1.6 \pm 0.4 - 0.3$, and unabsorbed flux of $1.9e-9$ ergs/cm²/s, which translates to an intrinsic luminosity of 1.4×10^{37} erg/s for the same assumptions.

1A 1742-294, SLX 1744-300, and SLX 1744-299 are known X-ray bursters (e.g. Galloway et al. 2008, ApJS, 179, 360) well within a plausible error circle, so the MAXI burst may originate from any of them. Beyond 30 arcminutes, several X-ray binaries are possible origins of this burst, including the transient burster SAX J1750.8-2900. New activity from within 3 arcminutes of SAX J1750.8-2900 triggered the Swift/BAT on Oct. 15 (GCN #18421), indicating that it is active (it was also seen active by Integral in mid-September, Atel #8058, and is clearly active in Swift/BAT daily lightcurves).

We thank the Swift planning team for rapidly scheduling our observations, and the MAXI team for providing rapid, public notices of interesting activity.

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[**Telegram Index**]

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