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The new X-ray transient Swift J174805.3-244637 in Terzan 5 is a neutron star LMXB

ATel #4264; [D. Altamirano, R. Wijnands \(U. of Amsterdam\), C. O. Heinke, G. R. Sivakoff \(U. of Alberta\), D. Pooley \(Sam Houston State U., Eureka Scientific\)](#)
 on 18 Jul 2012; 16:27 UT
 Credential Certification: Rudy Wijnands (rudy@space.mit.edu)

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We report on the ongoing monitoring Swift observations of the X-ray transient Swift J174805.3-244637 (ATEL #[4249](#), #[4242](#)) in the globular cluster Terzan 5. During an observation taken on July 17th, 2012, we detect a Type-I X-ray burst in a ~950 seconds long observation which started at 20:54:00 UT.

The burst shows a rapid rise (~3 sec) and exponential decay with an e-folding time of ~22 seconds. Preliminary analyses show that the spectrum is well fitted with an absorbed black-body model. Time-resolved spectra reveals that the black-body temperature decreases from ~2.3 keV at the peak, to 1.2 keV as the burst evolves from peak to persistent emission. The bolometric luminosity at the peak is about $1e38 \text{ erg s}^{-1}$ as estimated from the black-body normalization (assuming a distance of $5.9 \pm 0.5 \text{ kpc}$, see, Valenti et al. 2007, AJ, 133, 1287).

The shape, duration, and spectral characteristics of this X-ray burst is typical of thermonuclear (Type-I) X-ray bursts occurring on the surface of a neutron star, allowing us to identify Swift J174805.3-244637 as the 3rd conclusively identified neutron star low-mass X-ray binary in Terzan 5 showing a transient bright outburst in the last ~16 years.

We extracted spectra from Swift/XRT observations on July 16 and July 17 (the latter excluding the burst and tail), choosing only grade 0 data. Swift/XRT data of bright sources in WT mode have known calibration problems at low energies, so we exclude data below 1.1 keV and fix the N_{H} to $1.8e22$ (as found in ATEL #[4249](#)). Both datasets can be fit by comptonization models (COMPTT in XSPEC) with typical parameters (electron $kT > 50 \text{ keV}$, $\tau \sim 1$). The inferred 0.5-10 keV unabsorbed fluxes are $1.2e-9$ and $1.8e-9 \text{ ergs cm}^{-2} \text{ s}^{-1}$, translating (for a 5.9 kpc distance) to luminosities of $5e36 \text{ erg s}^{-1}$ and $7e36 \text{ erg s}^{-1}$, respectively.

Swift/BAT transient analysis by Hans Krimm (<http://swift.gsfc.nasa.gov/docs/swift/results/transients/>) indicates detection of a rising flux from Terzan 5, reaching 100 mCrab by July 14. Our preliminary comptonization model predicts a luminosity of $8e36 \text{ ergs/s}$ in the 15-50 keV band on July 16, which is consistent with the Swift/BAT estimate on that day.

Analyses of the power density spectrum in the 0.5-2 keV, 2-10 keV and 0.5-10 keV ranges find

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no evidence of burst oscillations during the burst, nor any evidence of broad band noise or QPOs in the persistent emission.

Observations of Swift J174805.3-244637 by Swift are on-going.

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rrutledge@astronomerstelegam.org

dfox@astronomerstelegam.org

mansi@astronomerstelegam.org