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Parikh, A.; Wijnands, R.; Degenaar, N.; Altamirano, D.

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ATel #10612; ***Aastha Parikh, Rudy Wijnands, Nathalie Degenaar, Diego Altamirano***
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Credential Certification: Rudy Wijnands (radwijnands@gmail.com)

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On 28 July 2017 Swift/BAT triggered (#00765081) on an event corresponding to a previously unknown source (Barthelmy et al. 2017, GCN #21369, #21385). Its properties suggested it was likely a Galactic source and not a gamma-ray burst. The source was therefore named Swift J181723.1-164300.

The BAT light curve of the event shows a peak lasting ~10 s. We extracted the spectrum of the central 8 s of the burst. When fitting a black-body model to the spectrum, we find a temperature of ~3 keV with an emitting region having a radius of ~8 km, based on our distance estimate of ~7 kpc (see below). The peak of the burst has a flux (15-150 keV) of ~1E-8 erg/cm2/s and a bolometric flux of ~6E-8 erg/cm2/s. The temperature and the peak flux are very similar to what is seen for thermonuclear type-I bursts observed from accreting neutron stars in Galactic low-mass X-ray binaries (LMXBs). Therefore, we suggest that this source is a neutron star LMXB as well. Assuming, the BAT burst was a thermonuclear burst occurring at Eddington luminosity (L_Edd = 3.8E38 erg/s; Kuulkers et al. 2003, A&A, 399, 663), we calculate the source to be at a distance of 7(+/- 1) kpc. On 30 July 2017, another burst was seen from this source (#00765422; Palmer et al. 2017, GCN #21400). Likely this trigger was also caused by a thermonuclear burst from the source, ~2.2 days after the first trigger. This was supported by the fact that the BAT spectrum and the BAT flux during this burst were very similar as observed during the first burst.

Swift/XRT began monitoring the source ~90 s after the first BAT trigger. The XRT light curve shows a decaying count rate (0.5-10 keV) from ~4 c/s at the start to ~1.4 c/s ~200 s after the BAT trigger, after which it remained approximately constant. We fit an exponential decay curve to the initial ~100 s of the light curve and found a e-folding time of ~50 s. We carry out time resolved spectroscopy of the data separating it into two intervals that correspond to the peak in the light curve and average accretion level. The average accretion level was well fit by an absorbed power-law model with an Nh of ~8E22 cm-2 and with with an index of ~1.5. The unabsorbed (0.5-10 keV) flux was ~5E-10 erg/s/cm2, resulting in a 0.5-10 keV luminosity of ~3E36 erg/s. Both this luminosity as well as the photon index are typical of a neutron star in its hard state. The spectrum of the decay part of the XRT light curve was fit using a two component model: a black-body model representing emission due to the type-I burst, and a power-law model representing the persistent accretion emission. For the power-law model we used the same photon index and normalization as obtained for the persistent flux after the burst. The black-body component indicated a temperature of ~1 keV, showing a decrease since the BAT peak. This is indeed expected for a thermonuclear burst, further confirming that the BAT trigger was likely indeed due to such an event. Since this first observation, the source has been monitored using the XRT for a total of ~13 ks (until 2 August 2017). The count rates were between 0.8-1.4 c/s and the spectral properties of the source were very similar during these additional observations as those seen right after the end of the first type-I burst.

The source has previously been in the Swift/XRT field of view twice - on 10 February 2011 and 8 October 2012. Both observations were very short (with a combined exposure time of ~500 s) and our source was not detected. We determined upper limits on the count rate using the prescription by Gehrels (1986, APJ, 303, 336). We calculated the count rate upper limits to be <5E-3 c/s. We simulated a spectrum in Xspec to determine the flux upper limit (0.5-10 keV), which was found to be <8E-13 erg/cm2/s. Based on our distance estimate, this corresponds to a luminosity upper limit of <5E33 erg/s (0.5-10 keV), a factor ~600 lower than its current activity level.

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