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Discovery of a new X-ray transient, Swift J175233.9-290952, in the Swift Bulge Survey

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Discovery of a new X-ray transient, Swift J175233.9-290952, in the Swift Bulge Survey

ATel #10355; *A. Bahramian, C. O. Heinke, A. W. Shaw, J. Strader, J. A. Kennea, G. R. Sivakoff, R. Wijnands, T. J. Maccarone, E. Kuulkers, J. J. M. in't Zand, N. Degenaar*
 on 6 May 2017; 20:51 UT
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Subjects: X-ray, Black Hole, Neutron Star, Transient

Referred to by ATel #: [10422](#), [12751](#)

The Swift Bulge Survey is a wide and shallow imaging survey of 16 square degrees of the Galactic Bulge around the Galactic Center, to be performed every other week for 15 epochs (of 60 second exposures) when the Galactic Bulge is visible (ATels #[10265](#), #[10273](#), #[10305](#)).

Observations in our most recent epoch, performed on May 4th, 2017, indicated marginal detection of a new faint X-ray source with a count rate of 0.05(-0.02/+0.04) ct/s (in 0.5-10 keV), 1.5 degree away from the Galactic center. A follow up Swift/XRT observation on May 5th (Obs.ID 00010118001, 700 s exposure), showed a clear detection of this source (Swift J175233.9-290952) with a count rate of 0.03(+/-0.01) ct/s.

Using the online Swift/XRT products tool yields coordinates of the source as:

RA: 17:52:33.97
 Dec: -29:09:52.3

with a radial uncertainty of 4.6 arcsec (90% confidence). There are no previously known X-ray sources in the error circle.

We extracted a spectrum from the follow up observation and performed spectral fitting using Xspec. We assumed Wilms et al. (2000, ApJ 542, 914) abundances, Verner et al. (1996, ApJ 465, 487) cross-sections, and used C-statistics (Cash 1979, ApJ 228, 939) for analysis. Fitting the spectrum with an absorbed power-law indicates an NH of $< 1.7e22 \text{ cm}^2$, photon index < 1.4 and an unabsorbed flux of $4.4(-2.0/+3.3)e-12 \text{ erg/s/cm}^2$ in the 0.5-10 keV band. Assuming a distance of 8 kpc, this flux corresponds to an X-ray luminosity of $\sim 3e34 \text{ erg/s}$. Given the faint nature of the source, results of our analysis here are merely suggestive and parameters are not tightly constrained.

The closest source detected in the UVOT image is 10" away, suggesting that Swift J175233.9-290952 is not a nearby CV. Investigating previous Chandra observations covering this region, we find two 2 ks Chandra GBS observations (e.g., Jonker et al., 2011, ApJS 194, 18) performed on

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May 13th and 14th, 2008. These observations provide an upper limit of $6.4e-4$ ct/s on the count rate (0.5-10 keV), corresponding to an unabsorbed flux upper limit of $1.4e-14$ erg/s/cm², demonstrating the source brightness has increased by a factor of > 300 since the Chandra observation in 2008, and that the source is a transient.

Further multi-wavelength follow up observations are planned and encouraged. We have requested more Swift observations, and will trigger NIR imaging with Gemini. We thank the Swift team for their support of these observations, which are ongoing.

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