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**Swift/XRT detects renewed activity of the Galactic center X-ray transient Swift J174535.5-285921**

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## Swift/XRT detects renewed activity of the Galactic center X-ray transient Swift J174535.5-285921

ATel #9236; *N. Degenaar (Cambridge), R. Wijnands (U. of Amsterdam), M. T. Reynolds (U. of Michigan), J. M. Miller (U. of Michigan), J. A. Kennea (PSU), on behalf of a larger collaboration*

on 11 Jul 2016; 19:53 UT

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Subjects: Radio, Infra-Red, X-ray, Binary, Black Hole, Neutron Star, Transient

Referred to by ATel #: [9551](#)

Our daily Swift/XRT monitoring observations of the Galactic center (Degenaar et al. 2015) have revealed activity of a transient X-ray source located  $\sim 1.4'$  to the north-east of Sgr A\*. An excess of photons was first seen during a 0.9-ks PC mode observation performed on 2016 July 7. The object remains to be detected in subsequent observations performed on July 8,9, and 10.

To obtain a position for the newly active X-ray source, we use the four PC-mode observations obtained between July 7 and 10 (amounting to 3.5 ks of exposure time) and utilize the online XRT data products tool (Evans et al. 2007, 2009). We obtain a "standard" position (J2000) of R.A. = 17:45:35.96 and Dec. = -28:59:27.2 with an uncertainty of 3.8" (90% confidence). When the UVOT is used to derive the astrometry (see Goad et al. 2007; Evans et al. 2009) an "enhanced" position (J2000) is obtained:

R.A. = 17:45:35.64  
Dec. = -28:59:27.5

with an uncertainty of 2.2" (90% confidence). The XRT coordinates are fully consistent with the Chandra localization of the X-ray transient Swift J174535.5-285921 (ATel #[3525](#)). The positional coincidence makes it likely that we have detected renewed activity from this source. Swift J174535.5-285921 was detected in outburst only once before during our Swift/XRT Galactic center monitoring campaign: It exhibited a  $\sim 1$ -2 week active period in 2011 that peaked at a 2-10 keV luminosity of  $\sim 1E35$  erg/s (Degenaar et al. 2015) for an assumed distance of 8 kpc. The source position is consistent with the dim X-ray source CXOUGC J174535.6-285928 (Muno et al. 2009), which has an estimated 2-10 keV luminosity of  $\sim 2E31$  erg/s and may represent the quiescent X-ray counterpart of this transient (ATels #[3472](#), #[3525](#)).

## Related

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- [9196](#) Continued Swift/XRT observations of the new Galactic center transients SWIFT J174540.2-290037 and SWIFT J174540.7-290015
- [9152](#) VVV near-infrared observations of the Swift J174540.2-290037 field
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The source count rate is low and we therefore extracted an average spectrum from the four XRT/PC-mode observations of July 7-10. This can be described by an absorbed power-law model with a hydrogen column density of  $N_H=(1.5\pm 0.9)E23$  cm<sup>-2</sup>, and an index of  $1.9\pm 1.5$ . The inferred unabsorbed 2-10 keV flux is  $(8.8\pm 3.3)E-12$  erg/cm<sup>2</sup>/s, which translates into a luminosity of  $(6.7\pm 2.5)E34$  erg/s at a distance of 8 kpc. The count rate varied by a factor  $\sim 3$  over the four different observations. A spectrum extracted from the one with the highest count rate (July 9) can be described with a power-law index of  $2.8\pm 0.9$  for  $N_H=1.5E23$  cm<sup>-2</sup> fixed. This yields an unabsorbed 2-10 keV flux of  $(1.8\pm 0.5)E-11$  erg/cm<sup>2</sup>/s, or a luminosity of  $(1.4\pm 0.4)E35$  erg/s at 8 kpc.

Apart from Swift J174535.5-285921, we detect ongoing activity of two other X-ray transients: Swift J174540.7-290015 that is located  $\sim 16''$  to the north of Sgr A\* and has been seen active since February of this year (e.g., ATels #8649, #8689, #8746, #9109, #9196), and Swift J174540.2-290037 that is located  $\sim 10''$  to the south of Sgr A\* and became active in late May (ATel #9109, #9196). The 2-10 keV unabsorbed fluxes inferred from the XRT observations of July 7-10 are  $(4.0\pm 0.3)E-11$  erg/cm<sup>2</sup>/s for Swift J174540.7-290015, and  $(1.6\pm 0.5)E-11$  erg/cm<sup>2</sup>/s for Swift J174540.2-290037. The corresponding luminosity at a distance of 8 kpc is  $(3.1\pm 0.2)E35$  erg/s and  $(1.2\pm 0.4)E35$  erg/s, respectively.

Our daily Swift/XRT observations of the Galactic center are ongoing. The monitoring campaign webpage can be found at: <http://www.swift-sgra.com>

#### References:

- Degenaar et al. 2015, JHEA 7, 137
- Evans et al. 2007, A&A 469, 379
- Evans et al. 2009, MNRAS 397, 1177
- Goad et al. 2007, A&A 476, 1401
- Muno et al. 2009, ApJS, 181, 110

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