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ATel #13716; *J. van den Eijnden, N. Degenaar, R. Wijnands, T. Russell, M. Stoop (Univ. of Amsterdam), M. Armas Padilla (Instituto de Astrofisica de Canarias), D. M. Russell (NYU Abu Dhabi), D. Maitra (Wheaton College), C. O. Heinke, G. R. Sivakoff (Univ. of Alberta), A. W. Shaw (Univ. of Nevada, Reno), T. J. Maccarone (Texas Tech Univ.), J. C. A. Miller-Jones, A. Bahramian (ICRAR-Curtin)*
*on **8 May 2020; 14:03 UT***
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Referred to by ATel #: 13717, 13718

Following the eROSITA discovery of the new X-ray transient SRGt J071522.1-191609 (ATel #13657) and the first follow-up observation using the X-ray telescope (XRT) on board the Neil Gehrels Swift Observatory (ATel #13661), we triggered an X-ray and radio monitoring program using Swift/XRT and the Karl G. Jansky Very Large Array (VLA).

The VLA performed an initial observation of SRGt J071522.1-191609 on 27 April 2020 22:09 UT to 28 April 2020 00:08 UT, while the array was in its C configuration. We observed in 8-bit mode, with two sub-bands centred at 4.5 and 7.5 GHz with 1 GHz bandwidth each. For primary and secondary calibration, we used 3C48 (0137+331) and the nearby calibrator J0725-1904, respectively. We then used the Common Astronomy Software Applications package (CASA) version 4.7.2 (McMullin et al. 2007, ASPC, 376, 127) to analyse the data. We imaged Stokes I using a Briggs weighting scheme, setting the robust parameter to 0 to balance sensitivity and minimise the effects from a brighter background radio source 5.56' away.

SRGt J071522.1-191609 is clearly detected at both 4.5 and 7.5 GHz. To measure its flux density, we applied the imfit-task in CASA to fit an elliptical Gaussian in the image plane, using the FWHM and angle of the synthesized beam (4.2" x 1.9", and position angle -8.3 degrees East of North at 7.5 GHz). We measure flux densities of 193 +/- 22 µJy and 176 +/- 7 µJy at 4.5 and 7.5 GHz, respectively. The spectral index is α = -0.18 +/- 0.25 (where the flux density $S_\nu \propto \nu^\alpha$). This is consistent with a flat radio spectrum from a self-absorbed, compact jet launched by an X-ray binary or, potentially, a steep spectrum ($\alpha \sim -0.7$) typical of jet ejecta.

The radio position of SRGt J071522.1-191609 at 7.5 GHz is:
RA (J2000) = 07h 15m 21.88s +/- 0.01s
Dec (J2000) = -19d 16' 05.0" +/- 0.4",

The positional accuracy is limited by standard VLA systematics at 10% of the synthesized beam. The radio position (1.4" from the Swift/XRT position reported in ATel #13661) is within the

Swift/XRT 90%-confidence region and consistent with the optical counterpart suggested in ATels #13663 and #13669.

Swift/XRT observed SRGt J071522.1-191609 on 28 April 2020 for 1 ks between 09:28 and 09:46 UT (ObsID 13484002). We used the online XRT pipeline (https://www.swift.ac.uk; Evans et al. 2009, MNRAS, 397, 1177) to extract the PC-mode X-ray spectrum. Fitting an absorbed power law model using C-statistics with XSPEC v12.10.1 (Arnaud 1996, ASPC, 101, 17), we find a hydrogen column density of N_H = (1.2 +/- 0.3)E+22 cm^{-2} and a power law index of Gamma = 1.91 +/- 0.25, both consistent with the values reported for the first XRT observation in ATel #13661. We measure an unabsorbed X-ray flux of (2.0 +/- 0.3)E-11 erg s^{-1} cm^{-2} ((1.15 +/- 0.15)E-11 erg s^{-1} cm^{-2}) in the 0.5-10 keV (2-10 keV) band.

The quasi-simultaneous radio and X-ray measurements correspond to 5-GHz and 0.5-10 keV luminosities of L_R = 5.7E+28 $(D/7\ kpc)^2$ erg s^{-1} and L_X = 1.1E+35 $(D/7\ kpc)^2$ erg s^{-1}, respectively. These luminosities support an X-ray binary nature of SRGt J071522.1-191609; the source is a very faint X-ray transient candidate (i.e. peak X-ray luminosity below 1E+36 erg s^{-1}) for source distances nearer than ~20 kpc. Depending on the distance, the radio and and X-ray luminosities are consistent with both the observed sample of black hole X-ray binaries and the radio-brightest neutron star X-ray binaries (e.g. Bahramian et al. 2018; https://github.com/bersavosh/XRB-LrLx_pub).

We thank the Swift and VLA observatories for rapidly scheduling and performing these observations. Further X-ray and radio monitoring is ongoing, and we encourage multi-wavelength follow-up observations.

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