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X-ray non-detection of black hole transient MAXI J1535-571

ATel #12780; *A. S. Parikh, R. Wijnands, T. D. Russell (UvA)*
on 20 May 2019; 08:41 UT
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Subjects: X-ray, Black Hole, Transient

MAXI J1535-571 is a candidate black hole low-mass X-ray binary that was discovered in outburst in September 2017 (Barthelmy et al. 2017, Negoro et al. 2017). We have monitored the source using the Neil Gehrels Swift Observatory/X-ray Telescope (Swift/XRT) since its discovery. Its main outburst ended in 2018 May, after which it was followed by several re-brightenings (e.g., Parikh et al. 2018). MAXI J1535-571 exhibited at least 5 such re-brightenings. However, these re-brightenings ceased at the end of January 2019 and the source entered a quasi-steady state during which its intensity was found to only vary by a factor of 3, hovering around an average XRT count rate of ~ 0.2 c/s (0.5-10 keV). This quasi-steady state lasted ~ 3.5 -4.5 months. We fit the spectrum extracted from the combined quasi-steady state XRT data with an absorbed power-law model find a photon index of $\Gamma \sim 1.7$ (and the equivalent hydrogen column density was found to be $N_{\text{H}} \sim 2.6E22 \text{ cm}^{-2}$). MAXI J1535-571 exhibited an average luminosity of $\sim 3.7E34 \text{ erg/s}$ (0.5-10 keV; assuming $d = 4 \text{ kpc}$) during this quasi-steady state.

A short XRT observation ($\sim 500 \text{ s}$) of MAXI J1535-571 carried out on 11 May 2019 showed that the source was no longer detected, with an upper limit corresponding to $5.2E-3 \text{ c/s}$ (using the 90% prescription by Gehrels, 1986). The source was detected at a count rate of 0.2 c/s (0.5-10 keV) ~ 27 days prior to this observation. We requested an additional XRT observation having a longer exposure time in order to further constrain the source activity level after the non-detection. We obtained an XRT observation on 17 May 2019 (having an exposure of $\sim 2.3 \text{ ks}$) during which the source was again not detected. We combined the data from these two observations in which the source was not detected (observation ID: 00010264119 and 00010264120) to obtain an upper limit of $8.6E-4 \text{ c/s}$. We calculated the luminosity corresponding to this upper limit using XSpec, assuming the same spectral parameters as those observed during the quasi-steady state. We find that the upper limit corresponds to a luminosity of $< 8E32 \text{ erg/s}$ (0.5-10 keV; $d = 4 \text{ kpc}$). Our approved XRT monitoring of MAXI J1535-571 continues for 1 more month, observing the source once every two weeks, allowing us to track if the source becomes active again.

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We thank the Swift team for approving and scheduling scheduling our requested observations.

Barthelmy et al. 2017, GCN #[21792](#)

Gehrels, 1986, ApJ, 303, 336

Negoro et al. 2017, ATel #[10699](#)

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