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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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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 ~ 1.7 (and the equivalent hydrogen column density was found to be Nh ~ 2.6E22 cm^-2). MAXI J1535-571 exhibited an average luminosity of ~3.7E34 erg/s (0.5-10 keV; assuming d = 4 kpc) during this quasi-steady state.

A short XRT observation (~500 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 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 ~2.3 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 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 erg/s (0.5-10 keV; d = 4 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.
We thank the Swift team for approving and scheduling our requested observations.

Barthelmy et al. 2017, GCN #21792
Negoro et al. 2017, ATel #10699
Parikh et al. 2018, ATel #11652

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