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Swift XRT/UVOT follow-up of the Black Hole Candidate MAXI J1659-152 during a low luminosity state

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on 2 Mar 2011; 15:29 UT

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We report on a Swift follow-up observation of the X-ray transient MAXI J1659-152 (ATel #2873, ATel #2877, GCN #11296). This source is suggested to be a stellar-mass black hole candidate (Kalamkar et al. 2011, arXiv:1012.4330). The source also has a very short orbital period ~ 2.4 hours (Kuulkers et al. 2011, arXiv:1102.2102). The optical counterpart of MAXI J1659-152 has been identified (GCN #11298, ATel #2884), and the quiescent optical magnitude has been found to be 22.4 in r-band (ATel #2976).

MAXI J1659-152 is currently in a low X-ray luminosity state. The Swift observation was performed on 2011-02-28 15:40:12 UT for a duration of ~ 1.2 ks, and was observed in Photon Counting mode. Preliminary results show that the average count rate of this source is about > 0.2 c/s. We note that the source is located on a bad column of the CCD, and therefore the count rate might be slightly underestimated. The corrected spectrum is best fitted with an absorbed power-law model which resulted in a column density $N_{\text{H}} = 3.8e+21 \text{ cm}^{-2}$, and a power-law photon index 1.8 ± 0.4 . We obtained an unabsorbed flux (0.3-10 keV) $2.1e-11 \text{ erg cm}^{-2} \text{ s}^{-1}$, which is more than two orders of magnitude lower than the previous reported flux with RXTE in October 2010 (ATel #2927). Assuming a distance of 7 kpc (Kuulkers et al. 2011, arXiv:1102.2102), we estimate the X-ray luminosity to be $1.2e+35 \text{ ergs s}^{-1}$.

In addition to the X-ray, the optical/UV counterpart of MAXI J1659-152 was also detected (at the >3 -sigma level) using the Swift UV/Optical telescope. The magnitudes are $v = 18.8 \pm 0.4$; $b = 19.2 \pm 0.2$; $u = 18.6 \pm 0.2$; $uvw1 = 19.2 \pm 0.3$; $uvm2 = 19.9 \pm 0.4$. When assuming a flat optical spectrum, the source is still $\sim 3 - 4$ magnitudes brighter than the proposed quiescent level of $r \sim 22.4$ (ATel #2976). Clearly the source is still actively accreting and we encourage continued monitoring of this source at all

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We thank the Swift team for their prompt arrangement of the observation. This work made use of data supplied by the UK Swift Science Data Centre at the University of Leicester.

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