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The black hole candidate IGR J17091-3624 going to quiescence

ATel #5112; ***D. Altamirano, R. Wijnands (UvA) & T. Belloni (INAF)***
*on **7 Jun 2013; 07:30 UT***
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Subjects: X-ray, Black Hole, Transient

Referred to by ATel #: 5192

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We report preliminary results on our Swift/XRT monitoring observations of the current outburst of the black hole candidate IGR J17091-3624 (e.g. Altamirano et al. 2011, ApJL, 742, 17, and references therein). Since our last report on 31 Jan 2013 (ATEL #4773), the X-ray flux as measured from Swift/XRT pointed observations has only varied by a factor not larger than 5. However, in the the last Swift/XRT pointed observation IGR J17091-3624 is barely detected, if detected at all.

The last two Swift/XRT observations were performed on 2 May 2013 (ObsID: 00035096081) and on 2 June 2013 (ObsID: 000350960812).

A source is clearly detected in the ~1.2 ksec observation performed on 2 May 2013 at coordinates consistent with IGR J17091-3624. The net count rate of the source is ~0.35 ct/s (0.5-10 keV). Similarly to what has been previously reported (e.g., ATEL #4773), in the Swift/XRT image a set of bright concentric rings can also be seen; one of those rings lies very close to IGR J17091-3624. These rings are due to the bright nearby source GX 349+2. The spectrum of IGR J17091-3624 was extracted following Evans et al. (2009, MNRAS, 397, 1177) and taking into account possible contamination of GX 349+2. Preliminary results show that the 0.5-10 keV source spectrum can be well fitted with an absorbed (Nh~8.6e21 cm^-2) power law with a photon index of ~1.2, leading to an unabsorbed 0.5-10 keV (2.0-10 keV) flux of ~3.8E-11 ergs/cm^2/s (~3.1E-11 ergs/cm^2/s).

In the ~1 ksec Swift/XRT observation performed on 2 June 2013 only 9 photons (0.5-10 keV) could be detected in a circular region (radius of 40") centered at IGR J17091-3624 coordinates. The number of background photons, as measured with similar circular regions centered on a place far from IGR J17091-3624, varies between a total of 0 and 7 photons, most probably due to GX 349+2 contaminating photons. This contamination inhibits our ability to conclusive determine whether or not the source can be detected. Assuming the extreme case that all 9 photons are from IGR J17091-3624 (i.e. there is no background contamination), we derive an average count rate of ~9E-03 ct/s, which means that the flux of IGR J17091-3624 has decreased by a factor of (at least) ~40 in the last month.

Using the best fit parameters obtained from the observation performed on 2 May 2013, and assuming a maximum count rate of ~9E-03 ct/s (0.5-10 keV), we obtain (using PIMMS) a maximum unabsorbed flux (0.5-10.keV) of 8.9E-13 ergs/cm^2/s. This flux is between 5 and 9

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times higher than that measured with XMM-Newton when the source was in quiescence (~(10-18)E-14 ergs/cm^2/s, see Wijnands et. al., 2012, MNRAS, 422, 91), which could indicate the source is still transiting towards quiescence.

If the source has returned or is returning back into quiescence, it will allow for detailed studies of the optical counterpart of the source to search for orbital modulation and possible determine the mass of the assumed black hole in this system.

The daily Swift/BAT monitoring observations: http://swift.gsfc.nasa.gov/docs/swift/results/transients/weak/IGRJ17091-3624/

We will keep monitoring IGR J17091-3624 with Swift to understand if this drop in flux is temporary or permanent. We thank the Swift/Team for scheduling our observations.

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