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## The accreting millisecond X-ray pulsar Swift J0911.9-6452 decays in X-rays after ~3.2 years of activity

ATel #12831; *A. S. Parikh and R. Wijnands (UvA)*

on 1 Jun 2019; 20:19 UT

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Referred to by ATel #: [12846](#), [12869](#)

The low-mass X-ray binary and accreting millisecond X-ray pulsar Swift J0911.9-6452 was discovered in outburst by MAXI and BAT in February 2016 (Serino et al. 2016). Sanna et al. (2017) observed the source using XMM-Newton and NuStar and found coherent pulsations of ~340 Hz.

During its outburst, we have monitored the source frequently and systematically using the X-ray Telescope (XRT) on board the Neil Gehrels Swift Observatory. Swift J0911.9-6452 maintained a quasi-steady count rate during the time since its discovery, at an average count rate of 4.4 c/s (0.5-10 keV), fluctuating only by a factor of 0.7-1.5. This corresponded to a luminosity of ~ $(3-6)E36$  erg/s (unabsorbed in the 0.5-10 keV energy range; assuming a distance of 9.5 kpc; Watkins et al. 2015).

However, the most recent XRT observations of our monitoring campaign indicated that the source count rate has decreased strongly compared to this quasi-steady level. During the last three monitoring observations (Observations IDs [obsID]: 00034456105-00034456107) on 2019 May 3, 14, and 31, we found that the source count rate was 3.9, 1.0, and 0.06 c/s, demonstrating that the source had decreased by a factor >60 in the last ~17 days. We requested rapid follow up observations using Swift to determine the evolution of the source level. We obtained an observation on 2019 June 1 (obsID: 00034456108) which also indicated a decay in the count rate

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to 0.03 c/s. This overall decaying trend strongly indicates that the source, after being in outburst for ~3.2 years, is transiting into quiescence.

We extracted a spectrum combining the two most recent observations (obsID: 00034456107-00034456108). This spectrum is contaminated by the emission contribution from other low-luminosity sources in the globular cluster. In order to correct for this, we have used archival XRT spectra of the cluster obtained before Swift J0911.9-6452 exhibited its outburst as the background spectrum. We fit the combined spectrum from the two most recent observations with an absorbed power-law model and find a photon index of  $\Gamma \sim 2.4 \pm 0.4$  (and the equivalent hydrogen column density was found to be  $N_{\text{H}} \sim 0.2 \text{E}22 \text{ cm}^{-2}$ ). The spectral fit indicates that the source is roughly at  $\sim 2 \text{E}34 \text{ erg/s}$  (0.5-10 keV, unabsorbed). We have further XRT coverage approved to monitor the evolution of the source.

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

Sanna et al. 2017, A&A, 598, 34  
Serino et al. 2016, ATel #[8872](#)  
Watkins et al. 2015, ApJ, 812, 149

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