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Low-frequency radio detection of MAXI J1348-630 with the MWA

ATel #12520; *Jaiverdhan Chauhan, James Miller-Jones, Gemma Anderson (ICRAR/Curtin), Tom Russell (UvA), Paul Hancock, Arash Bahramian, Stefan Duchesne, Andrew Williams (ICRAR/Curtin)*

on 20 Feb 2019; 06:42 UT

Credential Certification: *Gemma Anderson (gemma.anderson@curtin.edu.au)*

Subjects: Radio, X-ray, Binary, Black Hole, Transient

Referred to by ATel #: [13459](#), [13539](#)

Since 2019-02-06, the Murchison Widefield Array (MWA) has regularly monitored the outburst of the black hole candidate X-ray binary MAXI J1348-630 at 154 MHz and 216 MHz, which was first detected by MAXI on 2019-01-26 (ATel #[12425](#)). The ongoing outburst has been detected across the electromagnetic spectrum with observations from INTEGRAL, Swift, NICER, various optical facilities, ATCA and MeerKAT (e.g. ATels #[12434](#), #[12439](#), #[12441](#), #[12447](#), #[12456](#), #[12480](#), #[12497](#)).

We report on the preliminary analysis of the data taken on 2019-02-09 from 19:07:02 to 21:05:02 UTC, using 128 MWA tiles in the extended configuration, with 30 MHz of bandwidth. These data were taken within a few hours of both MeerKAT (ATel #[12497](#)) and ATCA monitoring. MWA detect the source at high significance, with radio flux densities of 301 ± 21 mJy and 362 ± 22 mJy at 154 MHz and 216 MHz, respectively. A spectral fit to the radio spectrum on 2019-02-09, which includes fluxes from MWA, MeerKAT (1.3 GHz) and ATCA (5-21 GHz), resulted in a spectrum peaking at 360 MHz at the synchrotron self-absorption turnover, with a power-law index of $\alpha = 2.45 \pm 0.03$ and $\alpha = -0.82 \pm 0.03$ pre- and post-peak, respectively. The MWA observations have constrained the spectrum in the low-frequency regime.

Ongoing MAXI and XRT monitoring show that MAXI J1348-630 had recently made its first excursion to the soft X-ray spectral state around 2019-02-09 (MAXI light curve: http://maxi.riken.jp/star_data/J1348-632/J1348-632.html). This suggests that our observations may have covered the radio flare known to be associated with the hard-to-soft X-ray spectral state transition.

We thank MWA operations staff for rapidly responding to our target of opportunity request.

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rrutledge@astronomerstelegam.org

dfox@astronomerstelegam.org

mansi@astronomerstelegam.org