



UvA-DARE (Digital Academic Repository)

VLA radio detection of the newly discovered transient and super-Eddington X-ray pulsar Swift J0243.6+6124

van den Eijnden, J.; Degenaar, N.; Russell, T.; Wijnands, R.; Hernandez Santisteban, J.V.; Sivakoff, G.; Heinke, C.; Miller-Jones, J.; Bahramian, A.; Maccarone, T.; Kennea, J.A.; Knigge, C.

Published in:
The astronomer's telegram

[Link to publication](#)

Creative Commons License (see <https://creativecommons.org/use-remix/cc-licenses/>):
Unspecified

Citation for published version (APA):

van den Eijnden, J., Degenaar, N., Russell, T., Wijnands, R., Hernandez Santisteban, J. V., Sivakoff, G., Heinke, C., Miller-Jones, J., Bahramian, A., Maccarone, T., Kennea, J. A., & Knigge, C. (2017). VLA radio detection of the newly discovered transient and super-Eddington X-ray pulsar Swift J0243.6+6124. *The astronomer's telegram*, 0946. <http://www.astronomerstelegram.org/?read=10946>

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (<http://dare.uva.nl>)

Outside

GCN
 IAUCs

Other

ATel on Twitter and Facebook
 ATELstream
 ATel Community Site

Raman Spectrometers - Industry leading performance

Highest throughput, lowest limit of detection Raman spectrometers @ 405 - 1064nm
 wasatchphotonics.com

OPEN

[[Previous](#) | [Next](#) | [ADS](#)]

VLA radio detection of the newly discovered transient and super-Eddington X-ray pulsar Swift J0243.6+6124

ATel #10946; *J. van den Eijnden, N. Degenaar, T. Russell, R. Wijnands, J. V. Hernandez Santisteban (University of Amsterdam), G. Sivakoff, C. Heinke (University of Alberta), J. Miller-Jones (ICRAR-Curtin), A. Bahramian (Michigan State University), T. Maccarone (Texas Tech University), J. A. Kennea (Penn State), C. Knigge (University of Southampton)*
 on 10 Nov 2017; 14:12 UT

Credential Certification: *Jakob Van den Eijnden (a.j.vandeneijnden@uva.nl)*

Subjects: Radio, X-ray, Binary, Neutron Star, Transient, Pulsar

Referred to by ATel #: [10968](#)

Tweet

We report the radio detection of the newly discovered transient X-ray pulsar Swift J0243.6+6124 in Director's Discretionary Time observations performed with the Karl G. Jansky Very Large Array (VLA).

We observed Swift J0243.6+6124 on 2017 November 8 from 00:31 UT to 01:30 UT (MJD 58065.04 +/- 0.02) at a central frequency of 6 GHz with a bandwidth of 4 GHz, while the VLA was in B configuration. As primary and secondary calibrators, we observed 3C48 and J0244+6228, respectively. Following standard procedures, we used the Common Astronomy Software Applications package (CASA v4.7.2; McMullin et al. 2017, ASPC, 376, 127) to calibrate and image the data. We used Briggs weighting with a robustness of zero to balance sensitivity and resolution.

We detect radio emission consistent with the reported Swift position of Swift J0243.6+6124 (Kennea et al., ATel #10809). Fitting a point source in the image plane by forcing an elliptical Gaussian fit with the same size as the synthesized beam, we measure a flux density of 76 +/- 7 uJy, where the error is given by the RMS of the image near the source position. This point source fit returns a position of:

RA(J200) = 02h 43m 40.4373s +/- 0.0083s

Dec(J200) = 61d 26m 03.713s +/- 0.018s

This position is 1.1 arc-seconds from the X-ray position reported by Kennea et al (ATel #10809), and falls within the 1.5 arc-seconds 90% confidence uncertainty on the X-ray position.

The radio flux density of the source corresponds to a radio luminosity ($4 \pi D^2 \nu S_\nu$) of $8.7e27$

Related

- 11517 X-ray rebrightening of the Be/X-ray transient Swift J0243.6+6124
- 11280 Fermi/GBM Update on the Orbital Ephemeris of Swift J0243.6+6124
- 10989 Historic light curve of Swift J0243.6+6124
- 10968 Determination of the distance to SWIFT J0243.6+6124
- 10946 VLA radio detection of the newly discovered transient and super-Eddington X-ray pulsar Swift J0243.6+6124
- 10907 Orbital ephemeris of Swift 0243.6+6124 estimated jointly with Insight-HXMT and Fermi/GBM
- 10886 Radio non-detection of the new accreting neutron star transient and X-ray pulsar Swift J0243.6+6124
- 10866 Swift and NuSTAR observations of Swift J0243.6+6124
- 10822 The optical counterpart to the new accreting pulsar Swift J0243.6+6124 is a Be star
- 10815 OISTER follow-up optical and near-infrared observations of Swift J0243.6+6124
- 10813 The outburst detected by MAXI/GSC (ATel. 10803) was not from LS I +61 303 but from the new X-ray transient Swift J0243.6+6124
- 10812 Fermi GBM detects pulsations from Swift J0243.6+6124
- 10811 ASAS-SN Optical Light Curve of Swift J0243.6+6124 Shows Long Term Variability
- 10809 Swift J0243.6+6124: Swift discovery of an accreting NS transient
- 10803 MAXI/GSC detection of an increase in X-ray intensity from LS I +61 303

$(D/4.0 \text{ kpc})^2 \text{ erg s}^{-1}$, where we assume that the source is located at a distance of 4 kpc as has been reported by Doroshenko et al. (2017, arXiv:1710.10912).

At the time of this radio observation, Swift BAT recorded the source at $1.75 \text{ counts s}^{-1}$ within a single Swift orbit. Assuming the NuSTAR X-ray spectrum as reported by Bahramian et al. (2017, Atel #10866), this Swift BAT count rate corresponds to an X-ray luminosity of $5.2e38 (D/4 \text{ kpc})^2 \text{ erg s}^{-1}$. As the NUSTAR observation was performed at the start of the outburst, the X-ray spectrum might have changed significantly. To confirm this luminosity estimate, we also fitted the Swift XRT spectrum obtained closest to the radio detection, between 2017 November 09 21:28 UT and 23:13 UT. The spectrum is well described by an absorbed blackbody plus powerlaw model, yielding an 0.5-10 keV X-ray luminosity of $6.5e38 (D/4 \text{ kpc})^2 \text{ erg s}^{-1}$. Based on both estimates, Swift J0243.6+6124 appears to have entered a super-Eddington state.

We thank the VLA schedulers for rapidly making this observation possible. Follow-up VLA monitoring has been requested, and Chandra and NuSTAR observations are planned, along with continued monitoring by Swift. Further multiwavelength observations are encouraged.

Beweise, Zeugen ,

International tätige Wirtschafts- und Privatdetektei acon-detektive.com

[OPEN](#)

[[Telegram Index](#)]

R. E. Rutledge, Editor-in-Chief

rrutledge@astronomerstelegam.org

Derek Fox, Editor

dfox@astronomerstelegam.org

Mansi M. Kasliwal, Co-Editor

mansi@astronomerstelegam.org