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## Quick Radio Brightening of Galactic Center Transient MAXI J1744-294 at 33 and 43 GHz

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on 8 May 2025; 00:55 UT

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Subjects: Radio, Transient

Post

MAXI J1744-294 is a bright X-ray and radio transient previously reported by ATels #16975, #16983, #17009, #17010, #17031, #17040, #17045, #17063, #17068, and #17087. We report four follow-up observations of this source at 33 and 43 GHz with the Karl G. Jansky Very Large Array (VLA; project 25A-314, PI: Michail). The source is bright and highly variable (by approximately 2-4x) at both frequencies over a period of a few days. There is a suggestion of spectral steepening as measured by the in-band spectral index. The VLA position of this source from the 2025 April 7 data is: (RA, Dec) = (17:45:40.43, -29:00:45.96), which is consistent with the Chandra (#17087) and MeerKAT (#17045) locations. Given the large beams in D-configuration, we estimate uncertainties in localization of approximately half a cleaned beam (0.6", 1.4") in the respective directions.

An area centered on Sgr A\* was observed over four full nights in 2025 April with the VLA at 33 and 43 GHz as part of a multiwavelength campaign on Sgr A\*. The frequency setup included 3-bit observations at Ka (33 GHz) and Q (43 GHz) bands with approximately 8 GHz of observable bandwidth each night. The VLA was in its D-configuration, yielding ~arcsecond cleaned beams; however, the full-track nature of these data limits sidelobes even in the complex Galactic center region. We used the VLA science-ready data product (SRDP) images from these observations and fitted a 2D Gaussian at the location of the MAXI source, including a background term left as a free parameter. Integrated flux

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densities and in-band spectral indices with 1-sigma statistical uncertainties are below. The source is 20" from the phase center, and primary-beam (PB) corrections in TCLEAN have been applied (PB levels 20" from the phase center are 0.84 and 0.74 for 33 and 43 GHz, respectively.) Cleaned beam sizes are given as RA x Dec.

2025 April 4 08:35:55 UT (MJD 60769.36) 42.9 GHz: 40.7 +/- 4.4 mJy, 0.12 +/- 0.29 (1.34" x 2.66")

2025 April 6 08:32:05 UT (MJD 60771.36) 32.7 GHz: 13.3 +/- 0.9 mJy, -0.21 +/- 0.09 (1.61" x 3.53")

2025 April 7 08:28:08 UT (MJD 60772.35) 42.9 GHz: 73.9 +/- 7.7 mJy, -0.39 +/- 0.43 (1.28" x 2.72")

2025 April 9 08:20:16 UT (MJD 60774.35) 32.7 GHz: 66.4 +/- 0.4 mJy, -0.60 +/- 0.23 (1.63" x 3.39")

Analysis of VLA SRDP images of the same region in 2024 April in the C-configuration yields the following PB-corrected 3 x RMS upper limits (above the extended emission) in an aperture of radius 5" centered on the above-reported location:

22 GHz: <2.34 mJy/beam  
 33 GHz: <4.41 mJy/beam  
 44 GHz: <2.97 mJy/beam

A complete analysis of the VLA data will be presented in a forthcoming paper, and follow-up observations are planned. We thank the VLA scheduling and operations teams who made these observations possible. The National Radio Astronomy Observatory is a facility of the National Science Foundation operated under cooperative agreement by Associated Universities, Inc. JM is supported by an NSF Astronomy and Astrophysics Postdoctoral Fellowship; SvF is supported by a Feodor Lynen fellowship of the Alexander von Humboldt Foundation.

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