



UvA-DARE (Digital Academic Repository)

RXTE detection of a thermonuclear burst from IGR J17498-2921

distance estimate and burst oscillations

Linares Alegret, M.; Altamirano, D.; Watts, A.; Strohmayer, T.; Chakrabarty, D.; Patruno, A.; van der Klis, M.; Wijnands, R.; Casella, P.; Armas Padilla, M.; Cavecchi, Y.; Degenaar, N.; Kalamkar, M.; Kaur, R.; Yang, Y.; Rea, N.

Publication date

2011

Document Version

Final published version

Published in

The astronomer's telegram

License

Unspecified

[Link to publication](#)

Citation for published version (APA):

Linares Alegret, M., Altamirano, D., Watts, A., Strohmayer, T., Chakrabarty, D., Patruno, A., van der Klis, M., Wijnands, R., Casella, P., Armas Padilla, M., Cavecchi, Y., Degenaar, N., Kalamkar, M., Kaur, R., Yang, Y., & Rea, N. (2011). RXTE detection of a thermonuclear burst from IGR J17498-2921: distance estimate and burst oscillations. *The astronomer's telegram*, 3568. <https://www.astronomerstelegam.org/?read=3568>

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 (<https://dare.uva.nl>)

Outside
 GCN
 IAUCs
 ATel on Twitter
Patreon

The Astronomer's Telegram

Post | Search | Policies
 Credential | Feeds | Email

7 Sep 2022; 09:44 UT

This space for free for your conference.

**MIAPP workshop on
 Interacting Supernovae**
 6 February - 3 March 2023
 Garching, Germany

Thanks to Patrons, The Astronomer's Telegram is free to read, free to publish and always will be. Thank you.

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

RXTE detection of a thermonuclear burst from IGR J17498-2921: distance estimate and burst oscillations

ATel #3568; *M. Linares (MIT), D. Altamirano, A. Watts (Amsterdam), T. Strohmayer (NASA/GSFC), D. Chakrabarty (MIT), A. Patruno, M. van der Klis, R. Wijnands (Amsterdam), P. Casella (Southampton), M. Armas-Padilla, Y. Cavecchi, N. Degenaar, M. Kalamkar, R. Kaur, Y. Yang (Amsterdam), N. Rea (CSIC-IEEC)*

on 18 Aug 2011; 00:40 UT

Credential Certification: Manuel Linares (linares@mit.edu)

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

Referred to by ATel #: [3601](#), [3622](#), [3634](#), [3638](#), [3643](#), [3646](#), [3661](#)

[Tweet](#)

We report the detection of a type I X-ray burst with burst oscillations during an RXTE-PCA observation of the recently discovered accreting millisecond pulsar (AMP) IGR J17498-2921 (ATels [#3551](#), [#3555](#), [#3556](#), [#3558](#), [#3559](#), [#3560](#), [#3561](#), [#3562](#), [#3563](#)). The burst intensity peaked on 2011-08-16 at 15:21:45 UTC. We find a rise time of ~ 0.4 s (time span for burst intensity to go from 25% to 90% of net peak value) and an approximate total duration in the RXTE-PCA bandpass of 30s.

The X-ray (2.5-15 keV) spectrum is well described throughout the burst by an absorbed blackbody model (nH fixed at $3e22 \text{ cm}^{-2}$; ATel [#3555](#)), showing a clear cooling tail typical of thermonuclear (type I) X-ray bursts (kT decreasing from ~ 2.6 to ~ 1.4 keV along the burst decay). This confirms the source as a thermonuclear burster (ATel [#3560](#)), and makes IGR J17498-2921 the 7th out of the 14 currently known AMPs to show thermonuclear bursts.

The burst light curve shows two peaks: a local intensity maximum followed by the global intensity maximum about 2s later. We find evidence for a moderate photospheric radius expansion (PRE) phase during the burst rise and peaks, followed by a temperature increase (from ~ 1.8 to 2.6 keV) simultaneous with a (factor of 3) radius decrease. After "touchdown" the apparent emitting area remains roughly constant. We measure a maximum burst bolometric net flux of $5.6e-8 \text{ erg/cm}^2/\text{s}$. Assuming that the maximum luminosity was equal to the value found for PRE bursts (3.8e38 erg/s; Kuulkers et al. 2003, A&A, 399, 663), we estimate a distance to IGR J17498-2921 of 7.6 kpc. The total radiated burst energy at 7.6kpc was $\sim 3.2e39 \text{ erg}$.

Related

- [5332](#) Report on (non-)activity in the Galactic bulge region as seen by INTEGRAL
- [5041](#) MAXI/GSC detection of an X-ray outburst probably from SAX J1747.0-2853 and Swift followup observation of the Galactic center region
- [4848](#) INTEGRAL/JEM-X detects a new outburst of the Rapid Burster (MXB 1730-335)
- [4840](#) Transient X-ray burster KS 1741-293 active again
- [3661](#) Swift observations of the accreting millisecond pulsar IGR J17498-2921: from outburst to quiescence
- [3646](#) INTEGRAL Galactic Bulge monitoring: transient activity from KS 1741-293, MXB 1730-335, and IGR J17498-2921
- [3643](#) Thermonuclear burst oscillations from the 401 Hz pulsar IGR J17498-2921
- [3638](#) Outburst near-infrared and Chandra observations of the ms-pulsar IGR J17498-2921
- [3634](#) Pre-outburst optical/NIR observations of the field around the accreting millisecond X-ray pulsar IGR J17498-2921
- [3632](#) Swift detects an X-ray burst and renewed activity from KS 1741-293
- [3622](#) The optical counterpart of the accreting millisecond X-ray pulsar IGR J17498-2921
- [3606](#) Chandra Localization of the Accretion-Powered Millisecond Pulsar IGR J17498-2921
- [3601](#) Refined Orbital Timing Solution for IGR J17498-2921
- [3568](#) RXTE detection of a thermonuclear burst from IGR J17498-2921: distance estimate and burst oscillations
- [3563](#) A preliminary orbital solution for the newly discovered AMSP, IGRJ17498-2921
- [3562](#) Search for the NIR counterpart to IGR J17498-2921 in quiescence
- [3561](#) Preliminary Candidate Binary Orbit Solutions for IGR J17498-2921
- [3560](#) INTEGRAL detects a Type I X-ray burst from IGR J17498-2921
- [3559](#) Chandra detection of IGR J17498-2921 in quiescence
- [3558](#) IGR J17498-2921: improved Swift/XRT position
- [3556](#) RXTE detects a coherent signal at ~ 401 Hz from IGR J17498-2921.

Oscillations at a frequency consistent with the persistent pulsar frequency (~401 Hz; ATel #3556) are detected during a 2-3 second interval in the tail of the burst after the PRE episode. The average pulsed amplitude (measured as the half-amplitude) during this interval corresponds to approximately 240 counts/sec, which is significantly larger than the 9 counts/sec half-amplitude of the persistent pulsations before the burst. This confirms that the burst flux must be modulated at the spin frequency.

- 3555 Swift localization of the new hard X-ray transient IGR J17498-2921
- 3551 A new hard X-ray transient discovered by INTEGRAL: IGRJ17498-2921
- 2465 INTEGRAL reports renewed activity from KS 1741-293
- 1541 Swift/XRT observations of the X-ray transients KS1741-293 and XTE J1719-291
- 1531 Chandra detects activity from the Galactic X-ray transients KS 1741-293, Swift J174535.5-290135.6 and CXOGC J174535.5-290124
- 1398 Recent activity of the Rapid Burster (MXB 1730-335)
- 1385 INTEGRAL Galactic bulge monitoring observations of GRO J1750-27 (AX J1749.1-2639), H1743-322 and SLX 1746-331

[[Telegram Index](#)]

R. E. Rutledge, Editor-in-Chief

rrutledge@astronomerstelegram.org

Derek Fox, Editor

dfox@astronomerstelegram.org