



UvA-DARE (Digital Academic Repository)

Cygnus X-1 entered the soft state

Grinberg, V.; Boeck, M.; Pottschmidt, K.; Pooley, G.G.; Wilms, J.; Nowak, M.A.; Cadolle Bel, M.; Rodriguez, J.; Marcu, D.M.; Uttley, P.; Tomsick, J.A.; Bodaghee, A.; Markoff, S.B.

Publication date

2011

Document Version

Final published version

Published in

The astronomer's telegram

[Link to publication](#)

Citation for published version (APA):

Grinberg, V., Boeck, M., Pottschmidt, K., Pooley, G. G., Wilms, J., Nowak, M. A., Cadolle Bel, M., Rodriguez, J., Marcu, D. M., Uttley, P., Tomsick, J. A., Bodaghee, A., & Markoff, S. B. (2011). Cygnus X-1 entered the soft state. *The astronomer's telegram*, 3616. <http://www.astronomerstelegram.org/?read=3616>

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.

4 Dec 2020; 14:03 UT

This space for free for your conference.

Outside

GCN
IAUCs

Other

ATel on [Twitter](#) and [Facebook](#)
ATELstream
ATel Community Site[[Previous](#) | [Next](#) | [ADS](#)]

Cygnus X-1 entered the soft state

ATel #3616; *V. Grinberg (Remeis/ECAP/FAU), M. Boeck (Remeis/ECAP/FAU), K. Pottschmidt (CRESST/GSFC/UMBC), G. G. Pooley (MRAO), J. Wilms (Remeis/ECAP/FAU), M. A. Nowak (MIT-CXC), M. Cadolle Bel (ESA/ESAC), J. Rodriguez (CEA SAp/Lab. AIM Saclay), D. M. Marcu (CRESST/GSFC/UMBC), P. Uttley (Univ. Southampton), J. A. Tomsick (SSL/UC Berkeley), A. Bodaghee (SSL/UC Berkeley), S. B. Markoff (Univ. Amsterdam)*

on 31 Aug 2011; 13:12 UT

Credential Certification: [Joern Wilms \(j.wilms@sternwarte.uni-erlangen.de\)](mailto:Joern.Wilms@sternwarte.uni-erlangen.de)

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

Referred to by ATel #: [3636](#), [3802](#), [3880](#)

Radio and X-ray monitoring observations over the past few weeks - ATel #[3534](#) (MAXI/GSC), ATel #[3535](#) (AMI) and ATel #[3546](#) (RATAN) - indicated Cyg X-1 entering the soft state. A plot of the behaviour of Cyg X-1 as observed with AMI, MAXI and BAT can be found under: <http://www.mrao.cam.ac.uk/~guy/cx1/2011.ps>. Our bi-weekly RXTE monitoring campaign of Cyg X-1 shows that the source transited into a soft state between August 13 and August 26. Three groups of observations were conducted: on July 29 (ObsID 96121-01-16-00/01/02/03/04, overall exposure 10 ks), August 13 (96121-01-17-00, 16 ks) and August 26/27 (96121-01-18-00/01/02/03, 6 ks). We model the 3--40 keV RXTE/PCA spectra with a broken power law, an iron line, an absorption component and, where required, a disk black body.

July 29:

The soft photon index of ~ 1.9 -2.0 and the average 3.2-10 Hz time lag ranging between 3ms and 4ms point towards a softer mode of the hard state. The power spectra (PSDs) show a clear two-humped structure without a power law component and no black body component is required in the spectral fits.

August 13:

The spectra are similar to those of the July 29, with a slight softening of the photon index to 2.05-2.15 and an increase of the lag to 4-5 ms, while the PSDs remains two-humped with no or very small power law contribution and the black body is still not required. This behaviour is still indicative of a softer mode of the hard state or of the hard intermediate state.

August 26/27:

Related

- 11539** The 30-day monitoring of MAXI J1820+070 at 4.7 GHz
- 10459** Ongoing radio monitoring of Cyg X-1 with the RATAN-600 radio telescope
- 10446** Change in radio behaviour of Cygnus X-1
- 10322** Unusual soft X-ray activity of Cygnus X-1 detected with MAXI/GSC
- 9089** New RATAN-600 data for Cygnus X-1
- 9087** Detection of a bright radio flare of Cygnus X-1 at 7.2 GHz with the Sardinia Radio Telescope
- 7327** Fermi/LAT observations of Cygnus X-1
- 7322** The current RATAN-600 observations of Cygnus X-1
- 7316** Cyg X-1 transiting into the hard state
- 6344** Cygnus X-1 has returned to soft state
- 6244** Title: Cygnus X-1 - a (failed?) state transition
- 6119** Fermi GBM detection of a rise in Hard X-rays from Cyg X-1
- 6115** MAXI/GSC detection of a transition back into the hard state in Cygnus X-1
- 6021** Cygnus X-1 in the intermediate state
- 5995** Cygnus X-1 is entering its X-ray hard state
- 3880** Fermi GBM observes another decrease in hard x-rays from Cyg X-1
- 3803** Cygnus X-1 15-GHz radio flux increasing
- 3802** FERMI GBM Observes Increase in Hard X-rays from Cyg X-1
- 3636** Fermi GBM Observes Decrease in Hard X-rays from Cyg X-1
- 3616** Cygnus X-1 entered the soft

A multi-temperature black body component (diskbb) with a temperature of 0.35-0.50 keV is clearly required in the fits. The spectrum is steep, with a soft power law index between 2.7 and 2.9. The time lag is highly variable between 9 ms and -0.2 ms and the PSDs show a strong power law component as is typical for the soft state.

Taking into account the recent X-ray and radio monitoring data, we conclude from these three pointed observations that the source has transited into a soft state. This is especially interesting since the transition occurred so quickly after the end (ATel #3307) of the last prolonged soft state, which lasted from July 2010 to April 2011.

	state
3546	The RATAN observations of Cygnus X-1
3535	Cygnus X-1 radio observations
3534	MAXI/GSC detected a possible hard-to-soft state transition in Cygnus X-1
3307	Cyg X-1 entered a transitional state, may be on its way from the soft state back to the hard state
2906	EVN e-VLBI detections of MAXI J1659-152
2755	Radio observations of Cyg X-1 in the soft X-ray state
2751	RXTE Monitoring of Cyg X-1 in its current transitional state
2734	Radio and X-ray monitoring of Cygnus X-1 during the recent state change
2724	Swift/XRT observations of Cyg X-1 during state transition
2721	Fermi GBM detects a rapid hard X-ray decline in Cyg X-1
2715	AGILE gamma-ray detection of Cygnus X-1
2714	RXTE-ASM detects the start of a possible state transition in Cygnus X-1
2711	MAXI/GSC detected a rapid soft X-ray brightening in Cyg X-1
2512	AGILE detection of a gamma ray flare from the Cygnus X-1 region

[[Telegram Index](#)]

R. E. Rutledge, Editor-in-Chief

Derek Fox, Editor

Mansi M. Kasliwal, Co-Editor

rrutledge@astronomerstelegam.org

dfox@astronomerstelegam.org

mansi@astronomerstelegam.org