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First superburst observed by INTEGRAL, from SAX J1747.0-2853

ATel #3183; *J. Chenevez, S Brandt (DTU Space, Denmark), E. Kuulkers (ESA/ESAC, Spain), J. Alfonso-Garzon (LAEX-CAB/INTA-CSIC, Spain), V. Beckmann (APC, France), T. Bird (Southampton, UK), Th. Courvoisier (ISDC, Switzerland), M. Del Santo (INAF/IASF-Roma, Italy), A. Domingo (LAEX-CAB/INTA-CSIC, Spain), K. Ebisawa (ISAS, Japan), P. Jonker (SRON, The Netherlands), P. Kretschmar (ESA/ESAC, Spain), C. Markwardt (GSFC, USA), T. Oosterbroek (ESA/ESTEC, The Netherlands), A. Paizis (INAF-IASF, Italy), K. Pottschmidt (UMBC/NASA GSFC, USA), C. Sanchez-Fernandez (ESA/ESAC, Spain), and R. Wijnands (UvA, The Netherlands)*

on 23 Feb 2011; 09:38 UT

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

Referred to by ATel #: [3217](#), [3930](#), [4622](#), [6602](#)

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A re-analysis of the INTEGRAL Galactic Bulge monitoring observation on February 13 (ATel #3172) shows that the flaring behaviour reported from SAX J1747.0-2853 is in fact due to a superburst.

The event started on February 13, 2011 at 13:01:40 UTC with a 2 minutes spike, but the JEM-X (3-30 keV) source light curve attests that the intensity continued to slowly decay during the remaining two hours of the observation. INTEGRAL slewed away from the Galactic centre region while the source intensity was still half of the maximum intensity level at 780 mCrab, and about three times above the average intensity prior to the flare. A rough extrapolation of the light curve suggests a total duration of four hours, which is consistent with a superburst.

The time-resolved spectral analysis confirms the nature of the event: the average JEM-X spectrum prior to the superburst is best described by an absorbed power law, while an additional black-body component is necessary to describe the average superburst spectra taken during the subsequent four exposures of 1800 sec duration each. The temperature decreases steadily from $kT=2.1\pm 0.1$ keV during the spike down to 1.4 ± 0.05 keV during the last exposure of the observation. The unabsorbed 3-30 keV persistent source flux prior to the flare is $3.0\text{e-}9$ erg/cm²/s.

Related

- 12580 NICER observations of the ongoing X-ray outburst from SAX J1747.0-2853
- 12578 INTEGRAL identified with SAX J1747.0-2853 a source of the X-ray outburst in the Galactic center region detected by MAXI
- 12576 MAXI/GSC detection of an ongoing X-ray outburst from SAX J1747.0-2853 or a new X-ray transient MAXI J1746-290
- 10115 MAXI/GSC detection of peculiar soft X-ray enhancement probably from SLX 1735-269
- 8751 Swift/BAT hard X-ray monitoring: A New Outburst of Black Hole Transient H1743-322
- 8189 Swift/XRT imaging finds no new transient near MAXI reported burst position
- 8058 INTEGRAL finds renewed X-ray activity of the Neutron star X-ray transient SAX J1750.8-2900
- 7954 MAXI GSC detection of a soft X-ray transient : XRF 150826A / MAXI J1501-026
- 7096 INTEGRAL detection of the on-going outbursts from 1RXS J180408.9-342058 and GRO J1750-27
- 7039 Swift observations of 1RXS J180408.9-342058
- 7028 Continuing outburst of Galactic transient IGR J17451-3022
- 7020 Chandra position of IGR J17454-2919 and discovery of a possible NIR counterpart
- 7008 MAXI/GSC observation of 1RXS J180408.9-342058 in outburst
- 6997 Swift/BAT detects an outburst from the neutron star binary 1RXS J180408.9-

The total unabsorbed 3-30 keV flux at the peak of the superburst is $6.7e-8$ erg/cm²/s.

As mentioned in ATel #3172, the whole event was only marginally detected by IBIS/ISGRI, and the 15-25 keV light curve during the entire observation is roughly flat at an average flux of 25 mCrab.

This first superburst ever recorded from SAX J1747.0-2853 is also the first superburst observed by INTEGRAL. It is preceded 30 minutes earlier by a shorter type I X-ray burst. The latter started during a 2 minutes slew of the INTEGRAL satellite, but due to the burst duration of several minutes, the tail was still observable during the next stable pointing. A preliminary analysis of this precursor burst indicates a peak count rate approximately at the same level as the peak of the superburst, as well as a dual exponential decay.

The above-mentioned persistent flux is derived from the average spectrum taken during the 1800 sec exposure prior to the first burst, i.e., less than one hour before the onset of the superburst.

We note that this event is only the 2nd superburst seen from a normal X-ray transient source after the superburst observed from 4U 1608-52 in 2005 (ATel #482).

	342058
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6668	MAXI/GSC detection of a superburst from 4U 0614+091
6602	INTEGRAL/JEM-X sees enhanced activity in the Galactic center region: SAX J1747.0-2853 and IGR J17454-2919
6574	Hard X-ray spectral and timing properties of IGR J17454-2919 consistent with a black hole in the hard state
6530	IGR J17454-2919: a new X-ray transient found by INTEGRAL/JEM-X close to the Galactic Center
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5241	MAXI/GSC detection of a renewed outburst from the black hole candidate H 1743-322
5041	MAXI/GSC detection of an X-ray outburst probably from SAX J1747.0-2853 and Swift followup observation of the Galactic center region
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3830	MAXI/GSC detection of an outburst from a black hole candidate 4U 1630-472
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3123	MAXI/GSC detects an X-ray outburst from the Galactic center region, GRO J1744-28/MAXI J1745-288
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