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J/ApJS/223/15 8yr INTEGRAL/IBIS soft gamma-ray source obs. (Bird+, 2016)

The IBIS soft gamma-ray sky after 1000 INTEGRAL orbits.

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ADC_Keywords: Gamma rays ; Galactic plane

Mission_Name: INTEGRAL

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Abstract:

Here we report an all-sky soft gamma-ray source catalog based on IBIS observations performed during the first 1000 orbits of INTEGRAL. The database for the construction of the source list consists of all good-quality data available, from the launch in 2002, up to the end of 2010. This corresponds to ~110Ms of scientific public observations, with a concentrated coverage on the Galactic Plane and extragalactic deep exposures. This new catalog includes 939 sources above a 4.5 σ significance threshold detected in the 17-100keV energy band, of which 120 sources represent previously undiscovered soft gamma-ray emitters. The source positions are determined, mean fluxes are provided in two main energy bands, and these are both reported together with the overall source exposure. Indicative levels of variability are provided, and outburst times and durations are given for transient sources. A comparison is made with previous IBIS catalogs and catalogs from other similar missions.

File Summary:

FileName	Lrec1	Records	Explanations
ReadMe	80	.	This file
table2.dat	152	939	IBIS catalog of 1000 INTEGRAL orbits
notes.dat	79	939	Source notes

See also:

[J/MNRAS/448/3766](#) : INTEGRAL 11-year hard X-ray survey (Krivonos+, 2015)
[J/ApJS/207/19](#) : Hard X-ray survey from Swift-BAT 2004-2010 (Baumgartner+, 2013)
[J/MNRAS/426/1750](#) : INTEGRAL/IBIS AGN catalogue (Malizia+, 2012)
[J/A+A/545/A27](#) : INTEGRAL/IBIS 9-yr Galactic Hard X-Ray Survey (Krivonos+, 2012)
[J/ApJS/201/34](#) : Swift-INTEGRAL X-ray (SIX) survey (Bottacini+, 2012)
[J/PAZh/37/651](#) : Hard X-ray bursts by INTEGRAL in 2003-2009 (Chelovekov+, 2011)
[J/MNRAS/403/945](#) : Swift/XRT obs. of unidentified IBIS sources (Landi+, 2010)
[J/A+A/523/A61](#) : Hard X-ray sources INTEGRAL all-sky survey (Krivonos+, 2010)
[J/ApJS/186/1](#) : 4th IBIS/ISGRI soft gamma-ray survey catalog (Bird+, 2010)
[J/A+A/505/417](#) : Second INTEGRAL AGN catalogue (Beckmann+, 2009)
[J/A+A/469/807](#) : Catalogue of Galactic low-mass X-ray binaries (Liu+, 2007)
[J/ApJS/170/175](#) : Third IBIS/ISGRI soft gamma-ray survey catalog (Bird+, 2007)
[J/ApJ/607/L33](#) : First IBIS Catalog: 20-100keV (Bird+, 2004)
[J/A+A/411/L59](#) : INTEGRAL reference catalog (Ebisawa+, 2003)
<http://integral.esac.esa.int/BULGE/> : INTEGRAL Galactic Bulge monitoring page

Byte-by-byte Description of file: [table2.dat](#)

Bytes	Format	Units	Label	Explanations
1- 23	A23	---	Name	Primary source identifier
25	A1	---	f_Name	[N] Flag on Name (1)
27- 33	F7.3	deg	RAdeg	Right Ascension in decimal degrees (J2000)
35- 41	F7.3	deg	DEdeg	Declination in decimal degrees (J2000)
43- 46	F4.2	arcmin	e_pos	[0.1/5.5] Position error (2)
48	A1	---	l_F20-40	Limit flag on F20-40
49- 54	F6.1	---	F20-40	[0.1/1001] Time-averaged 20-40keV band flux (3)
56- 58	F3.1	---	e_F20-40	[0.1/1.1]? Uncertainty in F20-40
60	A1	---	l_F40-100	Limit flag on F40-100
61- 66	F6.1	---	F40-100	[0.2/1001] Time-averaged 40-100keV band flux (3)
68- 70	F3.1	---	e_F40-100	[0.1/1.8]? Uncertainty in F40-100
72- 92	A21	---	Class	Source type classification (4)
94- 95	A2	---	Var	[Y/] Variability indicator (5)
97-103	F7.1	---	Sig	[4.5/10012] Maximum significance (6)
105-109	I5	ks	Exp	[46/12050] Corrected on-source exposure
111-133	A23	---	OName	Other source identifier
135-138	A4	---	WARN	Low significance warning flag (7)
140-144	A5	---	BLEND	Blended source; fluxes may be contaminated
146-152	A7	---	GCFLAG	Source lies in confused region (8)

Note (1):

N = A new detection since fourth IBIS/ISGRI catalog (Bird+, 2010, [J/ApJS/186/1](https://doi.org/10.1086/186110)).

Note (2): Expressed as radius of 90% confidence circle.

Note (3): Expressed in units of mCrab; appropriate conversion factors are:

(20-40keV) 10mCrab = $7.57e-11 \text{erg/cm}^2/\text{s} = 1.71e-3 \text{ph/cm}^2/\text{s}$;

(40-100keV) 10mCrab = $9.42e-11 \text{erg/cm}^2/\text{s} = 9.67e-4 \text{ph/cm}^2/\text{s}$.

Note (4): Classification as follows:

A = Atoll source (neutron star);
 AGN = Active galactic nuclei;
 AXP = Anomalous X-ray pulsar;
 B = Burster (neutron star);
 Be = B-type emission-line star;
 BH = Black hole (confirmed mass evaluation);
 BHC = Black hole candidate;
 BL = broad line;
 Cluster = Cluster of galaxies;
 CV = Cataclysmic variable;
 D = Dipping source;
 DN = Dwarf Nova;
 G = Globular Cluster X-ray source;
 GRB = Gamma-Ray Burst;
 HMXB = High-mass X-ray binary;
 IP = Intermediate Polar;
 LMXB = Low-mass X-ray binary;
 M = Microquasar;
 Mol Cloud = Molecular cloud;
 NL = narrow line;
 NS = Neutron Star;
 P = Polar;
 PSR = Radio pulsar;
 PWN = Pulsar wind nebula;
 QSO = Quasar;
 RG = Radio Galaxy;
 SFXT = Supergiant Fast X-ray Transient;
 SG = Supergiant;
 SGR = Soft gamma-ray repeater;
 SNR = Supernova remnant;
 Sy = Seyfert galaxy;
 Symb = Symbiotic star;
 T = Transient source;
 XB = Galactic X-ray binary;
 XBONG = X-ray bright, optically normal galaxy;
 XP = X-ray pulsar;
 Z = Z-type source (neutron star).

Note (5): Variability flag as follows:

Y = bursticity >1.1 (i.e., a 10% increase in significance can be obtained by selecting a single contiguous subset of the data) and a slightly variable source.

YY = bursticity of >4 (i.e., a 400% increase in significance), indicating a strongly variable source.

See Section 3 for details

Note (6): In a single map, see notes on individual sources for detection method.

Note (7):

WARN = the fraction of false sources may be as much as 25%.
 See Section 2.4 for details.

Note (8): Around Galactic Center. See Section 2.5 for details.

CGFLAG as follows:

GCFLAG1 = Source lies within the GC box, and is detected by our standard methods.

GCFLAG2 = Clear evidence of emission from the source position in one or more of our maps, but it lies within an unresolved emission region.

Byte-by-byte Description of file: [notes.dat](#)

Bytes	Format	Units	Label	Explanations
1- 23	A23	---	Name	Primary source identifier
25- 79	A55	---	Note	Source note

History:

From electronic version of the journal

(End) Prepared by [AAS], Emmanuelle Perret [CDS] 22-Apr-2016

The document above follows the rules of the [Standard Description for Astronomical Catalogues](#); from this documentation it is possible to generate *f77* program to load files [into arrays](#) or [line by line](#)