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The XMM-Newton serendipitous survey.

VII. The third XMM-Newton serendipitous source catalogue.

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ADC_Keywords: X-ray sources ; Surveys

Mission_Name: XMM

Keywords: catalogs - astronomical data bases - surveys - X-rays: general

Description:

The 3XMM-DR6 catalogue contains source detections drawn from 9160 XMM-Newton EPIC observations, covering an energy interval from 0.2keV to 12keV. These observations were made between 2000 February 3 and 2015 June 4 and all datasets were publicly available by 2016 January 31, but not all public observations are included in this catalogue (see below for more information).

Should you use the catalogue for your research and publish the results, please use the acknowledgement below and cite the paper describing 3XMM (Rosen, Webb, Watson et al., [2016A&A...590A...1R](#)).

This research has made use of data obtained from the 3XMM XMM-Newton serendipitous source catalogue compiled by the 10 institutes of the XMM-Newton Survey Science Centre selected by ESA.

The following table gives an overview of the statistics of the catalogue in comparison with the 3XMM-DR4 catalogue.

	3XMM-DR6	3XMM-DR5	Increment
Number of observations	9160	7781	1379
Number of 'clean' observations (i.e., observation class < 3)	5947	4735	1212
Observing interval	03-Feb-00 04-Jun-15	03-Feb-00 20-Dec-13	2.5yr
Sky coverage, taking overlaps into account (≥1ks exposure)	982sq.deg	877sq.deg	105sq.deg
Number of detections	678680	565962	112718
Number of 'clean' detections (i.e., summary flag < 3)	552991	456904	96087
Number of unique sources	468440	396910	71530
Number of 'cleanest' (summary flag = 0, not in high-background fields) extended detections	11066	9082	1984
Number of detections with spectra	149968	133032	16936
Number of detections with timeseries	149968	133025	16943
Number of detections where probability of timeseries being constant is <1x10 ⁻⁵	5238	4668	570

The production and content of the 3XMM catalogue is described in the the 3XMM-DR6 User Guide at

http://xmmssc.inap.omp.eu/Catalogue/3XMM-DR6/3XMM-DR6_Catalogue_User_Guide.html

The "slim" version of the catalogue (file "xmm3r6s.dat") contains one row per unique source, while the the main catalogue has one row per detection. This slim version includes 44 columns, essentially those containing information about the unique sources, while the full catalogue (file "xmm3r6.fit") describes all detections with 323 columns. The slim version also contains a column with links to the summary pages in the IRAP catalogue archive.

In the case of sources with multiple detections the summary page of the best detection is selected (i.e., the detection with the largest exposure time, summed over all cameras), and the summary page gives cross-links to the other detections.

A separate file "summary.dat" contains the key details about the observations used in the construction of the 3XMM-DR6 catalogue.

File Summary:

FileName	Lrecl	Records	Explanations
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ReadMe	80	.	This file
xmm3r6s.dat	459	468440	The 3XMM-DR6 Catalog, "slim" version
summary.dat	135	9159	List of observations
xmm3r6.fit	2880	349530	Full 3XMM-DR6 Catalog (678680 detections)

See also:

<http://xmmssc-www.star.le.ac.uk/Catalogue> : XMM-Newton Home Page
http://xmmssc.irap.omp.eu/Catalogue/3XMM-DR6/3XMM_DR6.html : 3XMM Home Page
<http://xmmssc-www.star.le.ac.uk/> : XMM-Newton Survey Science Centre,
 University of Leicester
<http://xmm.vilspa.esa.es/> : XMM-Newton Science Operations Centre
<http://xcatdb.u-strasbg.fr/xcat-db/> : XCAT-DB at SSC institute, Strasbourg
[J/A+A/493/339](#) : XMM-Newton serendipitous Survey V. (Watson+, 2009)
[B/xmm](#) : XMM-Newton Observation Log (XMM-Newton Science Operation Center)

Byte-by-byte Description of file: [xmm3r6s.dat](#)

Bytes	Format	Units	Label	Explanations
1- 15	I15	---	Source	[200001101010001/207705805010122] (SRCID) Unique source index
17- 20	A4	---	---	[3XMM]
22- 37	A16	---	3XMM	(IAUNAME) Unique source name (JHHMMSS.s+DDMMSS)
39- 47	F9.5	deg	RAdeg	(SC_RA) Mean source right ascension (ICRS)
49- 57	F9.5	deg	DEdeg	(SC_DEC) Mean source declination (ICRS)
59- 63	F5.2	arcsec	ePos	[0.03/20] (SC_POSERR) Mean error on position
65- 73	E9.3	---	srcML	(SC_DETM) Source detection likelihood (2)
75- 85	E11.5	mW/m2	Flux1	(SC_Ep1_FLUX) Mean flux in 0.2-0.5keV band
87- 95	E9.3	mW/m2	e_Flux1	(SC_Ep1_FLUXERR) Mean error on Flux1
97-107	E11.5	mW/m2	Flux2	(SC_Ep2_FLUX) Mean flux in 0.5-1.0keV band
109-117	E9.3	mW/m2	e_Flux2	(SC_Ep2_FLUXERR) Mean error on Flux2
119-129	E11.5	mW/m2	Flux3	(SC_Ep3_FLUX) Mean flux in 1.0-2.0keV band
131-139	E9.3	mW/m2	e_Flux3	(SC_Ep3_FLUXERR) Mean error on Flux3
141-151	E11.5	mW/m2	Flux4	(SC_Ep4_FLUX) Mean flux in 2.0-4.5keV band
153-161	E9.3	mW/m2	e_Flux4	(SC_Ep4_FLUXERR) Mean error on Flux4
163-173	E11.5	mW/m2	Flux5	(SC_Ep5_FLUX) Mean flux in 4.5-12keV band
175-183	E9.3	mW/m2	e_Flux5	(SC_Ep5_FLUXERR) Mean error on Flux5
185-195	E11.5	mW/m2	Flux8	(SC_Ep8_FLUX) Mean flux in 0.2-12keV band
197-205	E9.3	mW/m2	e_Flux8	(SC_Ep8_FLUXERR) Mean error on Flux8
207-217	E11.5	mW/m2	Flux9	? (SC_Ep9_FLUX) Mean flux in 0.5-4.5keV band
219-227	E9.3	mW/m2	e_Flux9	? (SC_Ep9_FLUXERR) Mean error on Flux9
229-239	E11.5	mW/m2	F8min	(SC_Ep8_FMIN) Minimum flux in 0.5-4.5keV band
241-249	E9.3	mW/m2	e_F8min	(SC_Ep8_FMINERR) Mean error on F8min
251-261	E11.5	mW/m2	F8max	(SC_Ep8_FMAX) Maximum flux in 0.5-4.5keV band
263-271	E9.3	mW/m2	e_F8max	(SC_Ep8_FMAXERR) Mean error on F8max
273-278	F6.3	---	HR1	[-1/1]? (SC_HR1) Hardness ratio, bands 1,2 (1)
280-285	F6.3	---	e_HR1	? (SC_HR1ERR) Mean error on HR1
287-292	F6.3	---	HR2	[-1/1]? (SC_HR2) Hardness ratio, bands 2,3 (1)
294-299	F6.3	---	e_HR2	? (SC_HR2ERR) Mean error on HR2
301-306	F6.3	---	HR3	[-1/1]? (SC_HR3) Hardness ratio, bands 3,4 (1)
308-313	F6.3	---	e_HR3	? (SC_HR3ERR) Mean error on HR3
315-320	F6.3	---	HR4	[-1/1]? (SC_HR4) Hardness ratio, bands 4,5 (1)
322-327	F6.3	---	e_HR4	? (SC_HR4ERR) Mean error on HR4
329-333	F5.1	arcsec	ext	(SC_EXTENT) Total band extent
335-343	E9.3	---	extML	(SC_EXTML) Detection likelihood of the extended source (3)
345-350	F6.3	---	Cst	[0/1]? (SC_CHI2PROB) Constant probability (4)
352	I1	---	V	[0/1] (SC_VARFLAG) Variability flag (V=1)
354	I1	---	S	[0/4] (SC_SUMFLAG) summary flag, 0=best (5)
356-365	F10.4	d	MJD0	[51577/57178] (MJD_FIRST) Date of first observation (MJD)
367-376	F10.4	d	MJD1	[51577/57178] (MJD_LAST) Date of last observation (MJD)
378-387	F10.6	---	Fvar	? (SC_FVAR) fractional excess variance of the unique source (6)
389-399	F11.6	---	e_Fvar	? (SC_FVARERR) Mean error on Fvar
401-402	I2	---	Nd	[1/50] (N_DETECTIONS) Number of detections
404	I1	---	c	[0/1] (CONFUSED) Confusion flag (7)
406-459	A54	---	uIRAP	(WEBPAGE_URL) URL for details at IRAP

Note (1): The hardness ratio is defined as $(F2-F1)/(F2+F1)$
 if F2 is the flux in the harder band (the hardness ratio is
 therefore -1 for softest sources and +1 for hardest sources).
 The energy bands are:
 1 = 0.2 - 0.5 keV (narrow band)
 2 = 0.5 - 1.0 keV (narrow band)
 3 = 1.0 - 2.0 keV (narrow band)
 4 = 2.0 - 4.5 keV (narrow band)
 5 = 4.5 - 12.0 keV (narrow band)
 6 = 0.2 - 2.0 keV = soft broad band, no images made

7 = 2.0 - 12.0 keV = hard broad band, no images made
 8 = 0.2 - 12.0 keV = total band
 9 = 0.5 - 4.5 keV = XID band

Note (2): defined as the maximum of the likelihoods of all detections of this source.

Note (3): defined as the average of the extent likelihoods of all detections of this source.

Note (4): χ^2 probability that the unique source as detected by any of the observations is constant, that is, the minimum value of the EPIC probabilities in each detection.

Note (5): the summary flag of the source is derived from the EPIC flag, and is assigned the following values:

- 0 = good: none of the EPIC flags was set.
- 1 = source parameters may be affected: at least one of the EPIC warning flags was set, but no possible-spurious detection flag is set.
- 2 = possibly spurious source: at least one of the possible-spurious detection flags was set but not the manual flag
- 3 = source located in a area where spurious detection may occur.
- 4 = source located in a area where spurious detection may occur and is possibly spurious.

Note (6): The fractional excess variance of the unique source. It is the value corresponding to the exposure and instrument that shows the lowest probability of being constant.

Note (7): This flag (1=true, 0=false) signifies that the 3- σ error circle of a detection within this unique source overlaps the 3- σ error circle of a nearby unique source. As such, it is an indicator of possible confusion (uncertainty) about the assignment of detections between sources.

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

Bytes	Format	Units	Label	Explanations
1- 4	I04	---	Rev	[28/2836] (REVOLUT) Satellite revolution number
6- 15	I010	---	ObsID	(OBS_ID) XMM Observation number (Cat. B/xmm)
17- 19	I03	---	iODF	[1/10] (ODF_VERS) Data File (ODF) number
21- 29	F9.5	deg	RAdeg	(RA) field Right Ascension (J2000)
31- 39	F9.5	deg	DEdeg	(DEC) field Declination (J2000)
41- 68	A28	---	Target	(TARGET) name
70	I1	---	Q	[0/5] (OBS_CLASS) Observations quality (1)
72- 74	I3	---	Nd	[1/731] (NDET) Number of detections in field
76- 78	I3	---	Ng	[0/391] (NDETG00D) Number of good detections in field
80	I1	---	Np	[1/4]? (PN_NEXP) Number of PN exposures merged
82- 84	A3	---	f.PN	(PN_FILT) Filter of the PN exposure(s) (2)
86- 90	A5	---	m.PN	(PN_MODE) Mode of the PN exposure(s) (3)
92- 97	I6	s	t.PN	?=--- (PN_TEXP) Total PN exposure time
99	I1	---	N1	[1/5]? (M1_NEXP) Number of M1 exposures merged
101-103	A3	---	f.M1	(M1_FILT) Filter of the M1 exposure(s) (2)
105-109	A5	---	m.M1	(M1_MODE) Mode of the M1 exposures (3)
111-116	I6	s	t.M1	?=--- (M1_TEXP) Total M1 exposure time
118	I1	---	N2	[1/5]? (M2_NEXP) Number of M2 exposures merged
120-122	A3	---	f.M2	(M2_FILT) Filter of the M2 exposure(s) (2)
124-128	A5	---	m.M2	(M2_MODE) Mode of the M2 exposures (3)
130-135	I6	s	t.M2	?=--- (M2_TEXP) Total M2 exposure time

Note (1): Quality classification of the whole observation based on the area flagged as bad in the manual flagging process

Note (2): EPIC camera filters of catalogue observations:

Med=MEDIUM, Tn1=THIN1, Tn2=THIN2, Tck=THICK, Opn=OPEN,

Note (3): MOS modes:

PFW = Prime Full Window
 PPW2 = Prime Partial W2
 PPW3 = Prime Partial W3
 PPW4 = Prime Partial W4
 PPW5 = Prime Partial W5
 FU = Fast Uncompressed
 FC = Fast Compressed
 PPRFS = Prime Partial Refreshed Frame Store

History:

From http://xmmssc.irap.omp.eu/Catalogue/3XMM-DR6/3XMM_DR6.html

(End)

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22-Sep-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](#)