

An XMM-Newton Science Archive for the next decade and its integration into ESASky

Nora Loiseau ^{1,2}

D. Baines ³, P. Rodríguez ², J. Salgado ³, M.H. Sarmiento ³, E. Colomo ³,
B. Merin ³, F. Giordano ³, E. Racero ³, S. Migliari ²

¹ *XMM-Newton SOC Archive Scientist, ESAC/ESA*

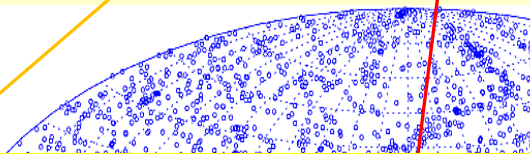
² *XMM-Newton SOC User Support Group, ESAC/ESA*

³ *European Space Data Centre (ESDC), ESAC/ESA*

The Contents of

➤ The XSA presently has:

- ODF/PPS of $\sim 12,400$ pointed observations
- SDF of $\sim 3,600$ Slew Survey observations
- SDF of $\sim 172,000$ Slew Survey sub-pointings
- 565,962 EPIC sources **See Poster J#03 on 3XMM-DR6**
- 6,246,432 OM sources (OM-SUSS2.1 catalogue)
- 41,423 Slew Survey sources (XMMSL1 DR6)
- Ancillary info (proposal info, publications, etc)



P.Rodríguez

P.Rodríguez

Poi

Sle

The XSA Web Interface

<http://nxsa.esac.esa.int/>



Position **File**

Name
 Equatorial
 Galactic
 Ecliptic

Target in Field Of View Circle Box

Select a file with Galactic Coordinates
 listaparaXSA

Radius

Observation and Proposal filters

Observation

Observation ID Revolution Status

Start Time between and Duration

Search from list of Observation IDs no file selected [\[Instrument Configuration\]](#)

Proposal

Target Type PI Name String in Abstract

[\[Advanced Proposal Options\]](#)

Display options

Observations	PPS Sources	Slew Observations	Catalogues
<input checked="" type="checkbox"/> Pointed Observations <input type="checkbox"/> Exposures <input type="checkbox"/> EPIC Exposures <input type="checkbox"/> OM Exposures <input type="checkbox"/> RGS Exposures <input type="checkbox"/> Proposals <input type="checkbox"/> Publications	<input checked="" type="checkbox"/> EPIC PPS Sources <input checked="" type="checkbox"/> OM PPS Sources	<input type="checkbox"/> Slew Observations <input type="checkbox"/> Slew Exposures	<input checked="" type="checkbox"/> EPIC Source Catalogue <input checked="" type="checkbox"/> OM Source Catalogue <input checked="" type="checkbox"/> Slew Source Catalogue

Select All

Validating Galactic Coordinates contained in file 'listaparaXSA'. Please wait...

15 valid targets found. Click 'Submit' to proceed.

[Reset Form](#)

The Results Page



Postcard Preview

P0729561001EPX0003COLIM8000.FIT

implotrgb vimplotrgb

Save/Open as Send Image to

Instrument: EMOS2 EMOS1 EMOS2 EMOS1 EP
Filter: Thin1 Medium Thin1 Medium Thin
Object: M83 LILX
Observer: Dr NORBERT SCHARTEL (PS)
DATE-OBS: 2015-02-02T18:00
Exposure: 1682 1733 19253 1877+ 16730
Image size: pixels (107:575,79:525)
colourmap = RGB

DEC--TAN
-29°56'
00'
-30°04'

RA--TAN
13^m38^s00^o 37^m40^s 20^s 00^s 36^m40^s 20^s 00^s

select down

58401001

GS fluxed spectrum

BibCode
2014Ap&SS.354..97Y
2014A&A...567A..84M
2014A&A...563A...6G

Direct data access: Command line & URL

<http://nxsa.esac.esa.int/#aio>



XMM-Newton Science Archive

HOME SEARCH **COMMAND LINE & URL ACCESS** TAP QUERIES TO XSA CATALOGUES & TOOLS DOCUMENTATION USER GUIDES CONTACT ADMIN ONLY (XAT)

COMMAND LINE AND URL ACCESS

- 1. INTRODUCTION
- 2. FAST WEB ACCESS
- 3. AIO USAGE
 - 3.1. AIO ACCESS USING URLS
 - 3.2. UNIX COMMAND-LINE ACCESS USING URLS
 - 3.3. COMMAND LINE ACCESS USING AIO CLIENT
 - Download AIO client
 - 3.4. AIO REQUEST PARAMETERS
- 4. APPENDIX A

Basic case. Retrieve ODF and PPS for a given observation:
<http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0144090201>

Retrieve ODF only:
<http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0144090201&level=ODF>

Retrieve all files for a given instrument (M1):
<http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0144090201&instname=M1>

Retrieve all PNG files for a given instrument (M2):
<http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0144090201&extension=PNG&instname=M2>

Retrieve all files for a given instrument (M1) and exposure flag (U for unscheduled) and exp number (003):
<http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0144090201&instname=M1&expflag=U&expno=003>

Retrieve all files for a specific exposure (S402) -> flag (S-scheduled) and exp number (402):
<http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0505720401&expflag=S&expno=402&level=PPS>

Retrieve all specific file type (ATTSR files) for a given observation:
<http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0505720401&name=ATTSR&level=PPS>

Retrieve proprietary data, in this case an ODF (where PPPPPPOOOO is the proprietary Observation ID, and replace <username> and <pwd> by the privileged user/password):
<http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=PPPPPPOOOO&level=ODF&AIUSER=<username>&AIOPWD=<pwd>>

Download all files for a given observation:

```
curl -o files.tar "http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0144090201"
```

Download all files for a given instrument (M1):

```
curl -o files.tar "http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0144090201&instname=M1"
```

Download all specific file type (ATTSR files) for a given observation:

```
curl -o files.tar "http://nxsa.esac.esa.int/nxsa-sl/servlet/data-action-aio?obsno=0505720401&name=ATTSR&level=PPS"
```

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TAP queries to XSA


TAP QUERIES TO THE XSA DATABASE

1. INTRODUCTION
2. XSA TAP via TOPCAT
3. XSA TAP via COMMAND LINE

1. INTRODUCTION


The XSA database content, including catalogues, can be queried via the Table Access Protocol (TAP) (see: <http://www.ivoa.net/documents/TAP/> .

The default query language for TAP is ADQL (Astronomical Data Query Language, (see <http://www.ivoa.net/documents/latest/ADQL.html> ), which includes most features of SQL plus some spatial search functions.

TAP service can process synchronous (immediate) or asynchronous (batch job) queries (see: [XSA User Guide](#) .

XSA TAP can be accessed via TOPCAT or by command line.

2. USING XSA TAP VIA TOPCAT

1. Run TOPCAT in your local environment. If you have Java's WebStart installed, you can install and invoke TOPCAT in one click from: <http://www.star.bris.ac.uk/~mbt/topcat/topcat-full.jnlp> 
2. Go to the top menu of TOPCAT and select "VO" and there select "Table Access Protocol (TAP) query".
3. In "Select Service", under "TAP Parameters", introduce the following TAP URL:

```
http://nxsa.esac.esa.int/tap-server/tap
```

and click on "Use Service".

4. In the left side of the Metadata panel select the Tables to be queried.
5. Once a table is selected click on "Columns" in the right side of the panel to get info on the table parameters that can be queried.
6. Introduce query commands in the ADQL Text panel below. The Examples provided can be edited.
7. When clicking on "Run Query" the selection is sent to the TOPCAT main panel.

TAP queries to the XSA database via TOPCAT

<http://nxsa.esac.esa.int/#tap>



TOPCAT

File Views Graphics Joins Windows VO Interop Help

Cone Search

Simple Image Access (SIA) Query

Simple Spectral Access (SSA) Query

Table Access Protocol (TAP) Query

Query remote databases using SQL-like

GAVO Millennium Run Query

BaSTI Data Loader

CDS Upload X-Match

Multicone

Multiple SIA

Multiple SSA

Table List

2: VII_258_vv10

103 / 910 M

Table Access Protocol (TAP) Query

Window TAP Edit Interop Help

Select Service Use Service Resume Job Running Jobs

Metadata

Find:

Name Descr Or

Service	Schema	Table	Columns	FKeys	Hints
ep_dec	public	ep_dec	DOUBLE		
ep_flag	public	ep_flag	CHAR		
ep_hr1	public	ep_hr1	DOUBLE		
ep_hr1_err	public	ep_hr1_err	DOUBLE		
ep_hr2	public	ep_hr2	DOUBLE		
ep_hr2_err	public	ep_hr2_err	DOUBLE		
ep_hr3	public	ep_hr3	DOUBLE		
ep_hr3_err	public	ep_hr3_err	DOUBLE		
ep_hr4	public	ep_hr4	DOUBLE		
ep_hr4_err	public	ep_hr4_err	DOUBLE		
epic_source_equatorial_spoint	public	epic_source_equatorial_spoint	VARCHAR		
epic_source_fov_scircle	public	epic_source_fov_scircle	VARCHAR		
epic_source_galactic_spoint	public	epic_source_galactic_spoint	VARCHAR		
epic_source_oid	public	epic_source_oid	INTEGER		
ep_tot	public	ep_tot	DOUBLE		
ep_tot_err	public	ep_tot_err	DOUBLE		
ep_tot_flux	public	ep_tot_flux	DOUBLE		
ep_tot_flux_err	public	ep_tot_flux_err	DOUBLE		
l1	public	l1	DOUBLE		
m1_cts	public	m1_cts	DOUBLE		
m1_tot	public	m1_tot	DOUBLE		
m1_tot_flux	public	m1_tot_flux	DOUBLE		
m2_cts	public	m2_cts	DOUBLE		
m2_tot	public	m2_tot	DOUBLE		
m2_tot_flux	public	m2_tot_flux	DOUBLE		
pn_cts	public	pn_cts	DOUBLE		

Service Capabilities

Query Language: ADQL-2.0 Max Rows:

ADQL Text

Mode: Synchronous

```
1
SELECT
TOP 1000
ra, dec, ep_tot_flux
FROM v_epic_source
```

Table List

2: VII_258_vv10

8: TAP_1.v_epic_source

124 / 910 M

Current Table Properties

Label: VII_258_vv10

Location: VII_258_vv10

Name: VII/258/vv10

Rows: 168,940

Columns: 16

Sort Order:

Row Subset: All

Activation Action: (no action) Broadcast Row

SAMP

Messages:

Clients:

Run Query

TAP command line queries to the XSA database

<http://nxsa.esac.esa.int/#tap>



TAP queries to XSA

TAP QUERIES TO THE XSA DATABASE

- 1. INTRODUCTION
- 2. XSA TAP via TOPCAT
- 3. XSA TAP via COMMAND LINE

3. USING XSA TAP VIA COMMAND LINE

The structure of a TAP query depends on whether the query is synchronous or asynchronous. For both cases the main query parameters are REQUEST, LANG, QUERY, FORMAT and UPLOAD (for table upload).

1. Getting all public tables:

```
curl "http://nxsa.esac.esa.int/tap-server/tap/tables"
```

2. Synchronous queries.

Examples:

- Search observations that intersect with a given circle, and in a range of revolutions:

```
curl -o file.csv "http://nxsa.esac.esa.int/tap-server/tap/sync?REQUEST=doQuery&LANG=ADQL&FORMAT=csv&QUERY=SELECT+top+10+ra_nom,dec_nom,observation_id,revolution+FROM+v_observation+WHERE+1=intersects(observation_fov_scircle,circle('ICRS',10.3,41.5,0.1))+AND+revolution>1000"
```

(watchout: the circle is defined as RA, DEC, radius, all in decimal degrees but in the results ra_nom is given in decimal hours, dec_nom in decimal degrees)

- Search 3XMM catalogue sources in a circle of radius 1 deg. around the galactic center and order them by Total Flux:

```
curl -o file.vot "http://nxsa.esac.esa.int/tap-server/tap/sync?REQUEST=doQuery&LANG=ADQL&FORMAT=votable&QUERY=SELECT+ra,dec,src_num,observation_id+FROM+v_epic_source_cat+WHERE+1=contains(epic_source_cat_equatorial_spout,circle('ICRS',266.41683,-29.0078055556,1))+ORDER+BY+ep_8_flux+DESC"
```

3. Asynchronous queries.

Example:

Search sources of the 3XMM catalogue within the given circle, order results by Total Flux.

```
curl -i -X POST --data "PHASE=run&LANG=ADQL&REQUEST=doQuery&QUERY=SELECT+ra,dec,src_num,observation_id+FROM+v_epic_source_cat+WHERE+1=contains(epic_source_cat_equatorial_spout,circle('ICRS',266.41683,-29.0078055556,1))+ORDER+BY+ep_8_flux+DESC" "http://nxsa.esac.esa.int/tap-server/tap/async"
```

The response will contain the URL of the job running at server side (see Location header):

```
HTTP/1.1 303 See Other
Date: Tue, 19 Apr 2016 09:20:34 GMT
Server: Apache-Coyote/1.1
Location: http://nxsa.esac.esa.int/tap-server/tap/async/1461057634887D
Content-Type: text/plain
Transfer-Encoding: chunked
```

To obtain the status of the running job run:

```
curl "http://nxsa.esac.esa.int/tap-server/tap/async/1461057634887D"
```


XSA integration into the ESASky

- **ESASky**: is a service and a visual interface for multi-wavelength data access:
 - Developed at ESAC with local (footprints, etc) and CDS (HIPS, Aladin-Lite) technology, and in collaboration with missions scientists.
 - Provides visually driven access to science-ready data for HST, Herschel, Planck, etc.
 - Has detailed footprints for the missions integrated.
 - Provides direct access to each mission archive for detailed queries and data download.
- **XMM-Newton data** were the first to be included in **ESASky**, followed by other ESA and non-ESA missions data.



- **ESASky v1.0** released this week for this conference → <http://sky.esa.int>
- **ESASky v2.0** (early 2017): **Spectral** hips (XMM-Newton, IUE, radio)
- **ESASky v3.0** (early 2018): **Time** domain for multi-wavelength variability studies

XSA integrated into ESASky



archives.esac.esa.int/esasky-release-candidate/

J2000 10 01 53.741 +69 59 55.14

Sky:XMM-Newton UV color

Select sky
Ultraviolet XMM-Newton UV color Native

m82

Data Panel XMM-Newton#1 3XMM EPIC XMM OM#1

Imaging Observations

Observation Type	# results
X-Ray	~10 ¹
UV	~10 ¹
Visible	~10 ³
IR/Radio	~10 ¹

- SUZAKU
- XMM-Newton
- XMM-OM(UV)
- XMM-OM(Optical)
- HST
- ISO
- Herschel

Source Catalogues

Source Catalogue	# results
Gamma	~10 ⁰
X-Ray	~10 ²
UV	~10 ²
Visible	~10 ³
IR/Radio	~10 ¹

- INTEGRAL
- XMM Slew
- 3XMM EPIC
- XMM OM
- Hipparcos-2
- Tycho-2
- HSC

Click on histograms bars to start retrieving metadata.

Close data panel

FoV: 1.04°

See poster B#01 & Demo by D. Baines et al.!

Short term plan

- For a list of targets searched, identify the results corresponding to each of them (**next release!**).
- On-the fly data analysis.
- Integration of the Upper limit tool into XSA.
- EPIC and RGS spectra visualizer. Integration of BiRD in XSA.
- Flag observations simultaneous with other missions/observatories.

Long term plan

- Source identifications in images from list (PPS sources, catalogue, etc).
- Queries "a la google" (full text).
- Search/display moving (solar) objects observations (via ESASky).
- *Access from the XSA interface to new external applications and tools.*

----> **FEEDBACK/SUGGESTIONS?**

xmmhelp@sciops.esa.int