The VO and CDS services & tools

Ada Nebot & the CDS team

Transient sky in 2020

CENTRE DE DONNÉES
ASTRONOMIQUES DE STRASBOURG

Outline

- The Virtual Observatory and the IVOA
  - Time Domain is a science priority
  - VOEvents
- The CDS
  - Simbad
  - VizieR
  - Aladin

The Virtual Observatory

Astronomical data and archives are heterogeneous

homogenisation

definition of standards

"*The Virtual Observatory (VO) is the vision that astronomical datasets and other resources should work as a seamless whole.*"

International Virtual Observatory Alliance

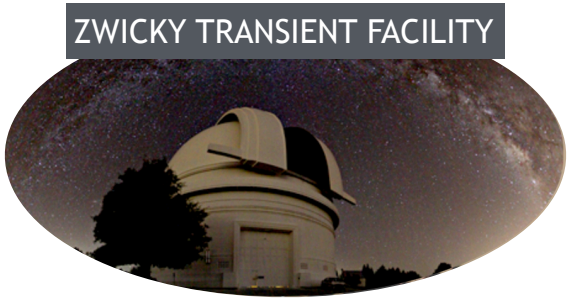
Goal: Easy and efficient access and analysis of the information hosted in astronomical archives.

To keep in mind

- VO: Federation of data centres sharing data through a common set of standards.
- VO tools:
  - Not a “does-it-all” software
  - Different tools for different problems
  - VO science: A reality since 5-10 years ago.
- What is VO for?
  - For programmers, for data centres, for astronomers, for big data projects.
  - For educators, amateurs, general public.

Time Domain is a priority for the IVOA

- Lots of missions specifically designed for Time Domain Astronomy:



- **Transient phenomena** >> follow-up >> Connect events/facilities/people.
  ➡**VOEvent** developed to facilitate transmission
- **Time Series** — collecting science cases from the astro-community. Send us yours!

VOEvents

- **Transient phenomena** >> follow-up >> Connect events/facilities/people.

  ➡**VOEvent** developed to facilitate transmission:

  - **Who**: Identification of scientifically responsible Author
  - **What**: Event Characterization modeled by the Author
  - **WhereWhen**: Space-Time Coordinates of the event
  - **How**: Instrument Configuration
  - **Why**: Initial Scientific Assessment
  - **Citations**: Follow-up Observations
  - **Description**: Human Oriented Content
  - **Reference**: External Content

VOEvent network architecture

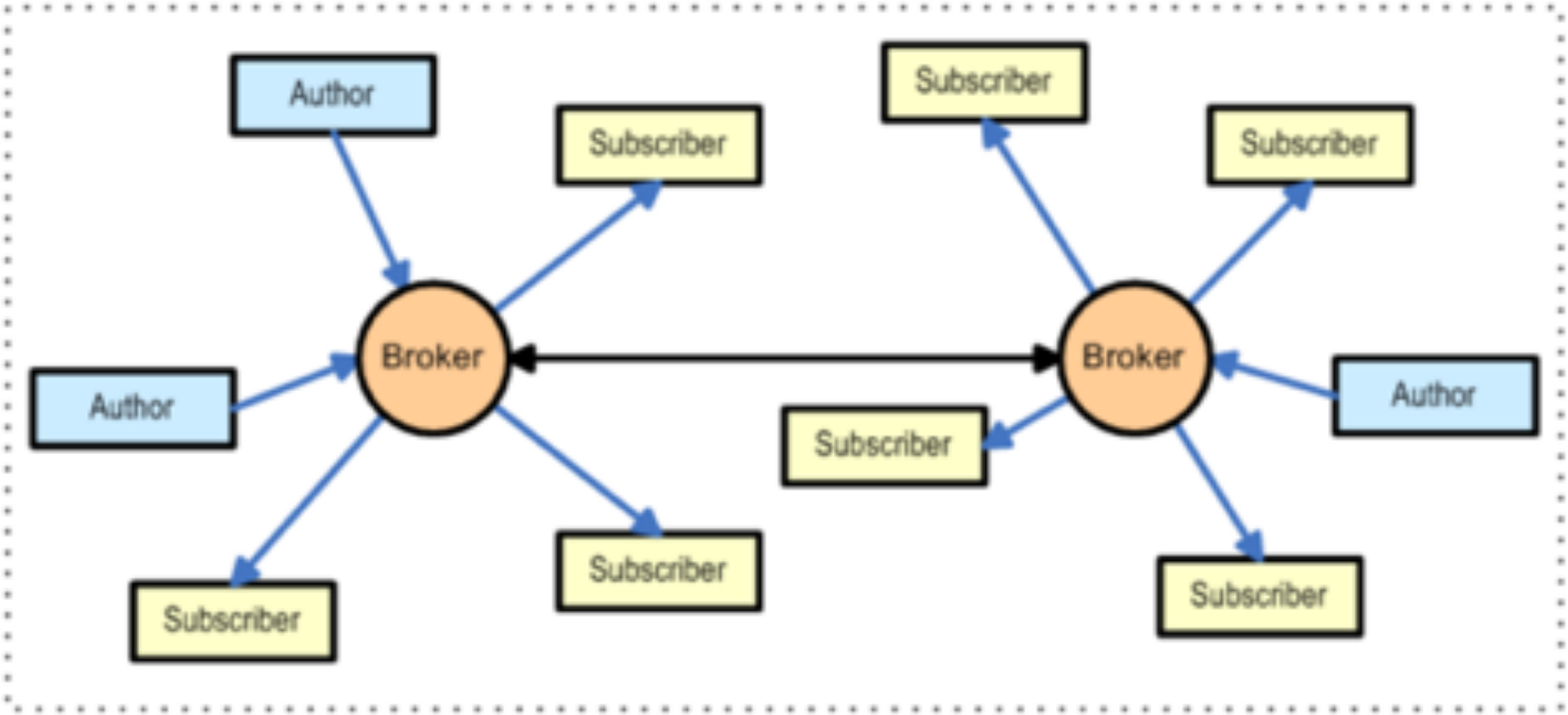
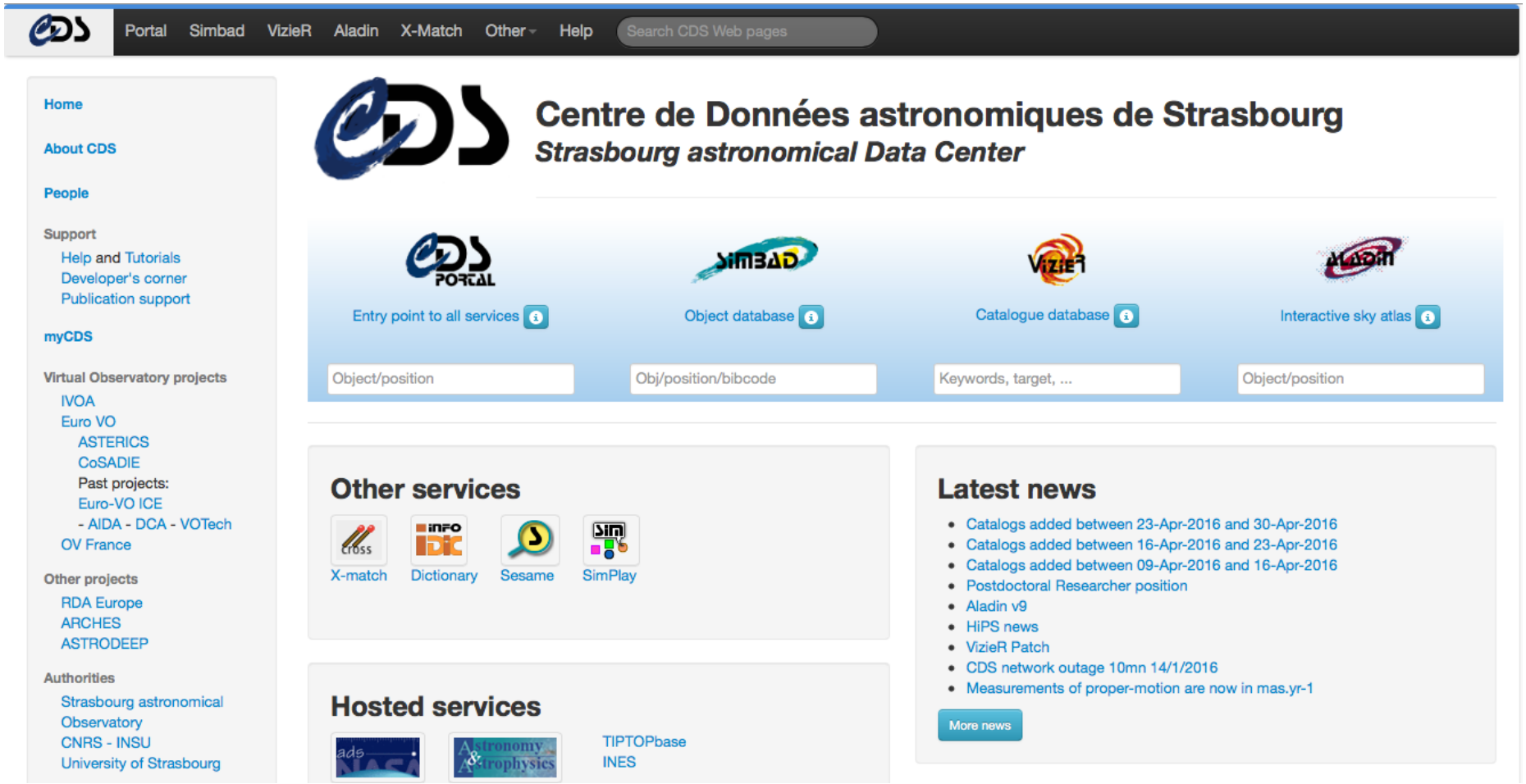


Figure 1. VOEvent network architecture showing node roles

VOEvent tools

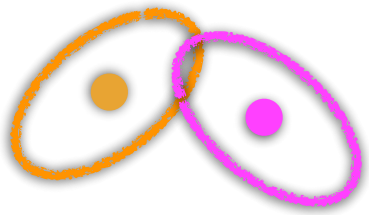
- There are tools for…
  - **Generating, Reading and Manipulating VOEvents:**
    - VOEventLib
    - voevent-parse
  - **Working with the VOEvent Transport Protocol:**
    - The Dakota VOEvent Tools
    - Comet
    - PyGCN
  - **VOEvent Databases:** voeventdb

CDS



http://cds.u-strasbg.fr

CDS services



- Astronomical Objects : IDs, bibliography, measurements
- Catalogue Service : Catalogues, published tables, observation logs, surveys, associated data
- Visualisation and integration : images, catalogues, archives, VO portal, All-sky capabilities
- X-Match : Catalogue cross-match

Simbad

Portal | Simbad | VizieR | Aladin | X-Match | Other | Help

M31

other query modes : Identifier query | Coordinate query | Criteria query | Reference query | Basic query | Script submission | TAP | Output options | Help

Query : M31

C.D.S. - SIMBAD4 rel 1.3 - 2015.12.14CET22:29:12

Available data : Basic data • Identifiers • Plot & images • Bibliography • Measurements • External archives • Notes • Annotations

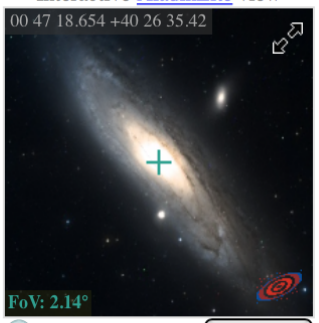
Basic data :

M 31 -- Galaxy

Other object types:	**LIN** (),**G** (Ref,LEDA,2MASX,MCG,UGC,UZC,Z,[M98c]),**QSO** (Ref,[VV2006],[VV2010]),**AGN** ([VV2000c],[VV2003c],[VV98c]),**Rad** (2C,DA,[DGW65]),**IR** (IRAS,IRC,RAFGL),**GiC** (GIN),**GiG** (K79),**X** (XSS)
ICRS coord. *(ep=J2000) :*	**00 42 44.330 +41 16 07.50 (Infrared) [ ] B** 2006AJ....131.1163S
FK5 coord. *(ep=J2000 eq=2000) :*	**00 42 44.330 +41 16 07.50 [ ]**
FK4 coord. *(ep=B1950 eq=1950) :*	**00 40 00.09 +40 59 41.7 [ ]**
Gal coord. *(ep=J2000) :*	**121.1743 -21.5733 [ ]**
Radial velocity / Redshift / cz :	**V(km/s) -300.0 [4.0] /** z(spectroscopic) -0.001000 [0.000013] / cz -299.85 [4.00] **(~) C** 2012AJ....144....4M
Morphological type:	**SA(s)b D** 2013AJ....146...67B
Angular size (arcmin):	**129 25 45 (~) (~) C ~**
Fluxes (6) :	**U 4.86 [0.03] D** 2007ApJS..173..185G **B 4.36 [0.02] D** 2007ApJS..173..185G **V 3.44 [0.03] D** 2007ApJS..173..185G **J 2.094 [0.016] C** 2006AJ....131.1163S **H 1.283 [0.017] C** 2006AJ....131.1163S **K 0.984 [0.017] C** 2006AJ....131.1163S

SIMBAD query around with radius 2 arcmin

Interactive AladinLite view



VizieR photometry viewer

Search within radius Max 30 arcsec

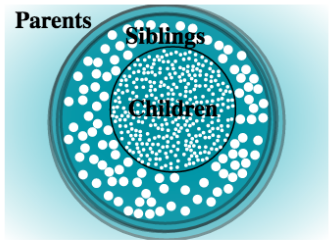
Simbad

notes:

- See GALEX UV data in GALEX data

Hierarchy : number of linked objects
whatever the membership probability is (see description here) :

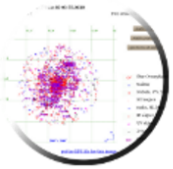
parents : 3 children : 10318 siblings : 102 Display criteria : All



Identifiers (30) :

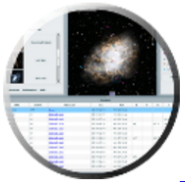
M 31
2C 56
DA 21
GIN 801
IRAS F00400+4059
IRAS 00400+4059
IRC +40013
K79 1C
LEDA 2557
2MASX J00424433+4116074
2MAXI J0043+412
MCG+07-02-016
NAME ANDROMEDA Nebula
NAME AND Nebula
NAME ANDROMEDA
NAME ANDROMEDA Galaxy
NGC 224
RAFGL 104
UGC 454
UZC J004244.3+411608
XSS J00425+4102
Z 535-17
Z 0040.0+4100
[DGW65] 4
[M98c] 004000.1+405943
[VV2000c] J004244.3+411610
[VV2003c] J004244.3+411610
[VV2006] J004244.3+411610
[VV2010] J004244.3+411610
[VV98c] J004245.1+411622

Plots and Images


plot

radius 10 arcmin

CDS portal


CDS Simplay
(requires flash)

Aladin applet

Simbad

References (9034 between 1850 and 2016)
Simbad bibliographic survey began in 1950 for stars (at least bright stars) and in 1983 for all other objects (outside the solar system).
Follow new references on this object

sort references
display reference summary
from: 1850 to: $currentYear

Sort reference summaries by : (not exhaustive, explanation here)

Date | Title|Abstract|Keyword | In table | Score

Measurements (11 types) :

distance : 7 | IRAS : 1 | IRC : 1 | ISO : 156 | IUE : 13 | posa : 1 | RVel : 4 | velocities : 7 | XMM : 22 | z : 1 | ze : 1

display selected measurements | display all measurements | clear

External archives :

Archive data at HEASARC - High-Energy Astrophysics Science Archive Research Center

Data at NED - NASA/IPAC Extragalactic Database : M31

Link by name to the catalogue in VizieR :

IRAS F00400+4059 | IRAS 00400+4059 | IRC +40013 | 2MASX J00424433+4116074 | NGC 224
RAFGL 104 | UGC 454

Search by coordinates in Vizier (radius: 30 arcsec)

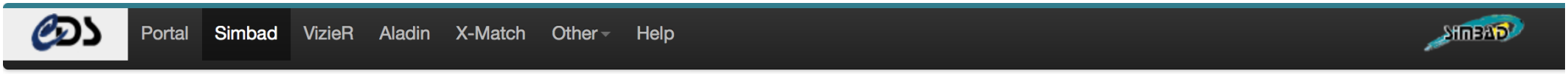
Annotations :
Annotations allow a user to add a note or report an error concerning the astronomical object and its data. It requires registration to post a note. See description .
The list of all annotations to SIMBAD objects can be found here .

Currently no annotations available

add an annotation to this object

report an error concerning the data of this object

Simbad: TAP



Simbad: TAP Service

Refreshing...

Execution options

Query name: Example 1

Format: Text

Max records: 1000

Batch mode

Check before start

Upload(0)

TAP resources

Help

- What is TAP ?
- ADQL cheat sheet
- Simbad tables

More links

ADQL QUERY TO EXECUTE *(or choose an example:* Get object by identifier *)*

```
-- Basic data from an object given one of its identifiers.
SELECT basic.OID,
       RA,
       DEC,
       main_id AS "Main identifier",
       coo_bibcode AS "Coord Reference",
       nbref AS "NbReferences",
       plx_value as "Parallax",
       rvz_radvel as "Radial velocity",
       galdim_majaxis,
       galdim_minaxis,
       galdim_angle AS "Galaxy ellipse angle"
FROM basic JOIN ident ON oidref = oid
WHERE id = 'm13';
```

Check !

Start ! Clear

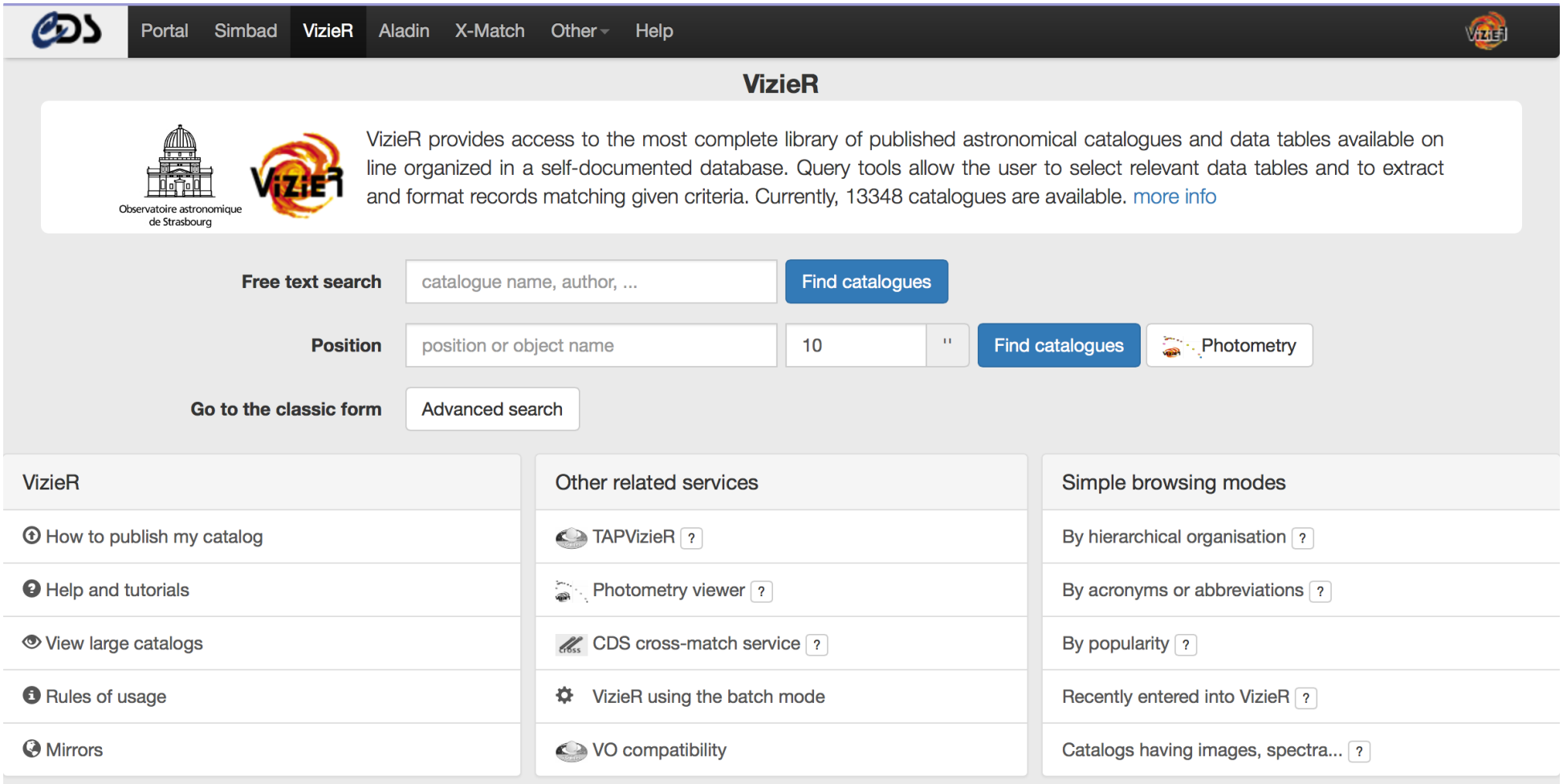
LIST OF YOUR TAP BATCH QUERIES

VizieR

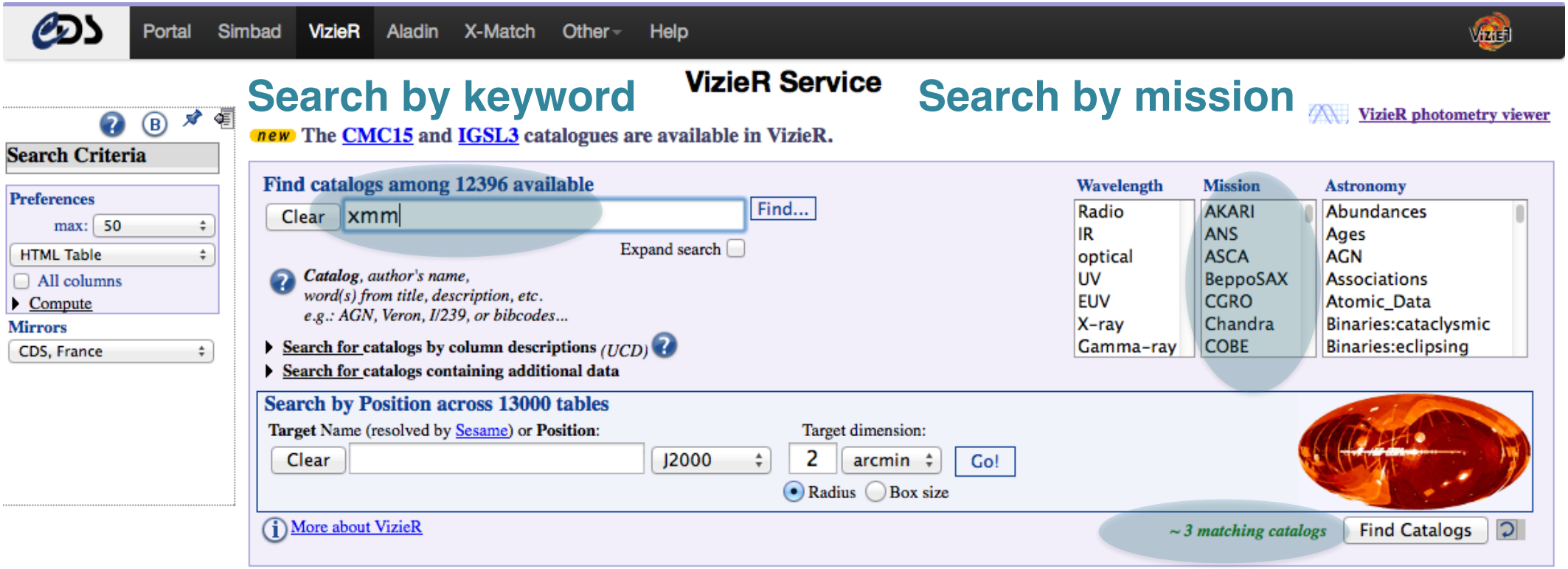
Catalogues, published tables, observation logs, surveys, **associated data**

- Heterogeneous tables described by standardised metadata
- Curated by professional ‘documentalists’
- Cooperation with major journals
- Added value - interoperability, usability, services
  - e.g. X-Match, visualisation, complex queries

VizieR renewed interface



VizieR



Browsing modes: Designation, Acronyms, Favorites, Dates, Image,spectra, Kohonen
Or list the large surveys

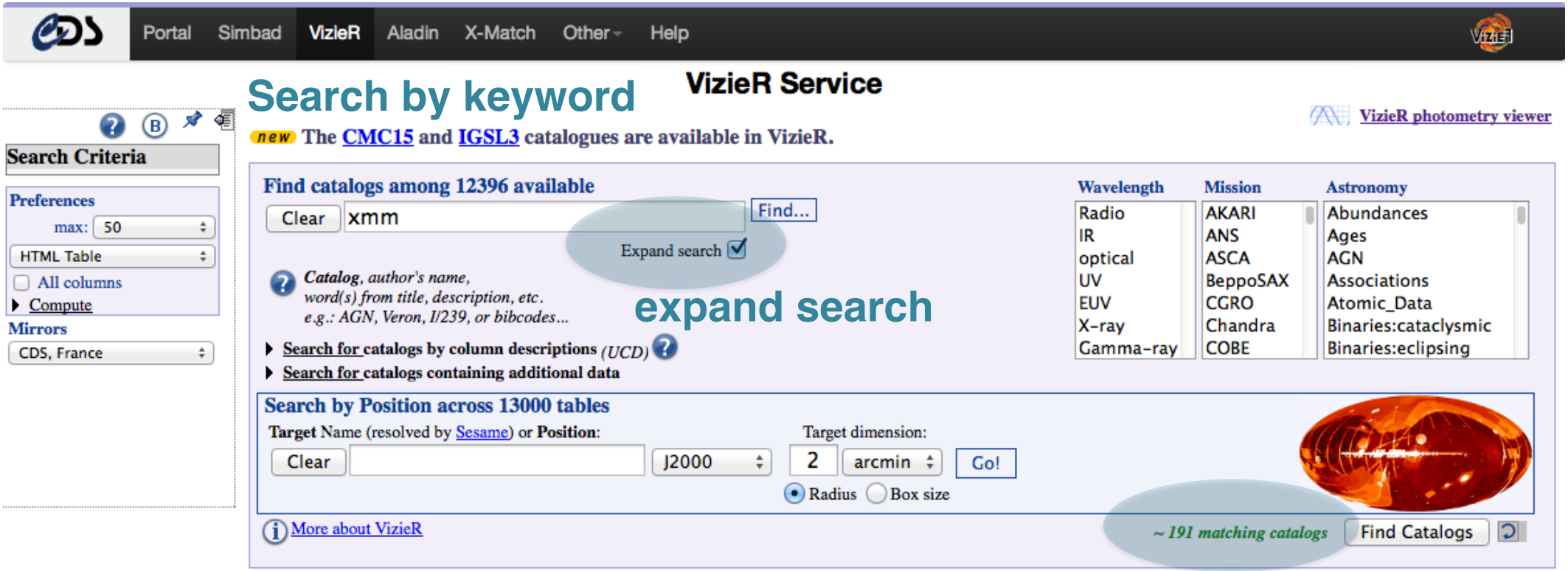
Tools related to VizieR

- new **Photometry viewer** : Plot photometry (sed) including all VizieR
- **TAP VizieR** : query VizieR using ADQL (a SQL extension dedicated for astronomy)
- **CDS cross-match service** : fast cross-identification between any 2 tables, including VizieR catalogues, SIMBAD

→ Thanks for acknowledging the VizieR Service

© UDS/CNRS
Contact

VizieR


Portal
Simbad
VizieR
Aladin
X-Match
Other
Help
Search by keyword
VizieR Service
VizieR photometry viewer
new The CMC15 and IGSL3 catalogues are available in VizieR.
Search Criteria
Preferences
max: 50
HTML Table
All columns
Compute
Mirrors
CDS, France
Find catalogs among 12396 available
Clear
xmm
Find...
Expand search
Catalog, author's name,
word(s) from title, description, etc.
e.g.: AGN, Veron, I/239, or bibcodes...
expand search
Search for catalogs by column descriptions (UCD)
Search for catalogs containing additional data
Wavelength
Radio
IR
optical
UV
EUV
X-ray
Gamma-ray
Mission
AKARI
ANS
ASCA
BeppoSAX
CGRO
Chandra
COBE
Astronomy
Abundances
Ages
AGN
Associations
Atomic_Data
Binaries:cataclysmic
Binaries:eclipsing
Search by Position across 13000 tables
Target Name (resolved by Sesame) or Position:
Clear
J2000
Target dimension:
2
arcmin
Go!
Radius
Box size
More about VizieR
~ 191 matching catalogs
Find Catalogs
Browsing modes: Designation, Acronyms, Favorites, Dates, Image,spectra, Kohonen
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VizieR

list of catalogues and tables available

Portal | Simbad | VizieR | Aladin | X-Match | Other | Help

Catalog Selection Page

source density maps

Search Criteria

Keywords: xmm

Tables: Add

..xmm1cros
IX/41
..xmm2ir3s
B/xmm
..xmmlog

Enlarge

Preferences: max: 50, HTML Table, All columns, Compute

Mirrors: CDS, France

new The CMC15 and IGSL3 catalogues are available in VizieR.

5 catalogs found

IX/37	XMM-Newton Serendipitous Source Catalogue (1XMM) (XMM-SSC, 2003) Detailed description and explanations are available in the User Guide of the **1XMM** Catalogue	ReadMe+ftp, Similar Catalogs
IX/37/xmm1src	(c)Sources detected in the EPIC images – see also the 1XMM Public SSC Interface at Strasbourg *(56711 rows)*	
IX/37/xmm1obs	Details of observations and processing *(585 rows)*	
IX/37/xmm1cros	Cross-correlations of XMM sources *(193258 rows)*	
IX/41	XMM-Newton Serendipitous Source Catalogue 2XMMi-DR3 (XMM-SSC, 2010) Detailed description and explanations are available in the User Guide of the **2XMMi-DR3 Catalogue**	ReadMe+ftp, Similar Catalogs
IX/41/xmm2ir3s	(c)The 2XMMi-DR3 Catalog, "slim" version *(262902 rows)*	
B/xmm	XMM-Newton Observation Log (XMM-Newton Science Operation Center, 2012)	ReadMe+ftp, image/fits, Similar Catalogs, 2002yCat....102009X
B/xmm/xmmlog	(c)The XMM-Newton Observation log (2014-06-02) *(10988 rows)*	
IX/39	The XMM-Newton 2nd Serendipitous Source Catalogue (2XMM) (XMM-SSC, 2007) This catalogue is obsoleted by IX/40	ReadMe+ftp, Similar Catalogs
IX/39/xmm2slim	(c)The 2XMM catalog, "slim" version – see also the 2XMM Public SSC Interface at Strasbourg *(191870 rows)*	
IX/40	The XMM-Newton 2nd Incremental Source Catalogue (2XMMi) (XMM-SSC, 2008) This catalogue is obsoleted by IX/41	ReadMe+ftp, Similar Catalogs
IX/40/xmm2is	(c)The 2XMMi catalog, "slim" version *(221012 rows)*	

Reset All | Query selected Tables | Join selected Tables | ALL

(c) indicates tables which contain celestial coordinates

→ Thanks for acknowledging the VizieR Service

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Contact

VizieR

query on columns or in combinations of columns

Portal | Simbad | VizieR | Aladin | X-Match | Other | Help

VizieR Search Page

Search Criteria

Save in CDSportal

Keywords — Back

- IX/41/xmm2ir3s

Tables — Add

IX/41
..xmm2ir3s

Choose

Preferences

max: 50

HTML Table

All columns

Compute

- Distance ϱ
- Position angle θ
- Distance (x,y)
- Galactic
- J2000
- B1950
- Ecl. J2000
- default

Sort by Distance

+ order -

No sort

Position in:

- Sexagesimal
- Decimal °

Simple Target | List Of Targets — Fast Xmatch with large catalogs or Simbad

Target Name (resolved by Sesame) or **Position**: Clear | J2000 | Target dimension: 2 arcmin

Radius | Box size

IX/41 — XMM-Newton Serendipitous Source Catalogue 2XMMi-DR3 (XMM-SSC, 2010)
Detailed description and explanations are available in the User Guide of the **2XMMi-DR3 Catalogue**
Post annotation — ReadMe+ftp — Similar Catalogs

1.IX/41/xmm2ir3s — The 2XMMi-DR3 Catalog, "slim" version *(262902 rows)*

Simple Constraint | List Of Constraints — Submit | Reset All

Query by Constraints applied on Columns *(Output Order: + -)*

Show	Sort	Column	Clear	Constraint		Explain (UCD)
☐	○	Source				[1,263230] (SRCID) Unique source index (meta.id)
☑	○	2XMMi			(char)	(IAUNAME) Unique source name *(Note 8)* (meta.id;meta.main)
☑	○	RAJ2000			deg	(SC_RA) Mean source right ascension (ICRS) (pos.eq.ra;meta.main)
☑	○	DEJ2000			deg	(SC_DEC) Mean source declination (ICRS) (pos.eq.dec;meta.main)
☐	○	ePos			arcsec	(SC_POSERR) Mean error on position (stat.error)
☑	○	srcML				(SC_DET_ML) Source detection likelihood (Sources with likelihood<8 may be spurious) *(Note 2)* (stat.likelihood;instr.saturation)
☐	○	Flux1			mW/m2	(SC_EP_1_FLUX) Mean flux in 0.2-0.5keV band (phot.flux;em.X-ray)
☐	○	e_Flux1			mW/m2	(SC_EP_1_FLUX_ERR) Mean error on Flux1 (stat.error)
☐	○	Flux2			mW/m2	(SC_EP_2_FLUX) Mean flux in 0.5-1.0keV band (phot.flux;em.X-ray)

VizieR

Portal | Simbad | VizieR | Aladin | X-Match | Other | Help

VizieR Result Page

Send to VO tools

external links

Search Criteria
Save in CDSportal
Keywords: Back
- IX/41

Tables: Add
IX/41
..xmm2ir3s
Choose

Constraints
Modify Query

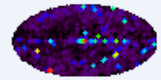
Preferences
max: 50
HTML Table
All columns
Compute
Submit

Mirrors
CDS, France

Show the target form
Show constraint information

The 2 columns in *color* are computed by VizieR, and are *not part of the original data*.

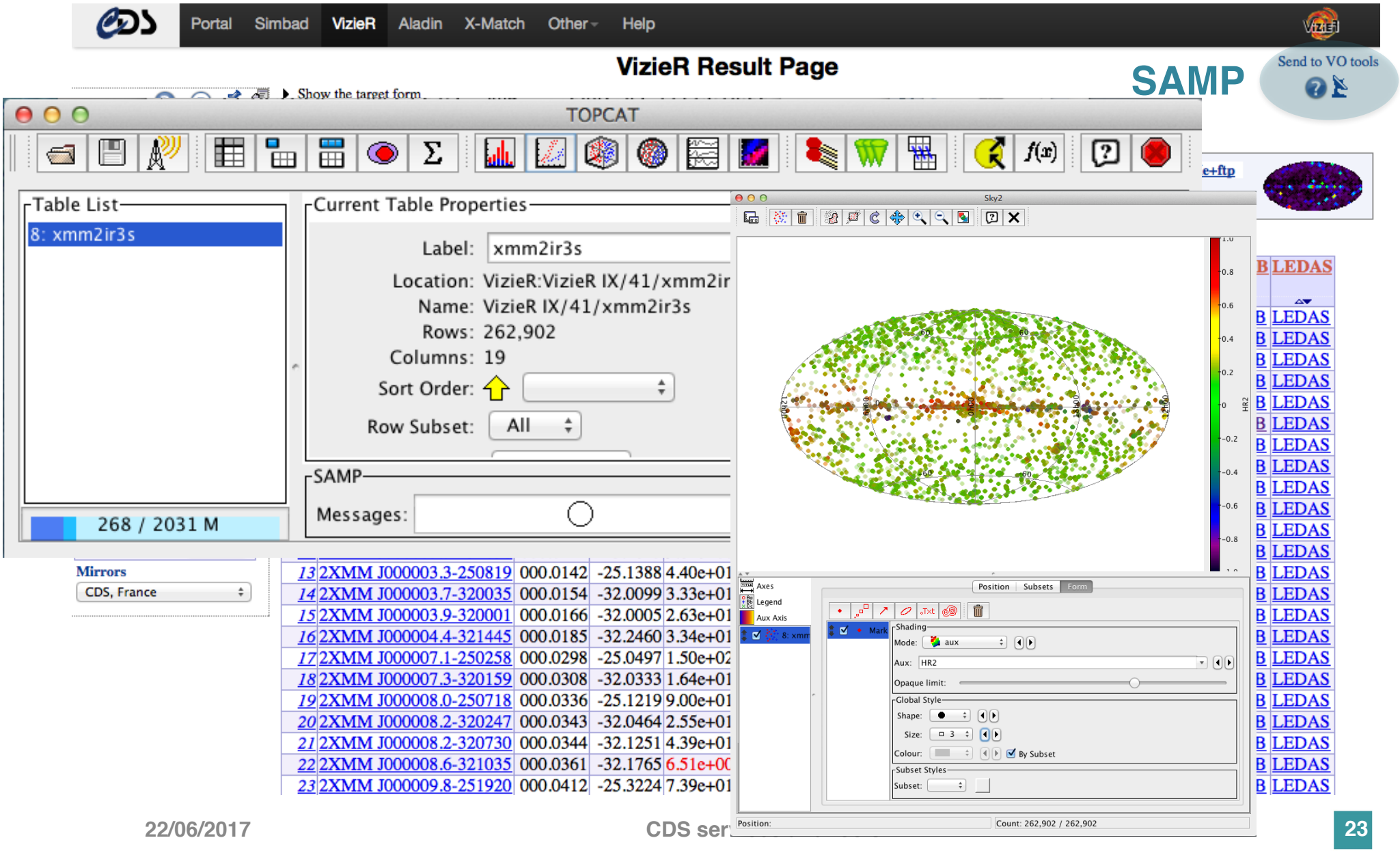
IX/41/xmm2ir3s XMM-Newton Serendipitous Source Catalogue 2XMMi-DR3 (XMM-SSC, 2010) — ReadMe+ftp
Post annotation
The 2XMMi-DR3 Catalog, "slim" version *(262902 rows)*



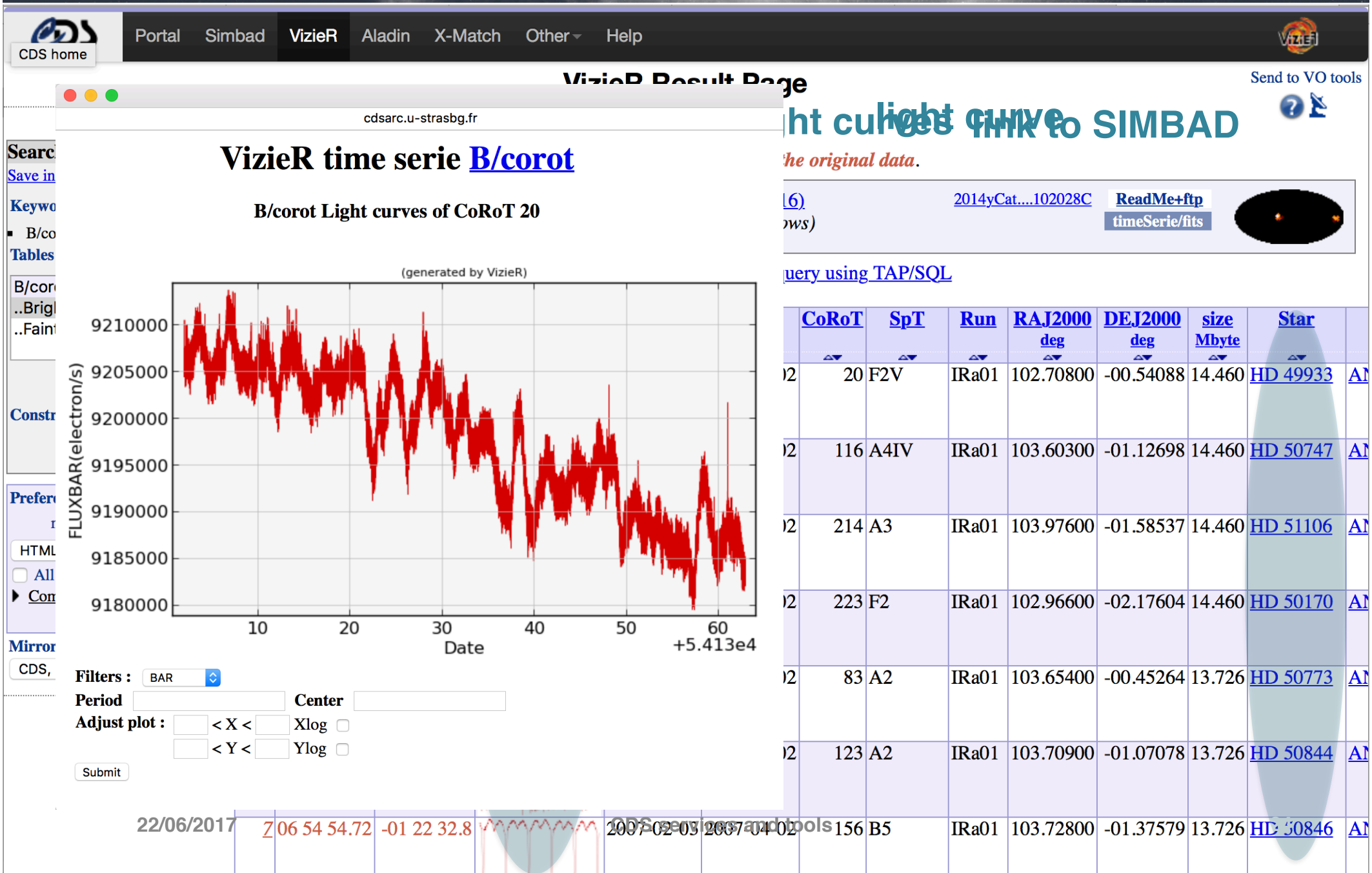
start AladinLite

Full	2XMMi	RAJ2000 deg	DEJ2000 deg	srcML	Flux8 mW/m2	e_ (...)	HR1	HR2	HR3	HR4	ext arcsec	V	S	Nd	f1	xcatDB	LEDAS
1	2XMM J000000.2-250631	000.0012	-25.1088	8.93e+00	5.4921e-15	3.24e-15	0.930	-0.360	0.018	-0.606	0.0	0	0	1	1	xcatDB	LEDAS
2	2XMM J000000.9-321353	000.0041	-32.2315	1.01e+01	6.2016e-15	3.73e-15	0.361	-0.284	-0.418	0.621	0.0	0	1	1	1	xcatDB	LEDAS
3	2XMM J000001.1-251022	000.0049	-25.1730	1.04e+01	9.0374e-15	5.57e-15	0.161	0.536	-0.346	-0.734	0.0	0	0	1	1	xcatDB	LEDAS
4	2XMM J000001.5-321311	000.0065	-32.2199	3.19e+02	1.5689e-14	1.99e-15	-0.038	-0.047	-0.338	-0.864	0.0	0	0	1	1	xcatDB	LEDAS
5	2XMM J000001.6-251706	000.0069	-25.2852	2.65e+01	1.4785e-14	1.44e-14	0.113	-0.196	0.087	-1.000	0.0	0	0	1	1	xcatDB	LEDAS
6	2XMM J000002.2-245944	000.0096	-24.9956	8.52e+00	3.8598e-15	5.20e-15	-0.104	0.359	-0.348	-0.873	0.0	0	0	1	1	xcatDB	LEDAS
7	2XMM J000002.6-321530	000.0110	-32.2586	3.24e+02	2.2391e-14	4.85e-15	0.011	-0.081	-0.486	-0.311	0.0	0	1	1	1	xcatDB	LEDAS
8	2XMM J000002.6-322201	000.0110	-32.3670	2.47e+01	6.3579e-14	7.25e-14	0.598	-0.706	-1.000	1.000	31.6	0	4	1	1	xcatDB	LEDAS
9	2XMM J000002.7-251136	000.0113	-25.1936	3.26e+02	6.6736e-14	1.17e-14	0.118	0.036	-0.238	-0.353	0.0	0	0	1	1	xcatDB	LEDAS
10	2XMM J000003.1-321404	000.0132	-32.2346	4.17e+01	2.0825e-14	8.64e-15	0.429	0.138	0.005	-0.749	11.5	0	0	1	1	xcatDB	LEDAS
11	2XMM J000003.3-251550	000.0139	-25.2641	6.84e+00	6.1700e-15	1.08e-14	0.868	0.006	-0.873	0.694	0.0	0	0	1	1	xcatDB	LEDAS
12	2XMM J000003.3-251656	000.0142	-25.2823	9.81e+00	9.3033e-15	7.18e-15	0.450	-0.646	-0.551	0.895	0.0	0	0	1	1	xcatDB	LEDAS
13	2XMM J000003.3-250819	000.0142	-25.1388	4.40e+01	1.4694e-14	6.66e-15	0.121	-0.794	0.110	-0.134	0.0	0	0	1	1	xcatDB	LEDAS
14	2XMM J000003.7-320035	000.0154	-32.0099	3.33e+01	1.7884e-14	8.27e-15	0.164	0.671	-0.034	0.167	0.0	0	0	1	1	xcatDB	LEDAS
15	2XMM J000003.9-320001	000.0166	-32.0005	2.63e+01	9.6139e-15	5.47e-15	-0.185	0.033	-0.823	0.884	0.0	0	0	1	1	xcatDB	LEDAS
16	2XMM J000004.4-321445	000.0185	-32.2460	3.34e+01	5.2527e-15	2.99e-15	0.356	-0.354	0.100	-0.290	0.0	0	0	1	1	xcatDB	LEDAS
17	2XMM J000007.1-250258	000.0298	-25.0497	1.50e+02	1.4132e-14	3.10e-15	0.120	-0.324	-0.402	-0.971	0.0	0	0	1	1	xcatDB	LEDAS
18	2XMM J000007.3-320159	000.0308	-32.0333	1.64e+01	2.3055e-14	9.46e-15	0.251	0.291	0.531	-0.244	0.0	0	0	1	1	xcatDB	LEDAS
19	2XMM J000008.0-250718	000.0336	-25.1219	9.00e+01	2.0934e-14	5.50e-15	0.431	-0.129	-0.203	-0.172	0.0	0	0	1	1	xcatDB	LEDAS
20	2XMM J000008.2-320247	000.0343	-32.0464	2.55e+01	1.1849e-14	7.38e-15	0.015	0.171	-0.665	0.968	0.0	0	0	1	1	xcatDB	LEDAS
21	2XMM J000008.2-320730	000.0344	-32.1251	4.39e+01	1.0974e-14	4.53e-15	0.711	0.643	-0.251	-0.361	0.0	0	0	1	1	xcatDB	LEDAS
22	2XMM J000008.6-321035	000.0361	-32.1765	6.51e+00	1.8824e-15	1.63e-15	0.467	0.376	-0.867	0.558	0.0	0	0	1	1	xcatDB	LEDAS
23	2XMM J000009.8-251920	000.0412	-25.3224	7.39e+01	2.9028e-14	1.68e-14	0.318	-0.795	0.145	0.358	0.0	0	0	1	1	xcatDB	LEDAS

VizieR

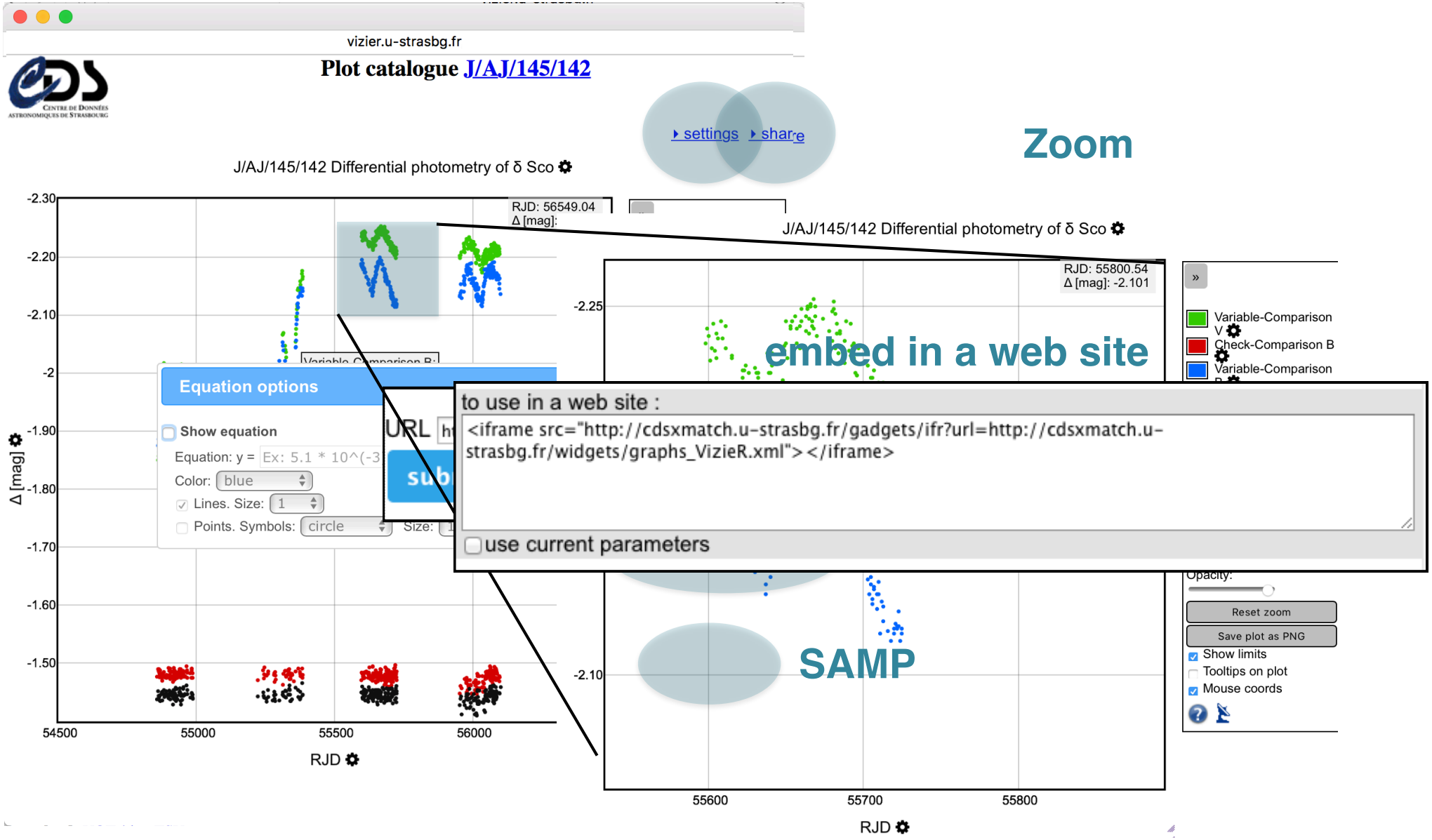

Portal
Simbad
VizieR
Aladin
X-Match
Other
Help
VizieR Result Page
SAMP
Send to VO tools
Show the target form
TOPCAT
Table List
8: xmm2ir3s
268 / 2031 M
Current Table Properties
Label: xmm2ir3s
Location: VizieR:VizieR IX/41/xmm2ir
Name: VizieR IX/41/xmm2ir3s
Rows: 262,902
Columns: 19
Sort Order:
Row Subset: All
SAMP
Messages:
Sky2
Mirrors
CDS, France
13 2XMM J000003.3-250819 000.0142 -25.1388 4.40e+01
14 2XMM J000003.7-320035 000.0154 -32.0099 3.33e+01
15 2XMM J000003.9-320001 000.0166 -32.0005 2.63e+01
16 2XMM J000004.4-321445 000.0185 -32.2460 3.34e+01
17 2XMM J000007.1-250258 000.0298 -25.0497 1.50e+02
18 2XMM J000007.3-320159 000.0308 -32.0333 1.64e+01
19 2XMM J000008.0-250718 000.0336 -25.1219 9.00e+01
20 2XMM J000008.2-320247 000.0343 -32.0464 2.55e+01
21 2XMM J000008.2-320730 000.0344 -32.1251 4.39e+01
22 2XMM J000008.6-321035 000.0361 -32.1765 6.51e+00
23 2XMM J000009.8-251920 000.0412 -25.3224 7.39e+01
LEDAS

VizieR



CDS home
Portal
Simbad
VizieR
Aladin
X-Match
Other
Help
VizieR Result Page
Send to VO tools
light curve
link to SIMBAD
cdsarc.u-strasbg.fr
VizieR time serie B/corot
B/corot Light curves of CoRoT 20
(generated by VizieR)
FLUXBAR(electron/s)
9210000
9205000
9200000
9195000
9190000
9185000
9180000
10
20
30
40
50
60
Date
+5.413e4
Filters : BAR
Period
Center
Adjust plot : < X < Xlog
< Y < Ylog
Submit
2014yCat....102028C
ReadMe+ftp
timeSerie/fits
query using TAP/SQL
CoRoT
SpT
Run
RAJ2000 deg
DEJ2000 deg
size Mbyte
Star
20 F2V IRa01 102.70800 -00.54088 14.460 HD 49933
116 A4IV IRa01 103.60300 -01.12698 14.460 HD 50747
214 A3 IRa01 103.97600 -01.58537 14.460 HD 51106
223 F2 IRa01 102.96600 -02.17604 14.460 HD 50170
83 A2 IRa01 103.65400 -00.45264 13.726 HD 50773
123 A2 IRa01 103.70900 -01.07078 13.726 HD 50844
7 06 54 54.72 -01 22 32.8
2007-02-03 2007-04-02 156 B5 IRa01 103.72800 -01.37579 13.726 HD 50846

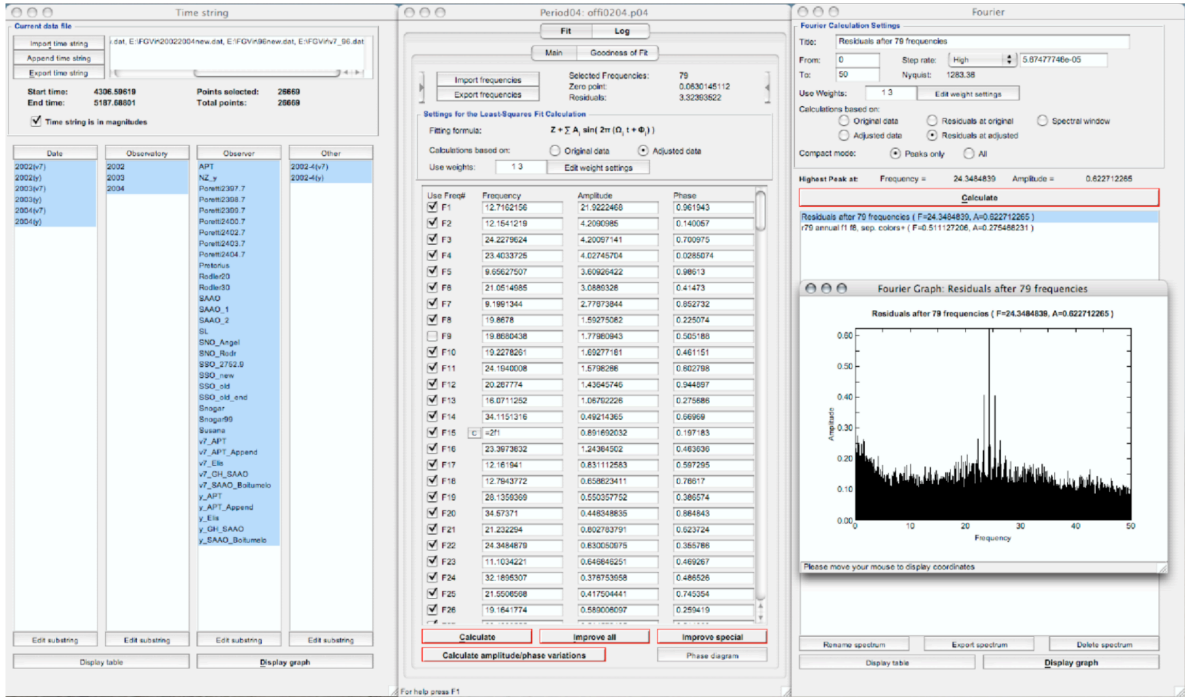
Widget


vizier.u-strasbg.fr
Plot catalogue J/AJ/145/142
settings
share
Zoom
J/AJ/145/142 Differential photometry of δ Sco
RJD: 56549.04
Δ [mag]:
Equation options
Show equation
Equation: y =
Color: blue
Lines. Size: 1
Points. Symbols: circle
Size:
URL
sub
Δ [mag]
RJD
54500
55000
55500
56000
-2.30
-2.20
-2.10
-2
-1.90
-1.80
-1.70
-1.60
-1.50
embed in a web site
to use in a web site :
<iframe src="http://cdsxmatch.u-strasbg.fr/gadgets/ifr?url=http://cdsxmatch.u-strasbg.fr/widgets/graphs_VizieR.xml"></iframe>
use current parameters
RJD: 55800.54
Δ [mag]: -2.101
-2.25
-2.10
55600
55700
55800
SAMP
Variable-Comparison V
Check-Comparison B
Variable-Comparison
Opacity:
Reset zoom
Save plot as PNG
Show limits
Tooltips on plot
Mouse coords

Further visualisation & analysis

Send data through SAMP to other VO tools

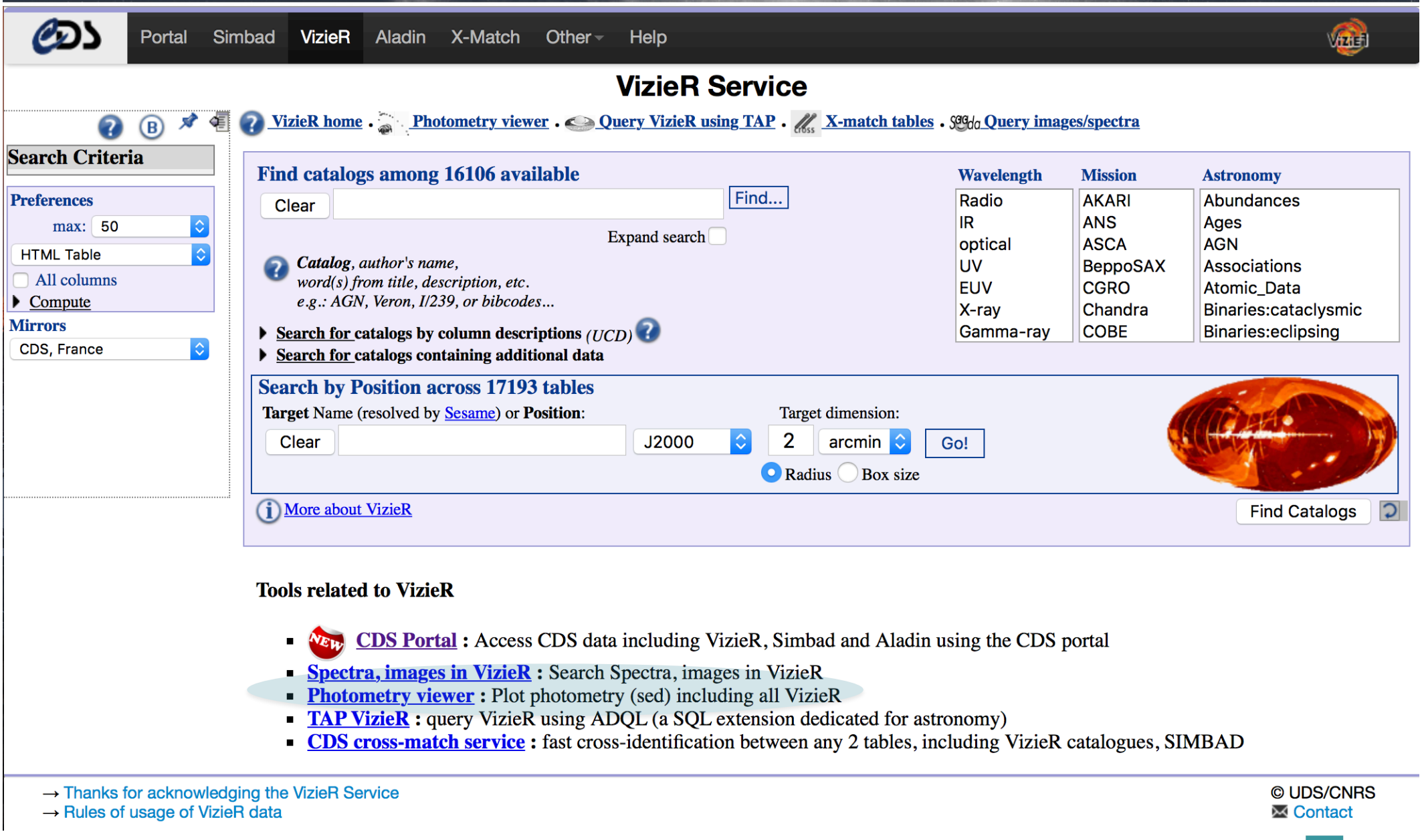
- Period04 for further analysis



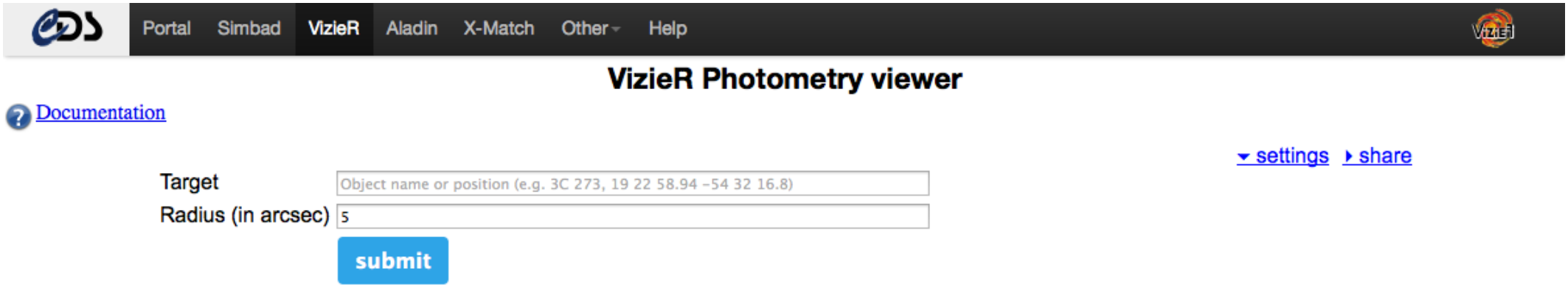
- TOPCAT (time plot option for time series and spectrograms)

- SPLAT

VizieR Photometric viewer

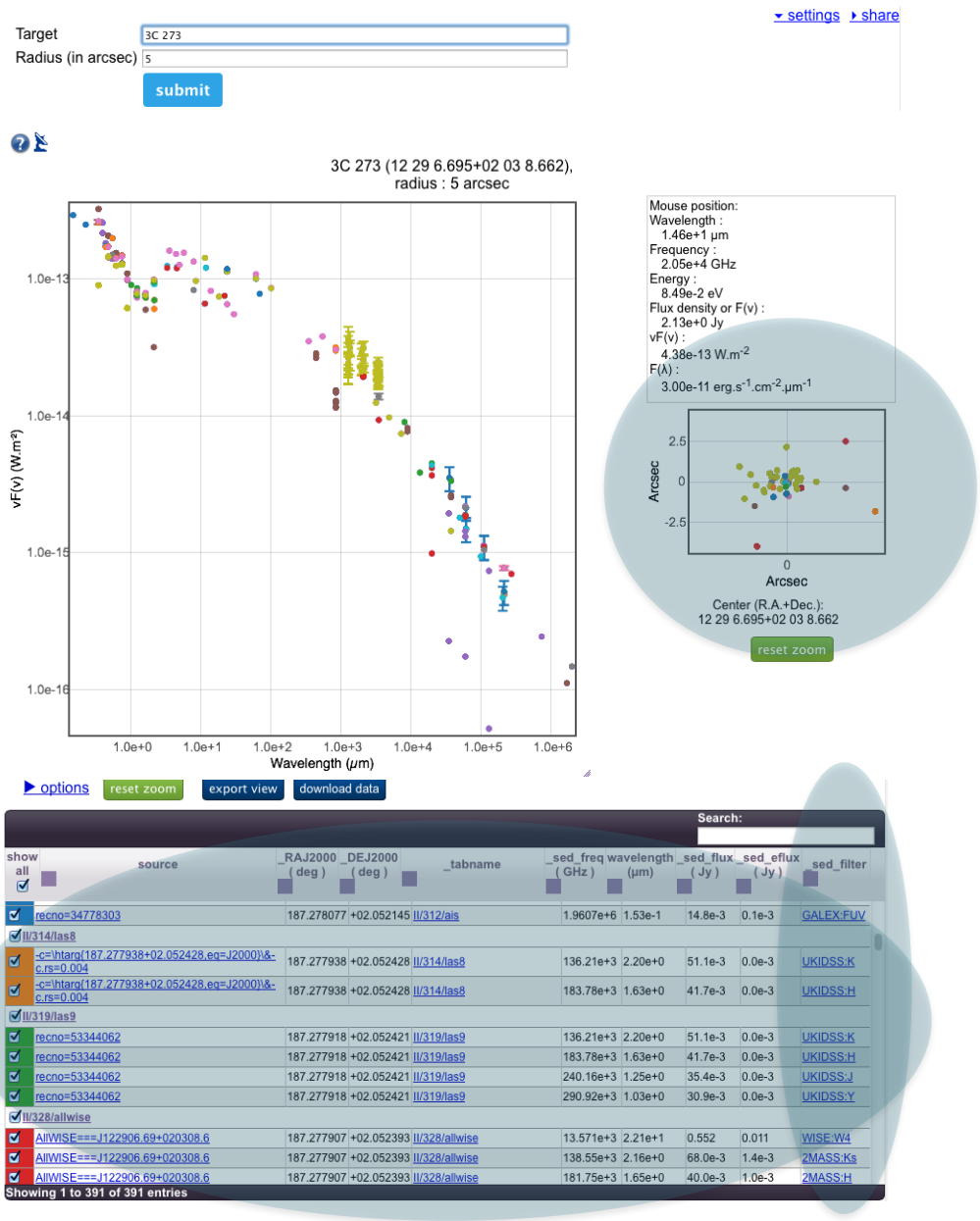


VizieR Photometric viewer



Search by object name or by coordinates

VizieR Photometric viewer



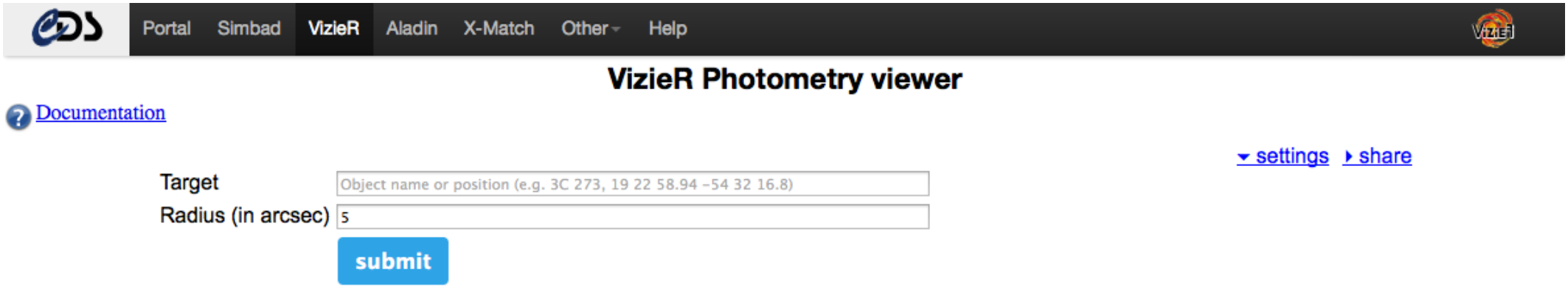
- url / embed in web
- mouse position
- SAMP
- display options

distance between catalogue and input coordinates

list of catalogues and filter information

associated magnitudes

VizieR: towards a time series viewer?



- Requirements of time series viewer:
  - Photometric data should be associated to time of observation
  - Standardisation of time - partly done
  - Any other requirement?
- Access to data by:
  - Name
  - Cone search, radius

VizieR TAP

Portal | Simbad | VizieR | Aladin | X-Match | Other | Help

VizieR Service

VizieR home · Photometry viewer · Query VizieR using TAP · X-match tables · Query images/spectra

Search Criteria

Preferences
max: 50
HTML Table
All columns
Compute

Mirrors
CDS, France

Find catalogs among 16106 available

Clear | Find...

Expand search

Catalog, author's name, word(s) from title, description, etc. e.g.: AGN, Veron, I/239, or bibcodes...

Search for catalogs by column descriptions *(UCD)*

Search for catalogs containing additional data

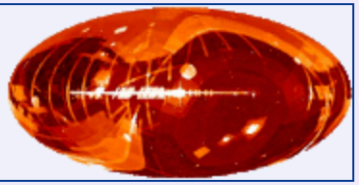
Wavelength	Mission	Astronomy
Radio	AKARI	Abundances
IR	ANS	Ages
optical	ASCA	AGN
UV	BeppoSAX	Associations
EUV	CGRO	Atomic_Data
X-ray	Chandra	Binaries:cataclysmic
Gamma-ray	COBE	Binaries:eclipsing

Search by Position across 17193 tables

Target Name (resolved by Sesame) or **Position**:

Clear | J2000 | Target dimension: 2 arcmin | Go!

Radius | Box size



More about VizieR

Find Catalogs

Tools related to VizieR

- NEW **CDS Portal** : Access CDS data including VizieR, Simbad and Aladin using the CDS portal
- **Spectra, images in VizieR** : Search Spectra, images in VizieR
- **Photometry viewer** : Plot photometry (sed) including all VizieR
- **TAP VizieR** : query VizieR using ADQL (a SQL extension dedicated for astronomy)
- **CDS cross-match service** : fast cross-identification between any 2 tables, including VizieR catalogues, SIMBAD

query using TAP

→ Thanks for acknowledging the VizieR Service
→ Rules of usage of VizieR data

© UDS/CNRS
Contact

VizieR associated data

Portal | Simbad | VizieR | Aladin | X-Match | Other | Help

VizieR Service

VizieR home · Photometry viewer · Query VizieR using TAP · X-match tables · Query images/spectra

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max: 50
HTML Table
All columns
Compute

Mirrors
CDS, France

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Search for catalogs by column descriptions *(UCD)*

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Wavelength	Mission	Astronomy
Radio	AKARI	Abundances
IR	ANS	Ages
optical	ASCA	AGN
UV	BeppoSAX	Associations
EUV	CGRO	Atomic_Data
X-ray	Chandra	Binaries:cataclysmic
Gamma-ray	COBE	Binaries:eclipsing

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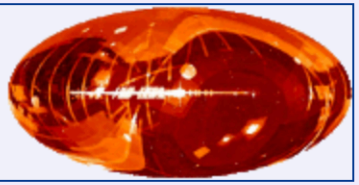
Radius / Box size



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- **CDS cross-match service** : fast cross-identification between any 2 tables, including VizieR catalogues, SIMBAD

query images/spectra

→ Thanks for acknowledging the VizieR Service
→ Rules of usage of VizieR data

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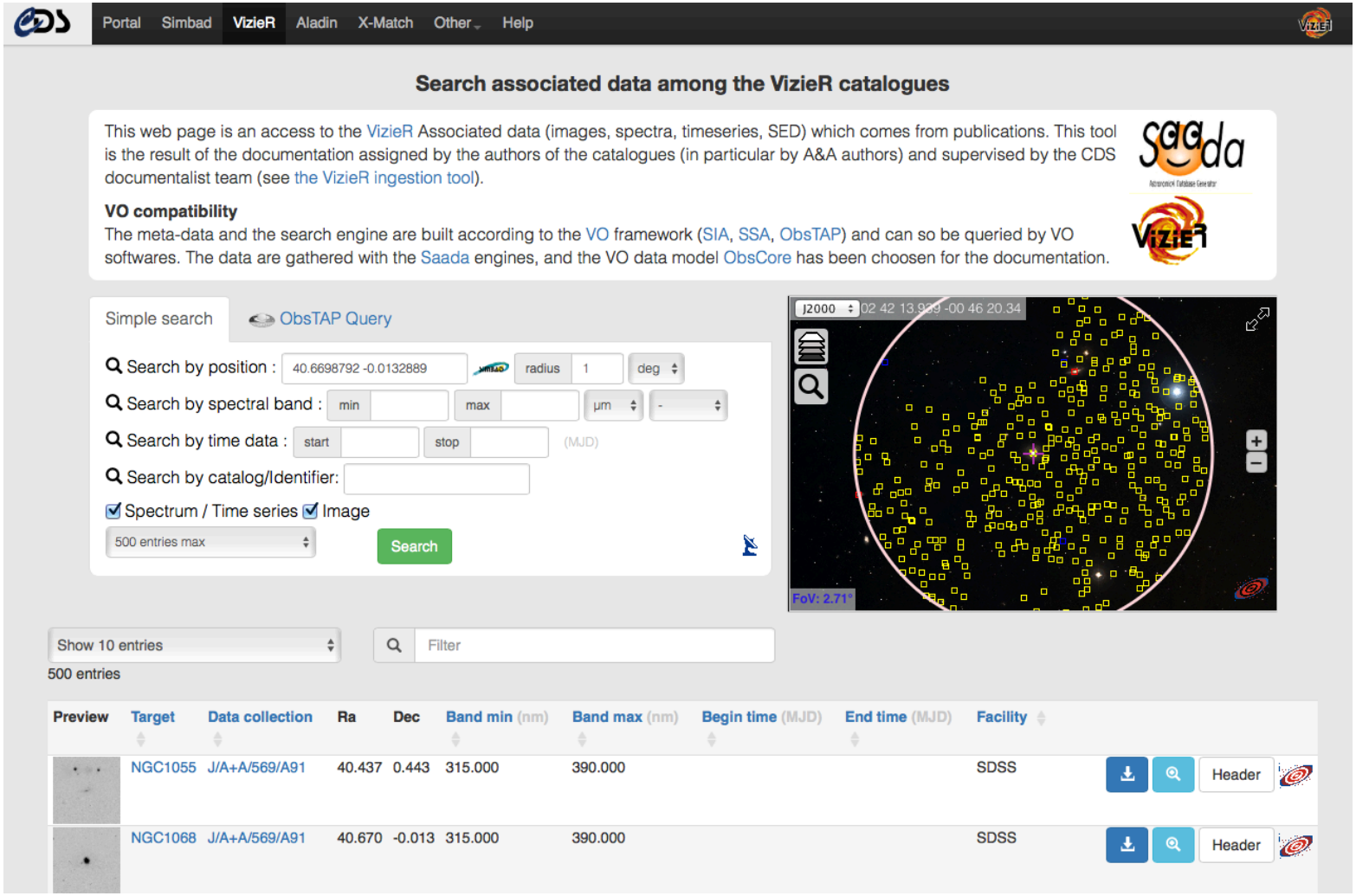
Contact

VizieR: Associated Data

Time-series / Spectra / Images



VizieR

Portal | Simbad | VizieR | Aladin | X-Match | Other | Help

VizieR Service

VizieR home . Photometry viewer . Query VizieR using TAP . X-match tables . Query images/spectra

Search Criteria

Preferences
max: 50
HTML Table
All columns
Compute

Mirrors
CDS, France

Find catalogs among 16106 available

Clear | Find...

Expand search

Catalog, author's name, word(s) from title, description, etc. e.g.: AGN, Veron, I/239, or bibcodes...

Search for catalogs by column descriptions *(UCD)*

Search for catalogs containing additional data

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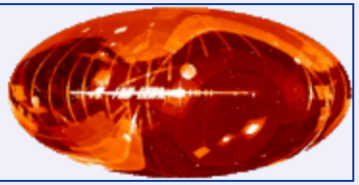
Radio	AKARI	Abundances
IR	ANS	Ages
optical	ASCA	AGN
UV	BeppoSAX	Associations
EUV	CGRO	Atomic_Data
X-ray	Chandra	Binaries:cataclysmic
Gamma-ray	COBE	Binaries:eclipsing

Search by Position across 17193 tables

Target Name (resolved by Sesame) or **Position**:

Clear | J2000 | Target dimension: 2 arcmin | Go!

Radius | Box size



More about VizieR

Find Catalogs

Tools related to VizieR

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- CDS cross-match service : fast cross-identification between any 2 tables, including VizieR catalogues, SIMBAD

X-match service

→ Thanks for acknowledging the VizieR Service
→ Rules of usage of VizieR data

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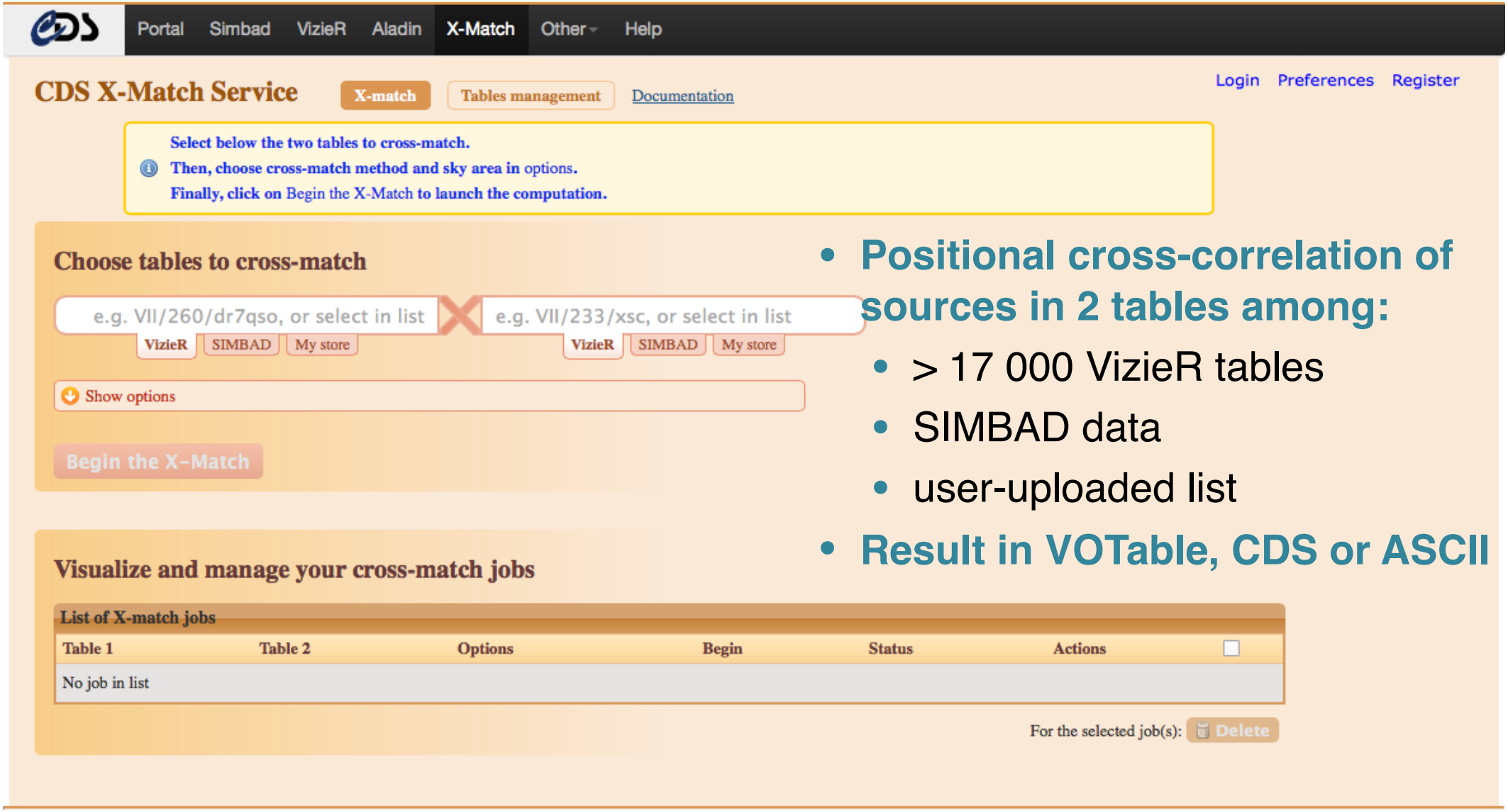
Contact

X-Match service



- **Positional cross-correlation of sources in 2 tables among:**
  - > 17 000 VizieR tables
  - SIMBAD data
  - user-uploaded list
- **Result in VOTable, CDS or ASCII**

© UDS/CNRS

X-match service

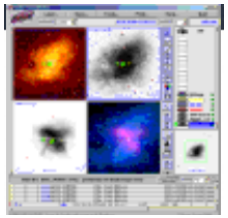
- Available through: Web interface, HTTP API (programmatic access), TOPCAT

Performances

Table 1	Table 2	Computation time	Result generation	Result size	Total time
SDSS DR7 *357M rows*	**2MASS** *470M rows*	7 min	11 min	13 GB	18 min
DENIS *355M*	**2MASS** *470M*	11 min	51 min	58 GB	1 hour 2 min
GLIMPSE *104M*	**NOMAD** *1.1 billion*	6 min	17 min	19 GB	23 min
SIMBAD *7M*	**USNOB1** *1 billion*	3 min	1 min	1 GB	4 min
List of *40k positions*	**SIMBAD** *7M*	1 second	4 seconds	10 MB	5 sec

http://cdsxmatch.u-strasbg.fr/xmatch/doc/

Aladin Sky Atlas, one in two!



Aladin Desktop

- High level features desktop
- access images, catalogs, footprints
- **full range of functionalities**
- interoperable with VO tools
  - Aladin is a VO portal
  - used to validate most stds
- Used for observation preparation tools (APT, GuideCam)
- Going all hierarchical now (HiPS)

Aladin Lite

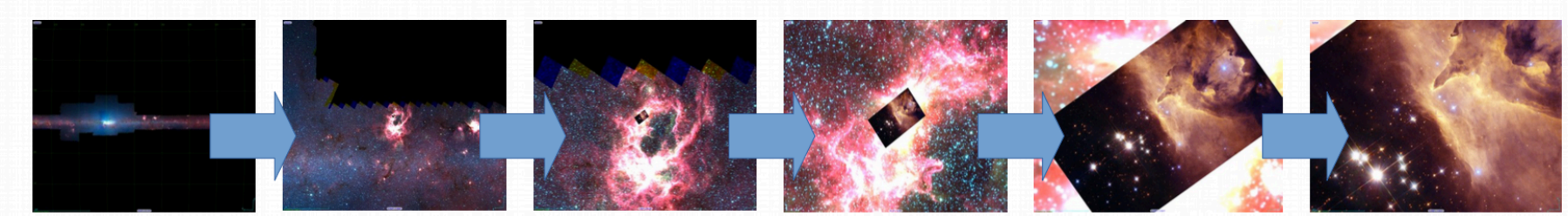
- **Web HiPS visualizer**
- preview mode
- embed in any webpage
- **easy appropriation**
- **highly used in wide range of sites/services**
- basic function… but more and more!

Aladin: HiPS

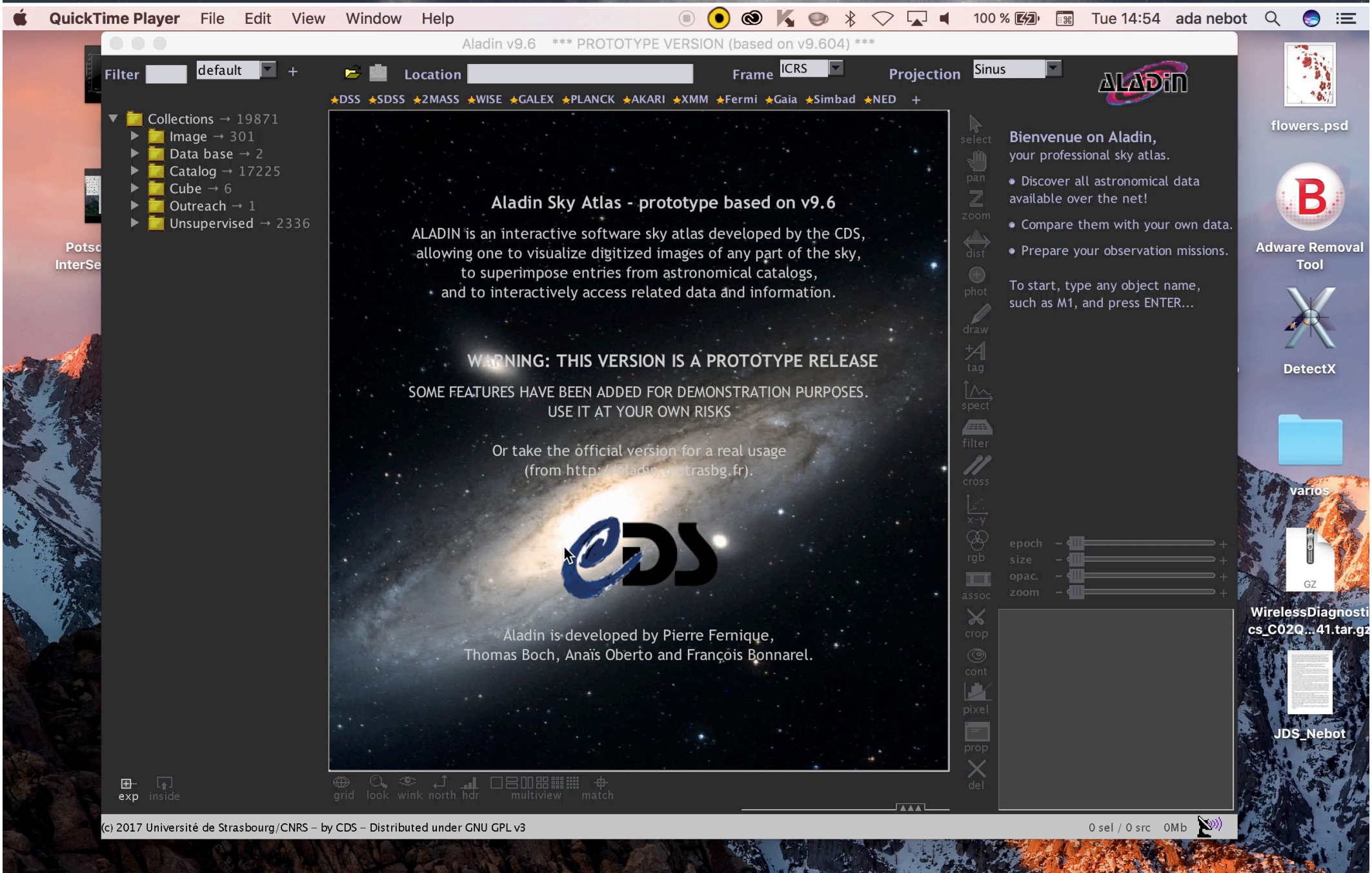
HiPS Hierarchical Progressive Survey

"*The more you zoom in on a particular area,the more details show up*"

- Multi-resolution on HEALPix data structure for Images, catalogues, 3-dimensional data cubes, ...
- Conserves scientific data properties alongside visualisation considerations.
- No databases or dedicated servers are required, just HTTP.
- **350+** HiPS for **120TB** data (CDS 95%, CADC 4%, ESAC 1%, ...)
  300 000+ HiPS tiles requested/day.



Aladin: cubes



Aladin Lite: Skymap viewer

Skymap Viewer

A sky atlas for understanding LIGO-Virgo skymaps. Help here, or watch a video about Skymap Viewer. Plenty simulated skymaps here. If you do not see the big dark sky map, look below and widen your browser. Zoom with the + and - at the right of the sky.

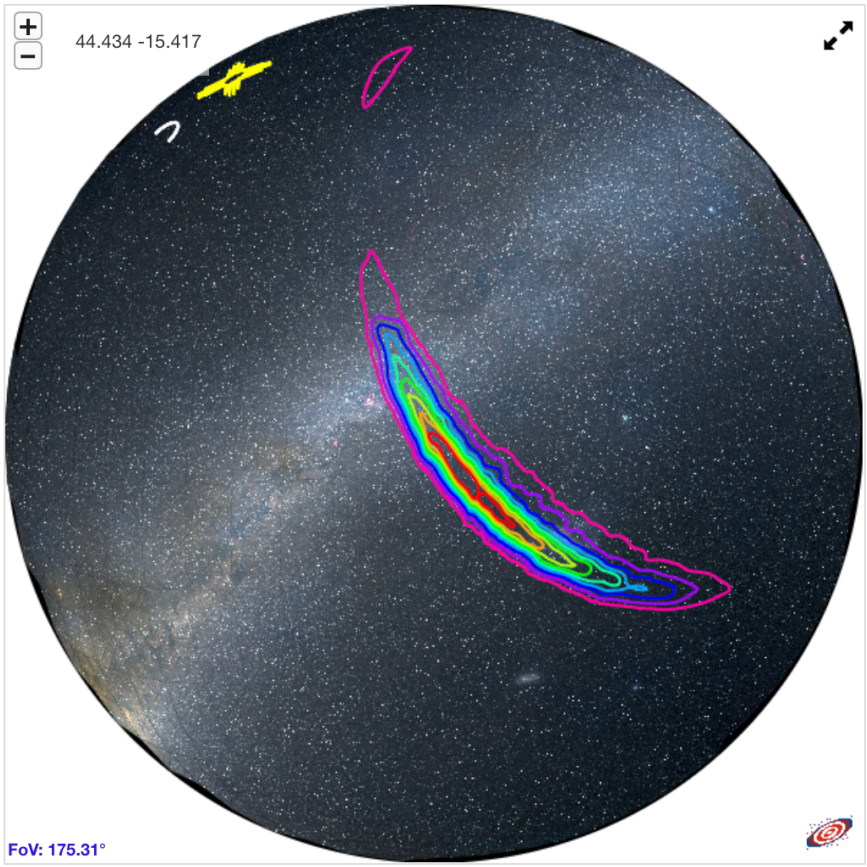
This is OBSERVED (real) data

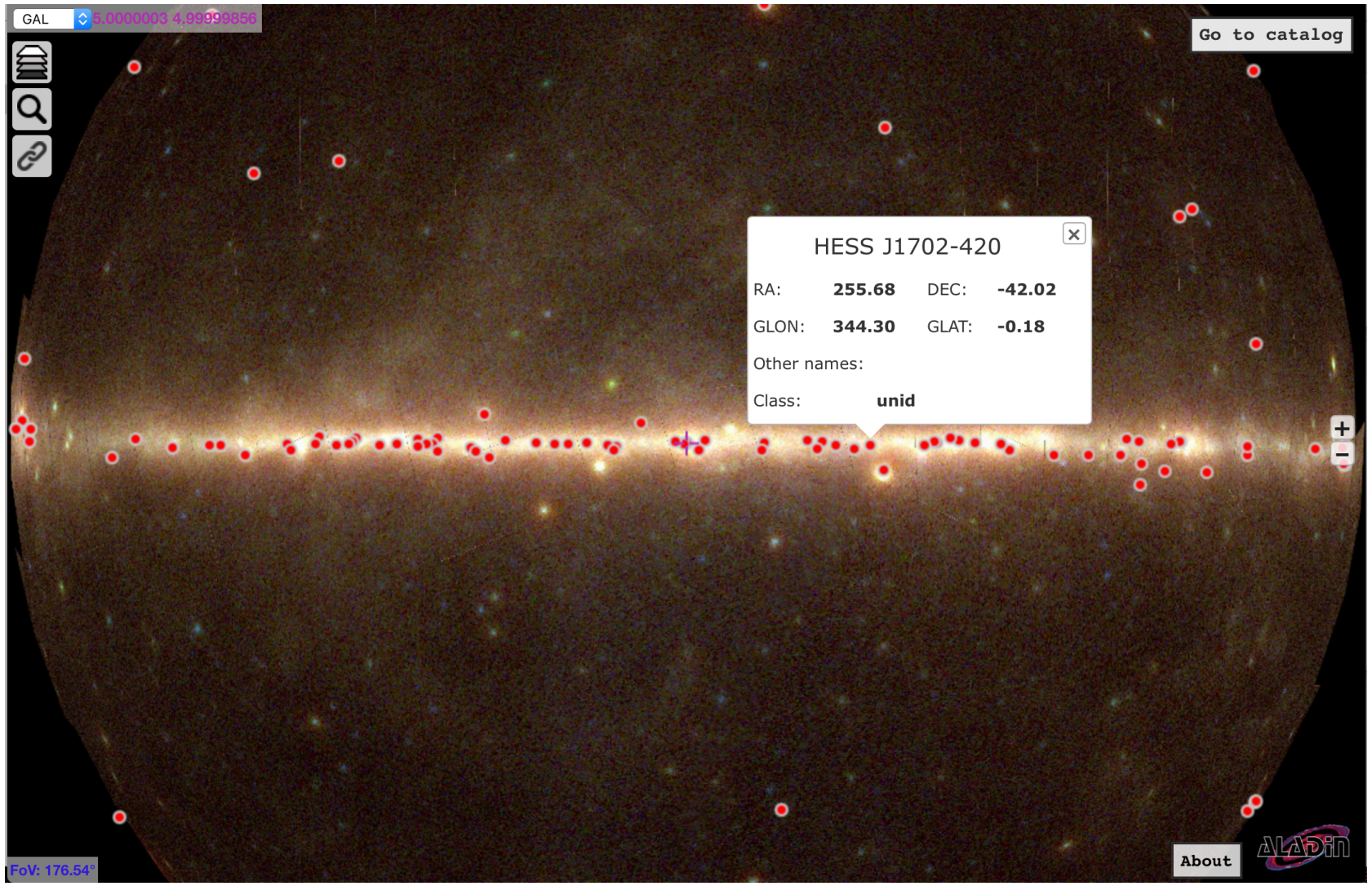
GW150914:LALI json
50% area = 149.0 sq deg
90% area = 616.4 sq deg

Observation Targets

- Gravitational Wave Galaxy Catalogue (White+ 2011)
- X-ray emission of RASS Abell clusters (Ledlow+, 2003)
- RASS-SDSS galaxy cluster survey. V. (Popesso+, 2007)
- GLADE (Galaxy List for the Advanced Detector Era) (Dalya+ 2016)
- WISExSCOS Photometric Redshift Catalogue (Bilicki+, 2016)
- MCXC Meta-Catalogue X-ray galaxy Clusters (Piffaretti+, 2011)
- Planck catalogue of Sunyaev-Zeldovich sources (Planck collab 2015)

- Choose one or more catalogs above
- Double-click in any Target square for source information (pink box above) and a centered display for zooming
- Make Target squares smaller larger
- Observation priorities as a table



Skymap Viewer Authors: Roy Williams, Thomas Boch, and Kunyang Li.

Aladin Lite: gamma sky