ProvHiPS :

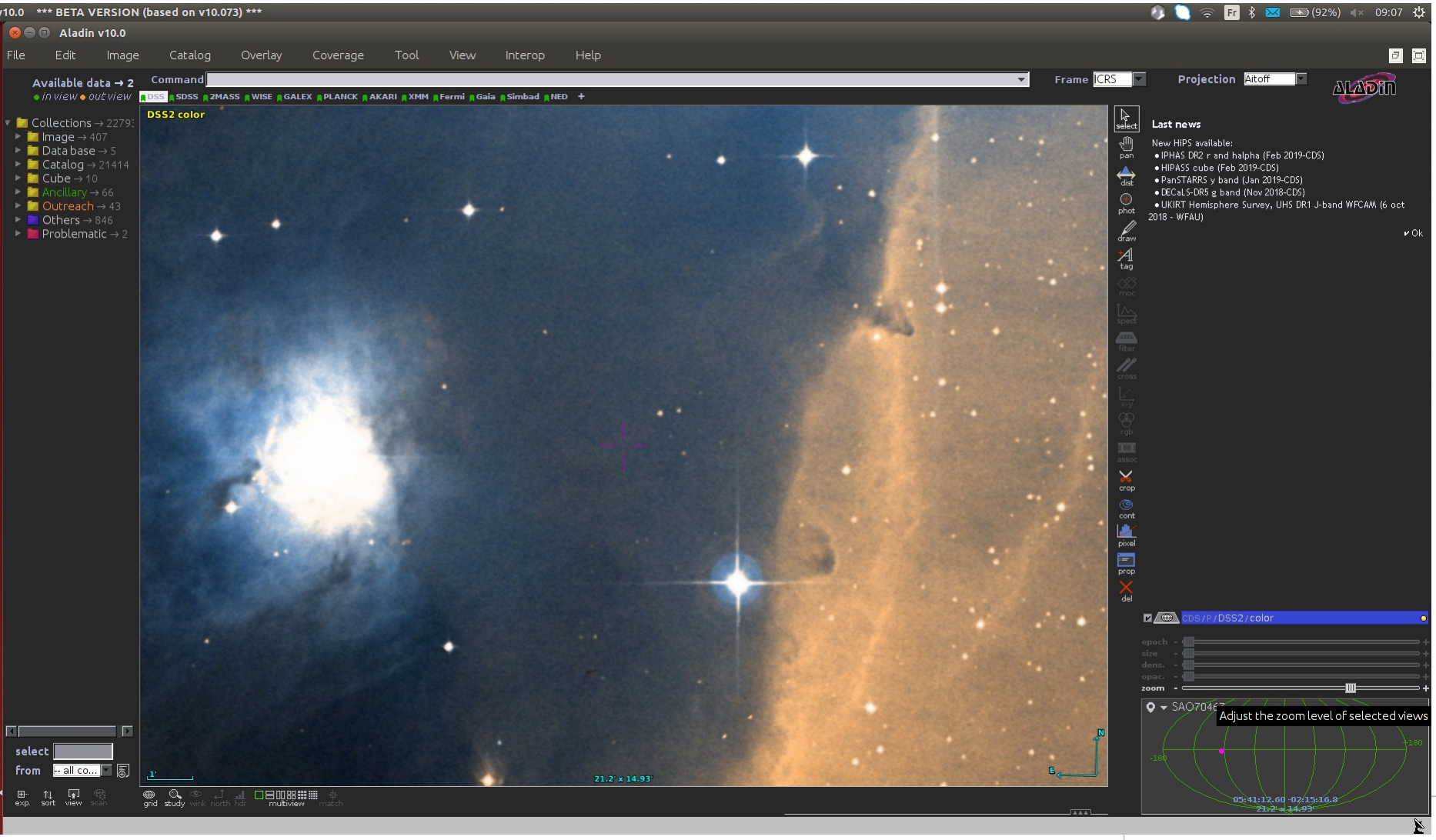
A ProvTAP service for providing IVOA provenance metadata for HiPS

F.Bonnarel

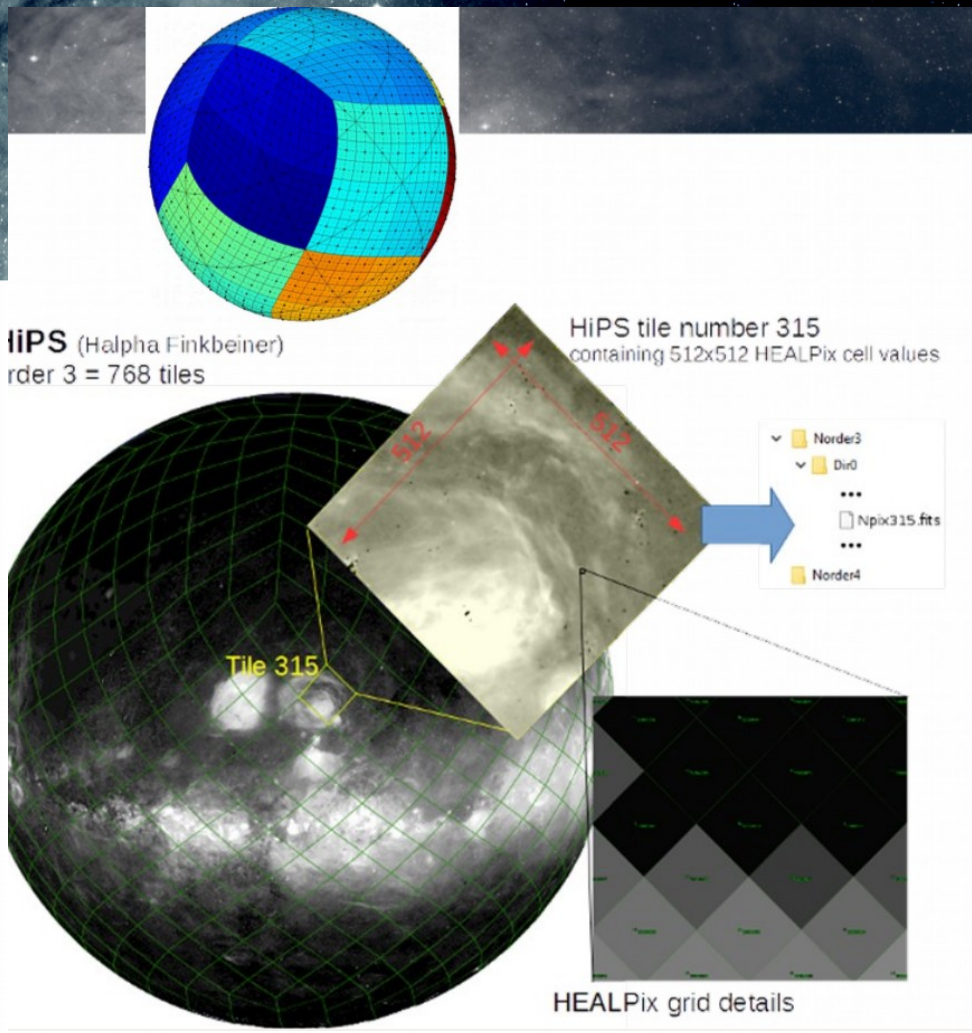
on behalf of the « provenance datamodel » author team of the IVOA

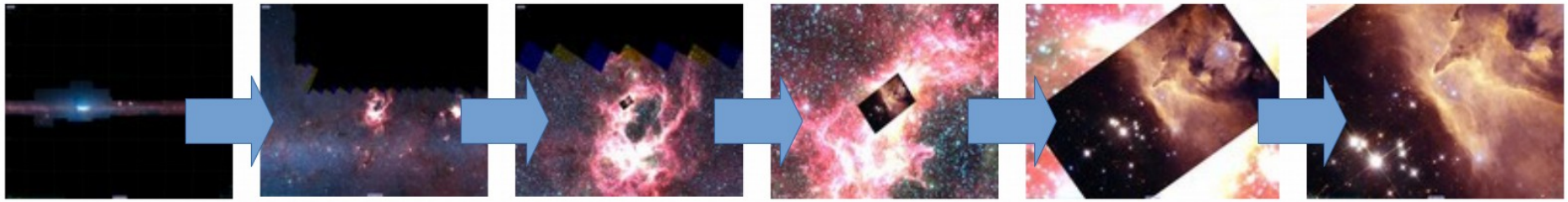
HiPS : hierarchical multi-resolution organisation of the data

HiPS : increasing resolution



HiPS : special data organisation





CDS prototype content : HiPS and progenitors

- HiPS
  - Multiresolution all sky view, hierarchical, based on healpix cells at all orders
  - needs processing of « original images » to be generated
  - It's a VO standard.
- Tools exist to generate and read it
- Progenitors are some time available
- AT CDS : Metainformation on the HiPS has been transferred in a relational database underlying the ProvTAP service

Motivation :Trace the history of HiPS

Every step in the same way (in contrast to HiPS properties spec)

→ Schmidt plates → DSS → DSS color → HiPS

→ MEGACAM → CFHTLS stacks → HiPS

What is ProvTAP for ?

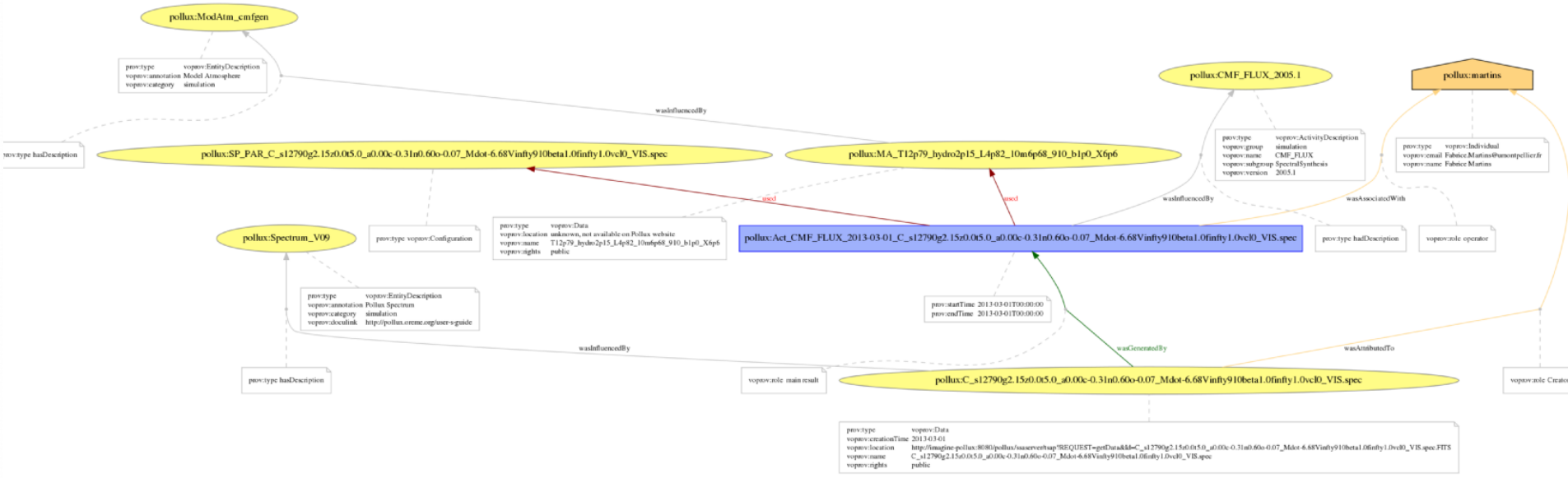
- Distributing provenance metadata for astronomical datasets
- Selecting datasets by provenance
- ProvTAP is a specification for services serializing IVOA provenance metadata model

Serialisation and services : ProvSAP exists

- A parameter based service

to get provenance information for a dataset in several formats including graphical format

	Parameter	Values	Description
Mandatory	ID	qualified ID	a valid qualified identifier for an entity, activity or agent (can occur multiple times)
	DEPTH	0,1,2,..., ALL	number of relations to be followed or ALL for everything, independent of the relation type
	RESPONSEFORMAT	PROV-N, PROV-JSON, PROV-XML, PROV-VOTABLE	serialisation format of the response
Optional	DIRECTION	BACK, FORTH	BACK = track the provenance history, FORTH = explore the results of activities and where entities have been used
	MEMBERS	true (1) or false (0)	if true/1, retrieve and track members of collections
	STEPS	true (1) or false (0)	if true/1, retrieve and track steps of activityFlows
	AGENT	true (1) or false (0)	if true/1, explore all relations for agents, i.e. find out what an agent is responsible for
	MODEL	IVOA or W3C	compatibility of the serialization to

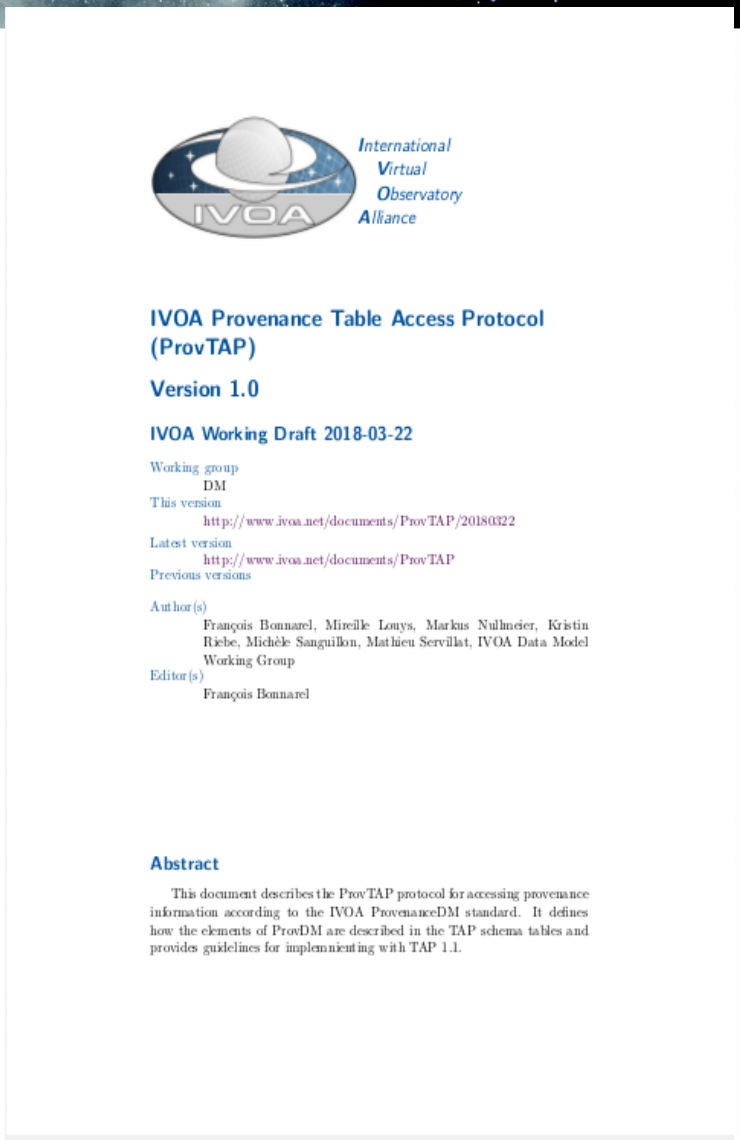


ProvTAP specification for datamodel serialisation and metadata service

1) ProvTAP is ….TAP

2) mapping of the model classes/attributes to the relational view.

3) specification is currently an internal IVOA draft



International Virtual Observatory Alliance

IVOA Provenance Table Access Protocol (ProvTAP)

Version 1.0

IVOA Working Draft 2018-03-22

Working group
DM
This version
http://www.ivoa.net/documents/ProvTAP/20180322
Latest version
http://www.ivoa.net/documents/ProvTAP
Previous versions

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Abstract

This document describes the ProvTAP protocol for accessing provenance information according to the IVOA ProvenanceDM standard. It defines how the elements of ProvDM are described in the TAP schema tables and provides guidelines for implemnienting with TAP 1.1.

TAP

- A specification which defines :
  - Interoperable table services, with relational view
  - Queriable via a sql-oriented langage : ADQL
  - Lot of tap services in many datacenters and big projects archives.
- DataModels can be mapped in TAP via the « TAP schema » (the database schema) using obect/relational mapping guidelines

ProvTAP

- A TAP schema has been defined
  - All classes and attributes of the model are mapped onto tables and columns of the schema
- A Prototype has been recently developped at CDS

→ screenshots in next slides

- CTA/HESS implementation in development in collaboration with CDS

Some ProvTAP tables : datasetEntity

Name	ucd	utype	datatype
d_id	meta.id	voprov:DatasetEntity.id	char
d_name	meta.title	voprov:DatasetEntity.name	char
d_type	meta.code.class	voprov:DatasetEntity.type	char
d_rights	meta.code.class	voprov:Entity.rights	char
d_comment	meta.description	voprov:DatasetEntity.comment	char
d_location	meta.ref.url	voprov:DatasetEntity.location	char
→ d_hadMember	meta.code.member	voprov:Entity.hadMember	char
→ d_description	meta.id	voprov:Entity.description_id	char
→ d_usedEntity	meta.id	voprov:Entity.wasDerivedFrom.usedEntity	char

Table 3: Column description for DatasetEntity table

Some ProvTAP tables : parameterDescription

Name	ucd	utype	datatype
pd_activitydescription	meta.id	voprov:ParameterDescription.activityDescription_id	char
pd_id	meta.id	voprov:ParameterDescription.id	char
pd_name	meta.title	voprov:ParameterDescription.name	param dependent
pd_description	meta.description	voprov:ParameterDescription.description	char
pd_datatype	meta	voprov:ParameterDescription.datatype	char
pd_unit	meta.unit	voprov:ParameterDescription.unit	char
pd_ucd	meta.ucd	voprov:ParameterDescription.ucd	char
pd_utype	meta	voprov:ParameterDescription.utype	char
pd_min	stat.min	voprov:ParameterDescription.min	param dependent
pd_max	stat.max	voprov:ParameterDescription.max	param dependent
pd_options	meta	voprov:ParameterDescription.options	param dependent

Some ProvTAP tables : parameter

Name	ucd	utype	datatype
p_activity	meta.id	voprov:Parameter.activity_id	char
p_id	meta.id	voprov:Parameter.id	char
p_value	stat.value	voprov:Parameter.value	param dependent
→ p_description	meta.id	voprov:Parameter.parameterDescription_id	reference to parameter description

Table 8: Column description for Parameter table

ProvHiPS database excerpt as an example

GAPS_sample_kp7.dat × prov_example_hipsv2.txt ×

```
voprov = "http://www.ivoa.net/documents/ProvenanceDM#"

## Description classes

ad_id hipsgen1 :: ActivityDescription
ad_name ActivityDescription.name = "Aladin/HipsGen v9.615"
ad_version ActivityDescription.version = "1"
ad_description ActivityDescription.description = "Genaration of HipS using CDS hipsgen version 9.615"
ad_ActivityDescription.doculink = "http://aladin.u-strasbg.fr/hips/#doc"
ad_ActivityDescription.type = "hipsgen"
ad_ActivityDescription.subtype = "hipsgen_mean"

dd_id hipsdata :: DatasetDescription
dd_name DatasetDescription.name = "Hierachical progressive Image Survey"
dd_description DatasetDescription.description = "Hierachical progressive Image Survey"
dd_content DatasetDescription.contentType = "application/hips"
dd_doculink DatasetDescription.doculink = "http://aladin.u-strasbg.fr/doculink.html"
dd_type DatasetDescription.type = "Data"
dd_subtype DatasetDescription.subtype = "HipsDataSet"


dd_id origimages :: DatasetDescription
dd_name DatasetDescription.name = "Original Images "
dd_description DatasetDescription.description = "Original Images "
dd_content DatasetDescription.contentType = "image/fits"
dd_type DatasetDescription.type = "Data"
dd_subtype DatasetDescription.subtype = "ImageCollection"


ud_id hipsgen0origimages ::  UsageDescription
ud_role UsageDescription.role = "HipSprogenitors"
ud_description UsageDescription.description = "HipS progenitors"
ud_type UsageDescription.type = "Main"
ud_multiplicity UsageDescription.multiplicity = "*"
ud_activity UsageDescription.activityDescription_id = "hipsgen0"
ud_entity UsageDescription.entityDescription_id = "origimages"
```

Goals of ProvHiPS prototype

- Create a first ProvTAP implementation
- Integrate information on HiPS as well as classical images in the same design
- Full integration of HiPS provenance searches in the general VO framework

Simple queries to browse the content

- Entities
- Activities
- Agents
- Select parameters with associated ParameterDescriptions and activities to which they are related
- Caution : the queries displayed there are consistent with the october PR → to be upgraded.

first query in the html interface provided with the TAP library (G.Mantelet) : select * from entity

TAP HOME PAGE

- CDS -

Available resources

- tables
- sync
- capabilities
- async
- availability

ADQL query

Query:

```
SELECT *
FROM entity;
```

Execution mode: Asynchronous/Batch Synchronous

Format: votable/td

Result limit: -1 rows *(0 to get only metadata ; a value < 0 means 'default value')*

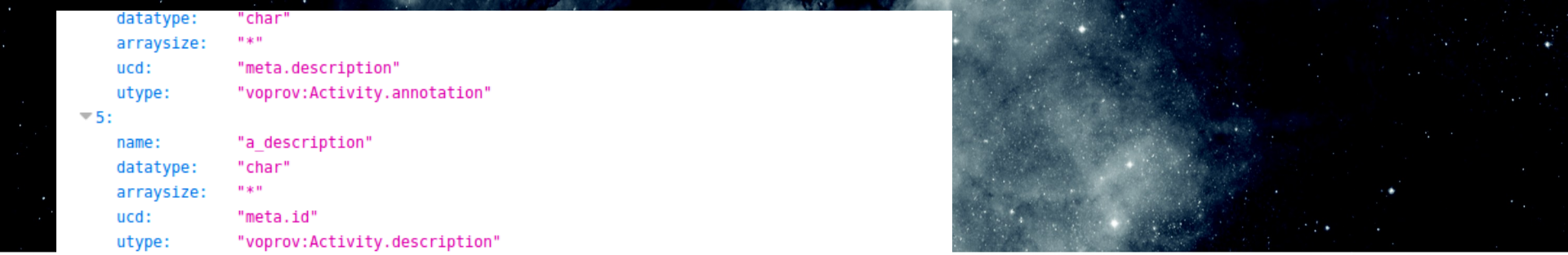
Duration limit: -1 seconds *(a value ≤ 0 means 'default value')*

Execute!

Page generated by TAPLibrary v2.0

VOTable response


```
<VOTABLE version="1.3" xsi:schemaLocation="http://www.ivoa.net/xml/VOTable/v1.3 http://www.ivoa.net/xml/VOTable/v1.3">
 <RESOURCE type="results">
  <INFO name="QUERY_STATUS" value="OK"/>
  <INFO name="PROVIDER" value="CDS"/>
  <INFO name="QUERY" value="SELECT * FROM entity;"/>
 <TABLE name="result_S1542030444145">
  <FIELD arraysize="*" datatype="char" name="e_id" ucd="meta.id" utype="voprov:Entity.id"/>
  <FIELD arraysize="*" datatype="char" name="e_name" ucd="meta.title" utype="voprov:Entity.name"/>
  <FIELD arraysize="*" datatype="char" name="e_type" ucd="meta.code.class" utype="voprov:Entity.type"/>
  <FIELD arraysize="*" datatype="char" name="e_rights" ucd="meta.code.class" utype="voprov:Entity.rights"/>
  <FIELD arraysize="*" datatype="char" name="e_annotation" ucd="meta.description" utype="voprov:Entity.annotation"/>
  <FIELD arraysize="*" datatype="char" name="e_description" ucd="meta.id" utype="voprov:Entity.description"/>
  <DATA>
   <TABLEDATA>
    <TR>
     <TD>ivo://CDS/P/2MASS/H</TD>
     <TD>2MASS H (1.66um) HiPS</TD>
     <TD>data</TD>
     <TD>public</TD>
     <TD/>
     <TD>hipsdata</TD>
    </TR>
    <TR>
     <TD>origima0</TD>
     <TD>2MASS H (1.66um) original data</TD>
     <TD>data</TD>
     <TD>public</TD>
     <TD>2MASS H (1.66um) original data</TD>
     <TD>origimages</TD>
    </TR>
    <TR>
     <TD>ivo://CDS/P/2MASS/J</TD>
     <TD>2MASS J (1.23um) HiPS</TD>
     <TD>data</TD>
     <TD>public</TD>
     <TD>
      2MASS has uniformly scanned the entire sky in three near-infrared bands to detect and characterize point sources brighter than about 1 mJy in each band, with signal-to-noise ratio (SNR) greater than 10, using a pixel size of 2.0". This has achieved an 80,000-fold improvement in sensitivity relative to earlier surveys. 2MASS used two highly-automated 1.3-m telescopes, one at Mt. Hopkins, AZ, and one at CTIO, Chile. Each telescope was equipped with a three-channel camera, each channel consisting of a 256x256 array of HgCdTe detectors, capable of observing the sky simultaneously at J (1.25 microns), H (1.65 microns), and Ks (2.17 microns). The University of Massachusetts (UMass) was responsible for the overall management of the project, and for developing the infrared cameras and on-site computing systems at both facilities. The Infrared Processing and Analysis Center (IPAC) is responsible for all data processing through the Production Pipeline, and construction and distribution of the data products. Funding is provided primarily by NASA and the NSF
     </TD>
     <TD>hipsdata</TD>
    </TR>
    <TR>
     <TD>origima1</TD>
     <TD>2MASS J (1.23um) original data</TD>
     <TD>data</TD>
     <TD>public</TD>
     <TD>2MASS J (1.23um) original data</TD>
     <TD>origimages</TD>
```




```
      datatype:     "char"
      arraysize:    "*"
      ucd:          "meta.description"
      utype:        "voprov:Activity.annotation"
   5:
      name:         "a_description"
      datatype:     "char"
      arraysize:    "*"
      ucd:          "meta.id"
      utype:        "voprov:Activity.description"
data:
   0:
      0:            "act:CDS/P/2MASS/H"
      1:            "Generation of 2MASS H (1.66um) HiPS"
      2:            null
      3:            null
      4:            "Generation of 2MASS H (1.66um) HiPS"
      5:            "hipsgen0"
   1:
      0:            "act:CDS/P/2MASS/J"
      1:            "Generation of 2MASS J (1.23um) HiPS"
      2:            "2013-05-06T20:36Z"
      3:            "2013-05-06T20:36Z"
      4:            "Generation of 2MASS J (1.23um) HiPS"
      5:            "hipsgen0"
   2:
      0:            "act:CDS/P/2MASS/K"
      1:            "Generation of 2MASS K (2.16um) HiPS"
      2:            "2014-02-11T11:28Z"
      3:            "2014-02-11T11:28Z"
      4:            "Generation of 2MASS K (2.16um) HiPS"
      5:            "hipsgen0"
   3:
      0:            "act:CDS/P/2MASS/color"
      1:            "Generation of 2MASS color J (1.23um), H (1.66um), K (2.16um) HiPS"
      2:            "2013-01-14T09:45Z"
      3:            "2013-01-14T09:45Z"
      4:            "Generation of 2MASS color J (1.23um), H (1.66um), K (2.16um) HiPS"
      5:            "hipsgen0"
   4:
      0:            "act:CDS/P/2MASS6X/H"
      1:            "Generation of 2MASS6X H (1.66um) HiPS"
      2:            "2012-02-24T12:43Z"
      3:            "2012-02-24T12:43Z"
      4:            "Generation of 2MASS6X H (1.66um) HiPS"
      5:            "hipsgen1"
   5:
```


SELECT * FROM ACTIVITY

JSON Response

Agents – text format

ag_id	ag_name	ag_type
"noagent"	"noname"	"notype"
"agent_1_277"	"1.0"	"Organisation"
"agent_1_328"	"Pierre Fernique [CDS]"	"Organisation"
"agent_1_537"	"L. Michel [Observatoire de Strasbourg]"	"Organisation"
"agent_1_222"	"P.fernique [CDS]"	"Organisation"
"agent_1_190"	"P.Fernique (CDS)"	"Organisation"
"agent_1_378"	"ESA (ESDC & Planck Science Office)"	"Organisation"
"agent_1_5"	"CDS (T.Boch)"	"Organisation"
"agent_1_318"	"Stefan Meingast (Institute for Astrophysics, University of Vienna)"	"Organisation"
"agent_1_371"	"ESA/ESDC"	"Organisation"
"agent_1_191"	"CDS (Pierre Fernique)"	"Organisation"
"agent_1_432"	"D. Paradis (IRAP/CADE)"	"Organisation"
"agent_1_330"	"Thomas Boch [CDS]"	"Organisation"
"agent_1_33"	"CDS (Thomas Boch)"	"Organisation"
"agent_1_407"	"Guilherme Soares"	"Organisation"
"agent_1_36"	"Thomas Boch"	"Organisation"
"agent_1_99"	"CDS (A.Oberto, P.Fernique)"	"Organisation"
"agent_1_97"	"CDS (P.Fernique)"	"Organisation"
"agent_1_8"	"CDS [P.Fernique]"	"Organisation"
"agent_1_44"	"T. Boch"	"Organisation"
"agent_1_7"	"CDS"	"Organisation"
"agent_1_352"	"ESA (ESDC & Herschel SOC)"	"Organisation"
"agent_1_342"	"China-VO"	"Organisation"
"agent_1_130"	"CADC (Daniel Durand)"	"Organisation"
"agent_1_409"	"NASA/HEASARC"	"Organisation"
"agent_1_9"	"P. Fernique [CDS]"	"Organisation"
"agent_1_14"	"M.Buga [CDS]"	"Organisation"
"agent_1_354"	"ESA (ESDC & Herschel Science Centre)"	"Organisation"
"agent_1_16"	"P.Fernique [CDS]"	"Organisation"
"agent_1_536"	"WFAU, Institute for Astronomy, University of Edinburgh"	"Organisation"
"agent_1_126"	"Christoph Deil, Axel Donath, Pierre Fernique"	"Organisation"
"agent_1_1"	"CDS (A.Oberto)"	"Organisation"
"agent_2_225"	"Axel Mellinger"	"Organisation"
"agent_2_227"	"JPL/Photojournal"	"Organisation"
"agent_2_535"	"SVO, CAB (INTA-CSIC)"	"Organisation"
"agent_2_221"	"Qrizona State University"	"Organisation"
"agent_2_350"	"http://archives.esac.esa.int/hsa/whsa/"	"Organisation"
"agent_2_36"	"http://portal.nersc.gov/project/cosmo/data/decaps/dr1/coadd/"	"Organisation"
"agent_2_232"	"USGS Astrogeology Science Center from Arizona State University"	"Organisation"
"agent_2_170"	"MAST archives"	"Organisation"
"agent_2_114"	"NASA s Earth Observatory"	"Organisation"
"agent_2_34"	"http://portal.nersc.gov/project/cosmo/data/legacysurvey/dr5/coadd/"	"Organisation"
"agent_2_216"	"https://photojournal.jpl.nasa.gov/catalog/PIA20284"	"Organisation"
"agent_2_377"	"http://iso.esac.esa.int/ida/"	"Organisation"
"agent_2_17"	"CFHT"	"Organisation"

```
SELECT p_isaparamof,pd_name, pd_ucd, pd_unit, p_value
FROM parameter INNER JOIN parameterdescription
ON parameter.p_parameterdescription = parameterdescription.pd_id;
```

p_isaparamof	pd_name	pd_ucd	pd_unit	p_value
"act:CDS/P/2MASS/H"	"hips_order"			"9"
"act:CDS/P/2MASS/H"	"hips_frame"			"equatorial"
"act:CDS/P/2MASS/H"	"hips_frame"	"meta.id"		"ivo://CDS/P/2MASS/H"
"act:CDS/P/2MASS/H"	"obs_title"	"meta.title"		"2MASS H (1.66um)"
"act:CDS/P/2MASS/H"	"hips_tile_width"		"px"	"512"
"act:CDS/P/2MASS/H"	"hips_tile_format"	"meta.format"		"jpeg fits"
"act:CDS/P/2MASS/J"	"hips_order"			"9"
"act:CDS/P/2MASS/J"	"hips_frame"			"equatorial"
"act:CDS/P/2MASS/J"	"hips_frame"	"meta.id"		"ivo://CDS/P/2MASS/J"
"act:CDS/P/2MASS/J"	"obs_title"	"meta.title"		"2MASS J (1.23um)"
"act:CDS/P/2MASS/J"	"hips_tile_width"		"px"	"512"
"act:CDS/P/2MASS/J"	"hips_tile_format"	"meta.format"		"jpeg fits"
"act:CDS/P/2MASS/K"	"hips_order"			"9"
"act:CDS/P/2MASS/K"	"hips_frame"			"equatorial"
"act:CDS/P/2MASS/K"	"hips_frame"	"meta.id"		"ivo://CDS/P/2MASS/K"
"act:CDS/P/2MASS/K"	"obs_title"	"meta.title"		"2MASS K (2.16um)"
"act:CDS/P/2MASS/K"	"hips_tile_width"		"px"	"512"
"act:CDS/P/2MASS/K"	"hips_tile_format"	"meta.format"		"jpeg fits"
"act:CDS/P/2MASS/color"	"hips_order"			"9"
"act:CDS/P/2MASS/color"	"hips_frame"			"equatorial"
"act:CDS/P/2MASS/color"	"hips_frame"	"meta.id"		"ivo://CDS/P/2MASS/color"
"act:CDS/P/2MASS/color"	"obs_title"	"meta.title"		"2MASS color J (1.23um), H (1.66um), K (2.16um)"
"act:CDS/P/2MASS/color"	"hips_tile_width"		"px"	"512"
"act:CDS/P/2MASS/color"	"hips_tile_format"	"meta.format"		"jpeg"
"act:CDS/P/2MASS6X/H"	"hips_order"			"9"
"act:CDS/P/2MASS6X/H"	"hips_frame"			"equatorial"
"act:CDS/P/2MASS6X/H"	"hips_frame"	"meta.id"		"ivo://CDS/P/2MASS6X/H"
"act:CDS/P/2MASS6X/H"	"obs_title"	"meta.title"		"2MASS6X H (1.66um)"
"act:CDS/P/2MASS6X/H"	"hips_tile_width"		"px"	"512"
"act:CDS/P/2MASS6X/H"	"hips_tile_format"	"meta.format"		"png jpeg fits"
"act:CDS/P/2MASS6X/J"	"hips_order"			"9"
"act:CDS/P/2MASS6X/J"	"hips_frame"			"equatorial"
"act:CDS/P/2MASS6X/J"	"hips_frame"	"meta.id"		"ivo://CDS/P/2MASS6X/J"
"act:CDS/P/2MASS6X/J"	"obs_title"	"meta.title"		"2MASS6X J (1.23um)"
"act:CDS/P/2MASS6X/J"	"hips_tile_width"		"px"	"512"
"act:CDS/P/2MASS6X/J"	"hips_tile_format"	"meta.format"		"jpeg fits"
"act:CDS/P/2MASS6X/K"	"hips_order"			"9"
"act:CDS/P/2MASS6X/K"	"hips_frame"			"equatorial"
"act:CDS/P/2MASS6X/K"	"hips_frame"	"meta.id"		"ivo://CDS/P/2MASS6X/K"
"act:CDS/P/2MASS6X/K"	"obs_title"	"meta.title"		"2MASS6X K (2.16um)"
"act:CDS/P/2MASS6X/K"	"hips_tile_width"		"px"	"512"
"act:CDS/P/2MASS6X/K"	"hips_tile_format"	"meta.format"		"jpeg fits"
"act:CDS/P/2MASS6X/color"	"hips_order"			"9"
"act:CDS/P/2MASS6X/color"	"hips_frame"			"equatorial"
"act:CDS/P/2MASS6X/color"	"hips_frame"	"meta.id"		"ivo://CDS/P/2MASS6X/color"
"act:CDS/P/2MASS6X/color"	"obs_title"	"meta.title"		"2MASS6X color J (1.23um) & K (2.16um)"

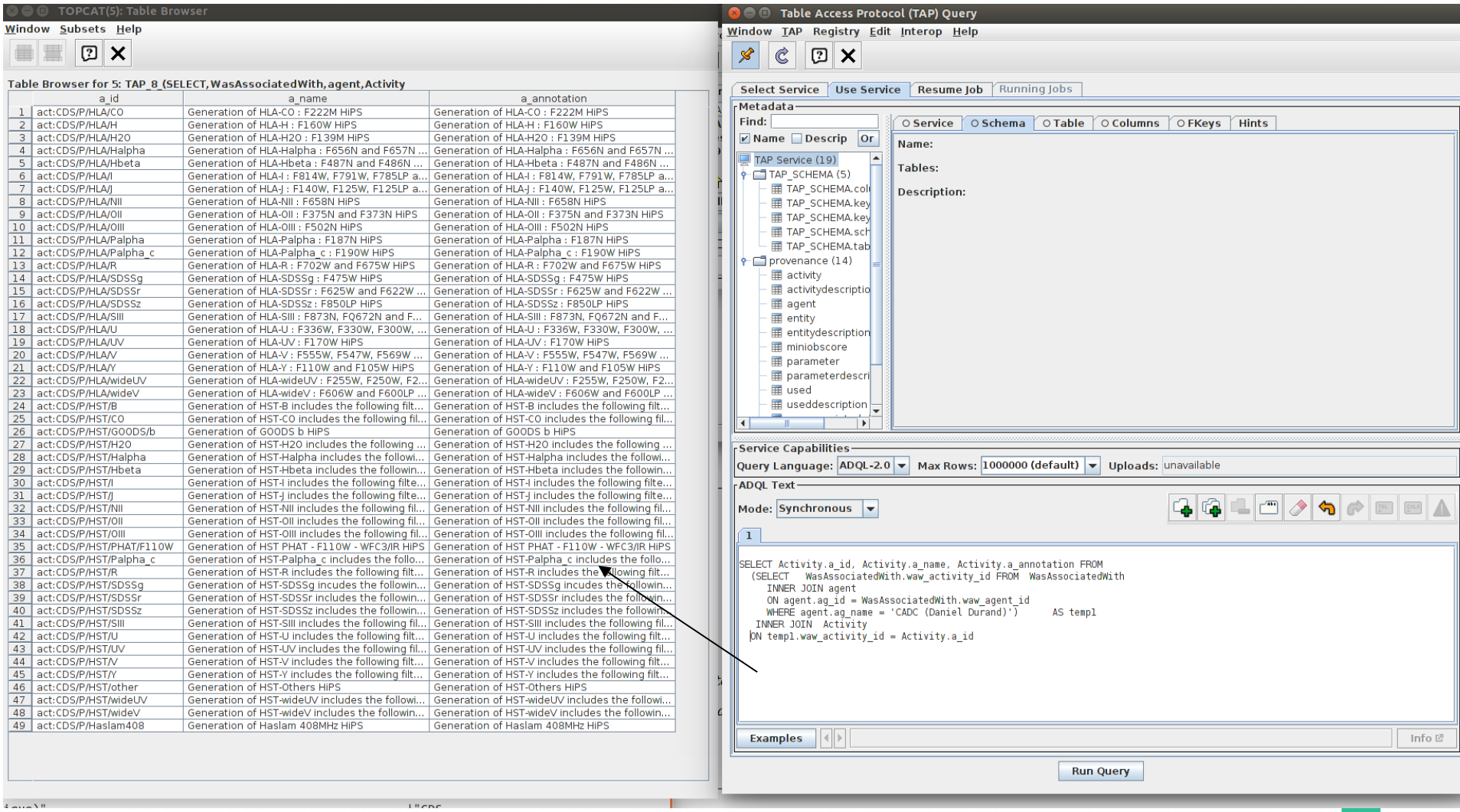
Configuration parameters with their description (name, ucd,unit And associated activity

Real-life queries :
To select HiPS activities or entities via criteria

- Select activities which have been attributed to a given « Agent »
- Select activities described by the same ActivityDescription (= here, running the same software)
- Select activities from some configuration parameters values
- Select entities and display them in Aladin (HiPS or classical images)

Select activities which have been attributed to a given « Agent »

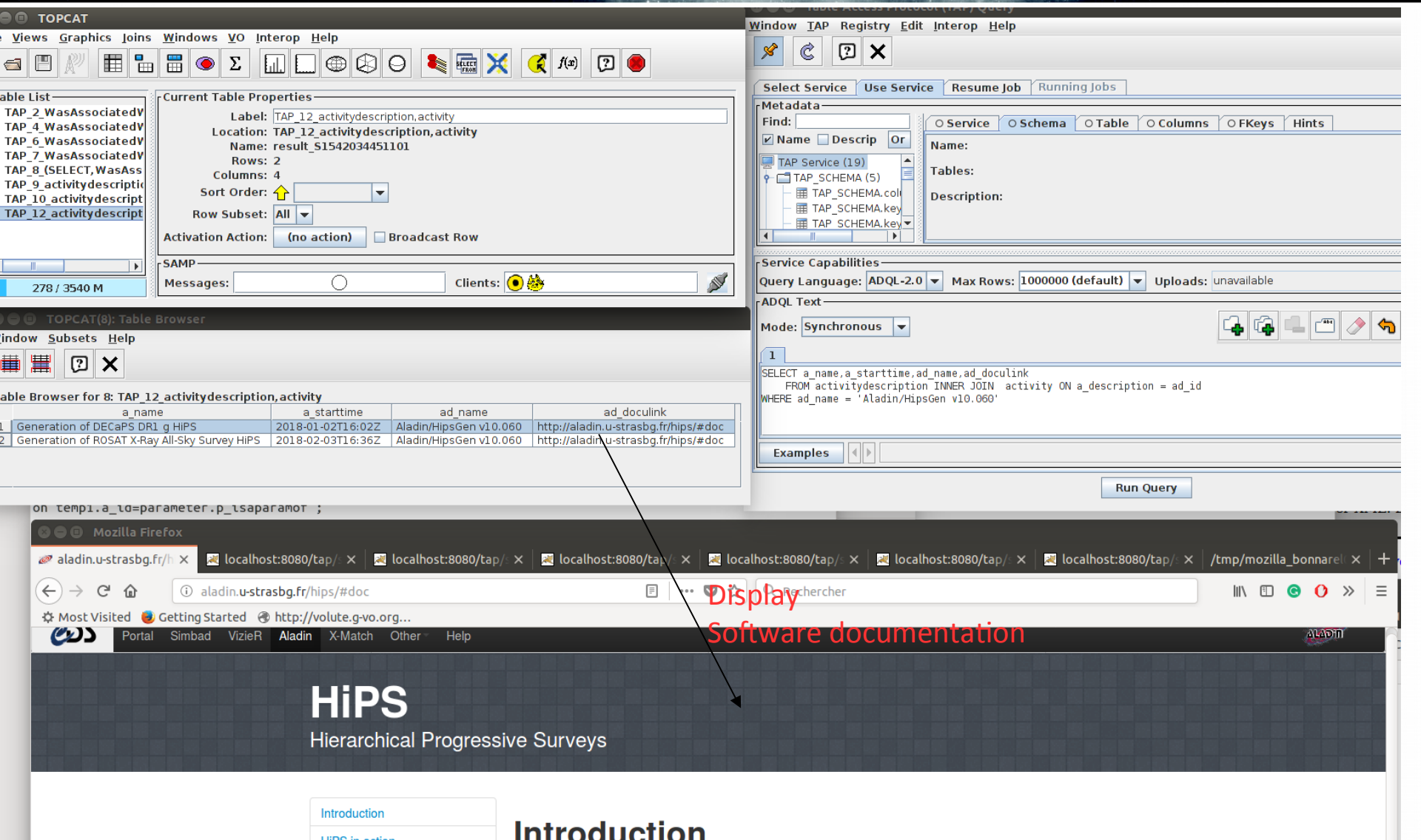
(here « CADC (Daniel Durand) »



	a_id	a_name	a_annotation
1	act:CDS/P/HLA/C0	Generation of HLA-C0 : F222M HiPS	Generation of HLA-C0 : F222M HiPS
2	act:CDS/P/HLA/H	Generation of HLA-H : F160W HiPS	Generation of HLA-H : F160W HiPS
3	act:CDS/P/HLA/H20	Generation of HLA-H20 : F139M HiPS	Generation of HLA-H20 : F139M HiPS
4	act:CDS/P/HLA/Halpha	Generation of HLA-Halpha : F656N and F657N ...	Generation of HLA-Halpha : F656N and F657N ...
5	act:CDS/P/HLA/Hbeta	Generation of HLA-Hbeta : F487N and F486N ...	Generation of HLA-Hbeta : F487N and F486N ...
6	act:CDS/P/HLA/I	Generation of HLA-I : F814W, F791W, F785LP a...	Generation of HLA-I : F814W, F791W, F785LP a...
7	act:CDS/P/HLA/J	Generation of HLA-J : F140W, F125W, F125LP a...	Generation of HLA-J : F140W, F125W, F125LP a...
8	act:CDS/P/HLA/NII	Generation of HLA-NII : F658N HiPS	Generation of HLA-NII : F658N HiPS
9	act:CDS/P/HLA/OII	Generation of HLA-OII : F375N and F373N HiPS	Generation of HLA-OII : F375N and F373N HiPS
10	act:CDS/P/HLA/OIII	Generation of HLA-OIII : F502N HiPS	Generation of HLA-OIII : F502N HiPS
11	act:CDS/P/HLA/Palpha	Generation of HLA-Palpha : F187N HiPS	Generation of HLA-Palpha : F187N HiPS
12	act:CDS/P/HLA/Palpha_c	Generation of HLA-Palpha_c : F190W HiPS	Generation of HLA-Palpha_c : F190W HiPS
13	act:CDS/P/HLA/R	Generation of HLA-R : F702W and F675W HiPS	Generation of HLA-R : F702W and F675W HiPS
14	act:CDS/P/HLA/SDSSg	Generation of HLA-SDSSg : F475W HiPS	Generation of HLA-SDSSg : F475W HiPS
15	act:CDS/P/HLA/SDSSr	Generation of HLA-SDSSr : F625W and F622W ...	Generation of HLA-SDSSr : F625W and F622W ...
16	act:CDS/P/HLA/SDSSz	Generation of HLA-SDSSz : F850LP HiPS	Generation of HLA-SDSSz : F850LP HiPS
17	act:CDS/P/HLA/SIII	Generation of HLA-SIII : F873N, FQ672N and F...	Generation of HLA-SIII : F873N, FQ672N and F...
18	act:CDS/P/HLA/U	Generation of HLA-U : F336W, F330W, F300W, ...	Generation of HLA-U : F336W, F330W, F300W, ...
19	act:CDS/P/HLA/UV	Generation of HLA-UV : F170W HiPS	Generation of HLA-UV : F170W HiPS
20	act:CDS/P/HLA/V	Generation of HLA-V : F555W, F547W, F569W ...	Generation of HLA-V : F555W, F547W, F569W ...
21	act:CDS/P/HLA/Y	Generation of HLA-Y : F110W and F105W HiPS	Generation of HLA-Y : F110W and F105W HiPS
22	act:CDS/P/HLA/wideUV	Generation of HLA-wideUV : F255W, F250W, F2...	Generation of HLA-wideUV : F255W, F250W, F2...
23	act:CDS/P/HLA/wideV	Generation of HLA-wideV : F606W and F600LP ...	Generation of HLA-wideV : F606W and F600LP ...
24	act:CDS/P/HST/B	Generation of HST-B includes the following filt...	Generation of HST-B includes the following filt...
25	act:CDS/P/HST/C0	Generation of HST-C0 includes the following fil...	Generation of HST-C0 includes the following fil...
26	act:CDS/P/HST/GOODS/b	Generation of GOODS b HiPS	Generation of GOODS b HiPS
27	act:CDS/P/HST/H20	Generation of HST-H20 includes the following ...	Generation of HST-H20 includes the following ...
28	act:CDS/P/HST/Halpha	Generation of HST-Halpha includes the followi...	Generation of HST-Halpha includes the followi...
29	act:CDS/P/HST/Hbeta	Generation of HST-Hbeta includes the followin...	Generation of HST-Hbeta includes the followin...
30	act:CDS/P/HST/I	Generation of HST-I includes the following filte...	Generation of HST-I includes the following filte...
31	act:CDS/P/HST/J	Generation of HST-J includes the following filte...	Generation of HST-J includes the following filte...
32	act:CDS/P/HST/NII	Generation of HST-NII includes the following fil...	Generation of HST-NII includes the following fil...
33	act:CDS/P/HST/OII	Generation of HST-OII includes the following fil...	Generation of HST-OII includes the following fil...
34	act:CDS/P/HST/OIII	Generation of HST-OIII includes the following fil...	Generation of HST-OIII includes the following fil...
35	act:CDS/P/HST/PHAT/F110W	Generation of HST PHAT - F110W - WFC3/IR HiPS	Generation of HST PHAT - F110W - WFC3/IR HiPS
36	act:CDS/P/HST/Palpha_c	Generation of HST-Palpha_c includes the follo...	Generation of HST-Palpha_c includes the follo...
37	act:CDS/P/HST/R	Generation of HST-R includes the following filt...	Generation of HST-R includes the following filt...
38	act:CDS/P/HST/SDSSg	Generation of HST-SDSSg incudes the followin...	Generation of HST-SDSSg incudes the followin...
39	act:CDS/P/HST/SDSSr	Generation of HST-SDSSr includes the followin...	Generation of HST-SDSSr includes the followin...
40	act:CDS/P/HST/SDSSz	Generation of HST-SDSSz includes the followin...	Generation of HST-SDSSz includes the followin...
41	act:CDS/P/HST/SIII	Generation of HST-SIII includes the following fil...	Generation of HST-SIII includes the following fil...
42	act:CDS/P/HST/U	Generation of HST-U includes the following filt...	Generation of HST-U includes the following filt...
43	act:CDS/P/HST/UV	Generation of HST-UV includes the following fil...	Generation of HST-UV includes the following fil...
44	act:CDS/P/HST/V	Generation of HST-V includes the following filt...	Generation of HST-V includes the following filt...
45	act:CDS/P/HST/Y	Generation of HST-Y includes the following filt...	Generation of HST-Y includes the following filt...
46	act:CDS/P/HST/other	Generation of HST-Others HiPS	Generation of HST-Others HiPS
47	act:CDS/P/HST/wideUV	Generation of HST-wideUV includes the followi...	Generation of HST-wideUV includes the followi...
48	act:CDS/P/HST/wideV	Generation of HST-wideV includes the followin...	Generation of HST-wideV includes the followin...
49	act:CDS/P/Haslam408	Generation of Haslam 408MHz HiPS	Generation of Haslam 408MHz HiPS

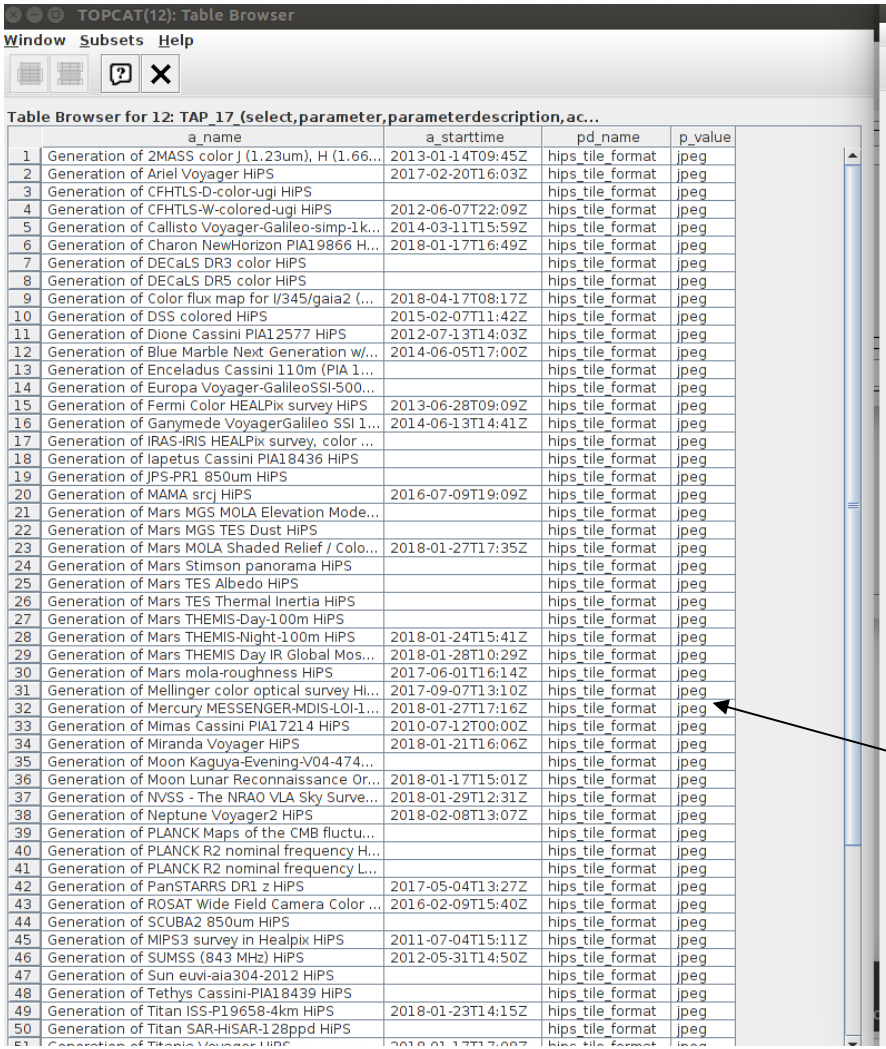
select activities described by the same ActivityDescription

(= here, running the same hipsgen software)



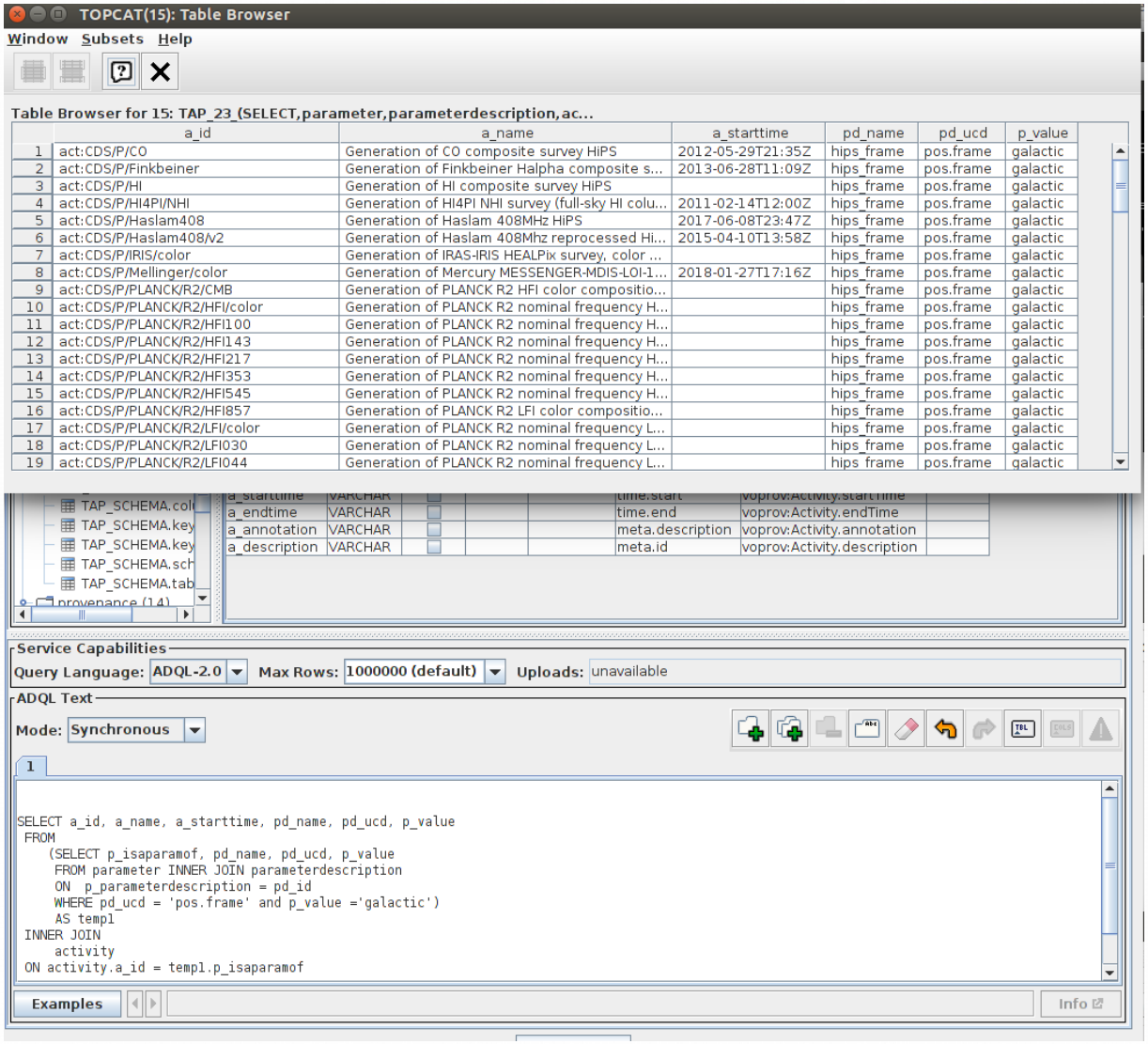
Select activities from some configuration parameters values

(here « created only in jpeg »)



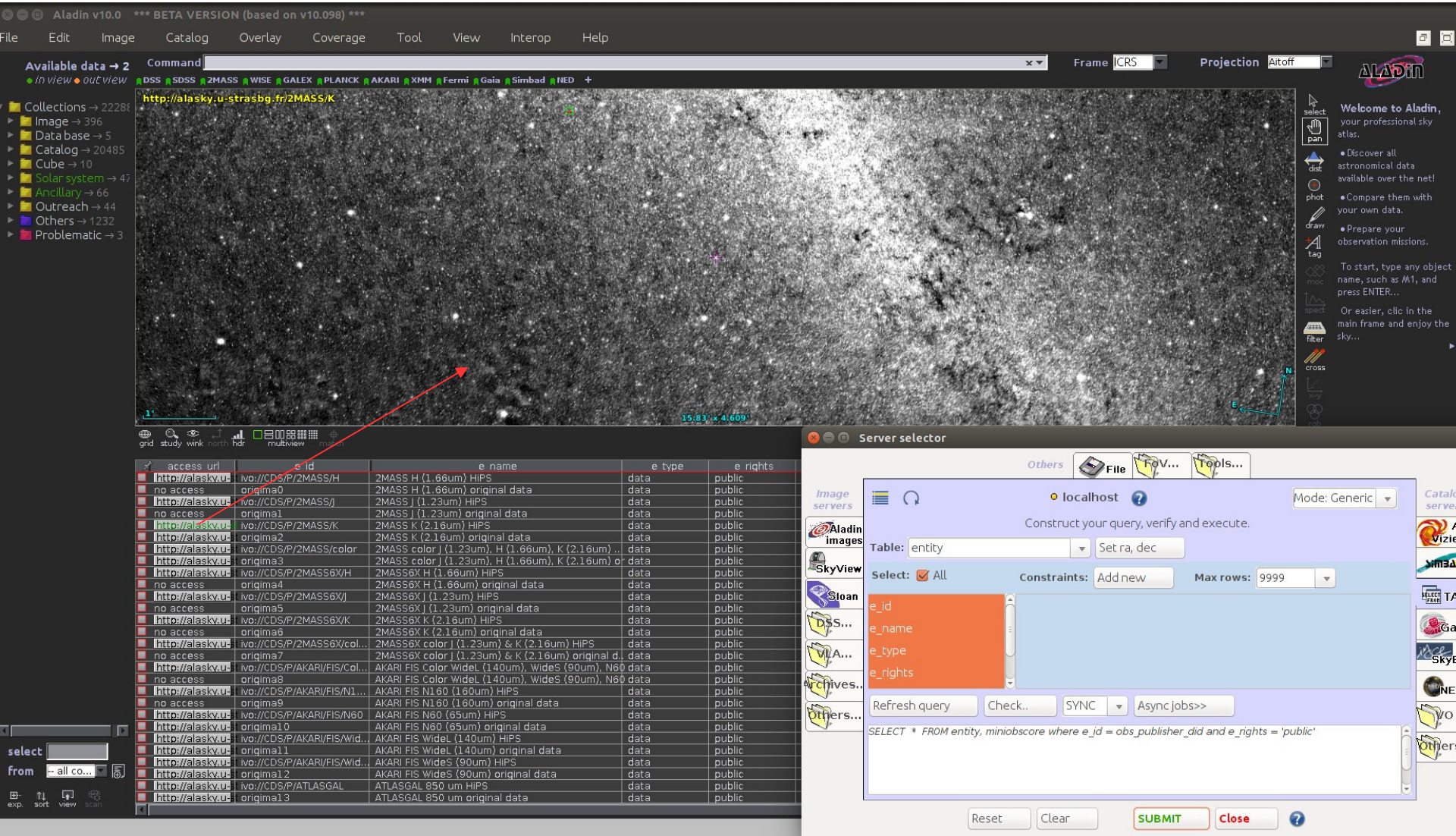
select activities from some configuration parameters values

(here selected by ucd and « created in galactic frame)



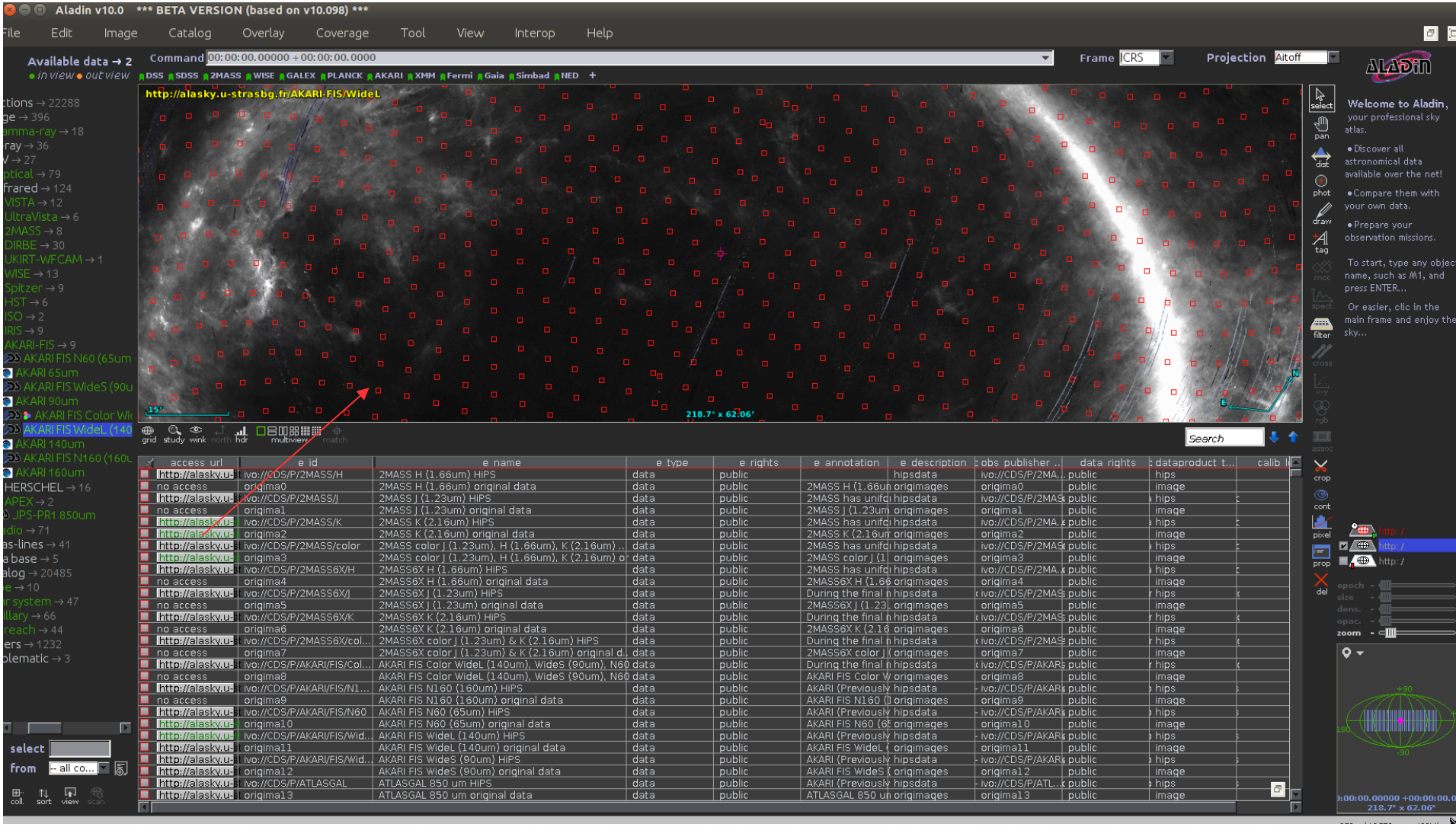
Select entities and display them in Aladin (HiPS or classical images)

(here « public » entities)



elect entities and display them in Aladin (HiPS or classical images)

(here progenitors centers overlay – ready to be loaded



Functions for complex queries

- See M.Nullmeier talk

Conclusion/future work

- Add provenance information for HiPS progenitors
  - Schmidt plate digitization
  - Mosaics
  - Raw data if available
- Enrich/update HiPS description in the service
- Cross combine information with HESS/CTA database