

# ProvTAP status report



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acknowledge the « provenance » author team  
of the DM WG





# Provenance UML diagram

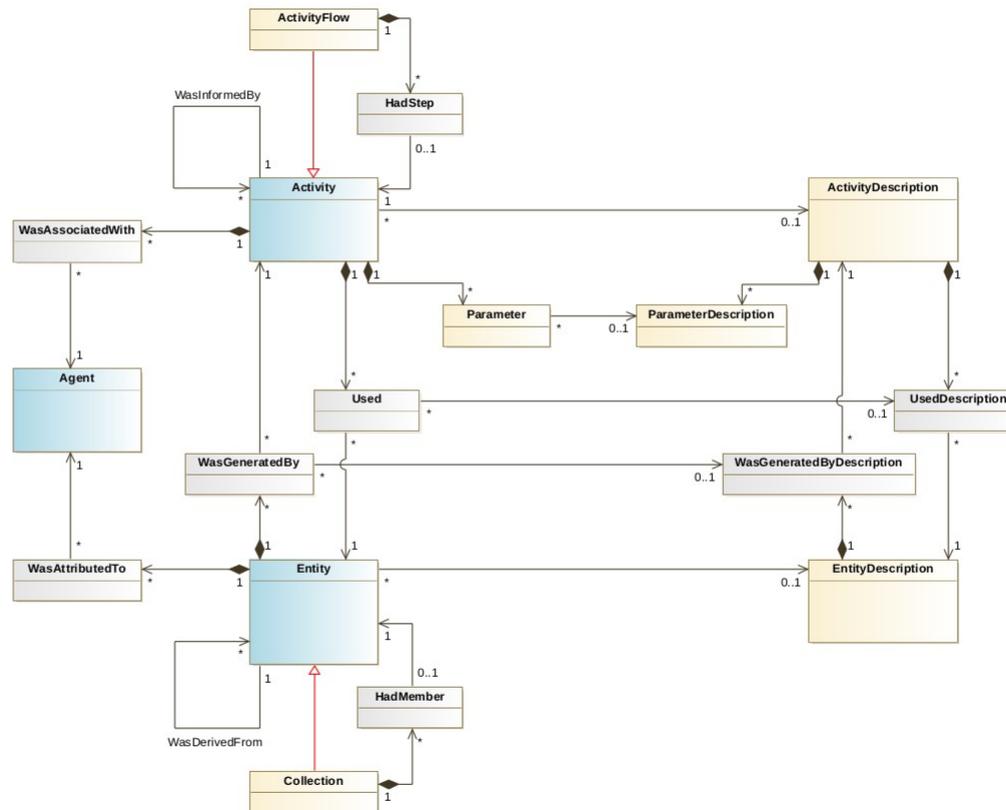


Figure 5: More detailed overview of the classes for the Provenance Data Model. Note that this UML class diagram is compatible with VO-DML.

# □ CDS ProvTAP service project

- It's a TAP service
- It implements a relational view of the model in its TAP schema
- It allows selection of related entity, activity and agent details by constraining any of the model classes attributes

# What has been done so far ?

- Spring 2017: A prototype of a postgresql database has been developed and is regularly updated
  - Original work by a student
  - Based on aladin image collections and activities
  - Use cases : schmidt plate digitizations, cutouts, RGB composition, HiPS generation
  - W3C PROV and VOTable I/O, interface
  - ---→ TAP interface « first light » (last week!!!)

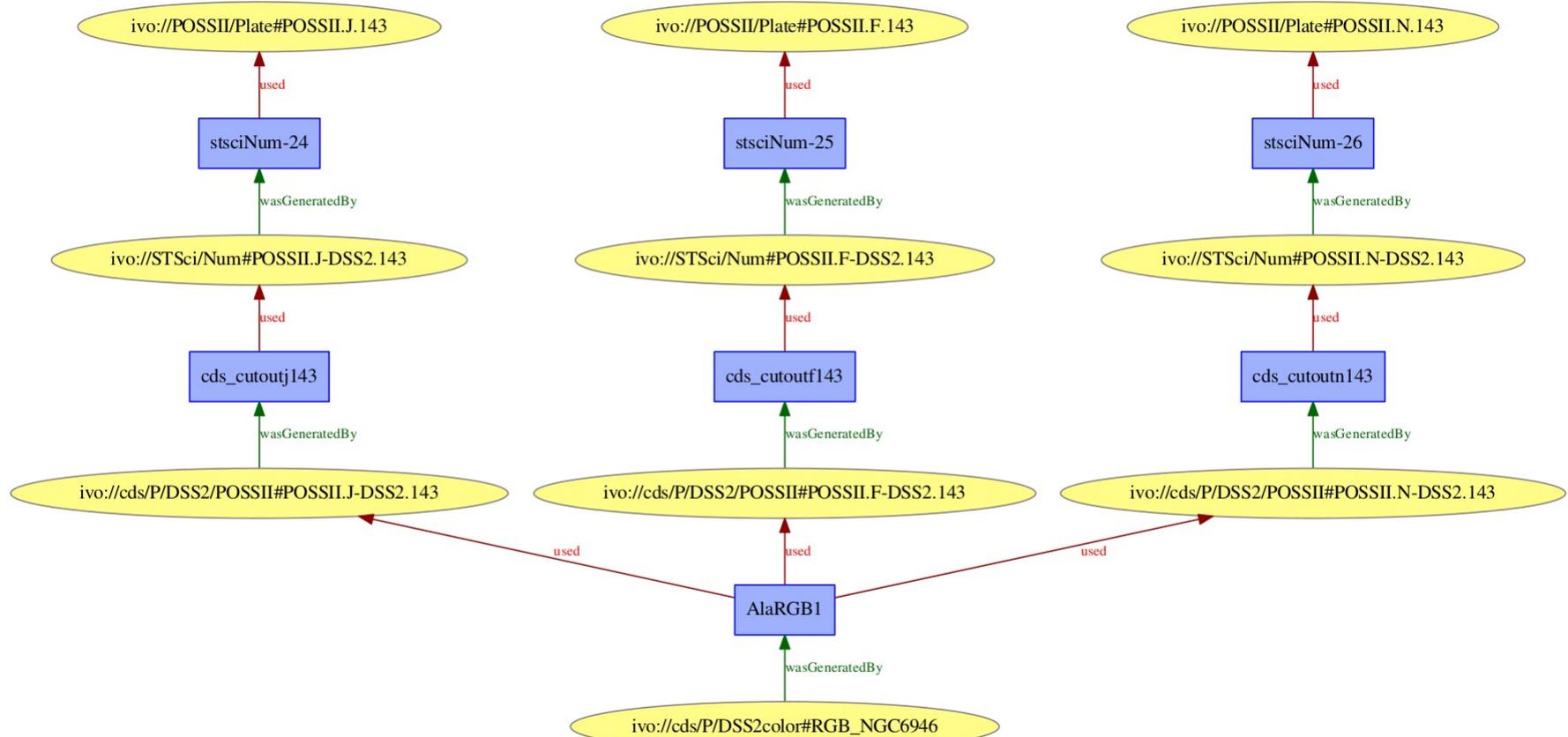


# What has been done so far ?

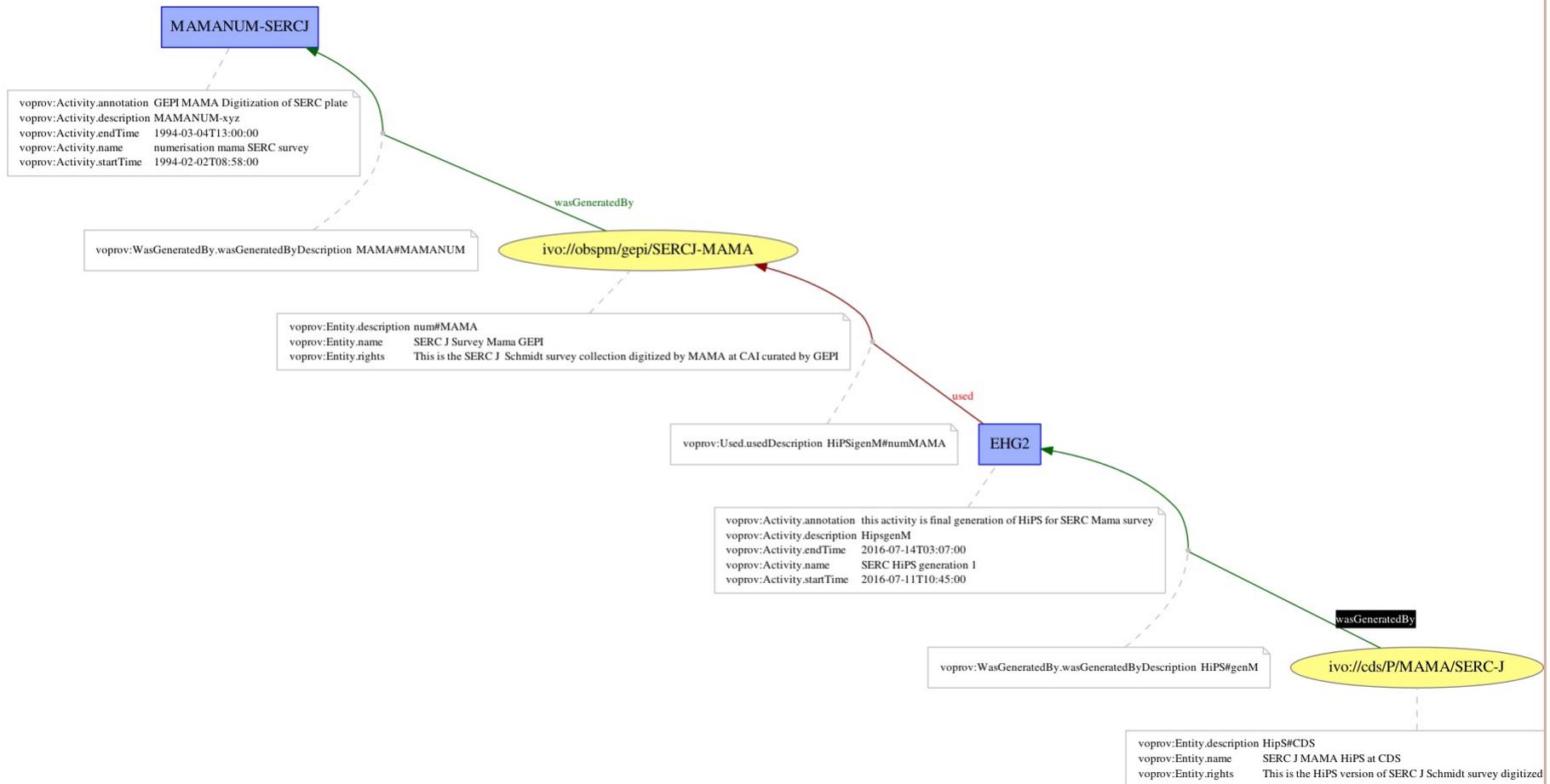
- Various « ActivityDescriptions » in the service
  - RGB image generation
  - CDS cutout extraction
  - STScI Schmidt plate numerisation
  - MAMA Schmidt plate numerisation
  - CDS HiPS generation
    - HiPS is a global (allsky) organisation of the image data
    - stored in Healpix cells,
    - retrievable at various Healpix orders



# From Schmidt plates to RGB images through digitized plates and cutouts



# Plate collection digitization HiPS generation



# What has been done so far ?

- Classes and columns description in the ProvTAP specification



# Column descriptions

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Name	ucd	utype	datatype
e_id	meta.id	voprov:Entity.id	char
e_name	meta.title	voprov:Entity.name	char
e_type	meta.code.class	voprov:Entity.type	char
e_rights	meta.code.class	voprov:Entity.rights	char
e_annotation	meta.description	voprov:Entity.annotation	char
→ e_hadMember	meta.code.member	voprov:Entity.hadMember	char
→ e_description	meta.id	voprov:Entity.description	char
→ e_usedEntity	meta.id	voprov:Entity.wasDerivedFrom.usedEntity	char

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*Table 2:* Column description for Entity table

Name	ucd	utype	datatype
ed_id	meta.id	voprov:EntityDescription.id	char
ed_name	meta.title	voprov:EntityDescription.name	char
ed_annotation	meta.description	voprov:EntityDescription.annotation	char
ed_category	meta.code.class	voprov:EntityDescription.category	char
ed_doculink	meta.ref.url	voprov:EntityDescription.doculink	char

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*Table 3:* Column description for EntityDescription table

# Column descriptions

Name	ucd	utype	datatype
a_id	meta.id	voprov:Activity.id	char
a_name	meta.title	voprov:Activity.name	char
a_startTime	time.start	voprov:Activity.startTime	char
a_endTime	time.stop	voprov:Activity.endTime	char
a_annotation	meta.description	voprov:Activity.annotation	char
a_votype	meta.code.class	voprov:Activity.votype	char
→ a_hadStep	meta.code.member	voprov:Activity.hadStep	char
→ a_description	meta.id	voprov:Activity.description	char
→ a_parameter	meta.id	voprov:Activity.parameter	char
→ a_informant	meta.id	voprov:Activity.wasInformedBy.informant	char

Table 4: Column description for Activity table

Name	ucd	utype	datatype
ad_id	meta.id	voprov:ActivityDescription.id	char
ad_name	meta.title	voprov:ActivityDescription.name	char
ad_type	meta.code.class	voprov:ActivityDescription.type	char
ad_subtype	meta.code.class	voprov:ActivityDescription.subtype	char
ad_annotation	meta.description	voprov:ActivityDescription.annotation	char
ad_doculink	meta.ref.url	voprov:ActivityDescription.doculink	char
→ ad_param	meta.id	voprov:ActivityDescription.parameter	char

Table 5: Column description for ActivityDescription table



# What has been done so far ?

- Classes and columns description in the ProvTAP specification
- TAP schema designed



## Entity in the TAP Schema

```
▼<schema>
  <name>provenance</name>
  <description>Provenance schema</description>
  ▼<table type="output">
    <name>Entity</name>
    <description>instances of Entity class</description>
    ▼<column>
      <name>e_id</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.id</ucd>
      <utype>voprov:Entity.id</utype>
    </column>
    ▼<column>
      <name>e_name</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.title</ucd>
      <utype>voprov:Entity.name</utype>
    </column>
    ▼<column>
      <name>e_type</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.code.class</ucd>
      <utype>voprov:Entity.type</utype>
    </column>
    ▼<column>
      <name>e_rights</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.code.class</ucd>
      <utype>voprov:Entity.rights</utype>
    </column>
    ▼<column>
      <name>e_annotation</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.description</ucd>
      <utype>voprov:Entity.annotation</utype>
    </column>
    ▼<column>
      <name>e_hadMember</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.code.member</ucd>
      <utype>voprov:Entity.hadMember</utype>
    </column>
    ▼<column>
      <name>e_description</name>
      <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
      <ucd>meta.id</ucd>
      <utype>voprov:Entity.description</utype>
    </column>
    ▼<foreignKey>
      <targetTable>EntityDescription</targetTable>
      ▼<fkColumn>
        <fromColumn>e_description</fromColumn>
        <targetColumn>ed_id</targetColumn>
      </fkColumn>
    </foreignKey>
  </table>
  ▼<table type="output">
```

## Activity in ProvTAP schema

```
▼<table type="output">
  <name>Activity</name>
  <description>instances of Activity class</description>
  ▼<column>
    <name>a_id</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.id</ucd>
    <utype>voprov:Activity.id</utype>
  </column>
  ▼<column>
    <name>a_name</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.title</ucd>
    <utype>voprov:Activity.name</utype>
  </column>
  ▼<column>
    <name>a_startTime</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>time.start</ucd>
    <utype>voprov:Activity.startTime</utype>
  </column>
  ▼<column>
    <name>a_stopTime</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>time.stop</ucd>
    <utype>voprov:Activity.stopTime</utype>
  </column>
  ▼<column>
    <name>a_annotation</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.description</ucd>
    <utype>voprov:Activity.annotation</utype>
  </column>
  ▼<column>
    <name>a_votype</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.code.class</ucd>
    <utype>voprov:Activity.votype</utype>
  </column>
  ▼<column>
    <name>a_hadStep</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.code.member</ucd>
    <utype>voprov:Activity.hadStep</utype>
  </column>
  ▼<column>
    <name>a_description</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.id</ucd>
    <utype>voprov:Activity.description</utype>
  </column>
  ▼<column>
    <name>a_parameter</name>
    <dataType xsi:type="vod:TAPType">VARCHAR</dataType>
    <ucd>meta.id</ucd>
    <utype>voprov:Activity.parameter</utype>
  </column>
</table>
```

# What has been done so far ?

- Classes and columns description in the ProvTAP specification
- TAP schema designed
- Specification ready to go to Working draft status



# □ ProvTAP Working draft (to be released soon)

## **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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Editor(s)

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# What has been done so far ?

- Classes and columns description in the ProvTAP specification
- TAP schema designed
- Can specification go to Working draft status ?
  - depend from model achievement
  - coauthors review is needed
- Service can be queried via ADQL queries

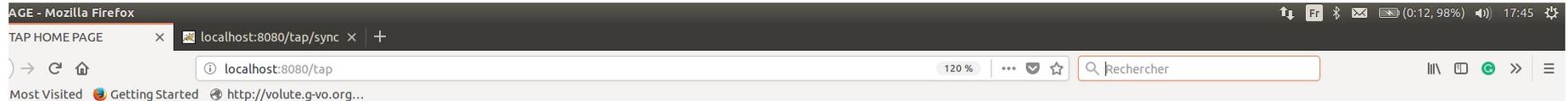


# Implementation tools/status

- Gregory Mantelet's library : easy creation of service on top of database
- Embedded web interface
- Topcat demonstration
- Aladin and TapHandle don't work in current context (my desktop implementation wifi IP numbers not recognized)
- But SAMP communication can help us.
- We created a « miniobscore » table in addition to describe more are « dataset » entities



# web interface embedded In TAP library



## TAP HOME PAGE - CDS -

### available resources

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- [tables](#)
- [sync](#)
- [capabilities](#)
- [async](#)
- [availability](#)

### DQL query

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Query:

```
SELECT *  
FROM entity;
```

Execution mode:  Asynchronous/Batch  Synchronous

Format:

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

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

# SELECT \* from entity HTML format

Most visited Getting started http://votca.gvo.org...

TAP result from CDS on 2018-08-30T15:42:13Z

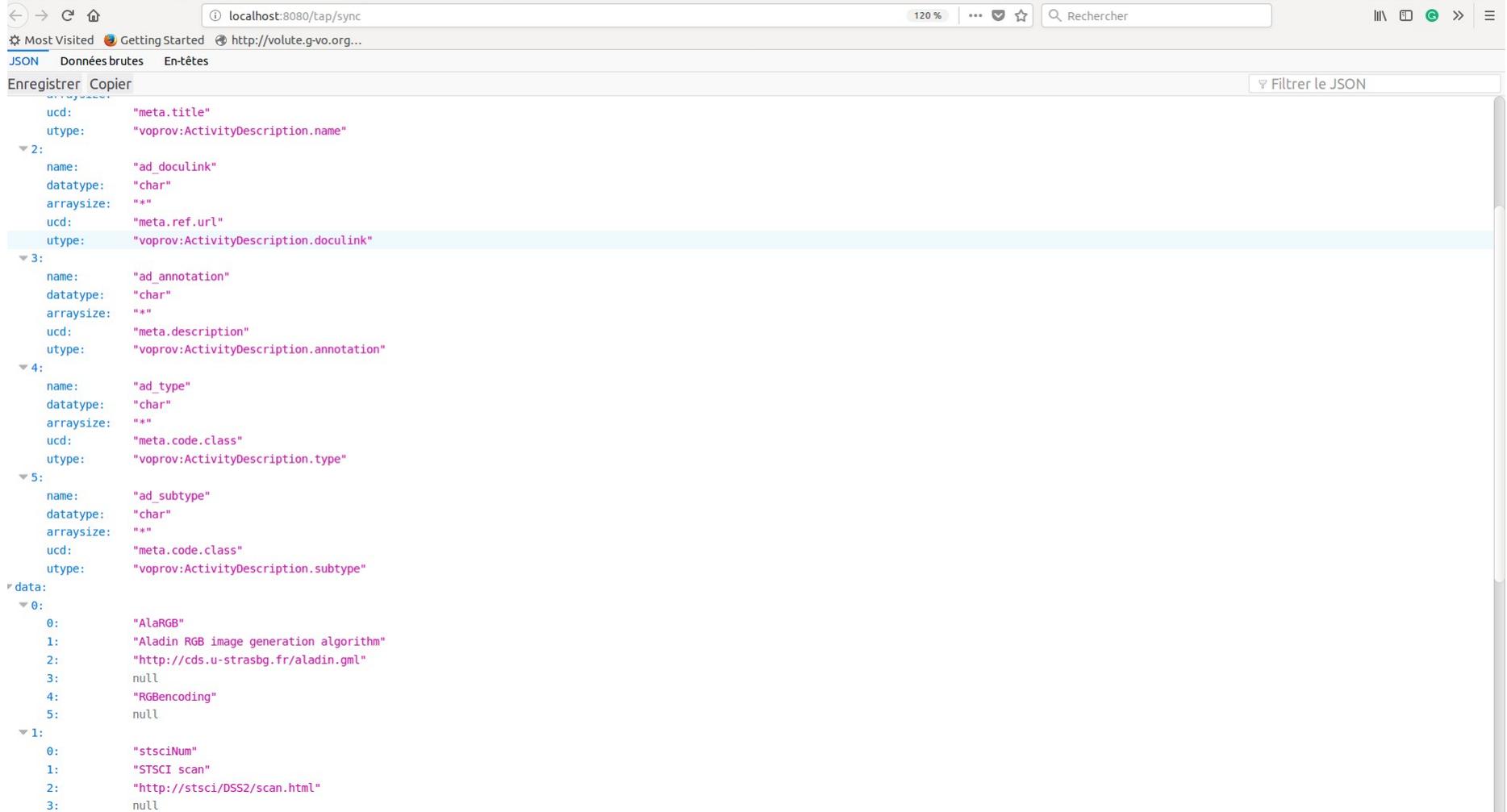
SELECT \* FROM entity;

e_id	e_name	e_type	e_rights	e_annotation	e_description
ivo://cds/P/DSS2color#RGB_NGC6946	RGB DSS2 image for NGC 6946			This is a PNG RGB image built from DSS2 with Aladin for galaxy NGC 69	color#RGB
ivo://cds/P/DSS2color#RGB_M101	RGB DSS2 image for Messier 101			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 101	color#RGB
ivo://cds/P/DSS2color#RGB_M33	RGB DSS2 image for Messier 33			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 33	color#RGB
ivo://cds/P/DSS2color#RGB_M51	RGB DSS2 image for Messier 51			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 51	color#RGB
ivo://cds/P/DSS2color#RGB_M81	RGB DSS2 image for Messier 81			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 81	color#RGB
ivo://cds/P/DSS2color#RGB_M83	RGB DSS2 image for Messier 83			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 83	color#RGB
ivo://cds/P/DSS2color#RGB_M87	RGB DSS2 image for Messier 87			This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 87	color#RGB
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.061	POSSII Infra Red Survey DSS2 M81			This is the DSS2 digitization of the POSSII Schmidt survey around Messier 81	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.061	POSSII Blue Survey DSS2 M81			This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 81	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.061	POSSII Red Survey DSS2 M81			This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 81	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.143	POSSII Blue Survey DSS2 NGC6946			This is the DSS2 digitization of the Blue POSSII Schmidt survey around NGC 6946	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.143	POSSII Red Survey DSS2 NGC6946			This is the DSS2 digitization of the Red POSSII Schmidt survey around NGC 6946	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.143	POSSII Infra Red Survey DSS2 NGC6946			This is the DSS2 digitization of the Infra red POSSII Schmidt survey around NGC 6946	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.174	POSSII Blue Survey DSS2 M101			This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 101	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.174	POSSII Red Survey DSS2 M101			This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 101	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.175	POSSII Infra Red Survey DSS2 M101			This is the DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 101	cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.270	POSSII Blue Survey DSS2 M51			This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 51	cutout#DSS2_MAMA

# SELECT \* from activity CSV format

```
sync x
_id,a_name,a_starttime,a_endtime,a_annotation,a_description
stsciNum-21","Num DSS2 POSSII 061 J","2006-06-29T15:32:50","2006-06-29T15:35:00","DSS2 Digitization of plates at Stsci POSSII 061 J","stsciNum"
stsciNum-22","Num DSS2 POSSII 061 F","2006-04-04T16:39:18","2006-04-04T16:41:00","DSS2 Digitization of plates at Stsci POSSII 061 F","stsciNum"
stsciNum-23","Num DSS2 POSSII 061 N","2006-04-04T16:52:00","2006-04-04T16:54:00","DSS2 Digitization of plates at Stsci POSSII 061 N","stsciNum"
AlaRGB1","Aladin RGB 1","2017-04-18T17:28:00","2017-04-19T17:29:00","Aladin RGB image generation for NGC 6946 ","AlaRGB"
AlaRGB2","Aladin RGB 2","2017-04-18T17:34:00","2017-04-19T17:35:00","Aladin RGB image generation for Messier 101 ","AlaRGB"
AlaRGB3","Aladin RGB 3","2017-04-18T17:41:00","2017-04-19T17:42:00","Aladin RGB image generation for Messier 33 ","AlaRGB"
AlaRGB4","Aladin RGB 4","2017-04-18T17:45:00","2017-04-19T17:46:00","Aladin RGB image generation for Messier 51 ","AlaRGB"
AlaRGB5","Aladin RGB 5","2017-04-18T17:47:00","2017-04-19T17:48:00","Aladin RGB image generation for Messier 81 ","AlaRGB"
AlaRGB6","Aladin RGB 6","2017-04-18T17:50:00","2017-04-19T17:51:00","Aladin RGB image generation for Messier 83 ","AlaRGB"
AlaRGB7","Aladin RGB 7","2017-04-18T17:53:00","2017-04-19T17:54:00","Aladin RGB image generation for Messier 87 ","AlaRGB"
stsciNum-24","Num DSS2 POSSII 143 J","2006-04-04T16:10:12","2006-04-04T16:10:30","DSS2 Digitization of plates at Stsci POSSII 143 J","stsciNum"
stsciNum-25","Num DSS2 POSSII 143 F","2006-04-04T16:25:45","2006-04-04T16:25:55","DSS2 Digitization of plates at Stsci POSSII 143 F","stsciNum"
stsciNum-26","Num DSS2 POSSII 143 N","2006-04-04T16:31:01","2006-04-04T16:31:21","DSS2 Digitization of plates at Stsci POSSII 143 N","stsciNum"
stsciNum-27","Num DSS2 POSSII 270 J","2006-04-04T16:17:26","2006-04-04T16:17:36","DSS2 Digitization of plates at Stsci POSSII 270 J","stsciNum"
stsciNum-28","Num DSS2 POSSII 270 F","2006-04-04T16:17:27","2006-04-04T16:17:37","DSS2 Digitization of plates at Stsci POSSII 270 F","stsciNum"
stsciNum-29","Num DSS2 POSSII 270 N","2006-04-04T16:35:11","2006-04-04T16:35:21","DSS2 Digitization of plates at Stsci POSSII 270 N","stsciNum"
stsciNum-2a","Num DSS2 POSSII 174 J","2006-04-04T16:36:03","2006-04-04T16:36:13","DSS2 Digitization of plates at Stsci POSSII 174 J","stsciNum"
stsciNum-2b","Num DSS2 POSSII 174 F","2006-04-04T16:22:28","2006-04-04T16:22:38","DSS2 Digitization of plates at Stsci POSSII 174 F","stsciNum"
stsciNum-2c","Num DSS2 POSSII 175 N","2006-04-04T16:41:00","2006-04-04T16:41:10","DSS2 Digitization of plates at Stsci POSSII 175 N","stsciNum"
stsciNum-2d","Num DSS2 POSSII 413 J","2006-04-04T16:19:43","2006-04-04T16:19:53","DSS2 Digitization of plates at Stsci POSSII 413 J","stsciNum"
stsciNum-2e","Num DSS2 POSSII 413 F","2006-04-04T16:18:05","2006-04-04T16:18:15","DSS2 Digitization of plates at Stsci POSSII 413 F","stsciNum"
stsciNum-2f","Num DSS2 POSSII 413 N","2006-06-29T15:32:42","2006-06-29T15:32:52","DSS2 Digitization of plates at Stsci POSSII 413 N","stsciNum"
stsciNum-2g","Num DSS2 POSSII 644 J","2006-04-04T16:07:36","2006-04-04T16:07:46","DSS2 Digitization of plates at Stsci POSSII 644 J","stsciNum"
stsciNum-2h","Num DSS2 POSSII 644 F","2006-04-04T16:11:58","2006-04-04T16:12:08","DSS2 Digitization of plates at Stsci POSSII 644 F","stsciNum"
stsciNum-2i","Num DSS2 POSSII 644 N","2006-04-04T16:11:58","2006-04-04T16:11:58","DSS2 Digitization of plates at Stsci POSSII 644 N","stsciNum"
stsciNum-2j","Num DSS2 SERC 445 I","2006-04-04T16:36:09","2006-04-04T16:36:19","DSS2 Digitization of plates at Stsci SERC 445 I","stsciNum"
MAMANUM-1","numerisation mama SERC J 444","1994-02-04T09:00:00","1994-02-04T14:57:00","GEPI MAMA Digitization of plate SERC 444J","MAMANUM-xyz"
MAMANUM-2","numerisation mama ESO R 444","1994-01-28T09:03:00","1994-01-28T13:07:00","GEPI MAMA Digitization of plate ESO 444R","MAMANUM-xyz"
MAMANUM-3","numerisation mama ESO R 445","1993-08-12T09:17:00","1993-08-12T13:32:00","GEPI MAMA Digitization of plate ESO 445R","MAMANUM-xyz"
MAMANUM-4","numerisation mama ESO R 446","1993-08-13T09:13:00","1993-08-13T13:25:00","GEPI MAMA Digitization of plate ESO 446R","MAMANUM-xyz"
MAMANUM-5","numerisation mama ESO R 447","1993-08-14T08:58:00","1993-08-14T13:00:00","GEPI MAMA Digitization of plate ESO 447R","MAMANUM-xyz"
MAMANUM-ESOR","numerisation mama ESO survey","1993-08-01T08:58:00","1993-08-31T13:00:04","GEPI MAMA Digitization of ESO plates","MAMANUM-xyz"
MAMANUM-SERCJ","numerisation mama SERC survey","1994-02-02T08:58:00","1994-03-04T13:00:00","GEPI MAMA Digitization of SERC plate","MAMANUM-xyz"
cde_cutoutj061","Cut out Aladin POSSII 061 J","2017-04-18T16:33:00","2017-04-19T16:34:00","Cut out CDS- soda service POSSII 061 J","cde_cutout"
cde_cutoutf061","Cut out Aladin POSSII 061 F","2017-04-18T16:34:00","2017-04-19T16:35:00","Cut out CDS- soda service POSSII 061 F","cde_cutout"
cde_cutoutn061","Cut out Aladin POSSII 061 N","2017-04-18T16:35:00","2017-04-19T16:36:00","Cut out CDS- soda service POSSII 061 N","cde_cutout"
cde_cutoutj143","Cut out Aladin POSSII 143 J","2017-04-18T16:36:00","2017-04-19T16:37:00","Cut out CDS- soda service POSSII 143 J","cde_cutout"
cde_cutoutf143","Cut out Aladin POSSII 143 F","2017-04-18T16:37:00","2017-04-19T16:38:00","Cut out CDS- soda service POSSII 143 F","cde_cutout"
cde_cutoutn143","Cut out Aladin POSSII 143 N","2017-04-18T16:38:00","2017-04-19T16:39:00","Cut out CDS- soda service POSSII 143 N","cde_cutout"
cde_cutoutj174","Cut out Aladin POSSII 174 J","2017-04-18T16:39:00","2017-04-19T16:40:00","Cut out CDS- soda service POSSII 174 J","cde_cutout"
cde_cutoutf174","Cut out Aladin POSSII 174 F","2017-04-18T16:40:00","2017-04-19T16:41:00","Cut out CDS- soda service POSSII 174 F","cde_cutout"
cde_cutoutn175","Cut out Aladin POSSII 175 N","2017-04-18T16:41:00","2017-04-19T16:42:00","Cut out CDS- soda service POSSII 175 N","cde_cutout"
cde_cutoutj270","Cut out Aladin POSSII 270 J","2017-04-18T16:42:00","2017-04-19T16:42:30","Cut out CDS- soda service POSSII 270 J","cde_cutout"
cde_cutoutf270","Cut out Aladin POSSII 270 F","2017-04-18T16:43:00","2017-04-19T16:43:30","Cut out CDS- soda service POSSII 270 F","cde_cutout"
cde_cutoutn270","Cut out Aladin POSSII 270 N","2017-04-18T16:44:00","2017-04-19T16:44:30","Cut out CDS- soda service POSSII 270 N","cde_cutout"
cde_cutoutj413","Cut out Aladin POSSII 413 J","2017-04-18T16:45:00","2017-04-19T16:45:30","Cut out CDS- soda service POSSII 413 J","cde_cutout"
cde_cutoutf413","Cut out Aladin POSSII 413 F","2017-04-18T16:46:00","2017-04-19T16:46:30","Cut out CDS- soda service POSSII 413 F","cde_cutout"
cde_cutoutn413","Cut out Aladin POSSII 413 N","2017-04-18T16:47:00","2017-04-19T16:47:40","Cut out CDS- soda service POSSII 413 N","cde_cutout"
cde_cutoutj644","Cut out Aladin POSSII 644 J","2017-04-18T16:48:00","2017-04-19T16:48:25","Cut out CDS- soda service POSSII 644 J","cde_cutout"
cde_cutoutf644","Cut out Aladin POSSII 644 F","2017-04-18T16:49:00","2017-04-19T16:49:26","Cut out CDS- soda service POSSII 644 F","cde_cutout"
cde_cutoutn644","Cut out Aladin POSSII 644 N","2017-04-18T16:50:00","2017-04-19T16:50:30","Cut out CDS- soda service POSSII 644 N","cde_cutout"
cde_cutouti445","Cut out Aladin SERC 445 I","2017-04-18T16:52:00","2017-04-19T16:52:20","Cut out CDS- soda service SERC 445 I","cde_cutout"
cde_cutoutj444","Cut out Aladin SERC 444 J","2017-04-18T16:54:00","2017-04-19T16:54:20","Cut out CDS- soda service SERC 444 J","cde_cutout"
```

# SELECT \* from activitydescription json format



```
localhost:8080/tap/sync
120%
Rechercher
Most Visited Getting Started http://volute.g-vo.org...
JSON Données brutes En-têtes
Enregistrer Copier
Filtrer le JSON

{
  "ucd": "meta.title",
  "utype": "voprov:ActivityDescription.name",
  "2": {
    "name": "ad_docuLink",
    "datatype": "char",
    "arraysize": "*",
    "ucd": "meta.ref.url",
    "utype": "voprov:ActivityDescription.docuLink",
  },
  "3": {
    "name": "ad_annotation",
    "datatype": "char",
    "arraysize": "*",
    "ucd": "meta.description",
    "utype": "voprov:ActivityDescription.annotation",
  },
  "4": {
    "name": "ad_type",
    "datatype": "char",
    "arraysize": "*",
    "ucd": "meta.code.class",
    "utype": "voprov:ActivityDescription.type",
  },
  "5": {
    "name": "ad_subtype",
    "datatype": "char",
    "arraysize": "*",
    "ucd": "meta.code.class",
    "utype": "voprov:ActivityDescription.subtype",
  },
  "data": {
    "0": {
      "0": "ALaRGB",
      "1": "Aladin RGB image generation algorithm",
      "2": "http://cds.u-strasbg.fr/aladin.gml",
      "3": null,
      "4": "RGBencoding",
      "5": null,
    },
    "1": {
      "0": "stsciNum",
      "1": "STSCI scan",
      "2": "http://stsci/DSS2/scan.html",
      "3": null,
    }
  }
}
```

# SELECT \* from miniobscore VOTable format

```
sync-1 x
?xml version="1.0" encoding="utf-8"?>
VOTABLE version="1.3" xmlns="http://www.ivoa.net/xml/VOTable/v1.3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" 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>
INFO name="QUERY" value="SELECT *
FROM miniobscore;"/>
TABLE name="result_51535644387945">
FIELD arraysize="*" datatype="char" name="obs_publisher_did" ucd="meta.ref.void" utype="obscore:Curation.publisherID"/>
FIELD arraysize="*" datatype="char" name="access_url" ucd="meta.ref.url" utype="obscore:Access.reference"/>
FIELD arraysize="*" datatype="char" name="data_rights" ucd="meta.code.class" utype="obscore:Curation.rights"/>
FIELD arraysize="*" datatype="char" name="dataprodct_type" ucd="meta.code.class" utype="obscore:ObsDataSet.dataProducttype"/>
FIELD datatype="int" name="calib_level" ucd="meta.code;obs.calib" utype="obscore:ObsDataSet.caliblevel"/>
DATA>
TABLEDATA>
<TR>
<TD>ivo://cds/P/MAMA/SERC-J</TD>
<TD>http://alasky.u-strasbg.fr/MAMA/CDS_P_MAMA_srcj</TD>
<TD>public</TD>
<TD>hips</TD>
<TD>3</TD>
</TR>
<TR>
<TD>ivo://cds/P/MAMA/ESO-R</TD>
<TD>http://alasky.u-strasbg.fr/MAMA/CDS_P_MAMA_esor</TD>
<TD>public</TD>
<TD>hips</TD>
<TD>3</TD>
</TR>
<TR>
<TD>ivo://cds/P/DSS2color#RGB_NGC6946</TD>
<TD>file://home/bonnarel/Aladin/RGB/RGB_NGC6946.png</TD>
<TD>public</TD>
<TD>image</TD>
<TD>3</TD>
</TR>
<TR>
<TD>ivo://cds/P/DSS2color#RGB_M101</TD>
<TD>file://home/bonnarel/Aladin/RGB/RGB_M101.png</TD>
<TD>public</TD>
<TD>image</TD>
<TD>3</TD>
</TR>
<TR>
<TD>ivo://cds/P/DSS2color#RGB_M33</TD>
<TD>file://home/bonnarel/Aladin/RGB/RGB_M33.png</TD>
<TD>public</TD>
<TD>image</TD>
<TD>3</TD>
</TR>
<TR>
<TD>ivo://cds/P/DSS2color#RGB_M51</TD>
<TD>file://home/bonnarel/Aladin/RGB/RGB_M51.png</TD>
```

# More realistic (and complex) queries

- To retrieve all activity metadata for activities sharing the same activityDescription:

```
SELECT * FROM Activity WHERE Activity.a_description = 'HipsgenM'
```

- To retrieve all activities associated with agent obspm:

```
SELECT WasAssociatedWith.waw_activity_id, Activity.a_name,  
Activity.a_annotation FROM WasAssociatedWith INNER JOIN Activity  
ON WasAssociatedWith.waw_activity_id = Activity.a_id WHERE  
WasAssociatedWith.waw_agent_id = 'ivo://obspm/cai'
```

- To retrieve all entities attributed to curator agents:

```
SELECT WasAttributedTo.wat_entity_id FROM WasAttributedTo  
WHERE WasAttributedTo.wat_role = 'voprov :curator'
```

# Activities sharing the same activity description « HipsgenM »

localhost:8080/tap

## TAP HOME

- CDS

### Available resources

- [tables](#)
- [sync](#)
- [capabilities](#)
- [async](#)
- [availability](#)

### ADQL query

**Query:**

```
SELECT * FROM Activity WHERE Activity.a_description = 'HipsgenM'
```

**Execution mode:**  Asynchronous/Batch  Synchronous

**Format:** text

**Result limit:** -1 rows (0 to get only n)

**Duration limit:** -1 seconds (a value > 0)

**Execute!**

Page generated by [TAPLibrary](#) v2.0

localhost:8080/tap/sync

a_id	a_name	a_starttime	a_endtime	a_annotation
"EHG1"	"ESO HiPS generation 1"	"2016-07-18T09:45:00"	"2016-07-20T10:00:00"	"this activity is final generation of HiPS for ESO Mam"
"EHG2"	"SERC HiPS generation 1"	"2016-07-11T10:45:00"	"2016-07-14T03:07:00"	"this activity is final generation of HiPS for SERC Ma"

Rechercher

# Activities associated with agent « ivo://obspm/cai »

localhost:8080/tap

## TAP HOME PAGE - CDS -

### Available resources

- [tables](#)
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### ADQL query

Query:

```
SELECT WasAssociatedWith.waw_activity_id, Activity.a_name, Activity.a_annotation  
FROM WasAssociatedWith INNER JOIN Activity ON WasAssociatedWith.waw_activity_id =  
Activity.a_id WHERE WasAssociatedWith.waw_agent_id = 'ivo://obspm/cai'
```

Execution mode:  Asynchronous/Batch  Synchronous

Format:

Result limit:  rows (0 to get only metadata ; a value > 0 means 'default')

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

Page generated by [TAPLibrary](#) v2.0

localhost:8080/tap/sync

waw_activity_id	a_name	a_annotation
"MAMANUM-1"	"numerisation mama SERC J 444"	"GEPI MAMA Digitization of plate SERC 444J"
"MAMANUM-2"	"numerisation mama ESO R 444"	"GEPI MAMA Digitization of plate ESO 444R"
"MAMANUM-3"	"numerisation mama ESO R 445"	"GEPI MAMA Digitization of plate ESO 445R"
"MAMANUM-4"	"numerisation mama ESO R 446"	"GEPI MAMA Digitization of plate ESO 446R"
"MAMANUM-5"	"numerisation mama ESO R 447"	"GEPI MAMA Digitization of plate ESO 447R"
"MAMANUM-ESOR"	"numerisation mama ESO survey"	"GEPI MAMA Digitization of ESO plates"
"MAMANUM-SERCJ"	"numerisation mama SERC survey"	"GEPI MAMA Digitization of SERC plate"

# Entities attributed to agents with role « voprov:curator »

localhost:8080/tap

## TAP HOME PAGE - CDS -

### Available resources

- [tables](#)
- [sync](#)
- [capabilities](#)
- [async](#)
- [availability](#)

### ADQL query

**Query:**

```
SELECT WasAttributedTo.wat_entity_id FROM WasAttributedTo WHERE  
WasAttributedTo.wat_role = 'voprov:curator'
```

**Execution mode:**  Asynchronous/Batch  Synchronous

**Format:** text

**Result limit:** -1 rows (0 to get only metadata ; a value

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

**Execute!**

Page generated by [TAPLibrary](#) v2.0

localhost:8080/tap/sync

```
wat_entity_id  
-----  
"ivo://obspm/gepi/ESO-MAMA"  
"ivo://obspm/gepi/SERCJ-MAMA"
```



# Querying service with TopCat

The image displays two overlapping screenshots of the TopCat web interface. The left screenshot shows the 'Table Access Protocol (TAP) Query' window with the 'Locate TAP Service' tab active. It lists 140 services, including TAPVizieR, HEASARC, and various SDSS and UKIDSS surveys. The 'Selected TAP Service' section shows the URL 'http://localhost:8080/tap'. The right screenshot shows the 'Table Access Protocol (TAP) Query' window with the 'Metadata' tab active. It displays the metadata for 'TAP Service (19)', including a tree view of schemas and tables. The 'Service Capabilities' section shows 'Query Language: ADQL-2.0' and 'Max Rows: 1000000 (default)'. The 'ADQL Text' section contains the query 'select \* from entity'. The 'Run Query' button is visible. Below the main interface, a 'Table List' shows '1: TAP\_1\_entity' and 'Current Table Properties' are displayed, including 'Label: TAP\_1\_entity', 'Location: TAP\_1\_entity', 'Name: result\_S1535645778758', 'Rows: 80', and 'Columns: 6'. A red 'on' label is visible on the right side of the interface.

# Service response

(list of entities. ADQL : select \* from Entity)

File Browser for 1: entity.xml

e_id	e_name	e_type	e_annotation	e_rights	e_description
ivo://cds/P/DSS2color#RGB_NGC6946	RGB DSS2 image for NGC 6946		This is a PNG RGB image built from DSS2 with Aladin for galaxy NGC 69		color#RGB
ivo://cds/P/DSS2color#RGB_M101	RGB DSS2 image for Messier 101		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 101		color#RGB
ivo://cds/P/DSS2color#RGB_M33	RGB DSS2 image for Messier 33		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 33		color#RGB
ivo://cds/P/DSS2color#RGB_M51	RGB DSS2 image for Messier 51		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 51		color#RGB
ivo://cds/P/DSS2color#RGB_M81	RGB DSS2 image for Messier 81		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 81		color#RGB
ivo://cds/P/DSS2color#RGB_M83	RGB DSS2 image for Messier 83		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 83		color#RGB
ivo://cds/P/DSS2color#RGB_M87	RGB DSS2 image for Messier 87		This is a PNG RGB image built from DSS2 with Aladin for galaxy Messier 87		color#RGB
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.061	POSSII Infra Red Survey DSS2 M81		This is the DSS2 digitization of the POSSII Schmidt survey around Messier 81		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.061	POSSII Blue Survey DSS2 M81		This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 81		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.061	POSSII Red Survey DSS2 M81		This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 81		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.143	POSSII Blue Survey DSS2 NGC6946		This is the DSS2 digitization of the Blue POSSII Schmidt survey around NGC 6946		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.143	POSSII Red Survey DSS2 NGC6946		This is the DSS2 digitization of the Red POSSII Schmidt survey around NGC 6946		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.143	POSSII Infra Red Survey DSS2 NGC6946		This is the DSS2 digitization of the Infra red POSSII Schmidt survey around NGC 6946		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.174	POSSII Blue Survey DSS2 M101		This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 101		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.174	POSSII Red Survey DSS2 M101		This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 101		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.175	POSSII Infra Red Survey DSS2 M101		This is the DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 101		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.270	POSSII Blue Survey DSS2 M51		This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 51		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.270	POSSII Red Survey DSS2 M51		This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 51		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.270	POSSII Infra Red Survey DSS2 M51		This is the DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 51		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.413	POSSII Blue Survey DSS2 M33		This is the DSS2 digitization of the Blue POSSII Schmidt survey around Messier 33		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.413	POSSII Red Survey DSS2 M33		This is the DSS2 digitization of the Red POSSII Schmidt survey around Messier 33		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.413	POSSII Infra Red Survey DSS2 M33		This is the DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 33		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.644	POSSII Blue Survey DSS2 M87		This is the cut-out DSS2 digitization of the Blue POSSII Schmidt survey around Messier 87		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.644	POSSII Red Survey DSS2 M87		This is the cut-out DSS2 digitization of the Red POSSII Schmidt survey around Messier 87		cutout#DSS2_MAMA
ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.644	POSSII Infra Red Survey DSS2 M87		This is the cut-out DSS2 digitization of the Infra red POSSII Schmidt survey around Messier 87		cutout#DSS2_MAMA
ivo://cds/P/DSS2/SERC#SERC.I-DSS2.445	SERC Infra Red Survey DSS2 M83		This is the DSS2 digitization of the Infra Red SERC Schmidt survey around Messier 83		cutout#DSS2_MAMA
ivo://cds/P/MAMA/SERC#SERC.J-MAMA.444	SERC Blue Survey MAMA M83		This is the MAMA digitization of the blue SERC Schmidt survey around Messier 83		cutout#DSS2_MAMA
ivo://cds/P/MAMA/ESO#ESO.R-MAMA.444	ESO Infra Red Survey MAMA M83		This is the MAMA digitization of the Red MAMA Schmidt survey around Messier 83		cutout#DSS2_MAMA
ivo://STScI/Num#POSSII.F-DSS2.061	POSSII Blue Survey DSS2 061		This is the DSS2 digitization of the Blue POSSII Schmidt survey plate 061		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.061	POSSII Red Survey DSS2 061		This is the DSS2 digitization of the Red POSSII Schmidt survey around plate 061		num#DSS2
ivo://STScI/Num#POSSII.N-DSS2.061	POSSII Infra Red Survey DSS2 061		This is the DSS2 digitization of the Infra Red POSSII Schmidt survey plate 061		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.143	POSSII Blue Survey DSS2 143		This is the DSS2 digitization of the Blue POSSII Schmidt survey around plate 143		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.143	POSSII Red Survey DSS2 143		This is the DSS2 digitization of the Red POSSII Schmidt survey around plate 143		num#DSS2
ivo://STScI/Num#POSSII.N-DSS2.143	POSSII Infra Red Survey DSS2 143		This is the DSS2 digitization of the Infra red POSSII Schmidt survey plate 143		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.174	POSSII Blue Survey DSS2 174		This is the DSS2 digitization of the Blue POSSII Schmidt survey around plate 174		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.174	POSSII Red Survey DSS2 174		This is the DSS2 digitization of the Red POSSII Schmidt survey plate 174		num#DSS2
ivo://STScI/Num#POSSII.N-DSS2.175	POSSII Infra Red Survey DSS2 M101		This is the DSS2 digitization of the Infra red POSSII Schmidt survey plate 175		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.270	POSSII Blue Survey DSS2 270		This is the DSS2 digitization of the Blue POSSII Schmidt survey plate 270		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.270	POSSII Red Survey DSS2 270		This is the DSS2 digitization of the Red POSSII Schmidt survey plate 270		num#DSS2
ivo://STScI/Num#POSSII.N-DSS2.270	POSSII Infra Red Survey DSS2 270		This is the DSS2 digitization of the Infra red POSSII Schmidt survey plate 270		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.413	POSSII Blue Survey DSS2 413		This is the DSS2 digitization of the Blue POSSII Schmidt survey plate 413		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.413	POSSII Red Survey DSS2 413		This is the DSS2 digitization of the Red POSSII Schmidt survey plate 413		num#DSS2
ivo://STScI/Num#POSSII.N-DSS2.413	POSSII Infra Red Survey DSS2 413		This is the DSS2 digitization of the Infra red POSSII Schmidt survey plate 413		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.644	Digital POSSII plate Blue Survey DSS2 644		This is the numerical plate of the Blue POSSII Schmidt survey		num#DSS2
ivo://STScI/Num#POSSII.F-DSS2.644	Digital POSSII plate Red Survey DSS2 644		This is the numerical plate of the Red POSSII Schmidt survey around Messier 87		num#DSS2
ivo://STScI/Num#POSSII.N-DSS2.644	Digital POSSII plate Infra Red Survey DSS2 644		This is the numerical plate of the Infra red POSSII Schmidt survey around Messier 87		num#DSS2
ivo://STScI/Num#SERC.I-DSS2.445	Digital SERC plate Infra Red Survey DSS2 445		This is the numerical plate of the Infra red SERC Schmidt survey for plate 445		num#DSS2
ivo://gpep/MAMA/Num#SERC.J-MAMA.444	SERC J Survey MAMA plate 444		This is the MAMA digitization of the blue SERC Schmidt survey plate 444		num#MAMA
ivo://gpep/MAMA/Num#ESO.R-MAMA.444	ESO Red Survey MAMA plate 444		This is the MAMA digitization of the Red MAMA Schmidt plate 444		num#MAMA
ivo://gpep/MAMA/Num#ESO.R-MAMA.445	ESO Red Survey MAMA plate 445		This is the MAMA digitization of the Red MAMA Schmidt plate 445		num#MAMA
ivo://gpep/MAMA/Num#ESO.R-MAMA.446	ESO Red Survey MAMA plate 446		This is the MAMA digitization of the Red MAMA Schmidt plate 446		num#MAMA
ivo://gpep/MAMA/Num#ESO.R-MAMA.447	ESO Red Survey MAMA plate 447		This is the MAMA digitization of the Red MAMA Schmidt plate 447		num#MAMA
ivo://POSSII/Plate#POSSII.F.644	POSSII plate Blue Survey DSS2 plate 644		This is the plate of the Blue POSSII Schmidt survey plate 644		Plate#POSSII
ivo://POSSII/Plate#POSSII.F.644	POSSII plate Red Survey DSS2 plate 644		This is the plate of the Red POSSII Schmidt survey plate 644		Plate#POSSII
ivo://POSSII/Plate#POSSII.N.644	POSSII plate Infra Red Survey DSS2 plate 644		This is plate of the Infra red POSSII Schmidt survey plate 644		Plate#POSSII
ivo://POSSII/Plate#POSSII.N.061	POSSII Infra Red Survey DSS2 plate 644		This is the DSS2 digitization of the Infra Red POSSII Schmidt survey plate 061		Plate#POSSII
ivo://POSSII/Plate#POSSII.F.061	POSSII Blue Survey DSS2 plate 061		This is the DSS2 digitization of the Blue POSSII Schmidt survey plate 061		Plate#POSSII
ivo://POSSII/Plate#POSSII.F.061	POSSII Red Survey DSS2 061		This is the DSS2 digitization of the Red POSSII Schmidt survey around plate 061		Plate#POSSII

# Service response

(list of activities . ADQL : select \* from Activity)

Table Browser

Window Subsets Help

Table Browser for 2: activity.xml

a_id	a_name	a_starttime	a_endtime	a_annotation	a_description
AlaRGB1	Aladin RGB 1	2017-04-18T17:28:00	2017-04-19T17:29:00	Aladin RGB image generation for NGC 6946	AlaRGB
AlaRGB2	Aladin RGB 2	2017-04-18T17:34:00	2017-04-19T17:35:00	Aladin RGB image generation for Messier 101	AlaRGB
AlaRGB3	Aladin RGB 3	2017-04-18T17:41:00	2017-04-19T17:42:00	Aladin RGB image generation for Messier 33	AlaRGB
AlaRGB4	Aladin RGB 4	2017-04-18T17:45:00	2017-04-19T17:46:00	Aladin RGB image generation for Messier 51	AlaRGB
AlaRGB5	Aladin RGB 5	2017-04-18T17:47:00	2017-04-19T17:48:00	Aladin RGB image generation for Messier 81	AlaRGB
AlaRGB6	Aladin RGB 6	2017-04-18T17:50:00	2017-04-19T17:51:00	Aladin RGB image generation for Messier 83	AlaRGB
AlaRGB7	Aladin RGB 7	2017-04-18T17:53:00	2017-04-19T17:54:00	Aladin RGB image generation for Messier 87	AlaRGB
stsciNum-21	Num DSS2 POSSII 061 J	2006-06-29T15:32:50		DSS2 Digitization of plates at Stsci POSSII 061 J	stsciNum
stsciNum-22	Num DSS2 POSSII 061 F	2006-04-04T16:39:18		DSS2 Digitization of plates at Stsci POSSII 061 F	stsciNum
stsciNum-23	Num DSS2 POSSII 061 N	2006-04-04T16:52:00		DSS2 Digitization of plates at Stsci POSSII 061...	stsciNum
stsciNum-24	Num DSS2 POSSII 143 J	2006-04-04T16:10:12	2006-04-04T16:10:30	DSS2 Digitization of plates at Stsci POSSII 143 J	stsciNum
stsciNum-25	Num DSS2 POSSII 143 F	2006-04-04T16:25:45	2006-04-04T16:25:55	DSS2 Digitization of plates at Stsci POSSII 143 F	stsciNum
stsciNum-26	Num DSS2 POSSII 143 N	2006-04-04T16:31:01	2006-04-04T16:31:21	DSS2 Digitization of plates at Stsci POSSII 143...	stsciNum
stsciNum-27	Num DSS2 POSSII 270 J	2006-04-04T16:17:26	2006-04-04T16:17:36	DSS2 Digitization of plates at Stsci POSSII 270 J	stsciNum
stsciNum-28	Num DSS2 POSSII 270 F	2006-04-04T16:17:27	2006-04-04T16:17:37	DSS2 Digitization of plates at Stsci POSSII 270 F	stsciNum
stsciNum-29	Num DSS2 POSSII 270 N	2006-04-04T16:35:11	2006-04-04T16:35:21	DSS2 Digitization of plates at Stsci POSSII 270...	stsciNum
stsciNum-2a	Num DSS2 POSSII 174 J	2006-04-04T16:36:03	2006-04-04T16:36:13	DSS2 Digitization of plates at Stsci POSSII 174 J	stsciNum
stsciNum-2b	Num DSS2 POSSII 174 F	2006-04-04T16:22:28	2006-04-04T16:22:38	DSS2 Digitization of plates at Stsci POSSII 174 F	stsciNum
stsciNum-2c	Num DSS2 POSSII 175 N	2006-04-04T16:41:00	2006-04-04T16:41:10	DSS2 Digitization of plates at Stsci POSSII 175...	stsciNum
stsciNum-2d	Num DSS2 POSSII 413 J	2006-04-04T16:19:43	2006-04-04T16:19:53	DSS2 Digitization of plates at Stsci POSSII 413 J	stsciNum
stsciNum-2e	Num DSS2 POSSII 413 F	2006-04-04T16:18:05	2006-04-04T16:18:15	DSS2 Digitization of plates at Stsci POSSII 413 F	stsciNum
stsciNum-2f	Num DSS2 POSSII 413 N	2006-06-29T15:32:42	2006-06-29T15:32:52	DSS2 Digitization of plates at Stsci POSSII 413...	stsciNum
stsciNum-2g	Num DSS2 POSSII 644 J	2006-04-04T16:07:36	2006-04-04T16:07:46	DSS2 Digitization of plates at Stsci POSSII 644 J	stsciNum
stsciNum-2h	Num DSS2 POSSII 644 F	2006-04-04T16:11:58	2006-04-04T16:12:08	DSS2 Digitization of plates at Stsci POSSII 644 F	stsciNum
stsciNum-2i	Num DSS2 POSSII 644 N	2006-04-04T16:11:58	2006-04-04T16:11:58	DSS2 Digitization of plates at Stsci POSSII 644...	stsciNum
stsciNum-2j	Num DSS2 SERC 445 I	2006-04-04T16:36:09	2006-04-04T16:36:19	DSS2 Digitization of plates at Stsci SERC 445 I	stsciNum
MAMANUM-1	numerisation mama SERC J 444	1994-02-04T09:00:00	1994-02-04T14:57:00	GEPI MAMA Digitization of plate SERC 444J	MAMANUM-xyz
MAMANUM-2	numerisation mama ESO R 444	1994-01-28T09:03:00	1994-01-28T13:07:00	GEPI MAMA Digitization of plate ESO 444R	MAMANUM-xyz
MAMANUM-3	numerisation mama ESO R 445	1993-08-12T09:17:00	1993-08-12T13:32:00	GEPI MAMA Digitization of plate ESO 445R	MAMANUM-xyz
MAMANUM-4	numerisation mama ESO R 446	1993-08-13T09:13:00	1993-08-13T13:25:00	GEPI MAMA Digitization of plate ESO 446R	MAMANUM-xyz
MAMANUM-5	numerisation mama ESO R 447	1993-08-14T08:58:00	1993-08-14T13:00:00	GEPI MAMA Digitization of plate ESO 447R	MAMANUM-xyz
MAMANUM-ESOR	numerisation mama ESO survey	1993-08-01T08:58:00	1993-08-31T13:00:04	GEPI MAMA Digitization of ESO plates	MAMANUM-xyz
MAMANUM-SERCJ	numerisation mama SERC survey	1994-02-02T08:58:00	1994-03-04T13:00:00	GEPI MAMA Digitization of SERC plate	MAMANUM-xyz
cds_cutout061	Cut out Aladin POSSII 061 J	2017-04-18T16:33:00	2017-04-19T16:34:00	Cut out CDS- soda service POSSII 061 J	cds_cutout
cds_cutout061F	Cut out Aladin POSSII 061 F	2017-04-18T16:34:00	2017-04-19T16:35:00	Cut out CDS- soda service POSSII 061 F	cds_cutout
cds_cutout061N	Cut out Aladin POSSII 061 N	2017-04-18T16:35:00	2017-04-19T16:36:00	Cut out CDS- soda service POSSII 061 N	cds_cutout
cds_cutout143	Cut out Aladin POSSII 143 J	2017-04-18T16:36:00	2017-04-19T16:37:00	Cut out CDS- soda service POSSII 143 J	cds_cutout
cds_cutout143F	Cut out Aladin POSSII 143 F	2017-04-18T16:37:00	2017-04-19T16:38:00	Cut out CDS- soda service POSSII 143 F	cds_cutout
cds_cutout143N	Cut out Aladin POSSII 143 N	2017-04-18T16:38:00	2017-04-19T16:39:00	Cut out CDS- soda service POSSII 143 N	cds_cutout
cds_cutout174	Cut out Aladin POSSII 174 J	2017-04-18T16:39:00	2017-04-19T16:40:00	Cut out CDS- soda service POSSII 174 J	cds_cutout
cds_cutout174F	Cut out Aladin POSSII 174 F	2017-04-18T16:40:00	2017-04-19T16:41:00	Cut out CDS- soda service POSSII 174 F	cds_cutout
cds_cutout175	Cut out Aladin POSSII 175 N	2017-04-18T16:41:00	2017-04-19T16:42:00	Cut out CDS- soda service POSSII 175 N	cds_cutout
cds_cutout270	Cut out Aladin POSSII 270 J	2017-04-18T16:42:00	2017-04-19T16:42:30	Cut out CDS- soda service POSSII 270 J	cds_cutout
cds_cutout270F	Cut out Aladin POSSII 270 F	2017-04-18T16:43:00	2017-04-19T16:43:30	Cut out CDS- soda service POSSII 270 F	cds_cutout
cds_cutout270N	Cut out Aladin POSSII 270 N	2017-04-18T16:44:00	2017-04-19T16:44:30	Cut out CDS- soda service POSSII 270 N	cds_cutout
cds_cutout413	Cut out Aladin POSSII 143 J	2017-04-18T16:45:00	2017-04-19T16:45:30	Cut out CDS- soda service POSSII 143 J	cds_cutout
cds_cutout413F	Cut out Aladin POSSII 143 F	2017-04-18T16:46:00	2017-04-19T16:46:30	Cut out CDS- soda service POSSII 143 F	cds_cutout
cds_cutout413N	Cut out Aladin POSSII 143 N	2017-04-18T16:47:00	2017-04-19T16:47:40	Cut out CDS- soda service POSSII 143 N	cds_cutout
cds_cutout644	Cut out Aladin POSSII 644 J	2017-04-18T16:48:00	2017-04-19T16:48:25	Cut out CDS- soda service POSSII 644 J	cds_cutout
cds_cutout644F	Cut out Aladin POSSII 644 F	2017-04-18T16:49:00	2017-04-19T16:49:26	Cut out CDS- soda service POSSII 644 F	cds_cutout
cds_cutout644N	Cut out Aladin POSSII 644 N	2017-04-18T16:50:00	2017-04-19T16:50:30	Cut out CDS- soda service POSSII 644 N	cds_cutout
cds_cutout445	Cut out Aladin SERC 445 I	2017-04-18T16:52:00	2017-04-19T16:52:20	Cut out CDS- soda service SERC 445 I	cds_cutout
cds_cutout444	Cut out Aladin SERC 444 J	2017-04-18T16:54:00	2017-04-19T16:54:20	Cut out CDS- soda service SERC 444 J	cds_cutout
cds_cutout444	Cut out Aladin ESO 444 R	2017-04-18T16:55:00	2017-04-19T16:55:30	Cut out CDS- soda service ESO 444 R	cds_cutout
EHG1	ESO HIPS generation 1	2016-07-18T09:45:00	2016-07-20T10:00:00	this activity is final generation of HIPS for ESO ...	HipsgenM
EHG2	SERC HIPS generation 1	2016-07-11T10:45:00	2016-07-14T03:07:00	this activity is final generation of HIPS for SER...	HipsgenM

# Service response (table field attributes)

The image shows two screenshots of the TOPCAT software interface. The top screenshot displays the 'Table Columns for 2: activity.xml' dialog, and the bottom screenshot displays the 'Table Columns for 1: entity.xml' dialog. Both dialogs show a table of column definitions with columns for Visible, Name, \$ID, Class, Domain, Description, UCD, Utype, Datatype, and VOTable.

**Table Columns for 2: activity.xml**

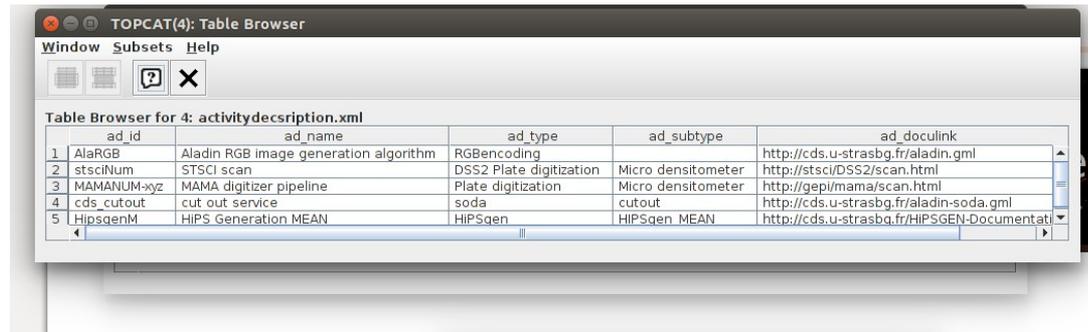
	Visible	Name	\$ID	Class	Domain	Description	UCD	Utype	Datatype	VOTable
0	<input type="checkbox"/>	Index	\$0	Long		Table row index				
1	<input checked="" type="checkbox"/>	a_id	\$1	String			meta.id	voprov:Activity.id	unicodeChar	a_id
2	<input checked="" type="checkbox"/>	a_name	\$2	String			meta.title	voprov:Activity.name	unicodeChar	a_name
3	<input checked="" type="checkbox"/>	a_starttime	\$3	String	Iso8601->Time		time.start	voprov:Activity.startTime	unicodeChar	a_starttime
4	<input checked="" type="checkbox"/>	a_endtime	\$4	String	Iso8601->Time		time.end	voprov:Activity.endTime	unicodeChar	a_endtime
5	<input checked="" type="checkbox"/>	a_annotation	\$5	String			meta.description	voprov:Activity.annotation	unicodeChar	a_annotati
6	<input checked="" type="checkbox"/>	a_description	\$6	String			meta.id	voprov:Activity.description	unicodeChar	a_descripti

**Table Columns for 1: entity.xml**

	Visible	Name	\$ID	Class	Description	UCD	Utype	Datatype	VOTable ID
0	<input type="checkbox"/>	Index	\$0	Long	Table row index				
1	<input checked="" type="checkbox"/>	e_id	\$1	String		meta.id	voprov:Entity.id	unicodeChar	e_id
2	<input checked="" type="checkbox"/>	e_name	\$2	String		meta.title	voprov:Entity.name	unicodeChar	e_name
3	<input checked="" type="checkbox"/>	e_type	\$3	String		meta.code.class	voprov:Entity.type	unicodeChar	e_type
4	<input checked="" type="checkbox"/>	e_annotation	\$4	String		meta.description	voprov:Entity.annotation	unicodeChar	e_annotation
5	<input checked="" type="checkbox"/>	e_rights	\$5	String		meta.code.class	voprov:Entity.rights	unicodeChar	e_rights
6	<input checked="" type="checkbox"/>	e_description	\$6	String		meta.id	voprov:Entity.description	unicodeChar	e_description

# Service response

ADQL : select \* from activity where activity.a\_description = 'AlaRGB'

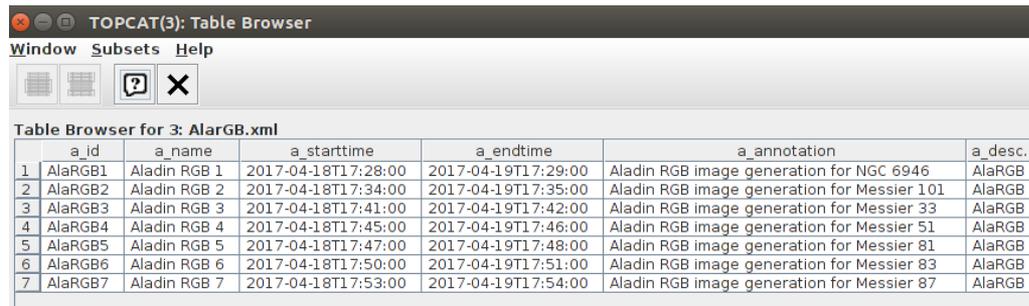


TOPCAT(4): Table Browser

Window Subsets Help

Table Browser for 4: activitydescription.xml

	ad_id	ad_name	ad_type	ad_subtype	ad_doculink
1	AlaRGB	Aladin RGB image generation algorithm	RGBencoding		<a href="http://cds.u-strasbg.fr/aladin.gmi">http://cds.u-strasbg.fr/aladin.gmi</a>
2	stsciNum	STSCI scan	DSS2 Plate digitization	Micro densitometer	<a href="http://stsci/DSS2/scan.html">http://stsci/DSS2/scan.html</a>
3	MAMANUM-xyz	MAMA digitizer pipeline	Plate digitization	Micro densitometer	<a href="http://gepi/mama/scan.html">http://gepi/mama/scan.html</a>
4	cds_cutout	cut out service	soda	cutout	<a href="http://cds.u-strasbg.fr/aladin-soda.gmi">http://cds.u-strasbg.fr/aladin-soda.gmi</a>
5	HipsqenM	HIPS Generation MEAN	HIPSqen	HIPSqen MEAN	<a href="http://cds.u-strasbg.fr/HIPSGEN-Documentati">http://cds.u-strasbg.fr/HIPSGEN-Documentati</a>



TOPCAT(3): Table Browser

Window Subsets Help

Table Browser for 3: AlarGB.xml

	a_id	a_name	a_starttime	a_endtime	a_annotation	a_desc...
1	AlaRGB1	Aladin RGB 1	2017-04-18T17:28:00	2017-04-19T17:29:00	Aladin RGB image generation for NGC 6946	AlaRGB
2	AlaRGB2	Aladin RGB 2	2017-04-18T17:34:00	2017-04-19T17:35:00	Aladin RGB image generation for Messier 101	AlaRGB
3	AlaRGB3	Aladin RGB 3	2017-04-18T17:41:00	2017-04-19T17:42:00	Aladin RGB image generation for Messier 33	AlaRGB
4	AlaRGB4	Aladin RGB 4	2017-04-18T17:45:00	2017-04-19T17:46:00	Aladin RGB image generation for Messier 51	AlaRGB
5	AlaRGB5	Aladin RGB 5	2017-04-18T17:47:00	2017-04-19T17:48:00	Aladin RGB image generation for Messier 81	AlaRGB
6	AlaRGB6	Aladin RGB 6	2017-04-18T17:50:00	2017-04-19T17:51:00	Aladin RGB image generation for Messier 83	AlaRGB
7	AlaRGB7	Aladin RGB 7	2017-04-18T17:53:00	2017-04-19T17:54:00	Aladin RGB image generation for Messier 87	AlaRGB

# More realistic (and complex) queries

To retrieve entity and activity details metadata for those leading to a given entity `'ivo://cds/P/DSS2color#RGB_NGC6946'`

```
select e_id,e_name, e_annotation, a_id, a_name, a_annotation  
FROM entity,used,activity,wasgeneratedby
```

Where `e_id = u_entity_id` and `u_activity_id = a_id`

and `a_id = wgb_activity_id`

and `wgb_entity_id = 'ivo://cds/P/DSS2color#RGB_NGC6946'`

# « History » of entity

« ivo://cds/P/DSS2color#RGB\_NGC6946 »

The screenshot displays the TOPCAT software interface. The main window is titled "Table Browser for 2: TAP\_2\_entity,used,activity,wasgeneratedby". It shows a table with 6 columns: e\_id, e\_name, e\_annotation, a\_id, a\_name, and a\_annotation. The table contains 3 rows of data.

	e_id	e_name	e_annotation	a_id	a_name	a_annotation
1	ivo://cds/P/DSS2/POSSII#POSSII.J-DSS2.143	POSSII Blue Survey DSS2 NGC6946	This is the DSS2 digitization of the Blue POSSII...	AlaRGB1	Aladin RGB 1	Aladin RGB image generation for
2	ivo://cds/P/DSS2/POSSII#POSSII.F-DSS2.143	POSSII Red Survey DSS2 NGC6946	This is the DSS2 digitization of the Red POSSII ...	AlaRGB1	Aladin RGB 1	Aladin RGB image generation for
3	ivo://cds/P/DSS2/POSSII#POSSII.N-DSS2.143	POSSII Infra Red Survey DSS2 NGC6946	This is the DSS2 digitization of the Infra red P...	AlaRGB1	Aladin RGB 1	Aladin RGB image generation for

The interface also shows a "Service Capabilities" section with "Query Language: ADQL-2.0" and "Max Rows: 1000000 (default)". The "ADQL Text" section contains the following query:

```
1
select e_id,e_name, e_annotation, a_id, a_name, a_annotation
FROM entity,used,activity,wasgeneratedby
Where e_id = u_entity_id and u_activity_id = a_id
and a_id = wgb_activity_id
and wgb_entity_id = 'ivo://cds/P/DSS2color#RGB_NGC6946'
```

The "Current Table Properties" section shows:

- Label: TAP\_2\_entity,used,activity,wasgeneratedby
- Location: TAP\_2\_entity,used,activity,wasgeneratedby
- Name: result\_S1535646566506
- Rows: 3
- Columns: 6
- Sort Order: ↑
- Row Subset: All
- Activation Action: (no action)  Broadcast Row

The status bar at the bottom indicates "99 / 3540 M" and "Messages: 0" with "Clients: 2".

# More realistic (and complex) queries

To retrieve activity details and generated entity id using parameters:

```
select temp1.a_id,temp1.a_name,temp1.wgb_entity_id,  
parameter.p_id,parameter.p_value  
from (SELECT * FROM activity inner join wasgeneratedby on  
    activity.a_id=wasgeneratedby.wgb_activity_id) as temp1  
inner join parameter  
on temp1.a_id=parameter.p_isaparamof ;
```

To retrieve all entity/obscure combinations

```
SELECT * FROM miniobscure  
JOIN entity  
ON miniobscure.obs_publisher_did=entity.e_id ;
```

# Activities which have parameters



The screenshot displays the TOPCAT software interface, which is used for managing astronomical data. It is divided into several panes:

- Table Access Protocol (TAP) Query:** The top-left pane shows the metadata for a TAP service. It includes a 'Find' section with checkboxes for 'Name', 'Descrip', and 'Or'. Below this is a tree view of the metadata, showing 'TAP Service (19)' with sub-entities like 'TAP\_SCHEMA (5)' and 'provenance (14)'. The 'Service Capabilities' section shows 'Query Language: ADQL-2.0', 'Max Rows: 1000000 (default)', and 'Uploads: unavailable'. The 'ADQL Text' section shows a query in progress: 

```
1
select templ.a_id,templ.a_name,templ.wgb_entity_id,
parameter.p_id,parameter.p_value
from (SELECT * FROM activity inner join wasgeneratedby on activity.a_id=wasgeneratedby.wgb_activity_id) as templ
inner join parameter
on templ.a_id=parameter.p_isaparamof ;
```
- TOPCAT(3): Table Browser:** The top-right pane displays a table browser for a query. The title is 'Table Browser for 3: TAP\_3 (SELECT,activity,wasgeneratedby,parameter)'. It shows a table with 5 columns: 'a\_id', 'a\_name', 'wgb\_entity\_id', 'p\_id', and 'p\_value'. The data is as follows:

a_id	a_name	wgb_entity_id	p_id	p_value
1	EHG1	ESO HIPS generation 1	hips_tile_format1	jpeg fits
2	EHG1	ESO HIPS generation 1	hips_order1	6
3	EHG2	SERC HIPS generation 1	hips_tile_format2	fits
4	EHG2	SERC HIPS generation 1	hips_order2	5
- TOPCAT:** The bottom-right pane shows the 'Table List' and 'Current Table Properties'. The 'Table List' includes:
  - 1: TAP\_1\_entity
  - 2: TAP\_2\_entity,used,acti
  - 3: TAP\_3 (SELECT,activity,The 'Current Table Properties' for the selected table (TAP\_3) are:
  - Label: TAP\_3 (SELECT,activity,wasgeneratedby,parameter)
  - Location: TAP\_3 (SELECT,activity,wasgeneratedby,parameter)
  - Name: result\_s1535646775063
  - Rows: 4
  - Columns: 5
  - Sort Order: (dropdown menu)
  - Row Subset: All
  - Activation Action: (no action)  Broadcast Row



# Join entities and obscure records Loading HiPS or images into Aladin

The image displays the Aladin software interface, which is used for astronomical data visualization. The main window shows a HiPS (Heavily Indexed Positional Sky) of a star field. A pink crosshair is positioned over a bright star. The interface includes several panels:

- Metadata:** Shows the selected service (TAP Service) and its schema, tables, and columns.
- Service Capabilities:** Displays the query language (ADQL-2.0) and the maximum number of rows (1,000,000).
- ADQL Text:** Contains the SQL query: `SELECT * FROM minioscore JOIN minioscore_obs_publisher_did-entity_e_id`.
- TOPCAT Table Browser:** Shows the table list and current table properties for the selected table (TAP\_4\_minioscore\_entity).
- Table Browser for 4: TAP\_4\_minioscore\_entity:** Displays a table with columns: obs\_publisher\_did, access\_url, data, and reserved.
- Table Browser for 3: TAP\_3\_SELECT\_activi:** Displays a table with columns: access\_url, obs\_publisher\_did, data, and reserved.
- Table Browser for 2: TAP\_2\_entity\_used, a:** Displays a table with columns: access\_url, obs\_publisher\_did, data, and reserved.
- Table Browser for 1: TAP\_1\_entity:** Displays a table with columns: access\_url, obs\_publisher\_did, data, and reserved.

The ADQL query is a join query that combines data from multiple tables. The results are visualized in the HiPS, where the pink crosshair indicates the location of a specific record. The word "SAMP" is overlaid on the image, likely referring to the Survey for Multi-wavelength Astronomy (SAMP) program.

# □ Future plans

- Publish the ProvTAP working draft
- Install publicly the TAP service for our CDS database
- Markus Nullmeier to create stored procedures helping for complex queries (end september)
- Feed with the real use case :

## HiPS generation at CDS

(~300 HiPS come from ~300 image collections. Some image collections also have progenitors (eg. Schmidt plates))