



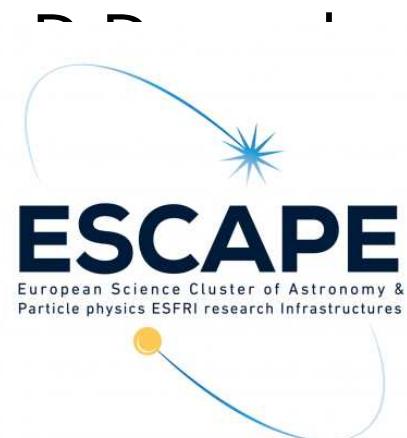
ProvHiPS

An « on top » provenance implementation

F.Bonnarel, CDS on behalf of M.Servillat,
M.Louys, M.Nullmeier, M.Sanguillon,
L.Michel, A.Eg

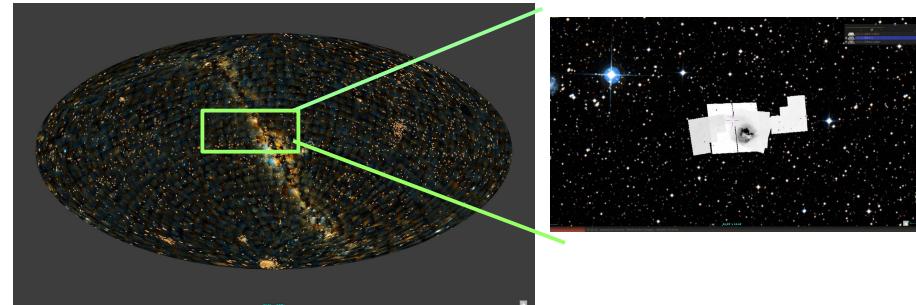


CENTRE DE DONNÉES
ASTRONOMIQUES DE STRASBOURG



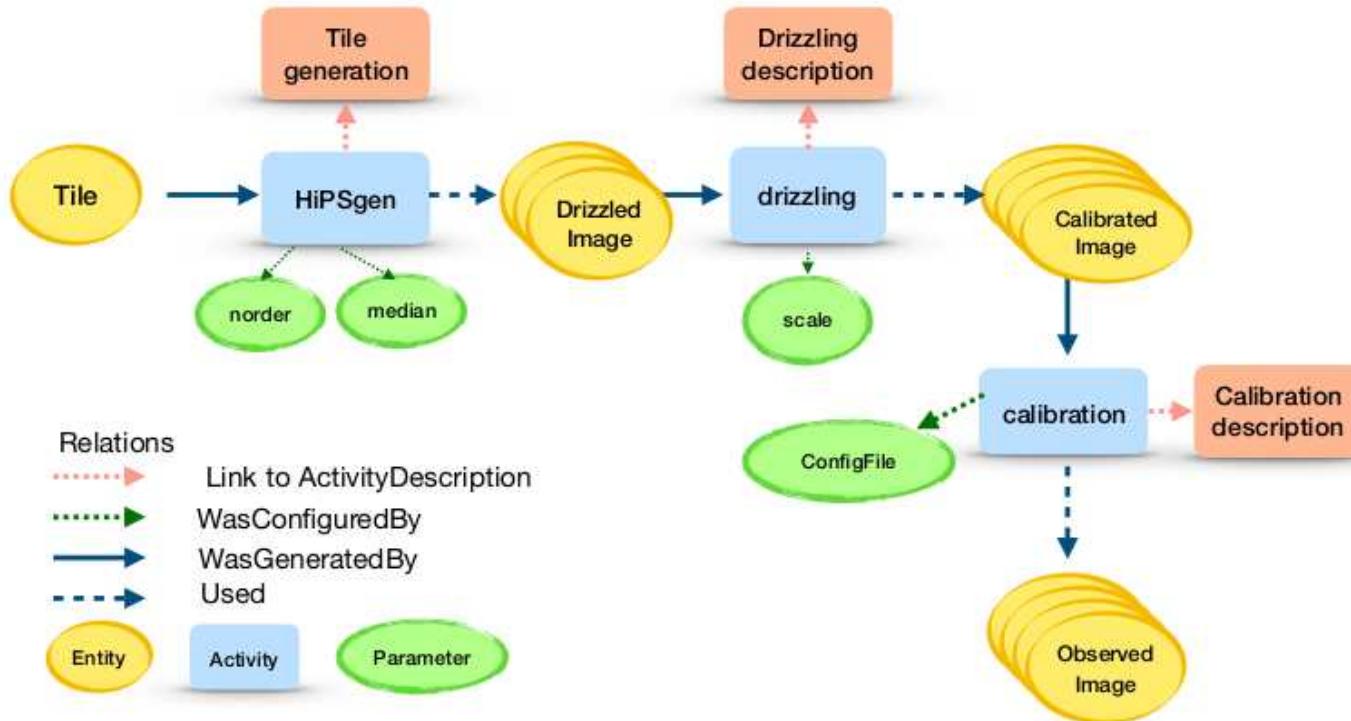
ProvHiPS project

- Tracing provenance of HiPS and HiPS tiles
 - From HiPS tiles back to raw HST images, through « drizzled » images and single « calibrated » images



- ProvHiPS is both :
 - A testbed for « On Top provenance » for image processing in optical astronomy.
 - See examples next slides
 - A reference implementation of ProvTAP
 - ProvTAP is basically a « TAP schema » mapping the Provenance DM.
 - Allows to deliver provenance information using TAP services
 - ProvTAP is currently adapted by authors with respect to the DM Recommandation
 - Soon published as a Working Draft

«HiPS» Provenance diagram



Provenance tracking for Prov-HiPS

07/0

ProvHiPS ADQL query examples

- Finding out drizzled images « progenitors » of a specific HiPS tile :

```
select e.e_name, e.e_comment, a_name, a_starttime, a_comment, ee.e_name,  
      ee.e_comment from entity e  
join wasgeneratedby on e.e_id = wgb_entity  
join activity on wgb_activity = a_id  
join used on a_id = u_activity  
join entity ee on ee.e_id = u_entity  
where e.e_name like '%Npix9199544'
```

- Finding out drizzling activities attributed to a specific agent

-



ProvHiPS ADQL query examples

- Displaying some activity documentation for a specific activity through its activity description
- Finding out other products of a drizzling activity which generated a specific drizzled image

```
select e.e_name, e.e_comment, a_name, a_starttime, ee.e_type, ee.e_name,  
       ee.e_comment from entity e  
join wasgeneratedby w on e.e_id = w.wgb_entity  
join activity on w.wgb_activity = a_id  
join wasgeneratedby ww on a_id = ww.wgb_activity join entity ee on ee.e_id =  
       ww.wgb_entity  
where e.e_name = 'j8de38020_drz' and ee.e_id != e.e_id
```



HiPS tile progenitor

Window TAP Registry Edit Interop Help

TOPCAT(48): Table Browser

Sel Window Rows Help

Met Find

Table Browser for 48: TAP_54_entity,wasgeneratedby,activity,used,entity...

	e_name	e_comment	a_name	a_starttime	a_comment	e_name	e_comment
1	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8e614010.drc	Drizzled HST image from ACS centered on 53.0...
2	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt37011.drc	Drizzled HST image from ACS centered on 53.0...
3	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt37021.drc	Drizzled HST image from ACS centered on 52.9...
4	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt37031.drc	Drizzled HST image from ACS centered on 52.9...
5	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt38011.drc	Drizzled HST image from ACS centered on 53.0...
6	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt38021.drc	Drizzled HST image from ACS centered on 53.0...
7	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt38031.drc	Drizzled HST image from ACS centered on 52.9...
8	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt39011.drc	Drizzled HST image from ACS centered on 53.0...
9	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt39021.drc	Drizzled HST image from ACS centered on 53.0...
10	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	j8mt39031.drc	Drizzled HST image from ACS centered on 53.0...
11	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jbwq1020.drc	Drizzled HST image from ACS centered on 53.0...
12	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jcn602010.drc	Drizzled HST image from ACS centered on 53.0...
13	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jcn602020.drc	Drizzled HST image from ACS centered on 53.0...
14	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jcn602030.drc	Drizzled HST image from ACS centered on 53.0...
15	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jcn604010.drc	Drizzled HST image from ACS centered on 53.0...
16	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jcn604020.drc	Drizzled HST image from ACS centered on 53.0...
17	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jcn609010.drc	Drizzled HST image from ACS centered on 52.9...
18	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jcn609020.drc	Drizzled HST image from ACS centered on 52.9...
19	HST_V_Order10_Npix9199544	Npix9199544 tile of HST-V HiPS of size 12.25 a...	HST_V_Order10_Npix9199544_Generation	2019-01-09T02:34Z	hipsGEN version 10.101 generation of Npix91...	jcn611010.drc	Drizzled HST image from ACS centered on 52.9...

Total: 36 Visible: 36 Selected: 0

used
valuedescription
wasassociatedwith
wasattributedto

Service Capabilities

Query Language: ADQL-2.0 Max Rows: 1000000 (default) Uploads: unavailable

ADQL Text

Mode: Synchronous

```
1
select e.e_name, e.e_comment, a_name, a_starttime, a_comment, ee.e_name, ee.e_comment from entity e
join wasgeneratedby on e.e_id = wgb_entity
join activity on wgb_activity = a_id
join used on a_id = u.activity
join entity ee on ee.e_id = u.entity
where e.e_name like '%Npix9199544'
```

Co-generated products of a specific activity

WINDOW TAP Registry Edit Interop Help

Select Service Use Service Resume Job Running Jobs

Metadata

Find: Name Descrip Or

TAP Service (25)
TAP_SCHEMA (5)
TAP_SCHEMA.columns
TAP_SCHEMA.key_columns
TAP_SCHEMA.keys
TAP_SCHEMA.schemas
TAP_SCHEMA.tables
provenance (20)
activity
activitydescription
agent
collection
configfile
configfiledescription
datasetdescription
entity
generationdescription
parameter
parameterdescription
usedescription
used
valuedescription
wasassociatedwith
wasattributeof

Service Schema Table Columns FKeys Hints

Name: Tables:

Description: TOPCAT(51): Table Browser

Window Rows Help

Table Browser for 51: TAP_58_entity, wasgeneratedby, activity, wasgenerat...

e_name	e_comment	a_name	a_s...	e_type	e_name	e_comment
j8de38020_drz	Drizzled HST image from ACS centered on 53.0...	j8de38020_drz	drizzleGeneration	Weight_image	j8de38020_drz_wht.fits	Context image of Drizzled HST image from ACS...
j8de38020_drz	Drizzled HST image from ACS centered on 53.0...	j8de38020_drz	drizzleGeneration	Context_image	j8de38020_drz_ctx.fits	Context image of Drizzled HST image from ACS...

Total: 2 Visible: 2 Selected: 0

Service Capabilities

Query Language: ADQL-2.0 Max Rows: 1000000 (default) Uploads: unavailable

ADQL Text

Mode: Synchronous

1

```
select e.e_name, e.e_comment, a.name, astarttime, ee.e_type, ee.e_name, ee.e_comment from entity e
join wasgeneratedby w on e.e_id = w.wgb_entity
join activity on w.wgb_activity = a.id
join wasgeneratedby ww on a.id = ww.wgb_activity
join entity ee on ee.e_id = ww.wgb_entity
where e.e_name = 'j8de38020_drz' and ee.e_id != e.e_id
```