

Description of HiPS surveys in the IVOA registry

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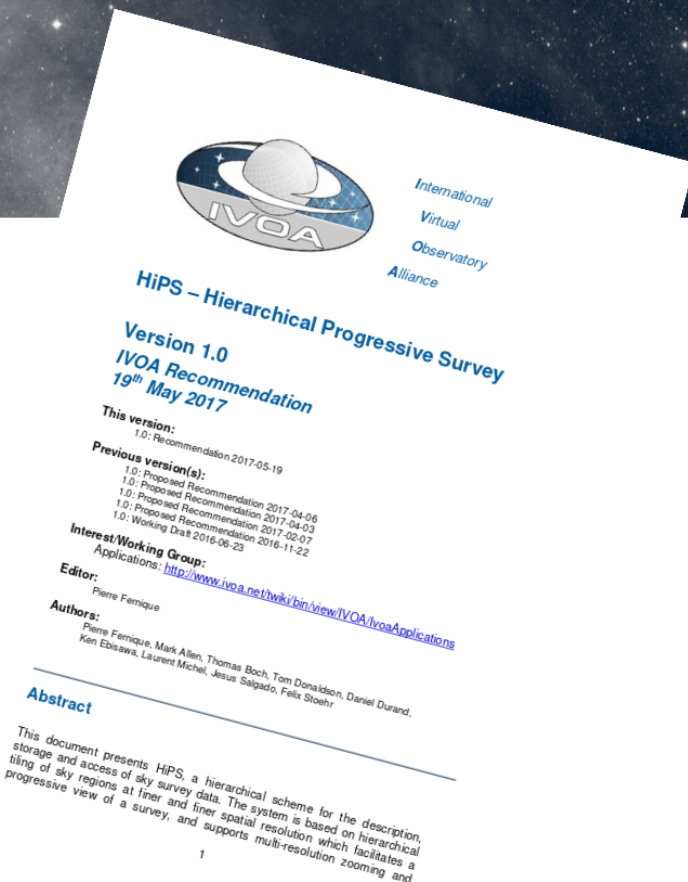
IVOA Interop meeting
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□ HiPS surveys

- HiPS is an IVOA standard
- Network of HiPS servers
 - 20 servers (incl. 3 at CDS)
 - ~1200 individual HiPS

<https://aladin.cds.unistra.fr/hips/list>
- HiPS Metadata in **properties** file
 - Simple text file with key=value pairs in root directory
 - Example : <https://alasky.cds.unistra.fr/2MASS/J/properties>



□ HiPS properties

```
hips_initial_fov      = 58.63230142835039
hips_initial_ra      = 266.40499479
hips_initial_dec     = -28.936173970
creator_did          = ivo://CDS/P/2MASS/J
hips_pixel_bitpix    = -32
data_pixel_bitpix    = -32
hips_sampling        = bilinear
hips_skyval_method   = SKYVAL
hips_skyval_value    = -0.5 100.0 -357.66149139404297 1421.6846084594727
hips_overlay         = mean
hips_hierarchy       = median
hips_creator         = CDS (Oberto A.)
hips_copyright       = CNRS/Unistra
obs_title            = 2MASS J (1.23um)
hips_builder         = Aladin/HipsGen v11.023
hips_version         = 1.4
hips_creation_date   = 2014-02-11T11:28Z
hips_release_date    = 2021-02-24T06:06Z
hips_frame           = equatorial
hips_order           = 9
hips_order_min       = 0
hips_tile_width      = 512
dataprodct_type      = image
moc_access_url       = http://alasky.u-strasbg.fr/2MASS/J/Moc.fits
#hips_service_url    = http://alasky.u-strasbg.fr/2MASS/J
hips_status          = public master clonableOnce
hips_tile_format     = jpeg fits
hips_pixel_cut       = -0.5 40
hips_data_range      = -357.7 1422
obs_collection       = The Two Micron All Sky Survey - J band (2MASS J)
obs_ack              = University of Massachusetts & IPAC/Caltech
bib_reference        = 2006AJ....131.1163S
bib_reference_url    = http://simbad.u-strasbg.fr/simbad/sim-ref?bibcode=2006AJ....131.1163S
obs_copyright        = University of Massachusetts & IPAC/Caltech
#Between 1997 June and 2001 February => MJD=(UnixTime/86400)+40587 ; 1997 June = 865123200 UnixTime ; 2001 February =980985600
UnixTime
t_min                = 50600
t_max                = 51941
obs_regime           = Infrared
em_min               = 1.147E-6
em_max               = 1.323E-6
[...]
```

10/05/2023

IVOA Interop meeting – DCP/Registry session

□ CDS publishing registry

- <ivo://CDS.VizieR/registry>
- OAI endpoint
<https://cds.unistra.fr/registry/>
- Upgraded in 2020 to use [pyoai](#) library
- Contains >24 000 Resources (+1200 new/year)
 - Represents a significant fraction of all VO Resources
 - Mostly VizieR catalogues described as `vs:CatalogService`, but also resources for TAP services, image services, ...

□ Situation in early 2023

- Registry records for HiPS servers
ivo://CDS/aladin/hipsmanager, ivo://CDS/aladin/hipsslave,
ivo://CDS/vizier/hipserver
- **No description** of individual HiPS in CDS
Registry : only visible through the HiPS network
 - Define **mapping** from HiPS properties file parameters to VOResource record elements
 - Select terms from **standard vocabulary**
 - Process to **automate Resource publication** when new HiPS are created

□ HiPS registration (standard)

- In the VO registry

5.3 HiPS registration

HiPS surveys and/or servers **may** be registered in the IVOA registry [2].

HiPS registration in the IVOA registry **may** occur at two different levels:

1. *Individual HiPS survey* registration could be useful to at least get a valid IVOID identifier [3]. However this step is not required for client visibility;
2. *HiPS server* registration allowing HiPS clients to discover all the HiPS via their HiPS list.

Only the *HiPS server* registration is required in order to be visible through compatible clients. The HiPS clients get the HiPS list for each registered HiPS server in order to compute the list of available HiPS surveys, their location, and their potential mirror sites.

In practice: this task may be done by an intermediate registry tool (HiPS list aggregator) which maintains an up-to-date merging of all available HiPS lists⁴. This approach is similar to the Global TAP schema aggregator described in section 3.1 of the IVOA “Discovering Data Collections” note [10].

□ Individual HiPS registration

5.3.2 Individual HiPS survey declarations

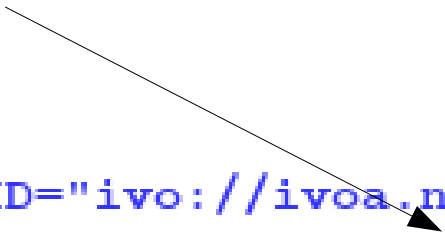
Optionally, each HiPS **may** be registered individually in the IVOA registry. There are two constraints: 1 – only the main HiPS creator is authorized to register them (and not by the potential clone site manager) 2 - Only the URL of the original HiPS (master site, not the clone site) **may** be provided by using the *standardID*: `ivo://ivoa.net/std/hips#hips-1.0`

```
<ri:Resource xmlns:(...) xsi:type="vs:CatalogService">
  <title>ALADIN image DSS2 blue survey collection</title>
  <shortName>Aladin DSS2 blue</shortName>
  <identifier>ivo://CDS/P/DSS2/blue</identifier>
  <curation>
    <publisher>CDS</publisher>
    <creator ivo-id="ivo://CDS">
      <name>Centre de Donnees astronomiques de strasbourg</name>
    </creator>
    <contact>
      <name>CDS Helpdesk</name>
      <email>cds-question@unistra.fr</email>
    </contact>
  </curation>
  <content>
    <subject>ALADIN image DSS2 blue survey collection</subject>
    <description> ALADIN image server provides reference ... </description>
    <referenceURL>http://aladin.u-strasbg.fr</referenceURL>
    <type>Survey</type>
    <contentLevel>Research</contentLevel>
  </content>
  <capability standardID="ivo://ivoa.net/std/hips#hips-1.0">
    <interface role="std" xsi:type="vs:ParamHTTP">
      <accessURL use="base">
        http://alasky.u-strasbg.fr/DSS/DSS2-blue-XJ-S</accessURL>
      </interface>
    </capability>
  <coverage>
    <footprint ivo-id="ivo://mocivod">
      http://alasky.u-strasbg.fr/DSS/DSS2-blue-XJ-S/Moc.fits
    </footprint>
  </coverage>
</ri:Resource>
```

□ ParamHTTP capability

- We discussed the best interface type
 - ParamHTTP ?
 - Dir ?

```
<capability standardID="ivo://ivoa.net/std/hips#hips-1.0">  
  <interface role="std" xsi:type="vs:ParamHTTP">  
    <accessURL use="base">  
      http://alasky.u-strasbg.fr/DSS/DSS2-blue-XJ-S</accessURL>  
    </interface>  
</capability>
```



- HiPS files are all in one directory, but there is an HTML landing page : **dir** not quite right
 - keep ParamHTTP as described in the standard

□ HiPS catalogues

- Different ways to access catalogues in VizieR :
 - Web Browser
 - ParamHTTP (returning VOTable)
 - Cone Search (for all tables having sky coordinates)
 - TAP
- For **large** catalogues : progressive HiPS access
 - Addition of a capability to these resources

□ HiPS catalogues

- Example : Gaia DR3 Part 1.

https://cds.unistra.fr/registry/?verb=GetRecord&metadataPrefix=ivo_vor&identifier=ivo://cds.vizier/I/355

```
-<capability standardID="ivo://ivoa.net/std/hips#hips-1.0">  
  <description>Hips catalogue for table I/355/gaiadr3</description>  
-<interface xsi:type="vs:ParamHTTP" role="std">  
  -<accessURL use="base">  
    https://axel.cds.unistra.fr/HiPSCatService/I/355/gaiadr3  
  </accessURL>  
</interface>  
</capability>
```

- 52 HiPS catalogue capabilities added
+1 for SIMBAD

```
SELECT COUNT(ivoid)  
FROM rr.capability  
  NATURAL JOIN rr.interface  
WHERE standard_id='ivo://ivoa.net/std/hips#hips-1.0'  
  AND intf_type='vs:paramhttp'  
  AND access_url LIKE '%cds.unistra.fr%'  
  AND ivoid LIKE '%cds.vizier%'
```

□ HiPS surveys

- Use **UAT terms** for <subject>
 - Electromagnetic domain
 - Planets, satellites, ...
 - Instruments
 - Sky regions, ...
- Mapping from **properties** to **VOResource**
 - Discussion on `moc_access_url`, `hips_creator`, `hips_copyright`, `obs_collection`, Licence
 - Homogenization of HiPS metadata in `properties` files

□ HiPS surveys

- Generation of individual XML records for all CDS HiPS
 - 481 HiPS image surveys
 - 14 HiPS cubes
- Example for 2MASS J band

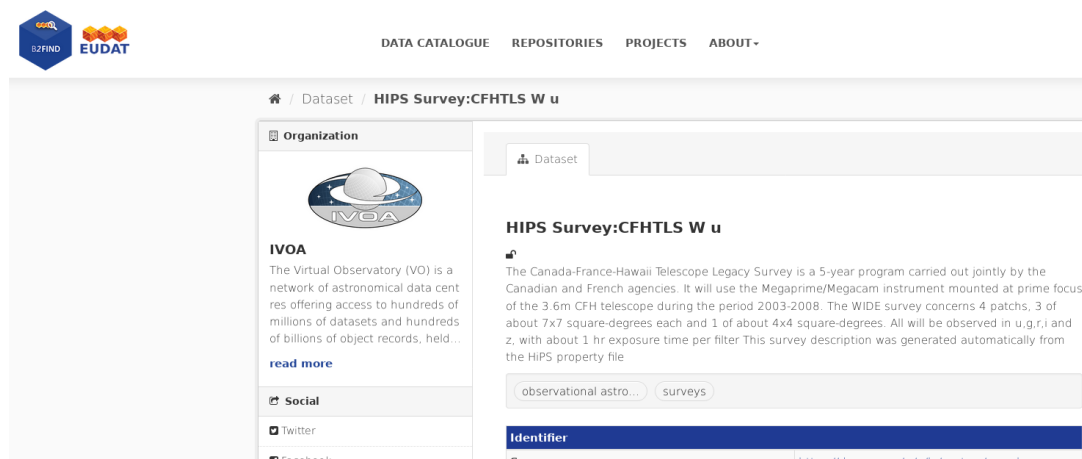
https://cds.unistra.fr/registry/?verb=GetRecord&metadataPrefix=ivo_vor&identifier=ivo://cds/P/2MASS/J

□ Example : 2MASS J images

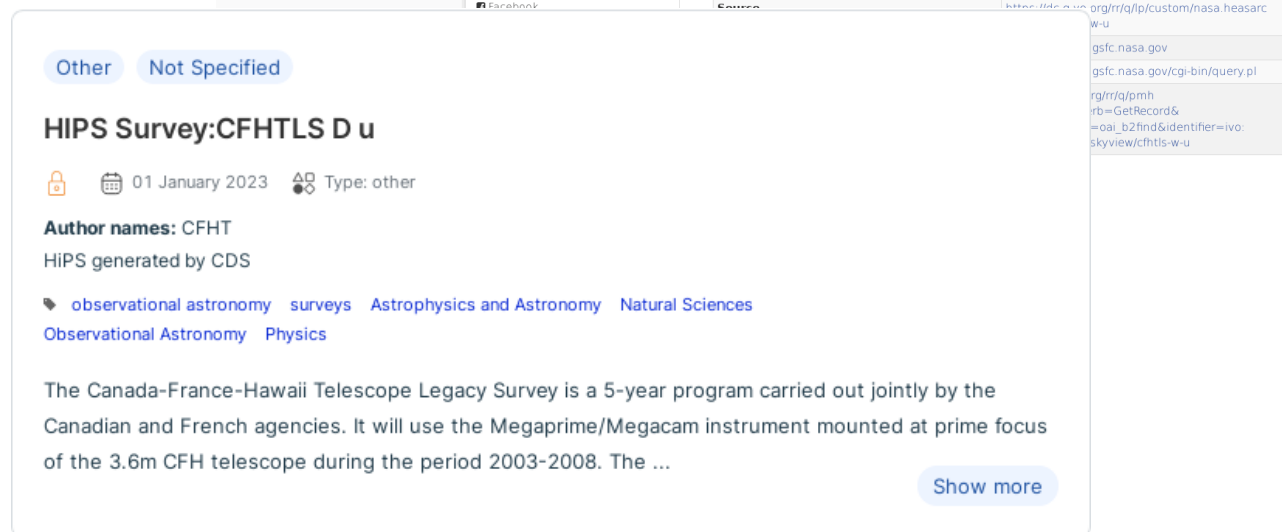
```
<referenceURL>https://alasky.cds.unistra.fr/2MASS/J</referenceURL>
<type>Survey</type>
<contentLevel>Research</contentLevel>
</content>
-<rights rightsURI="https://cds.unistra.fr/aladin-org/licences_aladin.html">
  This HiPS is distributed under ODbL license by Unistra/CNRS
</rights>
-<capability standardID="ivo://ivoa.net/std/hips#hips-1.0">
  -<interface role="std" xsi:type="vs:ParamHTTP">
    <accessURL use="base">https://alasky.cds.unistra.fr/2MASS/J</accessURL>
    <mirrorURL>https://alaskybis.cds.unistra.fr/2MASS/J</mirrorURL>
  </interface>
</capability>
-<coverage>
  <temporal>50600 51941</temporal>
  <footprint ivo-id="ivo://mocivod">https://alasky.cds.unistra.fr/2MASS/J/Moc.fits</footprint>
  <waveband>Infrared</waveband>
  <spectral>1.73186e-19 1.73186e-19</spectral>
</coverage>
```

□ Conclusions

- 543 individual HiPS now published in the IVOA registry by CDS (dedicated OAI-PMH set : **HiPS**)
- Also visible in EUDAT b2find



and EOSC
portal



□ Perspectives

- Add DOIs to Resources
- How to search for individual HiPS in the VO registry ?
 - TAP in the Relational Registry, sure !
 - Add Template queries to search interfaces (similar to ConeSearch, SIA or TAP) ?