



Fig. 1

## 1. STC in the Registry

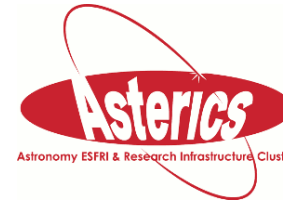


Fig. 2



Fig. 3



Fig. 4

(cf. Fig. 2)

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(cf. Fig. 3)

- Previously on STC in the Registry
- RegTAP STC extension
- Using existing metadata
- STC in VOResource

(cf. Fig. 4)

## 2. Previously

VODDataService 1.1: vs:Coverage with attributes

1. footprint – URL to spatial coverage
2. waveband – terms from a controlled vocabulary
3. regionOfRegard – rough idea of spatial resolution
4. STCResourceProfile – STC-X coverage in space, time, em spectrum, and redshift

(4) is not a big success: 1109 resources with STCResourceProfile, 973 of them AllSky, only 37 defining TimeInterval.

There's 11835 resources giving footprints according to (1).

No known Registry component has used either information so far.

(cf. Fig. 1)

### 3. RegTAP-STC

Part of original 2012 RegTAP draft were four STC tables. I've recently updated them to:

rr.stc_spatial	
ivoid	char(*)
coverage	REGION/MOC

rr.stc_temporal	
ivoid	char(*)
time_start d	DOUBLE P/MJD
time_end d	DOUBLE P/MJD

rr.stc_spectral	
ivoid	char(*)
spectral_start m	DOUBLE P
spectral_end m	DOUBLE P

rr.stc_redshift	
ivoid	char(*)
redshift_start	DOUBLE P
redshift_end	DOUBLE P

Each resource has 0..n intervals in time, spectrum, and redshift, and 0..n MOC "patches".

### 4. Stats

This extension exists on <http://dc.g-vo.org/tap>, filled from

- footprints (but:  $\approx$  400 are 404s or broken)
- stc coverages

Should we infer stc\_spectral limits from waveband?

Numbers as of 2017-05-03:

spatial	12399
temporal	25
spectral	16
redshift	2

These are the results of

```
select count(*) from rr.stc_spatial
```

and analogous.

Resources from 10 authorities are in stc\_spatial.

In case you're curious, we used the query

```
select distinct *
```

```
from (
  select regexp_replace(substr(ivoid,7), '/.*', '')
  from rr.stc_spatial) as q;
```

locally; sorry, ADQL can't do this sort of string manipulation.

We're severely incomplete in space and dramatically incomplete on all other axes. Probably so much so that even spatial isn't really usable in discovery right now.

### 5. In Practice

ADQL to yield resources for an upload of points:

```
SELECT ivoid FROM
rr.resource
NATURAL JOIN
(SELECT DISTINCT
  ivoid
  FROM rr.stc_spatial AS db
  JOIN TAP_UPLOAD.t2 AS tc
  ON 1=CONTAINS(
    POINT('ICRS', tc.ra, tc.dec),
    coverage)) AS spate
WHERE 1=ivo_hashlist_has(waveband, 'Infrared')
```

You can use this together with a query like

```
select ra, dec from basic where otype='ULX'
```

on SIMBAD – and it's already available as an example query in TOPCAT (Service-provided, "Find resources for a set of points").

Ugh: AllSky Spam. I *think* that will be a discovery issue.

### 6. Side Issue

You can say

```
select top 2 * from rr.stc_spatial
```

and you'll get back something like

```
<FIELD name="ivoid" utype="xpath:/identifier"/>
<FIELD arraysize="*" datatype="char" name="coverage"
  xtype="adql:REGION"/>
<TABLEDATA>
<TR>
  <TD>ivo://cds.vizier/j/aj/152/8</TD>
  <TD>MOC 5/3646,3690,3693-3694,3704,3706,3732...
</TR>
<TR>
  <TD>ivo://cds.vizier/j/a+a/599/a135</TD>
  <TD>MOC 6/28830</TD>
</TR>
```

The details on MOCs in VOTables are discussed in Apps.

## 7. In VODataService

footprint is spatial only and is fragile and an implementation liability.

STCResourceProfile uses broken STC 1.

I'd really like to enable discovery queries like "Fluxes or images around H $\alpha$  in the Sgr A region in November 1986".

Let's fix things and make coverage work.

Which means VODataService 1.2 (which is due anyway).

## 8. A Proposal for coverage/intervals

```
<coverage>
  <intervals>
    <spatial>6/48942-48943</spatial>
    <!-- suggested order limit: 6 (~1 deg) -->
    <temporal start="43837.7" end="48184.2"/>
    <!-- in TT expressed as MJD, multiple
         intervals possible: -->
    <temporal start="33428.1" end="36532.7"/>
    <spectral start="3.4e-07" end="6.9e-07"/>
    <redshift start="-0.0001" end="0.3571"/>
  </intervals>
  <waveband>Infrared</waveband>
</coverage>
```

Comments?

## 9. In Parting

There's a vicious cycle:

Data providers don't give STC coverage in their RRs,  
so astronomers don't use it to discover resources in the registry,  
so it's not worth investing time to define STC coverages,  
so data providers don't give STC coverage in their RRs,  
so astronomers don't use it to discover resources in the registry,  
...  
How do we break it?