



Fig. 1



Fig. 2



Fig. 3

1. STC in the Registry

(cf. Fig. 1)

Markus Demleitner
msdemlei@ari.uni-heidelberg.de

(cf. Fig. 2)

This is an update to the Shanghai talk with the same title.

- There's a note
- There's a draft schema
- There's live RegTAP tables
- There's a Roadmap – so who's hitting the road?

Oh, and there's a blog post on this:

<https://blog.g-vo.org/space-and-time-not-lost-on-the-registry/>

(cf. Fig. 3)

2. There's a Note

Published Feb 2018: "A Roadmap for Space-Time Discovery in the VO Registry". It discusses

- A VODataService extension (essentially as proposed in Shanghai)
- A RegTAP extension (essentially as proposed in Shanghai)
- Implementation status
- A Roadmap

Read it yourself: <http://ivoa.net/documents/Notes/Regstc>

3. VOResource Extension

The plan is to give coverage new children, like this:

```

<coverage>
  <spatial>
    4/2068
    5/8263,8268-8269
    6/33045-33047,33049,33051,33069,33080-33081,
    33083,33104-33106,33112,33124-33126,33128-33130
  </spatial>
  <temporal>51845.1 52262.2</temporal>
  <temporal>53122.9 53223.8</temporal>
  <spectral>3e-07 1.1e-06</spectral>
  <footprint ivo-id="ivo://ivoa.net/std/moc"
    >http://dc.g-vo.org/cdfspect/q/ssa/coverage</footprint>
  <waveband>Optical</waveband>
</coverage>

```

That is: Spatial coverage is given as an ASCII MOC, time and spectrum are in simple, DALI-style intervals, with multiple intervals per axis allowed.

Legacy footprint (a MOC/PNG URL in this case) and coverage/waveband remain recommended, as there's still use cases for them.

The note

```
ivo_interval_overlaps(l1 NUMBER(12, 4), h1 NUMBER(12, 4), l2 NUMBER(12, 4), h2
NUMBER(12, 4)) RETURN INTEGER
The function returns 1 if the interval [l1..h1] overlaps
with the interval [l2..h2]. For the purposes of this
function, the case l1=h2 or l2=h1 is treated as overlap.
The function returns 0 for non-overlapping intervals.
ivo_healpix_index(order INTEGER, ra DOUBLE PRECISION, dec DOUBLE
```

Fig. 4

4. RegTAP extension

RegTAP grows three tables:

rr.stc_temporal, rr.stc_spectral, rr.stc_spatial

They're all straightforward mappings of the proposed VOResource elements (needs MOC support in the database!).

Plus:

(cf. Fig. 4)

The ADQL user defined function is needed for robust matching in the interval-valued tables.

5. RegTAP example

Find services with X-Ray data in the center for the LMC:

```
SELECT ivo_id
FROM rr.stc_spatial
NATURAL JOIN rr.stc_temporal
WHERE
  1=CONTAINS(
    POINT('', 80.9, -69.8),
    coverage)
AND ref_system_name IS NULL
AND ivo_interval_overlaps(
  wavelength_start, wavelength_end,
  1e-8, 1e-11)
```

6. Status

Records with STC info 2017-05-03 and	spatial	12399	13773
2018-05-15:	temporal	25	77
	spectral	16	73

That's from MOC footprints, legacy STC-X and prototype implementations for the scheme proposed here.

Declare your coverages! Try the stuff proposed here!

Support with harvested MOCs on <http://dc.g-vo.org/tap>.

But: Only point vs. MOC, and without index, supported so far (pgsphere development ongoing).



Fig. 5

7. Roadmap

- Further axes? [in Shanghai, we still had redshift]
- Non-ICRS? [for solar system data] – now? later?
- Non-EM spectrum? [perhaps express coverage in energy, now wavelength?]
- Better MOCs in pgsphere!
- Standardising the schema! [a.k.a. VODataService 1.2]
- Standardising ASCII MOCs! [DALI 1.2? MOC 1.1?]
- MOCs in VOTable table cells! [DALI 1.2? VOTable 1.4?]
- Standardising the RegTAP tables [RegTAP 1.2? RegTAP STC 1.0?]

8. Join Me!

Let's make STC queries in the Registry a reality!

(cf. Fig. 5)