Gaia Source DM

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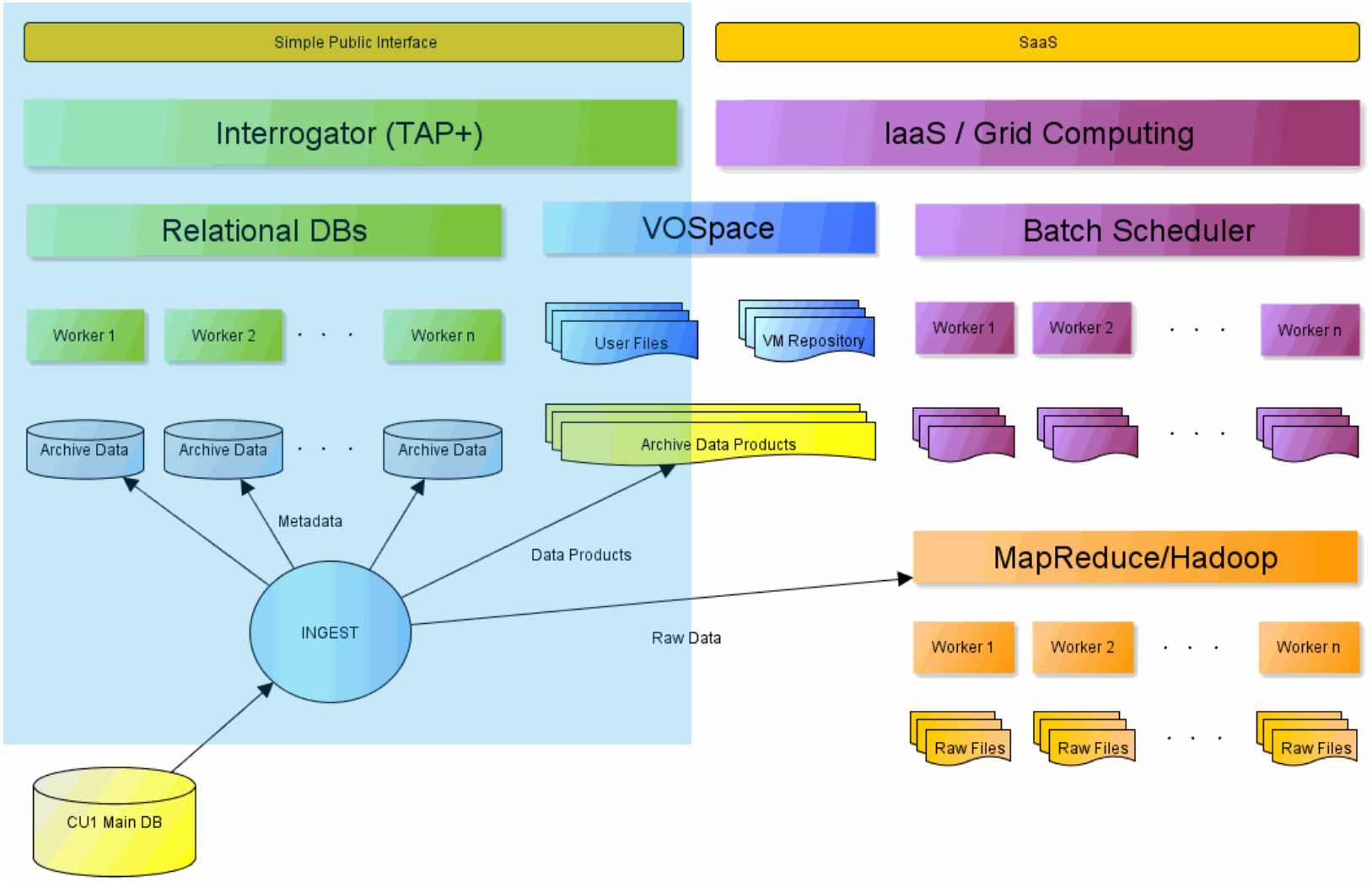
11/10/2014

Gaia Archive Architecture



Gaia Archive requirements for TAP+

Private data

- Users should have their own data/catalogues close to the archive

Gaia DM

- Gaia has its own DM that is propagated and used for all the software developed in the consortium

Crossmatch

- Crossmatch between Gaia catalogue and user catalogues to be executed as a user ADQL function

Big output results

- TAP server should be able to handle very big catalogues and very big output responses

TAP+ implementation: Gaia DM

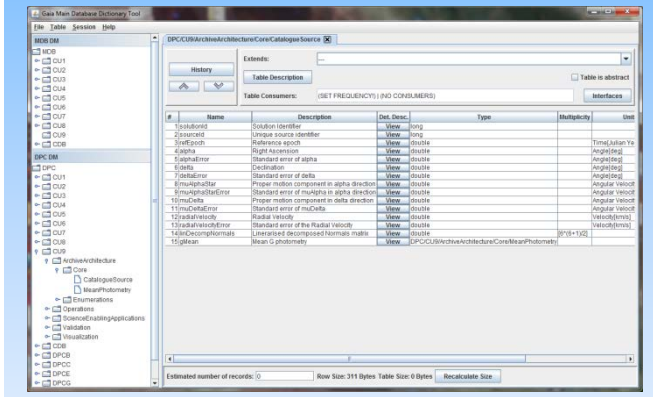
DM Preserved in TAP_SCHEMA? (TAP?)

- Gaia DM should be preserved and propagated through TAP response
- Should TAP_SCHEMA reflect this DM? How?
- DM exploration? Cleaner/self-consistent solution?

Output response OO complaint (TAP?)

- Compulsory output of TAP response is a single table VOTable
- Other output formats are allowed that could reflect better the Gaia DM (Gaia bin – a.k.a. gbin) so they should probably be implemented
- In the case of VOTable format, a VO-DML could/would be implemented

Gaia DM propagation



Gaia DM

DB Schema Creator

gbin

Gaia Archive TAP server

- VO-DML Annotations in TAP_SCHEMA?
- Different structure?

TAP_SCHEMA

```
<TABLE>
<GROUP utype="vo-dml:Instance.root" >
  <PARAM      name="type"      utype="vo-dml:Instance.type"      value="src:source.Source"
datatype="char" arraysize="*"/>
  <FIELDref ref="_designation" utype=" vo-dml:ObjectType.ID"/>
  <FIELDref ref="_designation" utype="src:source.Source.name"/>
  <PARAM name="type" utype="src:source.Source.classification" value="galaxy">
  <VALUES><OPTION value="galaxy"/><OPTION value="star"/>...</VALUES></PARAM>
  <GROUP utype="src:source.Source.position">
    <PARAM    name="type"    utype="vo-dml:Instance.type"    value="src:source.SkyCoordinate"
datatype="char" arraysize="*"/>
    <FIELDref ref="_ra" utype="src:source.SkyCoordinate.longitude"/>
    <FIELDref ref="_dec" utype="src:source.SkyCoordinate.latitude"/>
    <GROUP ref="_icrs" utype="src:source.SkyCoordinate.frame"/>
  </GROUP>
</GROUP>
<FIELD name="designation" ID="_designation" .../>
<FIELD name="ra" ID="_ra" unit="deg" .../>
<FIELD name="dec" ID="_dec"  unit="deg" .../>
<TR><TD>08120809-0206132</TD><TD>123.033734</TD><TD>-2.103671</TD></TR>
...
</TABLE>
```

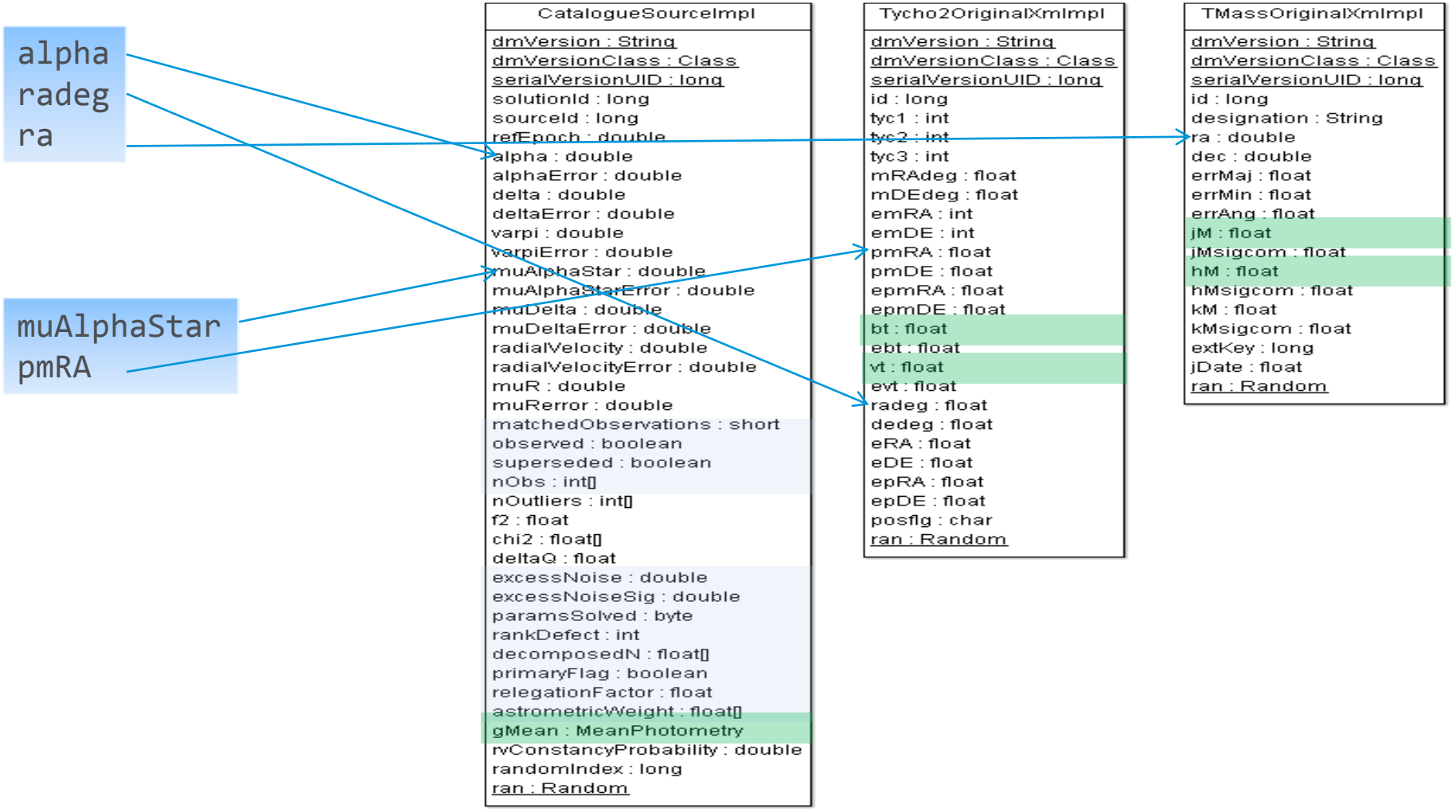
VOTable response with VO-DML

Gaia DM definition

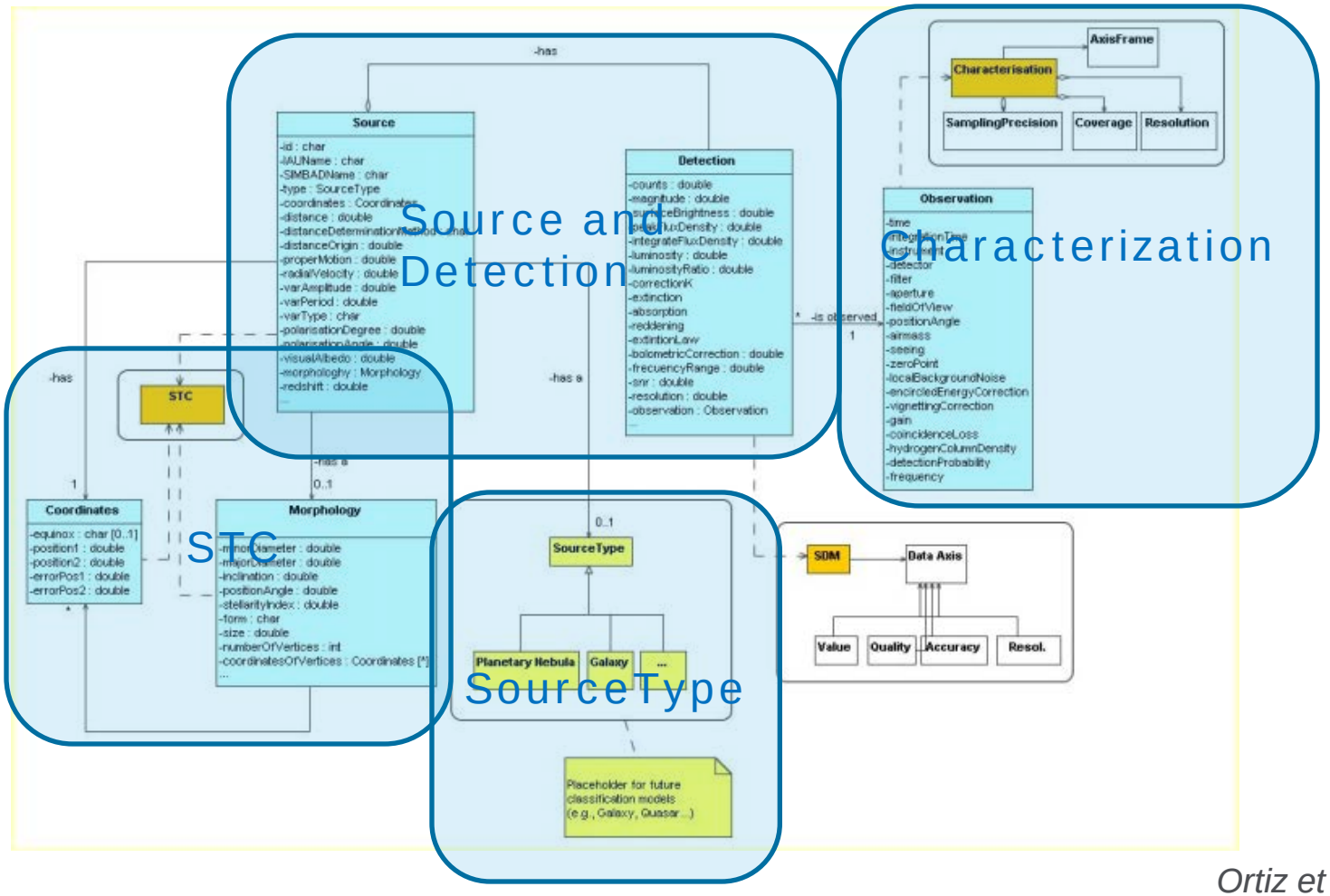
- Gaia DPAC is a quite big consortium distributed across Europe and other countries
- Work is divided into different Coordination Units (e.g. archive in under CU9)
- All the participants of the different coordination units can propose changes into the DM
- A Coordination Control Board (CCB) accept/reject changes per CU (in operations)

- Result: Collaborative process but, sometimes, not clear coordination

Gaia CatalogueSource + External Catalogues

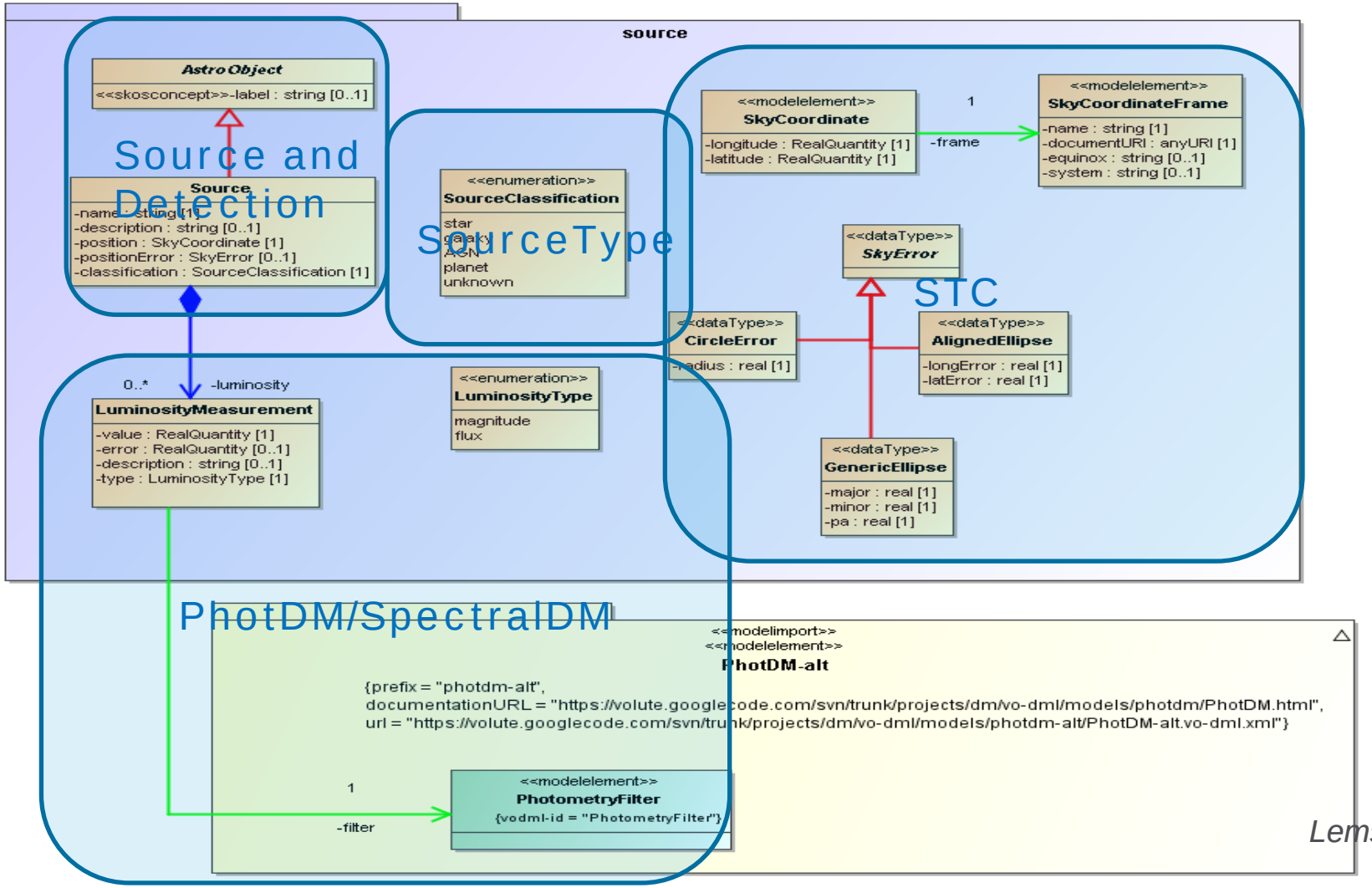


IVOA Source DM old draft



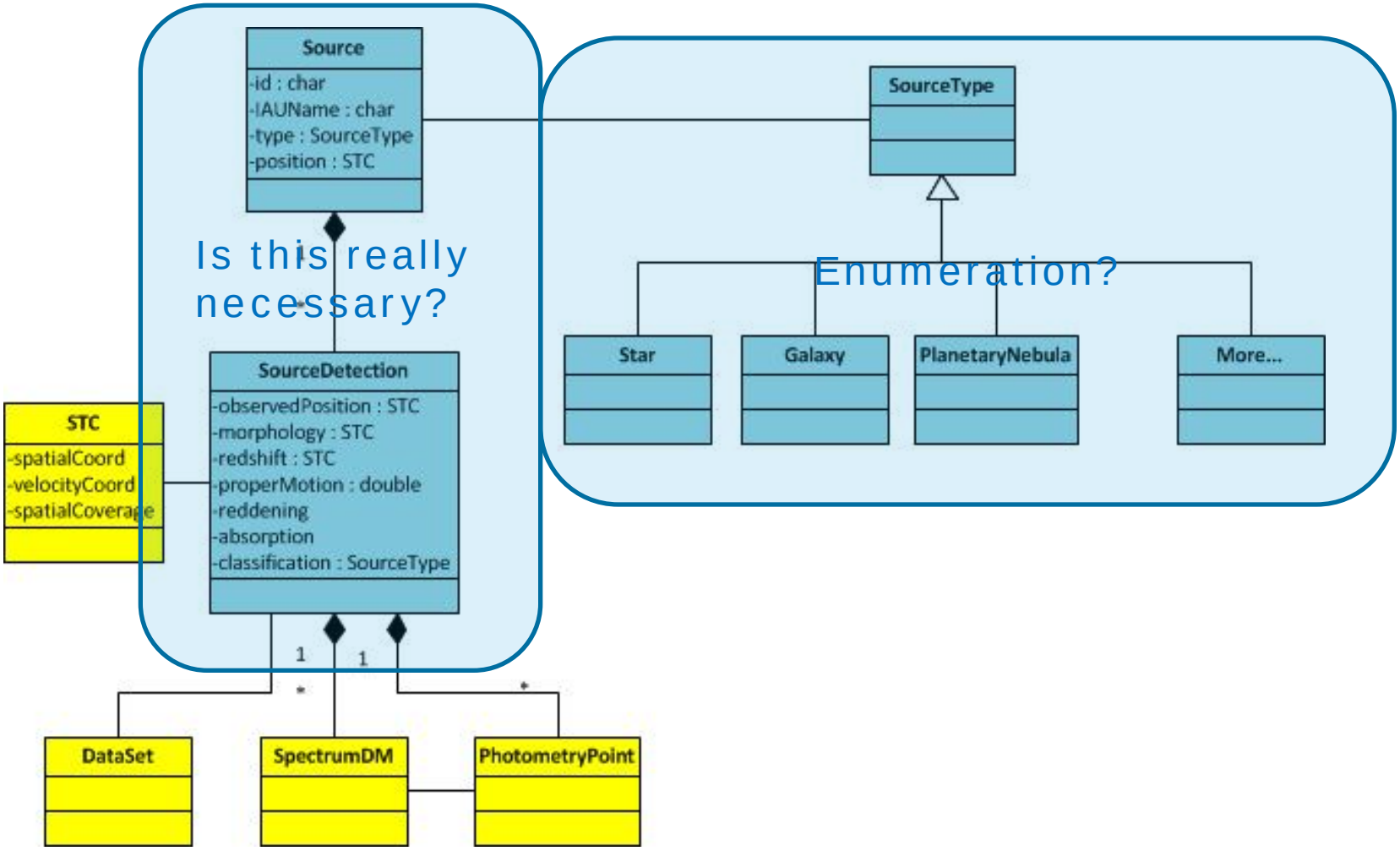
Ortiz et al (2006)

Source DM for VO-DML



Lemson et al (2013)

IVOA Source DM old draft – reloaded



Source DM beneficts

Simplified SourceDM due to DM reuse

- STC2
- PhotometryDM
- CharDM
- SpectralDM 2.0

Mapping

- TAP responses with IVOA utypes. Easier combination of results
- Possibility to map DMs and recover original objects

Support to DM definition

- Missions reuse IVOA DM concepts in the DM definition
- Operations between catalogues from different missions simplified
- Ideal situation: Use XMI->VO-DML workflow inside Project's Data Model processes/libraries

Proposal

- SourceDM is becoming a requirement
- It will facilitate the development of some ongoing projects and a better characterization of old/current ones
- If agreed, it has to be decided if a simplified or a complex DM needs to be developed
- However: Many ongoing specs on the DM Roadmap. Roadmap has to be clean-up
- Proposal: Use partially project resources to help into the definition of a SourceDM that could be endorse by IVOA
- Of course... it is a TCG decision

THANK YOU

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