



Time Series and the VO

Enrique Solano
Spanish Virtual Observatory
Centro de Astrobiología (INTA-CSIC)



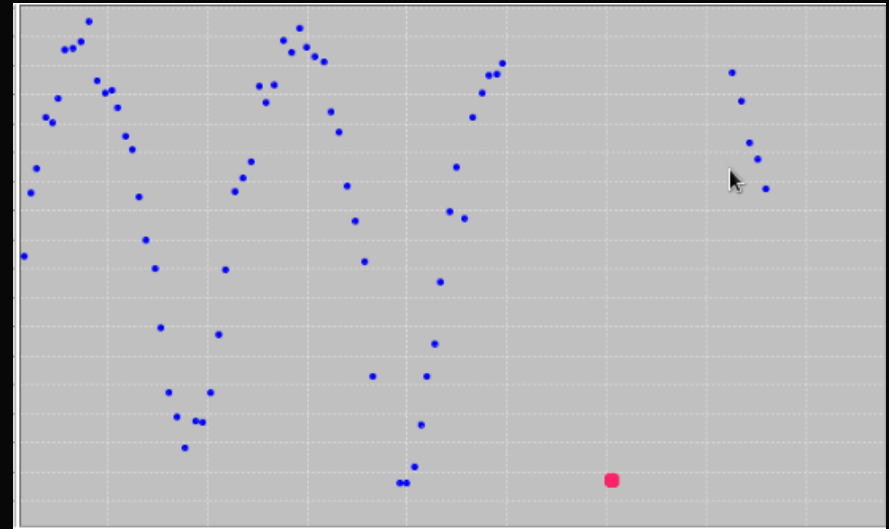
The three steps

- Discovery 
- Access 
- Representation 

```
<VOTABLE xsi:noNamespaceSchemaLocation="xmlns:http://www.ivoa.net/xml/VOTable/VOTable-1.1.xsd"
version="1.1">
- <RESOURCE type="results">
  - <DESCRIPTION>
    OMC Simple Spectral Access Protocol (SSAP) Service.
  </DESCRIPTION>
  <INFO name="QUERY_STATUS" value="OK">Successful Search</INFO>
- <TABLE>
  - <GROUP utype="ssa:Access">
    <FIELDref ref="acref"/>
    <PARAM name="format" datatype="char" arraysize="*" ucd="meta.code.mime"
      utype="ssa:Access.Format" value="application/x-votable+xml"/>
    </GROUP>
  - <GROUP ID="CoordSys" name="CoordSys" utype="ssa:CoordSys">
    <DESCRIPTION>Coordinate System Metadata.</DESCRIPTION>
  - <PARAM ID="SpaceFrameName" name="SpaceFrameName"
      utype="ssa:CoordSys.SpaceFrame.Name" value="ICRS" datatype="char" arraysize="*">
    <DESCRIPTION>Spatial coordinate frame.</DESCRIPTION>
  </PARAM>
```

Discovery

- How to identify services providing Time Series and/or Photometry?



Source Format

Reference URL

Types

Type

Content Levels

Content Level

Relationships

Relationship Type Mirror-of Service

Related Resources

Related Resource

Related Resource ivo-id

Type (string, list) [Dublin Core] [Required]
Definition: The nature or genre of the content of the resource.
Comment: Type includes terms describing general categories, functions, genres, or aggregation levels for content. VO Types include:

Type	Description
Archive	Collection of pointed observations
Bibliography	Collection of bibliographic references, abstracts, and publications
Catalog	Collection of derived data, primarily in tabular form
Journal	Collection of scholarly publications under common editorial policy
Library	Collection of published materials (journals, books, etc.)
Simulation	Theoretical simulation or model
Survey	Collection of observations covering substantial and contiguous areas of the sky
Education	Collection of materials appropriate for educational use, such

Representation

- Two approaches:
 - SimpleTimeSeries
 - Spectrum Data Model v2.0
- No reference implementations
 - OMC archive

OMC: Optical Monitoring Camera

- Light curves for 541802 objects.
- Web and VO access



OMC Archive

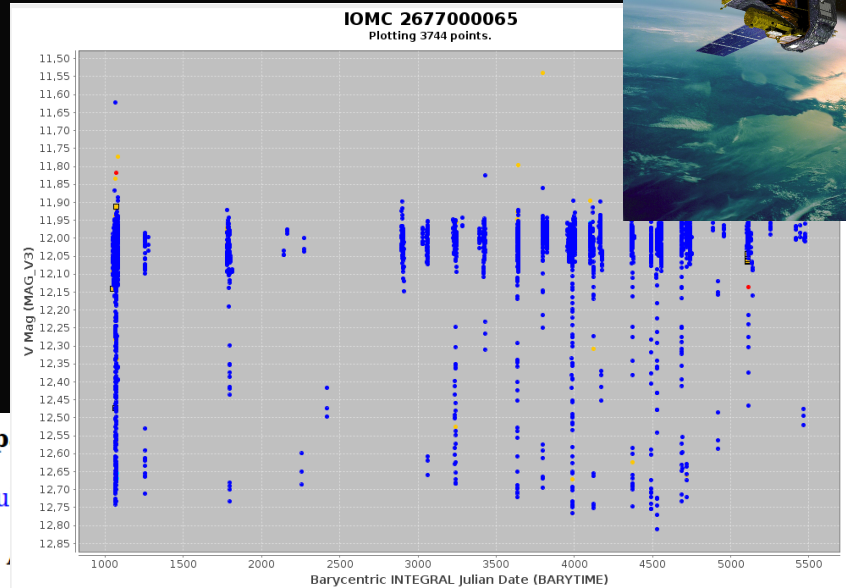
Not logged in

The OMC Archive

This data server provides access to the INTEGRAL Optical Monitoring Camera (OMC) Archive.

Resources

- ▶ Archive search and data retrieval
- ▶ News
- ▶ System Overview
- ▶ Help Desk
- ▶ Project Documentation
- ▶ The first INTEGRAL-OMC catalogue of optically variable sou



le-1.1.xsd"

```
-<VOTABLE xsi:noNamespace
version="1.1">
- <RESOURCE type="resu
- <DESCRIPTION>
  OMC Simple Spectral
</DESCRIPTION>
<INFO name="QUERY_STATUS" value="OK">Successful Search</INFO>
- <TABLE>
- <GROUP utype="ssa:Access">
  <FIELDref ref="acref"/>
  <PARAM name="format" datatype="char" arraysize="*" ucd="meta.code.mime"
  utype="ssa:Access.Format" value="application/x-votable+xml"/>
</GROUP>
- <GROUP ID="CoordSys" name="CoordSys" utype="ssa:CoordSys">
  <DESCRIPTION>Coordinate System Metadata.</DESCRIPTION>
- <PARAM ID="SpaceFrameName" name="SpaceFrameName"
  utype="ssa:CoordSys.SpaceFrame.Name" value="ICRS" datatype="char" arraysize="*">
  <DESCRIPTION>Spatial coordinate frame.</DESCRIPTION>
</PARAM>
```

Conclusions



*International
Virtual
Observatory
Alliance*

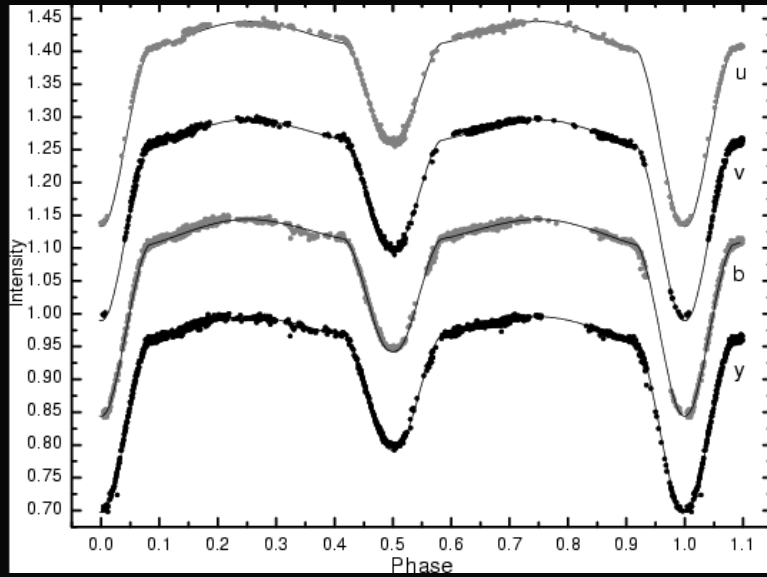
Implementing SimpleTimeSeries and Spectral Data Models in the OMC Archive.

3.- Conclusions

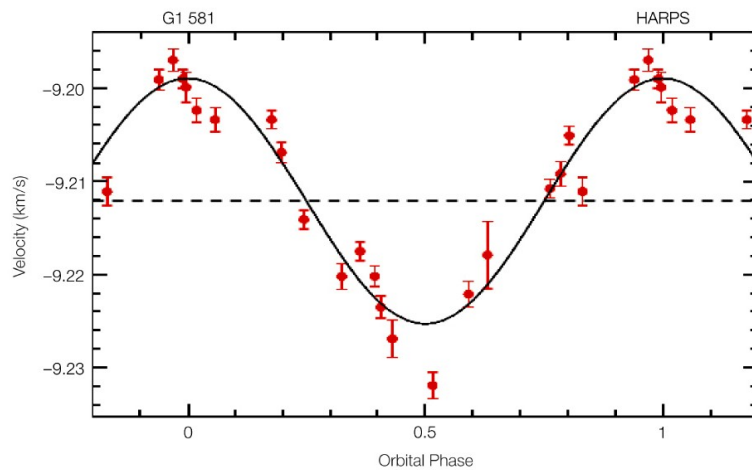
We have seen that the SimpleTimeSeries data model is not detailed enough to properly describe even simple services like OMC. On the contrary, the Spectral Data Model is adequate to be used in services returning monochromatic light curves.

The SimpleTimeSeries data model was proposed as an interim solution to provide the community with a mechanism to represent time series in an standard way until the IVOA Data Model Working Group finishes the definition of the Spectral Data Model v2.0. Given that, to our knowledge, no data center has implemented SimpleTimeSeries and that Spectral Data Model v2.0 is already at the level of *“Proposed Recommendation”*, we suggest to use the latter for, at least, the simple cases. The suitability of the Spectral Data Model for more complex cases (e.g. radial velocity curves, services providing simultaneous light curves in different bands) will require a further analysis.

More complex cases



- STS: OK
- SDM: VO service per band.



Summary

- ✓ Time Series are important.
 - We (VO) are really late and we have to react fast.
 - The VO publication of (at least the simplest cases of) Time Series should be a reality soon.

Sao Paulo (Oct 2012)

- ✓ What can CSP do to boost the VO publication of Time Series?