



VIRTUAL ASTRONOMICAL OBSERVATORY

SED and Spectrum DM @ VAO

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The VAO is operated by the VAO, LLC.



SED and Spectrum @VAO

- Our experience with SED draft and Spectrum v1.03:
 - On the server side: NED service
 - On the client side: SEDLib (used by two components of the VAO SED Tool and distributed)
- We think that both documents suffer several issues but we prioritized them:
 - Urgent issues (should be addressed ASAP)
 - Major Issues (make implementation much less efficient/effective)
 - Minor issues (should be addressed but do not block implementation)
- We (MCD, I) proposed a solution to the SED discussion list



Urgent Issues - Spectrum

- Extensibility is not really defined:
 - What is an Extension?
 - How to generate extended Utypes? (Utypes session, Wed 11.30)
 - Namespaces definitions/declarations
 - XML Schema doesn't match the specs.
- DM elements do not have an associated datatype
 - Sometimes the default value doesn't match the implicit datatype (e.g. "UNKNOWN" for Target.pos).



Urgent Issues - Spectrum

- Mandatory fields with default values
- Serialization (examples) do not match each other and/or the specs. For example:
 - XML schema doesn't support extensibility
 - VOTable declares different datatypes than XML
 - VOTable makes inconsistent use of namespace
- Unnecessary constraints:
 - Explicit distinction between data and metadata (urgent because it directly maps to SED DM issues)



Major Issues - Spectrum

- DM refers to its serializations, losing abstraction
- Confusion between inheritance and instantiation
 - e.g. Axes
 - Introduces serialization specific structures (e.g. VOTable groups)
- UCDs for flux axis
 - The UCDs table is ambiguous, not algorithm-friendly
 - UCDs depend on quantities and units, should be expressed in terms of these entities
- More information in the serialization examples than in the actual specification



Minor issues - Spectrum

- Many little things:
 - Missing/wrong references
 - Continuous references to serialization
 - References to SED and SSA

[Provided as feedback in Naples by Mark, Janet, posted to the wiki, more from this talk/discussion].
- UML diagrams are not really UML



Urgent issues - SED

- Again, inheritance and instantiation. The document states:
 - SED is a Spectrum DM Extension
 - A SED's segment is a Spectrum DM Extension
 - Photometric Point is a limiting case of a special case (Light Curve) of a Spectrum Extension (Time Series)
- However, SED doesn't extend Spectrum (it is first included and then changed)
- SED drops the XML serialization of Spectrum
- Different classes (Time Series, Photometric Point, Spectrum...) are distinguished only by a string
- Uniform and Aggregate SEDs are indistinguishable in the specs



SED – A Proposal

- Drop distinction between Data and Metadata in Spectrum DM
- Fix Extensibility in Spectrum DM

This yields

- Segment extends Spectrum DM
- SED contains Segment instances

Pros

- No need to redefine Utypes (from Metadata to Data + Ext)
- Spectrum clients can read Segment



IVOA Architecture

- It will be useful to try and create a consistent environment in which specs live (leading to fast, painless implementation)
- A Prototype case:
 - Utypes 1.0 (see Utypes session, DM-2, Wed)
 - Photometry 1.0
 - Spectrum 1.2/ Spectral 2.0
 - DAL?
- Requirements involve different components working together
 - e.g. reusable, pluggable components:
 - Loosely coupled DMs (changing a DM doesn't mean the including DMs must be modified)
 - DM mash-up (adding a DM doesn't mean other DMs must be modified)