SSA and Photometry services

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ESAVO/ESA

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Task Objectives

- Include photometry data in VO context
- This is an old and recurrent request of astrophysical community. One of the main topics raised during community workshops. One of the topics raised by the IVOA Take-up Committee
- Photometry data have many related problems but we can include a lot of data by very simple work
- In theory, SSAP gives support to photometry data, but no services providing photometry data are created. Something is missing
  - Filter characterization
  - Format of the different ways to serialize photometry data
- Present effort will not cover ALL the possible photometry issues but many (most?) of them

Photometry use case I: Synthetic Photometry
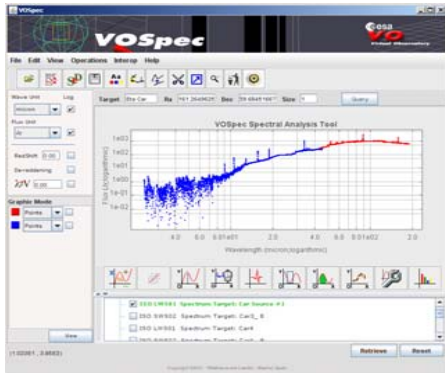
Give me list of registered Filters
(possible constrained by wavelength range)

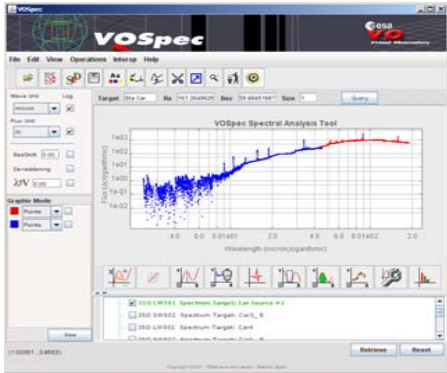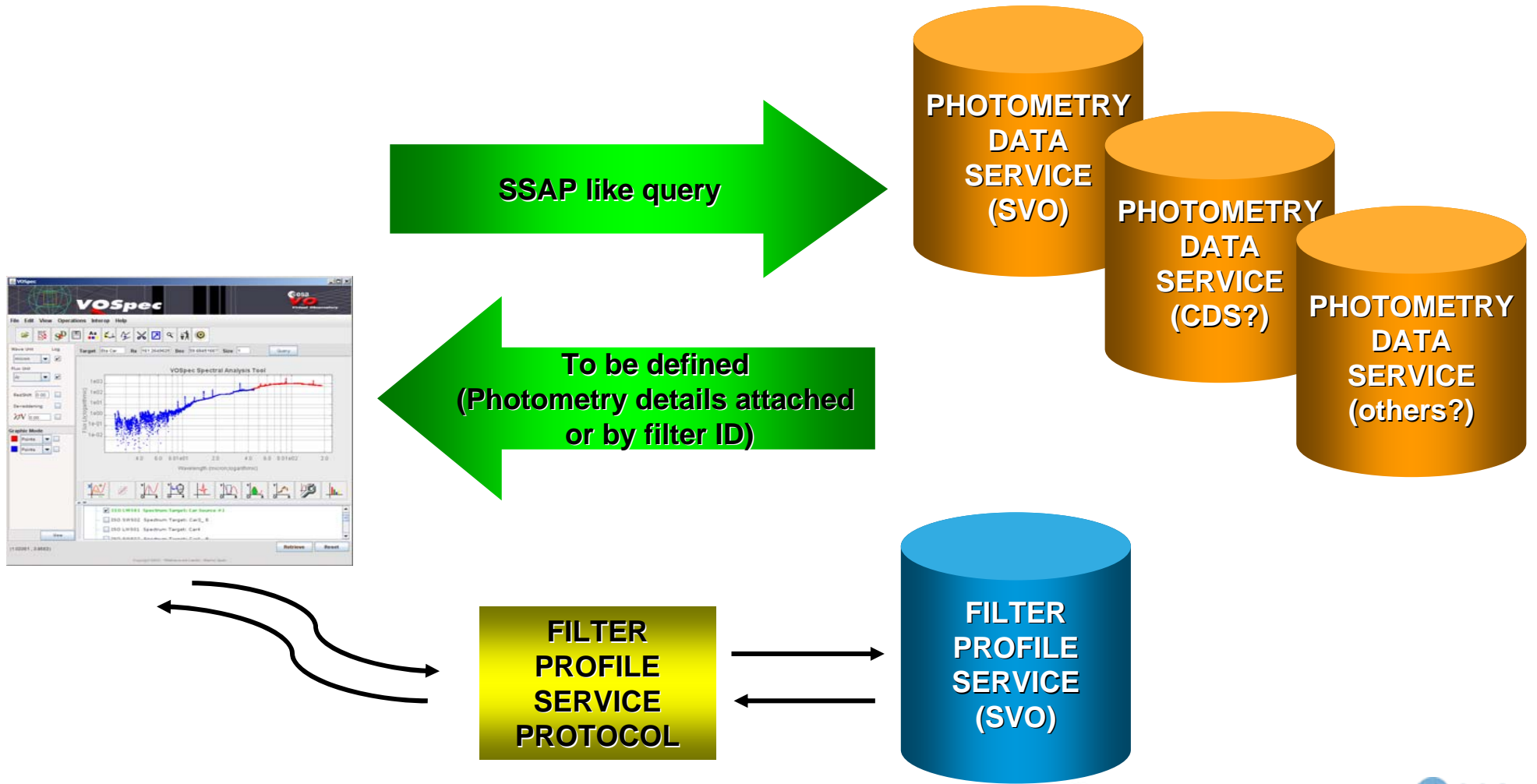Response, VOTable (VOResource?)

Show filters so user can select

Give Details for a certain filter list

Response, VOTable (VOResource?)
Including link to Transmission curve

Use filter
Details to create synthetic photometry points using real/model spectra as input

FILTER PROFILE SERVICE (SVO)

FILTER PROFILE SERVICE PROTOCOL

Photometry use case II:
Photometry Data Services

SSAP like query

To be defined (Photometry details attached or by filter ID)

PHOTOMETRY DATA SERVICE (SVO)

PHOTOMETRY DATA SERVICE (CDS?)

PHOTOMETRY DATA SERVICE (others?)

FILTER PROFILE SERVICE PROTOCOL

FILTER PROFILE SERVICE (SVO)

- Most of the photometric data in inside catalogs
- Different approaches were discussed:

- **Simple Cone Search**
- This is an IVOA recommendation and easy to implement. However:
- Include photometric data is not compulsory
- Lack of capabilities discovery (we cannot know if one catalog contains or not photometric data) (update of VOResource extension?)
- No place to put filter characterization metadata. UCD? -> currently, only phot.mag
- Same UCDs for different implementations of standard filters, e.g. filters could share a more specific JOHNSON U UCD but the interpretation is not exactly the same in different photometric systems
- No UCDs for all the possible photometry filters

Simple Cone Search Extension

What does it mean?

Simple Cone Search Extension example

- Added extra filter characterization information in groups/fieldrefs or using extension mechanism
- Use of utypes/DMs to characterize data
- Contra: It does not look very reasonable to extend SCS when this should be superseded by TAP…

TAP approach

- This looks the natural protocol to access catalog information.
- It was already explored long time ago by ESAVO (see VOQuest applications interop presentation Ortiz et al, Victoria 2006!)

However:

- TAP response is a VOTable with a unique Table (as a logical result of a SQL approach)
- Where do we can add extra characterization information? We have fields with ID/NAME, UCDs, utypes,….
- When one record (one object in the catalog) has more than one magnitude value, the same utype and UCD will be appear for different record columns, both for the filter identifier and for the value
- We would need some kind of grouping, references or extra extension tables in the response (unique field identifiers?)
- Both in the SSAP approach and the TAP approach, Photometry DM is needed, so, even if we find a way to provide this information in TAP, the PhotDM would be still valid

...SSAP? SCS? TAP?…. SSAP?

SSAP approach

- No revolutions. SED would be constructed using a unique IVOA recommendation

- Extra specific spectral characterization has already a way to be expressed in SSAP

- SDM -> Add reference to new DM and one example of photometry file serialization

- SSAP -> data type field? Not necessary if previous point is done (valid SDM serialization)

- Nice to have, modify the VOResource extension for registry registration to allow user to specify if the SSAP service is a photometry data one

- Very easy integration in VO spectral applications

What was done?

- **Definition of SSAP services for photometry data (ESAVO/SVO)**
    - Implementation of 5 SSAP new services following this definition
    - (4 SSAP including theoretical data, a.k.a. TSAPs - COND, DUSTY, KURUCZ, NEWGEN and
    - 1 SSAP including observational data - IUE photometry)
    - As far as we know, these are the first services of this type in VO context
    - Services registered in EuroVO registry (SVO)
    - Adaptation of VOSpec to consume these photometric SSAP services

    - CDS has already 3 prototype servers!

                                                            - USE CASE 2 IMPLEMENTED -

- **Definition of a Filter Profile service**
    - FPS server implemented by SVO
    - FPS client implemented by ESAVO and integrated in VOSpec

- Module added to VOSpec to allow the creation of **synthetic photometry** at client level using Filter Profile Service information
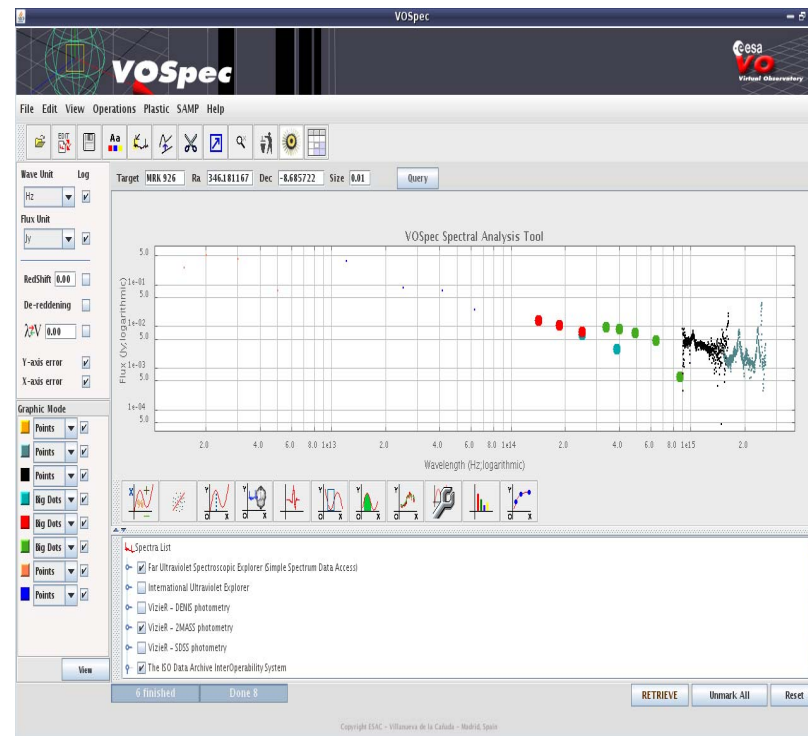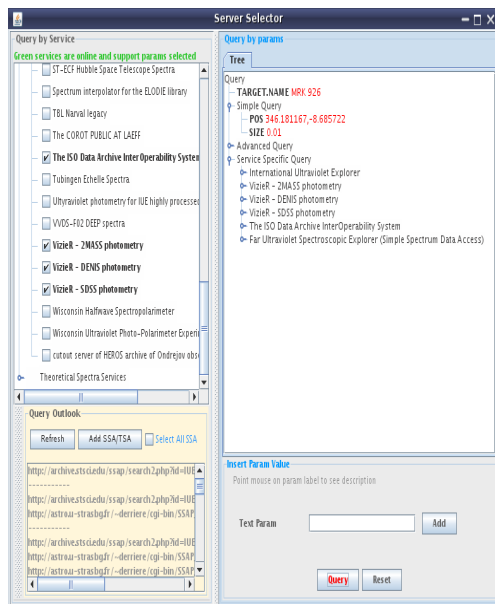
                                                            - USE CASE 1 IMPLEMENTED -

- **Photometry Filter DM first version**
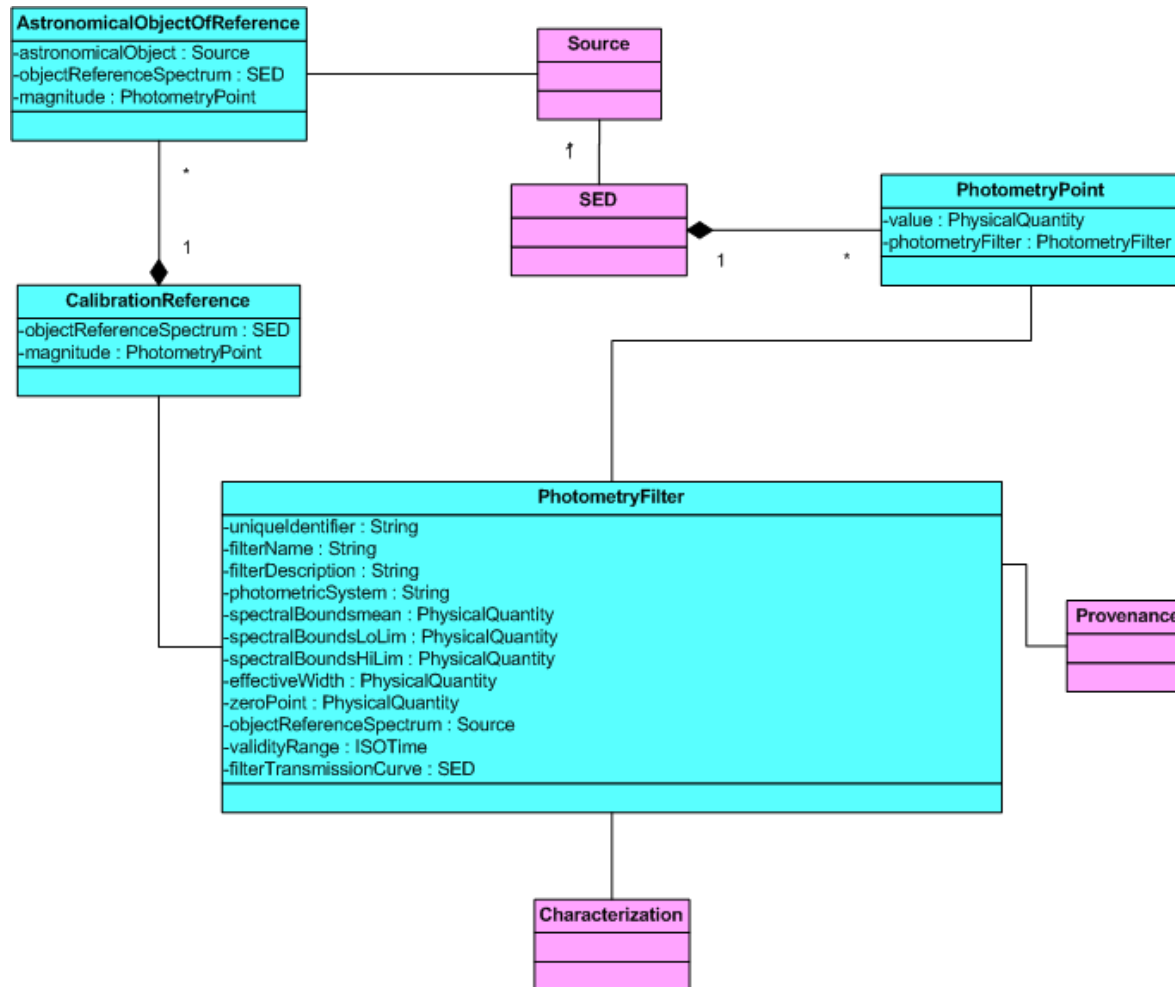
Current Status:
SSAP servers on going!

- Sebastien Derriere has implemented 3 SSAP services for 2MASS, SDSS and Denis from data in Vizier

- Still prototype phase, changes to be done in server and client for better consumption but…

THANK YOU

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