

IFU Data in the Virtual Observatory

Igor Chilingarian (Observatoire de Paris, France)

Collaborators:

Francois Bonnarel, Mireille Louys, Pierre Fernique, Thomas Boch (CDS, France)

Pierre Le Sidaner, Frederic Royer, Isabelle Jegouzo (Observatoire de Paris)

Ivan Zolotukhin (SAI MSU, Russia)



3 Cornerstones for 3D data in VO

1. Data Model

2. Data Access Services

3. Client Applications

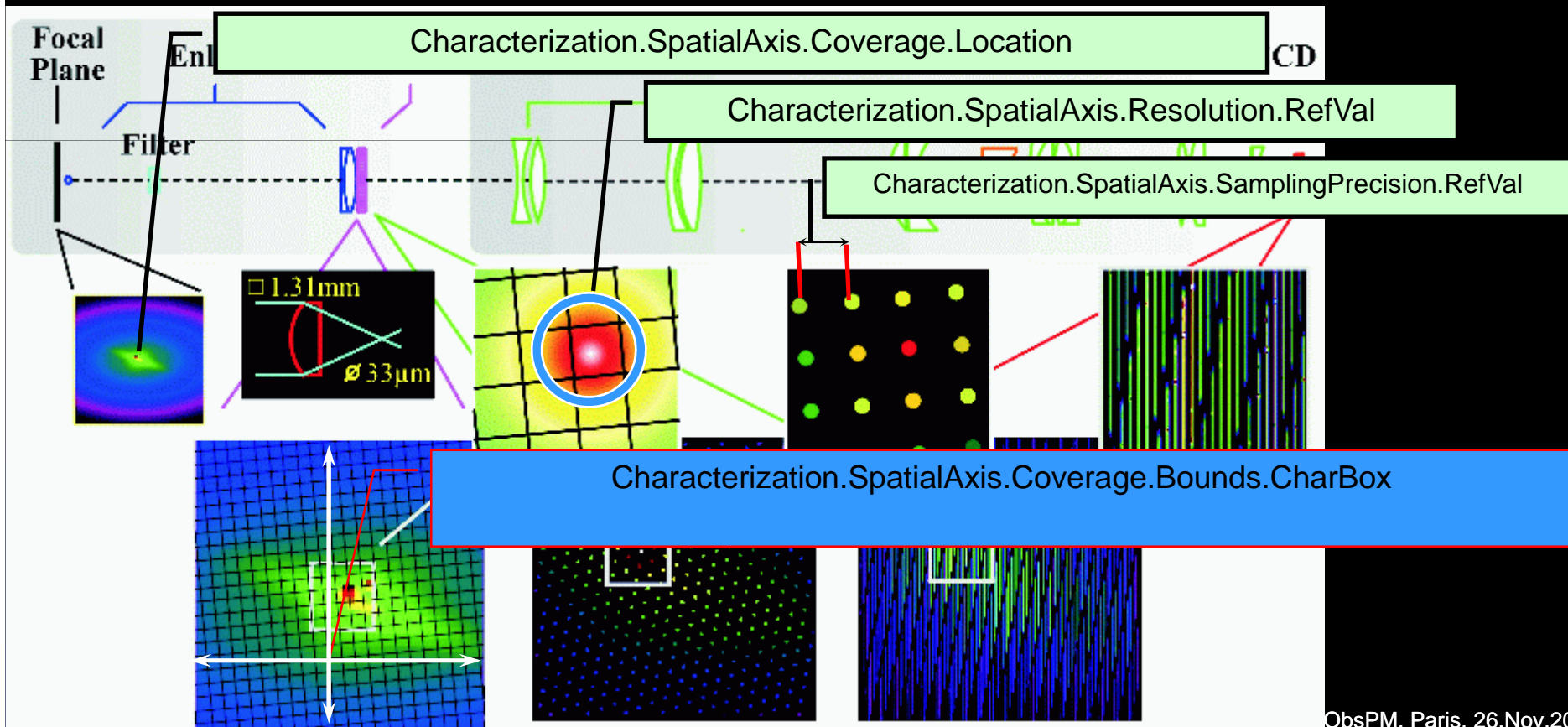
Characterisation DM

The basic part of the most general data model: Observation DM
Provides a physical characterisation of a dataset

<u>Level 1</u>	Coverage	Resolution	Sampling
<u>Level 2</u>	Coverage	Resolution	Sampling
<u>Level 3</u>	Coverage	Resolution	Sampling
<u>Level 4</u>	Coverage	Resolution	Sampling
Spatial (pos)	Map	Map	Map
Temporal (time)	Map	Map	Map
Spectral (em)	Map	Map	Map
Observable (phot)	Map	Map	Map

Characterising IFU datasets

Only first two levels (Location/Ref.Value and Bounds) should be provided for the whole dataset



3 Cornerstones for 3D data in VO

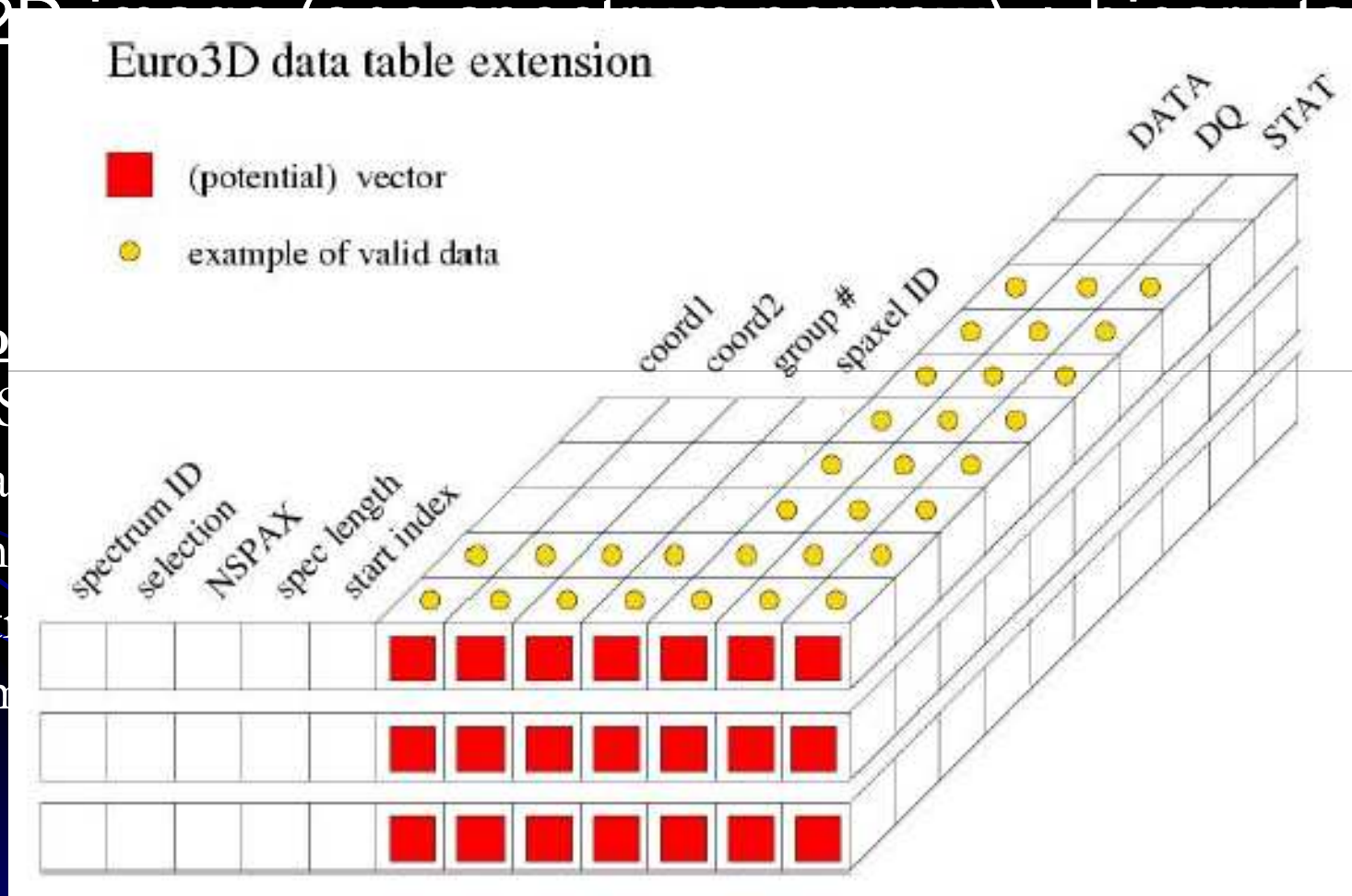
1. Data Model

2. Data Access Services

3. Client Applications

Storing 3D Data in FITS

- Pure 3D data cube (for IFP data and for some IFU)
- 2D images (for some instruments) with a table ⇒



Euro

- FITS
- Binary
- Some
- spect
- param

1. Giraffe Archive at ObsPM

- Delivery of Euro3D FITS format and “stacked spectra” for reduced observations made with FLAMES/Giraffe at ESO VLT in MEDUSA mode (multi-object spectroscopy)
- SSAP access to spectra individual objects (extracted fibers)
- More data (IFU/ARGUS) are coming...

2. ASPID-SR at SAO RAS

- Direct querying of the Characterisation DM metadata stored in PostgreSQL database with native XML support using SQL+XPath
- SSAP interface on top of it
- Delivery of Euro3D FITS + 3D FITS cubes for ~600 datasets including ~100 MPFS IFU datasets, ~70 IFP data cubes, long slit spectra (the rest)
- WEB-2.0 interface
- Highest possible integration of the archive WEB-site with existing VO client applications

3 Cornerstones for 3D data in VO

1. Data Model

2. Data Access Services

3. Client Applications

VO-Paris Euro3D Client

- Open source tool, Java 5+
- Available as applet and Java WebStart
- I/O of Euro3D FITS files (local or URL)
- Extraction of spectra for individual fibers
- Export of extracted spectra in the VOTable serialization of the IVOA Spectral DM 1.0
- Export of the catalogue of fiber positions as VOTable 1.1
- Communication with CDS Aladin and ESA VOSpec using PLASTIC messages for data visualisation



<http://vo.obspm.fr/tools/Euro3D/>

Summary

Our implementation is yet rather simple, however it demonstrates how existing VO standards and tools can be integrated to provide access to complex datasets

How this all works... (ASPID-SR)

The image shows a workflow for data analysis using ASPID-SR and VOSpec. It consists of several windows and components:

- ASPID-SR Search Interface:** A web browser window showing search results for a target. A blue box highlights the text "PLASTIC-aware ASPIDApplet".
- Aladin v4.0:** A software window showing the target's position in ICRS coordinates (23:03:59.21 +22:38:18.6) and a pixel value of 3567.0.
- VOSpec:** A software window for spectral analysis. It features a "Spectra Viewer" showing a plot of Flux (Jy, logarithmic) versus Wavelength (micron, logarithmic). The plot shows a spectrum with several absorption features. The x-axis ranges from 4.80 to 6.40 microns, and the y-axis ranges from 2.0 to 6.0 Jy. A "Spectra List" at the bottom shows "Local Spectrum" selected.
- VO-Paris Euro3D-VO Client:** A window for loading Euro3D FITS files. It includes a text input field for the file location and buttons for "PLASTIC Disconn", "Cat->Aladin", and "VOSpec".

Arrows and text labels indicate the workflow steps:

- "Load D" (likely Load Data) points from the search results to the Aladin window.
- "Load Euro3D File" points from the search results to the Euro3D-VO Client window.
- "Extract & Display Spectrum" points from the Euro3D-VO Client window to the VOSpec window.
- "Show Fiber Position" points from the Euro3D-VO Client window to the VOSpec window.
- "Select Fiber" points from the Euro3D-VO Client window to the VOSpec window.