SLAP v0.9
Simple Line Access Protocol

Jesús Salgado

Jesus.Salgado@sciops.esa.int

ESAVO Team,

European Space Astronomy Centre (ESAC)

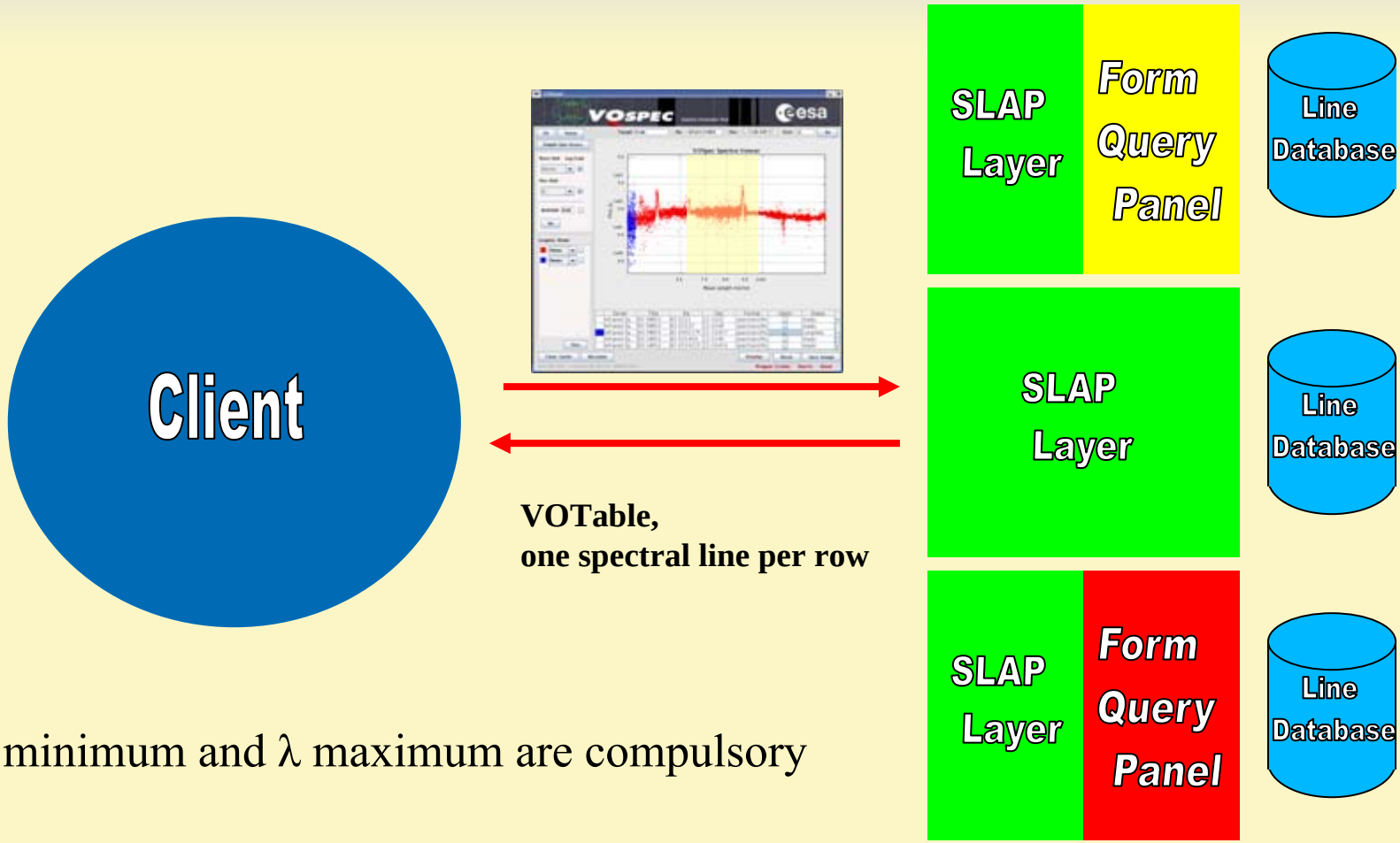
European Space Agency

Document authors

Jesus Salgado, Pedro Osuna, Matteo Guainazzi,

Isa Barbarisi, Marie-Lise Dubernet, Doug Tody

SLAP concept



λ minimum and λ maximum are compulsory

Jesús Salgado

European Space Astronomy Centre (ESAC)
Villafranca del Castillo, MADRID (SPAIN)

Last interop agreements

- Atomic and Molecular Line data model is very complex. Basic model was prepared in line with SLAP but many things could be extended
- Delay in the DM release was producing an unnecessary delay in SLAP protocol release
- It was agreed with DM chair, DAL chair and TCG chair to create a Simple Spectral Line Data Model (in line with SLAP and using AMLDM v0.5 as a basis) so both documents could follow the standardization process
- During these months, v0.9 of both documents has been upgraded/prepared and, finally, distributed to the working groups (DM and DAL)

SLAP modifications since latest distributed version

- SLAP has been upgraded to the new DAL2 interfaces, in line with current SSAP
- **REQUEST** (for operations) and **VERSION** (for version handling) inputs have been added. Operation **REQUEST=queryData** described in document
- Operations getCapabilities and has been reserved but not fully described (as in SSAP). FORMAT=METADATA operation is still valid and future version would define the getCapabilities operation
- Document has been updated accordingly with the latest SSLDM changes

- Some new input/output parameters added

New Input parameters

- **PROCESS_TYPE** The service MAY implement a parameter to specify the physical process type for the generation of the line or for the modification of its physical properties. This is a closed classification list
- **PROCESS_NAME** The service (in particular the services that implement previous input parameter) MAY implement a parameter to specify the physical process exact description responsible for the generation of the line or for the modification of its physical properties. As this is an open/free list, the use of the FORMAT=METADATA or getCapabilities operation will be needed as a preliminary step

New output fields

- One field MAY have **utype="ssldm:Line.initialLevel.configuration"** and one may have **utype="ssldm:Line.finalLevel.configuration"** describing the electron configuration of the initial levels of the line. LATEX like escaped characters: Example:

$$3p^6 3d^6 4s^2$$

could be expressed as: **3p^6 3d^6 4s^2**

- In the case of molecular levels:

$$^{2S+1}\Lambda_{\Omega}$$

could be expressed as: **^{2S+1}\Lambda _{\Sigma }**

New output fields (II)

- One field MAY have **utype="ssldm:Line.initialLevel.quantumState"** and one may have **utype="ssldm:Line.finalLevel.quantumState"** describing the quantum state of the initial and final levels in a parseable string representation. It was discussed to use extensions but this was the final agreement to do not add extra complexity. The format would be the following:

  [label:type:numerator:denominator;label:type:numerator:denominator;…][….]

  Where (for initialLevel):
  - label:

  ssldm:Line.initialLevel.quantumState.quantumNumber.label
  - type:

  ssldm:Line.initialLevel.quantumState.quantumNumber.type
  - numerator:

  ssldm:Line.initialLevel.quantumState.quantumNumber.numeratorValue
  - denominator:

  ssldm:Line.initialLevel.quantumState.quantumNumber.denominatorValue

SLAP implementations

- **SLAP Server Name:** **IASD**
- **Type:** **Observational**
- **Publisher:** ESA
- **Service Description:** SLAP Access to ISO Astronomical Spectral Lines Database
- **Contact:** ESA-VO team
- **Spectral Coverage:** IR
- **Number of Records:** 300 transitions
- **Comment:** Client: VOSpec

- **SLAP Name:** **LERMA**
- **Type:** **Theoretical**
- **Publisher:** Observatoire de Paris
- **Service Description:** LERMA SLAP access to the CDMS and JPL molecules correlated to the Basecol database
- **Contact:** N. Moreau & M.L. Dubernet
- **Spectral Coverage:** millimetric, sub-millimetric
- **Number of Records:** 37500 transitions
- **Comment:** Client developed by N. Moreau

SLAP implementations (II)

- **SLAP Server Name:** **NIST**
- **Type:** **Theoretical**
- **Publisher:** National Institute of Standards
- **Contact:** Yuri Ralchencko
- **Service Description:** SLAP Access to NIST Atomic Spectra Database
- **Spectral Coverage:** Multiple Coverage
- **Number of Records:** 142000 transitions !!

- **SLAP Name:** **CIELO**
- **Type:** **Observational**
- **Publisher:** ESA
- **Service Description:** SLAP Access to XMM-Newton observed spectral lines from CIELO Database
- **Contact:** M. Guainazzi & the rest of ESA-VO team
- **Spectral Coverage:** X-Ray
- **Number of Records:** 2700 transitions

SLAP implementations (III)

- **SLAP Server Name:** **CHIANTI**
- **Type:** **Observational**
- **Publisher:** Astrogrid using ESAVO DALToolkit
- **Contact:** Kevin Benson
- **Service Description:** A database for astrophysical emission line spectroscopy
- **Spectral Coverage:** Multiple Coverage

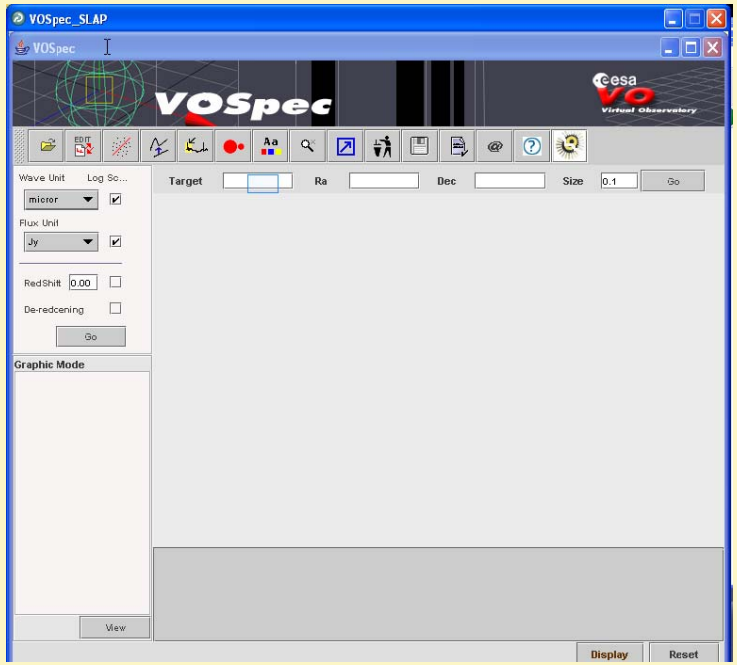
- **Name:** **STSCI SLAP**
- **Type:** **Observational**
- **Publisher:** STSCI
- **Service Description:** SLAP prototype of HST lines using ssa data model
- **Contact:** Randy Thompson
- **Spectral Coverage:** NIR-Optical
  Utypes to be upgraded

SLAP-like implementations

- **Service:** **ALMA internal SLAP**
- **Type:** **Observational**
- **Publisher:** ALMA Archive Group at The University of Manchester
- **Contact:** Stewart Williams, Andrew Markwick-Kemper, Sandra Etoka & Gary Fuller
- **Service Description:** Internal SLAP services to propagate line list within the project. IVOA spectral line list data model used in database schema
- **Comments:** Client: Splatalogue

  Unidentified lines

SLAP in VOSpec demo



Jesús Salgado

European Space Astronomy Centre (ESAC)
Villafranca del Castillo, MADRID (SPAIN)