

SLAP vs LineTAP

DAL Running Meeting
12 May 2025

Goal

To find an IVOA solution to discover and access spectral lines

Criteria:

- To be technically easy to implement and deploy in as many data providers
- To provide a good enough data model for end-users
- To be findable in the IVOA Registry

Two proposed
standards

SLAPv2

- **Data model: SSLDM**
(managed by the IVOA's Working Group DM)
- **Simple access protocol**
with a classical HTTP API

Available parameters:

- WAVELENGTH (mandatory)
- CHEMICAL_ELEMENT
- LEVEL_ENERGY
- LOWER_LEVEL_ENERGY
- UPPER_LEVEL_ENERGY
- TEMPERATURE
- EINSTEIN_A
- PROCESS_TYPE
- PROCESS_NAME

Possible output formats:

- **VOTable** (mandatory)
 - Description of spectral line with **SSLDM**
- RESPONSEFORMAT=**XSAMS**
possible
 - Detailed description of spectral lines

SLAPv2

- [REC-SLAP-1.0](#) (*9 December 2010*)
 - 3 services in the IVOA Registry:
 - IASD ESA SLAP (beta): KO
 - [NIST Atomic Spectra](#): OK
 - [TOSS -- Tübingen Oscillator Strengths Service](#): OK (GAVO)
- [WD-SLAP-2.0](#) (*9 April 2019*)
- [PR-SSLDM-2.0](#) (*9 September 2019*) (*frozen during RFC*)

LineTAP

- **Goal:** describe in a simple way spectral lines available in a database
 - A more detailed access to spectral lines is possible by following the URI given in the column `lines.xsams_uri`)
- **Independent Data Model** based on the VAMDC Data Model.
 - Mapping between VAMDC/XSAMS and LineTAP provided
- **Complex query language** (ADQL) + UWS async jobs + relational database
- **IVOA documents:** [WD-LineTAP-1.0](#) (21 November 2024)

LineTAP

2 available tables:

Lines
title
vacuum_wavelength
vacuum_wavelength_error
method
element
ion_charge
mass_number
upper_energy
lower_energy
inchi
inchikey
einstein_a
xsams_uri
line_reference

Species
inchikey
inchi
name
formula
source_id

Possible output formats:

- **VOTable** (*mandatory*)
- (*XSAMS possible?*)

Side meeting

Side meeting (23 Apr. 25)

- **Participants:**

- **VAMDC** (Carlo Maria Zwölf, Nicolas Moreau),
- **CASSIS** (Jean-Michel Glorian),
- **VALD** (Thomas Marquet),
- **Obs. de Paris** (Franck Le Petit, Nicolas Moreau),
- **Others** (Audrey Coutens, Mickaël Boiziot, Grégory Mantelet)

- 2 hours meeting

- **Goals:**

1. What is the preferred protocol?
2. What should be improved? Next steps?

Side meeting conclusions

1. LineTAP is complicated

- **Too many tables: 2**

- CASSIS would prefer only 1 table
- Users would prefer a much simpler approach (like in ObsCore)

- **Implementation:**

- Too complicated to implement on ***all*** data providers
 - data model mapping, UWS, ADQL, TAP, DB
- For instance:
 - VAMDC = ~30 data providers
 - Different local data models
 - Technical barrier
 - Too heavy maintenance

2. Try new SLAPv2 service

- New up-to-date local implementation of SLAPv2:
 - By Nicolas Moreau
 - When ready, pushed on 1 or 2 nodes
 - VALD volunteered as 2nd node
- Let's see if it works and if enough

3. Need to update standards

- SLAP-2.0:
 - Add use cases from WD-LineTAP-1.0
 - Only the 6th cannot be covered yet
 - “*Resolve molecular designation*”
 - maybe in next version of SLAP
 - Add very basic provenance information
 - Origin (e.g. VAMDC node)
 - Version
 - Add OpenAPI document
- SSLDM-2.0:
 - Add mass, ion charge and atom number

4. Slow implementations

- In the particular case of VAMDC, time required to propagate SLAP services in all nodes
 - Difficulty to convince and motivate infrastructure changes on most data providers side

Discussion with Markus D.

Discussion with Markus D. *(25 Apr. 25)*

- OK for SLAPv2 if it's OK for VAMDC...
 - ...BUT use the DM proposed in LineTAP instead of SSLDM
 - Because:
 - After ~ 10 years, broke things in SSLDM
 - Simpler
 - Mapped over the VAMDC's DM
 - Provenance provided in the XSAMs linked through the LineTAP DM
 - ...so, no need for extra columns in the proposed DM
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- VAMDC Registry
 - Forked from IVOA Registry
 - Request: "update it!"