IVOA April 2022 Interoperability Meeting - DAL Session 2

Time: Thursday April 28 06:30 UTC
Participants: (31) Margarida Castro Neves (MCD), François Bonnarel (FB), Stéphane Erard (SE), Markus Demleitner (MD), James Dempsey, Grégory Mantelet (GM), Ada Nebot (AN), Jean-Michel Glorian (J-MG) et al

Schedule

Margarida Castro Neves - **LineTAP, a spectral line relational model that can be retrieved via TAP**
François Bonnarel - **ProvTAP implementation - ProvHIPS**
Stéphane Erard - **EPN-TAP progress and status**
Markus Demleitner - **An ADQL astrometric library**

Notes

LineTAP, a spectral line relational model that can be retrieved via TAP (Margarida Castro Neves)

Spectral line services curently:

- VO SLAP/SSLDM
- VAMDC/XSAMS

Propose to have a TAP model built from VAMDC but a single table
Have some use cases but more are welcome
Preparing a draft note - aiming for June 2022
Prototype service in GAVO-Dachs
Prototype client in SPLAT-VO and aiming for CASIS

Questions:

- What wavelength to use as default - Angstrom and have ADQL function to convert
- What error to provide? Provide a combined error
- How to refer to a molecule in a query? InChi/InChiKey vs non unique but readable names

Learning from Implementation

- Upper/lower state energy

- Number of transitsions ot include? just the stronger/more likely ones?

Discussion

SE: We would like to incude support for lines from solids (broad bands) for planetary science

GM: Are you using the existing in_unit function to convert

JD: Have you connected wth non-opticals communities
MCD: Have used Angstrom as it is based on VAMDC
MD: Conversion fucntions there to support different units and thus communities
PD: wavelength in metres is the "sucks for everybody" standard elsewhere in the VO
SE: We have the same issue in EPN-TAP - we decided for frequency in Hz The important thing is that conversion coeff / formula are the same everywhere (ADQL and clients) - so ADQL conversion functions are welcome.

AN: SLAP v2 is progressing - have you connected with that team.
MCD: Have some common members and communication
MD: Is there any progress on SLAP v2? There doesn;t seem to be much uptake. This is intended to replace SLAP v2
MM: IIRC the effort is unique since SLAP/SSLDM was forzen
Pierre Lesidaner:: I have already made a validator for slap v2 with help of Nicolas Moreau
J-MG: Yes SLAP V2 has been implemented in CASSISwhy we could not have the 2 protocole like SSA and TAP with spectrum data product
J-MG: CASSIS could implemented both protocole ..

Mickaël Boiziot
Two questions:
- About the identification of molecules, Inchikey is not pratical, but it is working as demonstrated by VAMDC, do you have an alternative ?
- If the protocol is TAP based I think it would be best for the service to provide as much data as available. The client can then select only what he want, no ?
MD: Mickael: (1) InChI is fine, it´s just that people don't like it, so adding some UI between common users and it seems wise.
MD: But in the DB, I agree it'll have to be InChI.
MD: Mickael: As to (2), putting in as much as possible: I'm sure it's generally highly preferable to have a small set of metadata that is reliably there than to have a large metadata model where some services give X and some give Y.
MD: Making a full data record available is of course good.
MD: That's why we have the xsams_uri (or so) that would give you an XSAMS record where available.
MD: But for the core schema, we want to make it easy to query and to use, and for that, every additional column has a high cost.
Mickaël: My concern here is if we are too much restricted in was is provided it will

become like SLAP v1, who is unusable by most use case

J-MG: at the end, the most important is to have le wavelength of the line, an identifier of the line with an identifier of the species related to the line

MD: What have you missed in SLAPv1 (except services:-)?

Stéphane Erard: @JMG - for solids we also need a width (and possibly an asymmetry parameter)

Mickaël: Ability to queries to know the molecules available, and some informations in the lines thenself

MD: The available species thing is covered trivally because we have TAP here.

J-MG: @Markus yes indeed

MD: and the "some information" is of course the tough part. Our guideline here is: "give just enough metadata so a client can figure out to an order of magnitude how strong a line might be given some physics"

Franck Le Petit: Solids are a different problem than atomic and molecular lines. I wonder if they would not deserve a specific work.

MD: (oh, and of course: plot a labelled marker on top of a spectrum, possibly with an indication of the total uncertainty)

Sébastien Derrière: Angstrom are considered obsolete by IAU since 1989! They have only been kept in vounits for description of legacy datasets... Even if bad habits are hard to get rid of, choosing Angstrom in new standards is IMO a poor choice, especially if it constrains communities (radio, high-energy) who conform to IAU recommendations to use a deprecated unit!
https://www.iau.org/publications/proceedings_rules/units/

J-MG: @Margarida Thank you for the presentation

MD: And on solids: You know,
I always panic when I come near solid spectroscopy. Even to molecules are already scary. I *think* I´d much rather postpone those...

Mickaël: Yes, for knowing which species are available TAP is good. But it is also good to provided as much information is possible and let the client query only what is need. This is why I think we should let service provide as much informations as available

MD: Sebastien: As I said, personally, I'm all in favour of Joule (because wavelength sucks anyway, given it depends on the medium). It's just that we need to convince the VAMDC folks...

Mickaël: Is it needed to specify a default unit if functions to convert them are provided ?

MD: As to "give as much as possible": Again, if you do this, then you'll have tables that are *extremely* hard to use, because table A will have values a, b, c, and table B d, b, and e. A client, in effect, can rely on close to nothing.

MCN: Sebastien: thanks for the input on units.

MD: Again: have a small, reliable core is king.

MD: And yes, we have to give the units of the colums, or they become unqueriable.

Mickaël: @Markus: can we have some mandatory and optional data then ?

MD: well, as a deployer you can add whatever columns you want.

MD: But I'd say the model should be: provide good XSAMS records and link to them.

MD: XSAMS is a nice standard, and is *is* comprehensive.

SD: @Markus, yes we use frequency as our pivot quantity as frequency does not depend on the propagation medium (contrary to wavelength). But it would really break habits of people doing optical spectro. Switching from Angstrom to nm is the least painful, Angstrom=0.1nm ☺. As was said, using m is very standard... and slightly ennoying for everyone

ProvTAP implementation - ProvHIPS (François Bonnarel)

Specificiation is progressing but still an internal draft
ProvHIPS now accessibler as a prototype
Tracks provenance of Hubble HiPS back through drizzling and calibration
Take tiles to order 10
Each cell has a number which is used to reference back to the database

Demonstration of navigating the schema

- Complex multi-table queries

Issues:

- Table denomralised so redundant info
- Loop issues - duplicate triplets in the same table for different objects
- Testing out views to resolve these

Demonstration of querying against the views, showing it is much simpler to answer specific questions

Future work

- Complete the database with more tiles or hips
- Workflow for superactivity
- Add parameters anbd config to the database
- COllaborate with other providers
- Release ProvTAP WD

LM: You can also browse ProvHIPS from
https://taphandle.astro.unistra.fr/tapcomplex/app/Tap_Handle_MK2/taphandev.html?url=//saada.unistra.fr/provtap/sync

EPN-TAP progress and status (Stéphane Erard)

Large number of implementations, most of which are up to date with the RFC
Have responded to RFC feedback in March - thank-you for all feedback
Github has the changes

Open issues

1. How do we handle footprints? MOC vs s_region - may need to use STMOCs

so should we keep them seperate? Likely to keep them separate due to use by planetary community wanting contours and OGC compliance. Same services will use MOC footprint for use in Aladin
2. Extensions - optional parameters defined in groups, expected to be permanent - where should these live? Living extensions can't be in the standard. Propose to maintain these in a web page on http://www.europlanet-vespa.eu/EPN_TAP.shtml and then point to it from the EPN-TAP standard.
3. Vocabularies will be discussed in semantics session but could be maintained like extensions

Work plan

- All existing servers up to v2 being reviewed, most in DaCHS v2.5 and definitions in Obs Paris gitlab
- Registration procedure - Chloé presenting

SE: [correction of the above : in EPN-TAP we use fq in Hz - that is so transparent in a dedicated client that I get confused []]
SE: [but we could use ADQL conversion functions]

FB: Extensions - suggest having a section in the document explaining what an extension is, then have an appendix with the stable extensions and state that people are free to create new ones on the site
SE: While poeple are free to create extensions, we want to gather people together to dicuss the extensions, with the solid absorption bands being one of those, and converge on a list of standard parameters that wil later be included in the document, so we woudn't include the discussion there now.

TD: Support keeping s_region and MOC separate. Wondering if the use of GEO-JSON in s_region would cause a problem for clients.
SE: Don't include GEO-JSON in table, but have the server output GEO-JSON on the fly
MD: Database stores geometry - can ask db to output geo-json
TD: User can request format?
MD: Yes via TAP's format parameter

An ADQL astrometric library (Markus Demleitner)

We are getting far enough from J2000 that we need to worry about this now. Some stars have moved arcsec since.
Propose UDFs to solve this and conversion between reference frames

Which approach to use? Not clear whether tangential plane or rigorous solution
Notes have queries to run on GAVO to try out different approaches

Suggest using the rigorous approach as it is used by major survey catalogues

ESA: epoch_prop_pos function - but with different NULL handling for ra, dec - returns a point

DaCHS: ivo_apply_pm - returns a point

ESA: epoch_prop: produces 6 parameter solution - not conviinced it needs to be in the database, point as prev two functions may be sufficient

ESA: epoch_prop_error: returns co-variance matrix but too complex for standard
ESA: epoch_prop_covariance: As above and parameter order is unexpected

Frame Transformation
Removing this in ADQL 2.1 as it is a can of worms
DaCHS: gavo_transform

- Is transform a reasonable identifier
- Frajme identifiers
- Frames that need equinox?
- Only geometries or points?

Proposed Plan
Adopt ESA's epoch_prop_pos
COnsider a simplifed version (no parallax or RV)
Add epoch propogation to pgsphere
Would like to add gavo_transform to UDF catalogue but need a second implementation.
Postpone others to later

Volunteers wanted!

Paul Harrison: +1 for just doing the simplest proper transformation and outputs only ra,dec, as surely within ADQL the purpose is to find whether a pm tranformed point lies in a region
PH: +1 for two epochs
Mark Taylor: -1 for two epochs :-)

AM: Is there already an epoch_prop_pos second implem?
MD: yes, ESA and then GAVO
MD: If you could provide an implementation named ivo_... it would help to move quickly
AM: Please send algorithm

AM: STatus of ADQL 2.1
GM: Waiting to close validation step - need a list of validation queries. See last email in Dec
AM: Can provide some queries
GM: Aiming to combine all queries

GM: RFC once queries

GL: What about non pgsphere systems?
MD: Expecting that crossmatches two step: a) rough corssmatch and then apply proper motions to pairs
GL: Yes problem in indexing, Vizier doesn't apply proper motion but has library - problem is efficiency
MD: Could you volunteer to provide gavo_transform implem?
GL: Not sure have time, but will get back to you