Applications Session 1
IVOA Interop 2021b
Tuesday Nov 02 22:00 UTC
# of participants: 56

Adrian Damian
PyVO Status Update
Update on current PyVO work and issues, including the status of TapPlus integration.

Tom and Adrian are chairs of the Apps WG, and are also 2 of the maintainers for pyvo.
This presentation will be the first of hopefully several semi-regular meetings to progress with pyvi work.
What is PyVO?
Goal to provide reference implementations for accessing VO services and give end-user functionality for programmatic users.
An affilated package with Astropy; means it should keep up with certain changes in Astropy and share some ecosystem.
Functionality includes

- data access (TAP, SIA, SLA, SSA)
- Registry search
- both anonymous and authentcated access

Used in astroquery by ALMA, CADC and NASA

- Astroquery includes a package called TAPPlus whose functionality will be migrated to pyvo, merging with existing TAP support
- pyvo usage is coming to astroquery.ipac.irsa, too

Recent history
May 2019 - Astropy org added PyVO as affiliated package
Sep 2019 - v1.0 released, included authN
Jun 2020 - v1.1, SIA2, improvements to TAP
~Nov 2021 - v1.2

- infrastructure items
- small new features in regTAP and VOResources
- Issues need grooming/purging
- TAPPlus, little progress, but one new PR to support CADC protoype for table creation/deletion, table content upload, index creation - TAP 1.2
- No clear resolution on how to handle "experimental" (non-standard, etc.) code. How to differentiate those features from "reference" features

Future

- SAMP to move from Astropy to pyvo (PR 239)

- Data model implementations
- new clients: VO Space
    - CADC has a popular VO Space client for their users
- Higher-level applications
    - Hide IVOA jargon, add higher level features
    - Improved usability in Regisrty search (GatherTown meetup Wed 16:30 UTC)
    - Improved docs and tutorials

We need you!
How to reach us:
• GitHub (https://github.com/astropy/pyvo) • Slack
• #pyvo channel on Astropy org
• #applications channel on IVOA) • IVOA mailing list (apps@ivoa.net)
• Next PyVO meeting on Nov 10th at 16:00(UTC).

Q: What is the motivation for moving SAMP from astropy to pyvo?
A: Desire from astropy to gain expertise and resources in maintaining the functionality

Q: How many people work on it?
A: Officially 4 maintainers plus a few extra contributors.HEASARC has a new hire that will contribute.

Trey Roby
IPAC's work with the VO Spectral Data Model
This presentation will give implementation feedback and include a brief demo about how Firefly is extracting spectrum from cubes and creating VO tables using the data model. We are also experimenting with trying to recognize older spectrum data from TAP/Obscore searches and giving the user the option save it out in the Spectral data model.

Demo!

Shows graphically extracting spectra from visualized data.
Saving the extraction uses spectral data model

Then showed non-IPAC data from a MAST ObsTAP query for spectral products
Once a products looks like a spectrum, can open it and plot it. Some guessing involved in finding the data.
After exploring/plotting, want to extract to a better-defined spectral dm dataset
Started as fits table found via obsCore, then exported as VOTable in spectral DM

IPAC has a long-standing table format that delivers spectra as well. With some guesswork, can apply this technique again.
Can also do the same with user-uploaded data.

Switch gears to DataLink and ObsCore
ZTF table from IRSA
In displaying datalink options,
woud like to show for sure which options are required v. optional, along with examples, maybe showing the URL construction in following the DataLink

Rubin has just started adding service descriptors

Francois: DL 1.1 now has example URL on master branch

Markus: Intrigued by idea of more metadata on parameters. Req. v. opt., one challenge what about conditional dependency. e.g. for cutouts, can have either RA and dec or pixel coords, not both

Trey: Maybe proceed with a simpler notion first, then expand

James: How have users responded to use of VOTables for spectra?

Trey: It hasn't been released yet. Has a perception that users are not comfrtable with things VO, but if these things are interoperable, that coudl be a big sell eventually

Ada: You can upload data. Can you upload via SAMP?

Trey: Not at this time. Haven't dived in due to issues with http. Not sure if users are demanding it.

From chat:
Mark T - SAMP works quite well in the browser these days - OK even with https except from Safari.
Simon - SAMP works quite well in the browser these days - OK even with https except from Safari.
Doug B - We use SAMP for our Chandra Source Catalog viewer using the WWT. Which is appropriate given that Peter has just started talking about the WWT...

Peter Williams
Recent developments in AAS WorldWide Telescope
Improvements include support for HiPS imagery and catalogs and WebGL-accelerated tiled FITS rendering.

Demo!

Zoom doesn't do it justice, partly due to frame rate, so can click on this mybinder link to try it out:
https://mybinder.org/v2/gh/pkgw/pywwt-notebooks/adass31

Rethinking how WWT works with Jupyter
In Jupyter labs (as opposed to individual notebook), you can put your app in an iframe in a tab in Jupyter, even before starting a kernel.. This tab can be shown side-by-side with a notebook with which it can communicate.
See ADASS31 Focus Demo
Important new features:

- ability to visualize extremely large fits imagery
  - subdividing similar to HiPS, but not VO standard (WWT study format, square TAN projection, works well for angular size < ~5deg)
  - Showed Andromeda, including colormap adjustments
- Get tabular data from viewer, e.g. HiPS catalogs

Would like to have more JAvaScript/Typescript implementations for client code,

Trey: Implemented a Jupyter lab extension and agrees that it's much nicer than a notebook widget. Did find the lab extension difficult due to challenging documentation.
Peter: Agreed. Had to figure out a lot on our own. Once messaging infrastructure set up, then not bad, but just setting that up was a hassle. Keeping that encapsulation is beneficial anyway because you still have a stand-alone ap