VESPA updates, May 2023

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IVOA Interop, Bologna May 8-12, 2023

New in VESPA

Clean up of data services/registry

VESPA portal updates

New data services

New functionalities

New developments

Prospects

Clean up of data services/registry

EPN-TAP: Rec since Aug 2022

=> update/fix existing services (> 60) + DaCHS update where possible
=> fixed service registration process
=> clean up registry
Relies on taplint validation & EPN-TAP mixin in DaCHS
PADC validator now supports EPN-TAP, based on taplint *(R. Savalle in Ops)*
   very helpful to track non-compliances

=> will continue in the coming months
    most services stored on a gitlab, greatly helps maintenance

Europlanet VESPA: Data services connected via EPN-TAP / field

Open
Open in test | upgrade required
Drafted
Scheduled 2024 (selection)
● New or upgraded in 2021/22
● New content in 2021/22

Atmospheres
- ●● Titan profiles - CIRS **(Cassini, LESIA)**
- ●● *Venus spectroscopy - VIRTIS (VEx, LESIA)*
- ●● Mars & Venus Climate Databases **(**modeling, **LMD)**
- ● GEM_Mars **(**modeling, **IASB-BIRA)**
- ●● Venus profiles - SPICAV/SOIR **(VEx, IASB-BIRA)**
- ● Mars profiles - SPICAM **(MEx, LATMOS)**
- *All MEx derived atmospheric products (via MEx IDS)*
- *Venus cloud products (LATMOS)*
- ● TGO/NOMAD **(BIRA-IASB)**

Small bodies
- *M4ast (ground based spectroscopy, IMCCE)*
- 1P/Halley spectroscopy **(IKS / Vega-1, LESIA)**
- ●● BaseCom **(Nançay Obs, LESIA)**
- TNOs are cool **(Herchel & Spitzer** + compilation,
  LESIA & LAM & Utinam)
- ● SBNAF **(**from H2020 prog, **Konkoly Obs)**
- ● *MP3C: Small body properties (OCA)*
- *Vesta & Ceres spectroscopy - VIR/DAWN (IAPS)*
- ● DynAstVO: NEO refined parameters **(IMCCE)**
- ● *MPCorb: Small bodies orbital cat (MPC/Heidelberg)*
- *Rosetta ground-based support (Edinburgh)*
- 67P illumination config **(IRAP)**
- Meteor_showers predictions **(IMCCE)**
- *Occultations predictions, ast & sat (IMCCE)*
- *LuckyStar, occultations (ERC prog, LESIA)*
- *Natural satellites db (IMCCE)*
- ●● asteroid spectra **(CDS / LESIA)**

Solid spectroscopy
- ●● SSHADE ices & minerals spectro **(IPAG & network)**
- *Planetary Spectral Library (DLR)*
- PDS spectral library **(LESIA)**
- *Berlin Reflectance Spectral Lib (DLR)*
- *Hoserlab (Winnipeg U)*

Surfaces
- ●● Mars craters **(Jacobs U,** + update by GEOPS**)**
- USGS planetary maps WMS **(Jacobs U)**
- ● PlanMap: geol maps **(H2020 prg, Jacobs U)**
- CRISM WCS service **(MRO, Jacobs U)**
- *M3 WMS service (Chandrayaan-1, Jacobs U)*
- HRSC nadir images, WMS **(MEx, Frei Univ)**
- OMEGA cubes and maps **(MEx, IAS)**
- ● VIMS satellites, w/geometry **(Cassini, LPG)**
- ● Mars topo preTharsis **(GEOPS)**
- *Global spectral param of Mercury (DLR)*

Magnetospheres / radio
- ●● APIS **(HST/Cassini, LESIA)**
- ●● NDA **(Jupiter & Sun radio, LESIA/CDN)**
- ● AMDA **(CDPP / IRAP)**
- ●● MASER & related services **(LESIA)**
- ● *RadioJove (PDS PPI: US amateur network)*
- ● *Datasets from PDS / PPI (UCLA)*
- IItate HF data of Jupiter **(Tohoku Univ, Jap)**
- *UTR-2 Juno ground support (Kharkiv)*
- MDISC & JASMIN **(modeling, UCL)**
- Cluster & Themis data **(IAP, Prague)**
- *IMPEx models (from FP7 prog, IWF Graz)*
- ● *Hisaki (Tohoku Univ., Jap)*
- Transplanet **(CDPP / IRAP)**
- ● LOFAR Jupiter **(CBK/PAS, Warsaw)**
- *Magnetic field simus (LMSU)*
- *ASPERA & MARSIS atm obs (MEx, Iowa U)*

Solar
- ● HELIO AR & 1T3 solar features **(**FP7 prog, **LESIA)**
- ●● Bass2000 **(LESIA)**
- *Radio Solar db (Nançay, LESIA)*
- ● CLIMSO **(Pic du Midi, IRAP)**
- ● IPRT/AMATERAS **(Tohoku Univ, Jap)**
- ● Gaia-DEM (SDO, IAS)
- ● EIT_syn (SoHO, IAS)
- *e-Callisto (Windisch, Sw)*

Generic / interdisciplinary
- ● BDIP **(LESIA)**
- ●● PVOL **(UPV/EHU & amateur network)**
- Telescopic planetary spectra collection **(LESIA)**
- ● PSA complete archive **(ESA)**
- ●● HST planetary data **(LESIA, to CADC archive)**
- *Catalogues of planetary maps (Budapest)*
- ● VizieR_planets: Planetary Science catalogues **(CDS)**
- *Gas absorption cross-sections (Granada)*
- Planets *then satellites properties* **(LESIA/IMCCE)**
- *Nasa dust catalogue (IAPS)*
- *Stellar spectra, support for observations (LESIA)*
- *DARTS (JAXA - currently via PDAP)*
- *ESAsky planetary data (ESA)*
- *Interface with VAMDC ?*

Exoplanets
- ● Encyclopedia of exoplanets **(LUTH/LESIA)**
- *Catalogue of exo disks (LESIA)*
- *Interface with DACE (Geneva)*
- *ARTECS climate simulations (AOTS/INAF)*
- *Atmospheric studies (UCL)*
- ● Exotopo: exoplanet surface simulations **(GEOPS)**

VESPA portal updates

VESPA portal: dedicated client https://vespa.obspm.fr

Layout updated Sept 2022, from UX analysis
    More layout updates to come

New functions required:
- to support large increase in service number *(S. Joy, this session)*
     => thematic grouping?
- to provide an alternative search interface in "natural language"
    Requires downloading all metadata (~ 10^9 values)
    Currently used to check / validate service content (private access)

New EPN-TAP services

And major updates

- **NASA PPI** projects (many!) - *(S. Joy, this session)*

- **MASER** and **Heliophysics** services - *(B. Cecconi in RadioIG)*

- **VizieR_planets** service (descriptions completed, PADC + CDS)
- Several **small bodies** services
   including spectro_asteroids (now the largest collection after Gaia DR3)
   See also *A. Zinzi / M. Giardino, this session*
- Several **exoplanets** services being setup by various groups
   with focus on planetary science (disks, atmospheres, climate…)

New functionalities in EPN-TAP services

Datalink: routinely used to provide docs, alternative formats, associated files, links to other data services, ephemeris (with row parameters)

MOC:
   - Preferred to s_region (issues with large coverages typically acquired during flybys or orbital insertions, and some configurations)
   - Extension to ST-MOC foreseen - e.g., to describe operation phases of space experiments

New developments

2D searches in ElasticSearch context (*R. Haigron,* starting)
Planetary coordinate reference systems (CRS, IAU definitions)
    In astropy (*C. Marmo, just started* - body-fixed for solid bodies)
      => to be included in reframe vocabulary
   Ties with OGC consortium (mostly to handle planetary CRS, with compliant IDs) - *(T. Hare / J. C. Malapert, this session)*
New Planetary HIPS (CDS) - *(T. Boch, this session)*
Hips to WMS converter (provided by CNES)
New support functions in TOPCAT, Aladin, CASSIS
Facility list and resolver (broader than Solar System)
    => to be included in vocabulary

Prospects

- closer links with PDS4 (*S. Hugues in DM*)
- more data services - VESPA implementation workshop end of may
- more tutorials, e.g. as Jupyter notebooks
     https://github.com/epn-vespa/tutorials
- DOIs on data collections (started for MASER services)

• SpaceSci-RI proposal in Horizon Europe, initiated by Europlanet mngt
  Follow-up to ESCAPE (and Euro-VO progs), Europlanet progs, CheTEC-infra, etc
  Large VA WP encompassing VO, VESPA + SPIDER + GMAP + SSHADE, VAMDC, existing astro db, ML activities
  Answer expected during summer