

EPN-TAP status

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VESPA in a nutshell

- An activity in successive Europlanet programmes, started 2011
- Provides Open Access to Solar System data:
 - Open Science policy / FAIR principles: Findable / Accessible / Interoperable / Reusable
 - Contributive system open to the community
- Uses the Virtual Observatory framework

=> The core VESPA team is still active beyond Europlanet *programmes*

Europlanet is now a Society — similar to EAS

Currently 94 data reviewed EPN-TAP services (cross-searchable from tools and portals)

- 70+ planetary HiPS (mostly built at CDS)
- 30+ contributing institutes worldwide
- ESA's Planetary Science Archive (PSA, 37 Mfiles), some NASA / PDS assets
- Results from 10+ European programmes
- Derived data from ~ 12 space borne instruments
- Pro-Am network activities — e.g., Europlanet Telescope Network

EPN-TAP / Motivation

- Europlanet EU programme(s): consistent access to Solar System data (including derived data)?

Scope = Planetary Science, Heliophysics, exoplanets

=> VO framework seemed appropriate

- **Difficulties:**

- Moving objects / targets, seldom clearly identified in existing archives
- Targets are resolved: many coordinate systems - related to targets or configurations
- More diverse types of measurements:
 - Not only (reflected) light, but also particles, fields + lab samples
- Need to cross-correlate data services => vocabulary needs to be uniform

- **EPN-TAP** = Usual TAP mechanism

EPNCore metadata vocabulary + associated UCDs

Set of rules related to services and tables

EPN-TAP status

- First draft published in Astronomy and Computing (Erard et al 2014) — v1.0
- Refined and detailed with implementation of actual (50+) data services plus use cases
- **v2.0 approved by IVOA, Aug 2022**
- All existing services now in v2.0, mostly updated to current version (some still being reviewed)
- Service validator included in taplint / TOPCAT
includes check on EPNcore parameter name/ucd/units + range of values
- EPN-TAP v2 mixin in DaCHS (defines EPNcore parameter correctly in services)
- **Many update notes collected**, update started but limited to corrections so far

EPN-TAP status

- **EPN-TAP Rec v2.0**, Aug 2022: <https://ivoa.net/documents/EPNTAP/>
- **functional description of parameters**: see Erard et al, PV2023 @ CERN:
https://indico.cern.ch/event/1188041/contributions/5309306/attachments/2636441/4561234/6620_Erard_EPN-TAP_ynnwr.pdf
- **Similar to ObsCore** for celestial objects, but different constraints & solutions, see here
<https://voparis-wiki.atlassian.net/wiki/spaces/VES/pages/403374081/Differences+between+ObsCore+and+EPN-TAP>
(let me know if you don't have access)

EPN-TAP open questions

TAP / ADQL issues?

- Two ADQL issues make it difficult to handle in the VESPA portal
 - ADQL options (lower, etc) — also an issue in notebooks
 - Pagination

- (Robust) **private access** required
 - May be required to filter nuisance accesses (for ML engines)
 - will allow using VO services for space instruments and ground experiments
(assessment with MIRS / MXX to Phobos / Mars, possibly with Simbio-SYS on BepiColombo)

EPN-TAP open questions

EPNCore Extensions

- New parameters related to specific fields are discussed in small groups / projects and validated without the need to enter a new review phase
Available from here: https://hdl.handle.net/21.15110/epn_tap_extensions
(already included)
- New extensions to be finalized / integrated in the next Rec (will be 2.1):
 - assess and refine lab spectroscopy
 - add mass spectrometry
 - correct orbital parameters
 - more small bodies properties + classification / taxonomy

EPN-TAP open questions

Improve global description

- Use IVOA vocabularies whenever possible & Add / ask for missing UCDs
- New target_type / target_class, TBC (issues with disk, rogue planets, interstellar objects)
 - some conflict with IAU thesaurus / IVOA vocabularies
- Identify primary body (satellites, trojans, etc)
- Bib_reference: provide one independently for all EPN-TAP parameters
- Proc_level: try to clarify / standardize — *this may become very demanding for a limited benefit*
- Filter characteristics - datalink to svo?
- Events: waiting for new vocabulary, first list ready

EPN-TAP open questions

Coordinate systems

Finalize coordinate systems (clear IDs compliant with other environments)

- Body-fixed CRS (Coord ref system) from IAU: IDs have been standardized in OGC-compliant form
- Map projections can be handled similarly? TBC
- Heliophysics coordinate systems look mature
 - => to be implemented
- Cartesian coordinates on irregular shape models — details TBC (support plate models?)
- (many) other CRS are TBD, but difficult
- Specific issue with disk images — 50% respond to any coordinate query and but not often relevant
 - => use special flag? Provide resolution at center? Only provide central coord + orientation?

EPN-TAP open questions

Provenance

- instrument_name / instrument_host_name
 - Use ObsFacility, but requires a main descriptor for each value

Other uses

- Support target lists for a space instrument: more columns, range of values, need to rank solutions
 - granule = observational config, not target by itself

EPN-TAP prospects

EPN-TAP v2.1

- Draft ready sometime in 2026?
- Probably fall Interop (rather than spring)

EPN-TAP side issues

Concern about US databases at risk

- Mitigation actions?
- Mirrors abroad + IVOA registry to keep track of them?

Register on SSIG list!

- <http://mail.ivoa.net/mailman/listinfo/ssig>
- Need to renew members with contributions from Planetary Science, Heliophysics, Exoplanets
Observatories / mixed archives