

# VESPA = TAP + EPNcore

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- TAP = Table Access Protocol.  
IVOA developed standard
- Query to relational database, using SQL-type language  
(*ADQL, astronomy data query language*)  
Results in VOTable (*many servers allow other output types, such as JSON*)
- **TAP is generic** (*i.e., can be reused outside astronomy*)
- TAP services are implemented for many ESA science mission (astronomy, planetary and heliophysics)

# EPN-TAP

- **EPN-TAP = EPNcore (metadata dictionary) + TAP**  
Developed by Europlanet/VESPA for Solar System sciences (i.e.: planetary + heliophysics)
- EPN-TAP = **data discovery API**
  - Query metadata = coverage (time, spectra, location), provenance, content, access...
  - Service is registered in IVOA registry (discoverable by clients)
- EPN-TAP compliance allows:
  - same query sent once to all services
  - access through any TAP client
- Currently: 55 services (1/3 serving heliophysics data)

## EPNcore metadata

- Coverage: temporal, spectral, spatial (range, sampling, resolution)
- Target: name, class, region, feature
- Instrument: name, host name, measured quantity
- Geometry: incidence, emergence, phase, local time, season, distance
- Access: URL, size, create date, modification date, thumbnail
- Reference: publisher, bibliographic reference...

<https://ivoa.net/documents/EPNTAP/> (IVOA Recommendation since Aug. 2022)

# Data Providers

- **VESPA (EPN-TAP) data services = metadata catalogue of your data products**
  - A table describing each of the service files (using std parameters)
  - Stored in PostgreSQL + TAP-handling application at the institutes
  - Searches through an optimized interface, connected to VO tools

VESPA  
git repo  
<https://voparis-gitlab.obspm.fr/vespa>

- q.rd (epn\_core service configuration)
- extra scripts (reading data)

+ Issues, testing

Data Files

Quicklooks Files

> dachs import q.rd

DaCHS  
(VO framework)

# Service repository: support and knowledge base

services  
Group ID: 22

This repository gathers services configuration for VESPA services using DaCHS, as part of the VESPA-H...

| Subgroup/Project                 | Owner | Stars | Last updated |
|----------------------------------|-------|-------|--------------|
| IAA (Granada - Spain)            | Owner | 1     | 5 months ago |
| ORB (Brussels - Belgium)         | Owner | 3     | 5 months ago |
| DLR (Berlin - Germany)           | Owner | 2     | 5 months ago |
| IASB-BIRA (Brussels - Belgium)   | Owner | 2     | 5 months ago |
| CBK-PAN (Warsaw - Poland)        | Owner | 1     | 5 months ago |
| UCL (London - UK)                | Owner | 2     | 5 months ago |
| OATS (Trieste - Italy)           | Owner | 1     | 5 months ago |
| OMP (Toulouse - France)          | Owner | 2     | 5 months ago |
| Tohoku (Sendai - Japan)          | Owner | 1     | 5 months ago |
| FHNW.CH (Windisch - Switzerland) | Owner | 2     | 5 months ago |
| IDOC (Orsay - France)            | Owner | 7     | 5 months ago |
| JacobsUni (Bremen - Germany)     | Owner | 1     | 5 months ago |
| PADC (Paris - France)            | Owner | 1     | 5 months ago |
| IPSL (Paris - France)            | Owner | 2     | 5 months ago |
| UPV (Bilboa - Spain)             | Owner | 1     | 5 months ago |

voparis-tap-maser  
Group ID: 93

Repositories for services in voparis-tap-maser DaCHS server.

| Subgroup/Project | Maintainer | Stars | Last updated |
|------------------|------------|-------|--------------|
| wind_waves       | Maintainer | 0     | 5 months ago |
| voyager_pra      | Maintainer | 0     | 4 months ago |
| stereo_waves     | Maintainer | 0     | 5 months ago |
| tfcats           | Maintainer | 0     | 5 months ago |
| expres           | Maintainer | 0     | 4 months ago |
| cassini_rpws     | Maintainer | 0     | 5 months ago |

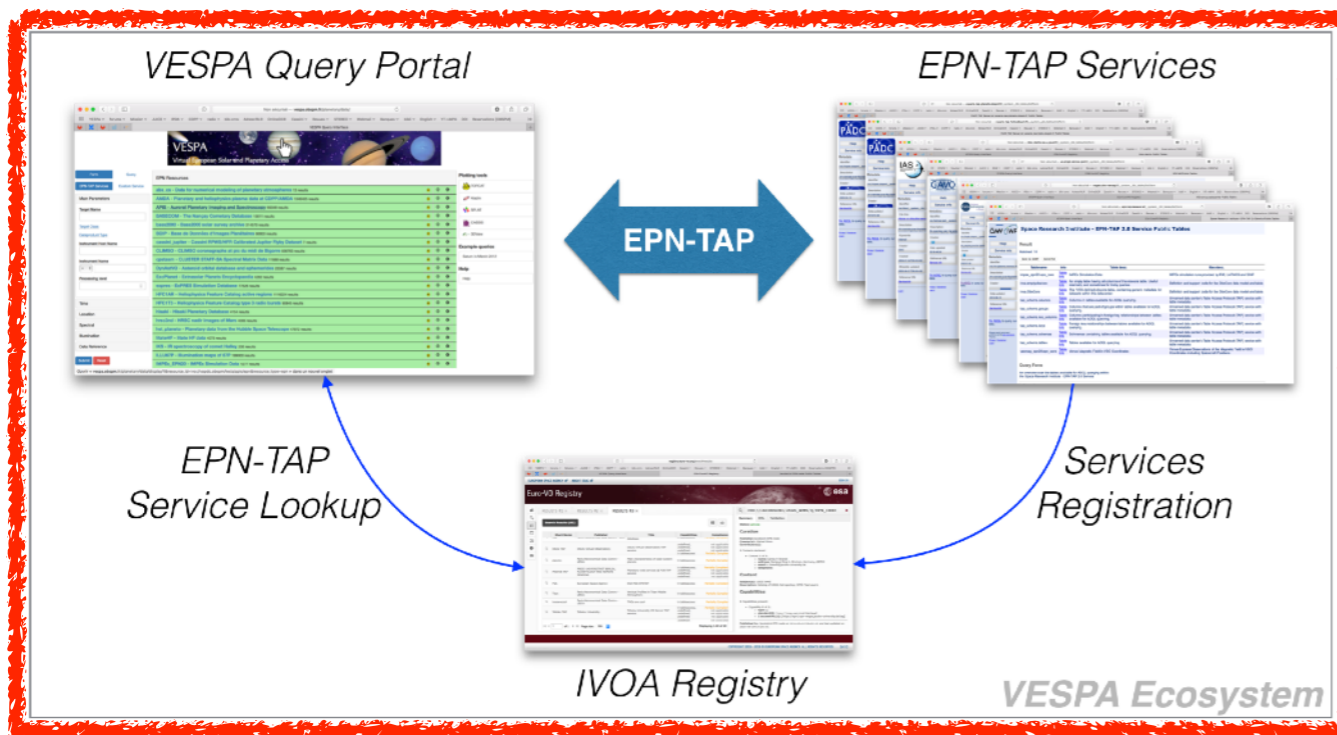
expres  
Project ID: 76

7 Commits | 1 Branch | 0 Tags | 164 KB Files | 164 KB Storage

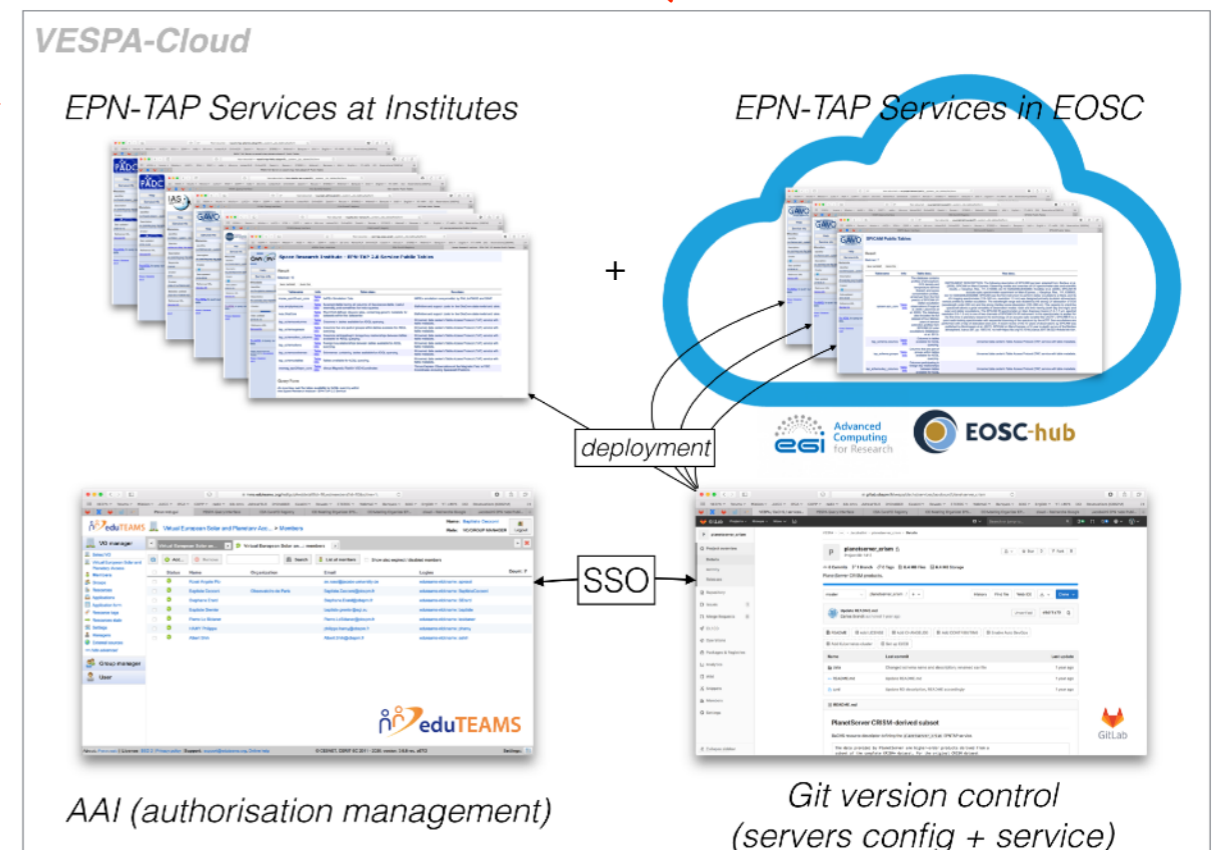
published table and new query service  
Cecconi Baptiste authored 5 months ago

| Name   | Last commit                           | Last update  |
|--------|---------------------------------------|--------------|
| log    | Initial commit                        | 1 year ago   |
| res    | fixed for python3                     | 6 months ago |
| epn.rd | published table and new query service | 5 months ago |

## A distributed Virtual Observatory for Solar System Sciences



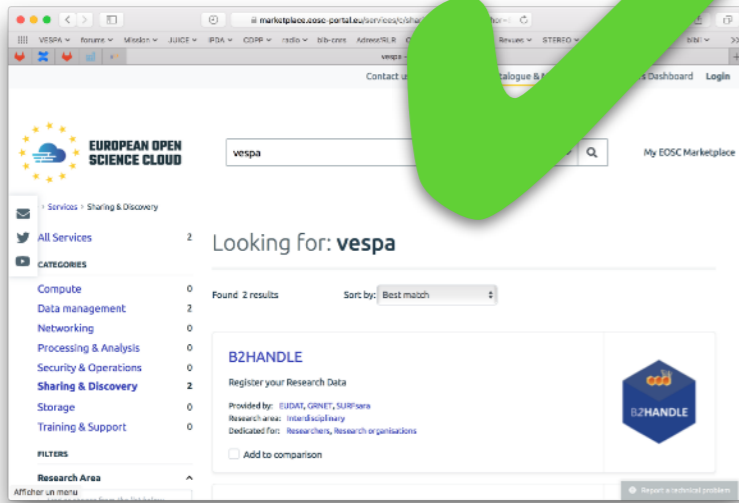
**A cloud-based instance of EPN-TAP provider's server (hosted on EOSC) was used during last VESPA provider's workshop**



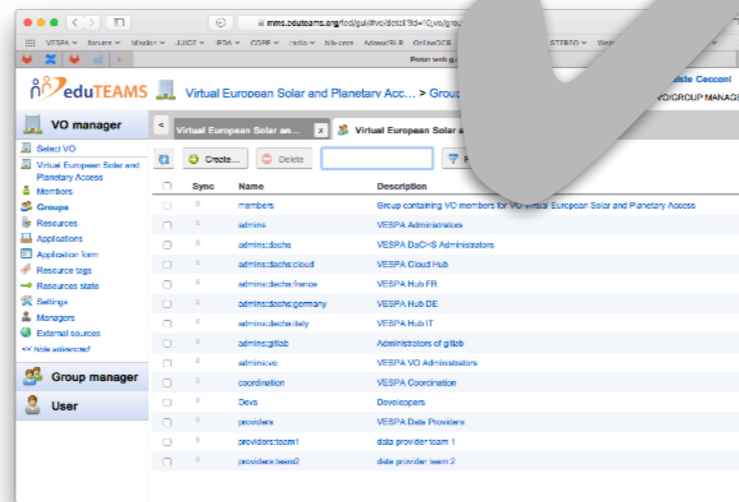
# VESPA-Cloud

Virtual European Solar and Planetary Access

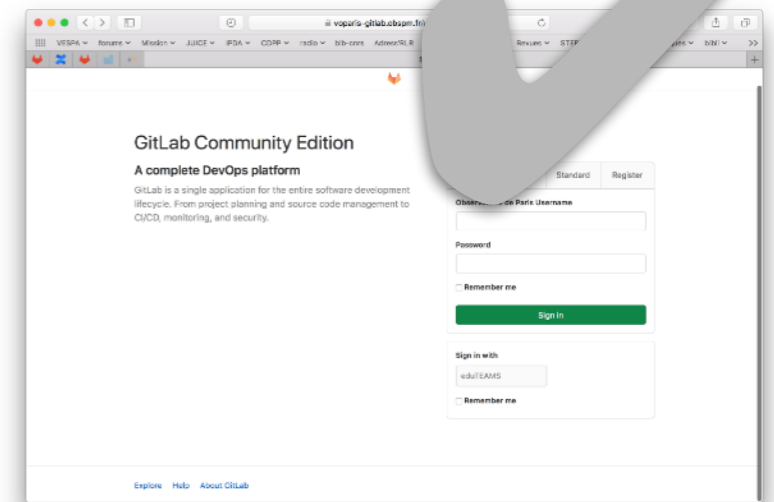
**Marketplace**



**eduTEAMS**



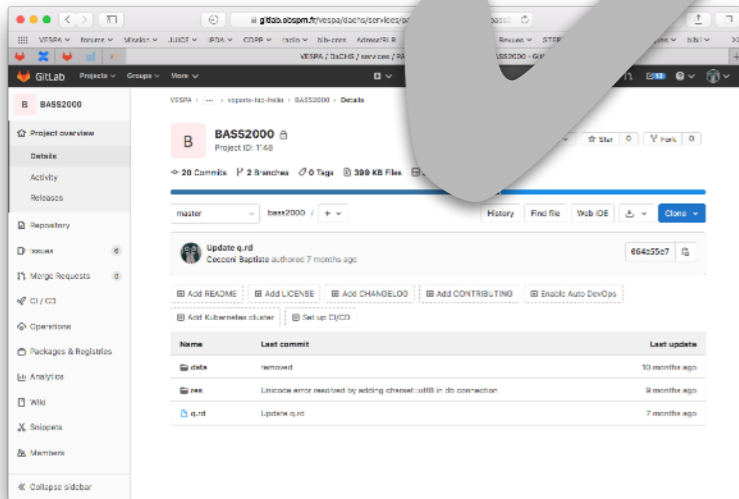
**GitLab**



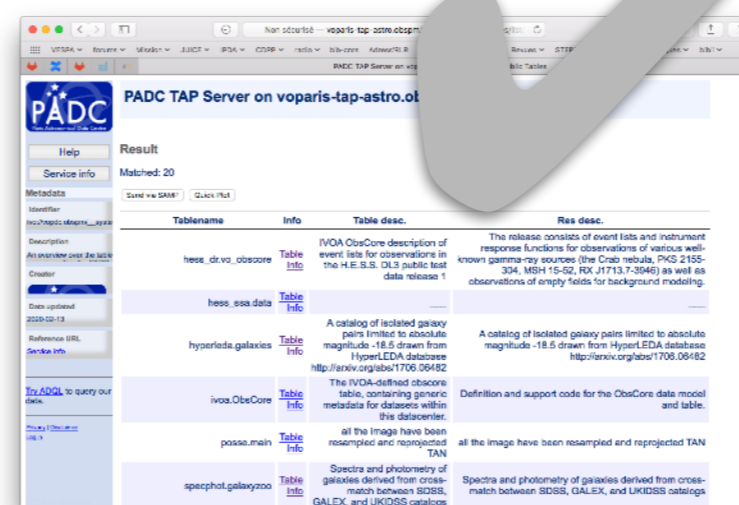
**AAI**

**server config.**

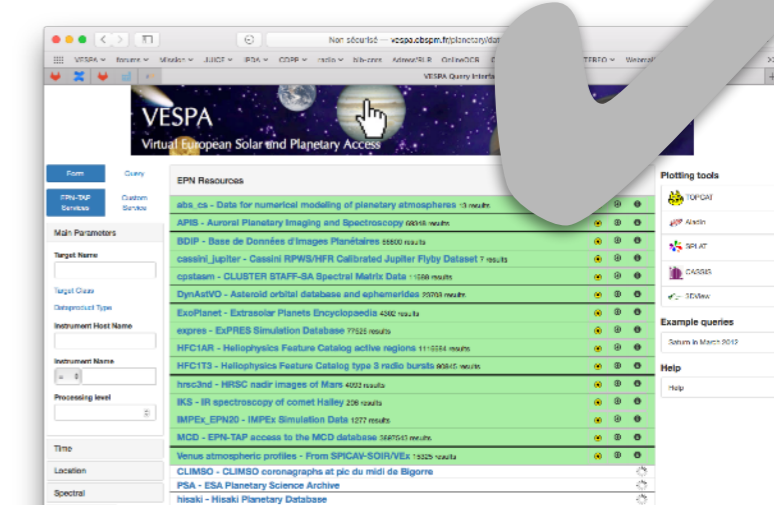
**GitLab**



**DaCHS**



**VESPA**



**service config.**

**openstack deployment**

**accessible and findable**

# VESPA

## Virtual European Solar and Planetary Access

### List of (accessible/working) Data services related to Heliophysics (as of Oct 2023):

- AMDA** (FR) - Planetary and heliophysics plasma data at CDP/AMDA
- APIS** (FR) - Auroral Planetary Imaging and Spectroscopy
- bass2000** (FR) - Bass2000 solar survey archive
- CLIMSO** (FR) - CLIMSO coronagraphs at pic du midi de Bigorre
- SPoCA-CH** (BE) - Coronal Hole catalogue - SPoCA CH
- cpstasm** (CZ) — CLUSTER STAFF-SA Spectral Matrix Data
- E-Callisto** (CH)
- eit\_syn** (FR) - Synchronous synoptic maps of the solar corona from EIT/SoHO
- expres** (FR) - ExPRES Simulation Database
- Gaia-DEM** (FR) - Thermal structure maps of the solar corona from SDO
- HFC1AR** (FR) - Heliophysics Feature Catalog active regions
- HFC1T3** (FR) - Heliophysics Feature Catalog type 3 radio bursts
- litateHF** (JP) - litate HF data
- IMPEX** (CZ) - IMPEX Simulation Data
- ionosondes** (PL) - Warsaw Ionogrammes data
- IPRT** (JP) - IPRT/AMATERAS data
- JASMIN** (UK) - Jovian thermosphere model
- lofar\_jupiter** (PL) - Jupiter obs. by LOFAR
- MDISC** (UK) - UCL Magnetodisc Model for Jupiter and Saturn
- NDA** (FR) - Nancay Decameter Array observation database
- NRH** (FR) - Nancay Radio Heliograph
- ORFEES** (FR)
- PSWS Transplanet** (FR) - Magnetosphere Ionosphere coupling simulation runs
- thmsm** (CZ) - THEMIS Spectral Matrix Data
- voyager\_pra** (FR) - Voyager radio datasets

**+ 175 services from PDS/PPI ! (US)**

The screenshot shows the VESPA web interface. At the top, there is a header with the VESPA logo and the text "Virtual European Solar and Planetary Access". Below the header, there is a search bar and a "Refine your search" section. The search results are displayed in a table with columns for "granule\_uid", "dataprodut\_type", and "target\_". The table contains several rows of data, including "spoca\_coronalhole\_9998\_20171205\_060005" and "spoca\_coronalhole\_9998\_20171205\_000005". There is also a "Coronal Hole catalogue - SPoCA CH" section with a description and credits.

**Coronal Hole catalogue - SPoCA CH**  
This service provides a catalog of Coronal Holes obtained with the Spatial Pos... and corrected for degradation) are used, at a cadence of one AIA image every 1... box and characteristics such as areas and pixel intensity statistics, on AIA 19.3

**Credits:**  
Creators: Freek Verstringe  
Contributors: Veronique Delouille  
Publisher: ORB

| granule_uid                            | dataprodut_type | target_ |
|--|-----------------|---------|
| spoca_coronalhole_9998_20171205_060005 | catalogue_item  | Sun     |
| spoca_coronalhole_9998_20171205_000005 | catalogue_item  | Sun     |
| spoca_coronalhole_9996_20171202_120005 | catalogue_item  | Sun     |
| spoca_coronalhole_9996_20171202_060005 | catalogue_item  | Sun     |
| spoca_coronalhole_9995_20171202_060005 | catalogue_item  | Sun     |
| spoca_coronalhole_9994_20171201_180005 | catalogue_item  | Sun     |
| spoca_coronalhole_9994_20171201_120005 | catalogue_item  | Sun     |
| spoca_coronalhole_9993_20171201_120005 | catalogue_item  | Sun     |
| spoca_coronalhole_9991_20171201_120005 | catalogue_item  | Sun     |
| spoca_coronalhole_9987_20171201_180005 | catalogue_item  | Sun     |
| spoca_coronalhole_9987_20171201_120005 | catalogue_item  | Sun     |