

VESPA & EPN-TAP

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What is VESPA?

- VESPA: Virtual European Solar and Planetary Access
- A network of data provider's sharing Solar System data (including heliophysics-related products)
- Each provider share a metadata table with common metadata, including “coverage” (temporal, spectral, spatial), target, instrument, access...
- Interoperable network:
 - same metadata : EPNcore
 - same protocole : TAP
- VESPA recommends the use of standard formats (FITS, CDF, VOTable...)
- Main query portal: <http://vespa.obspm.fr>
Queries can be done through any TAP client.

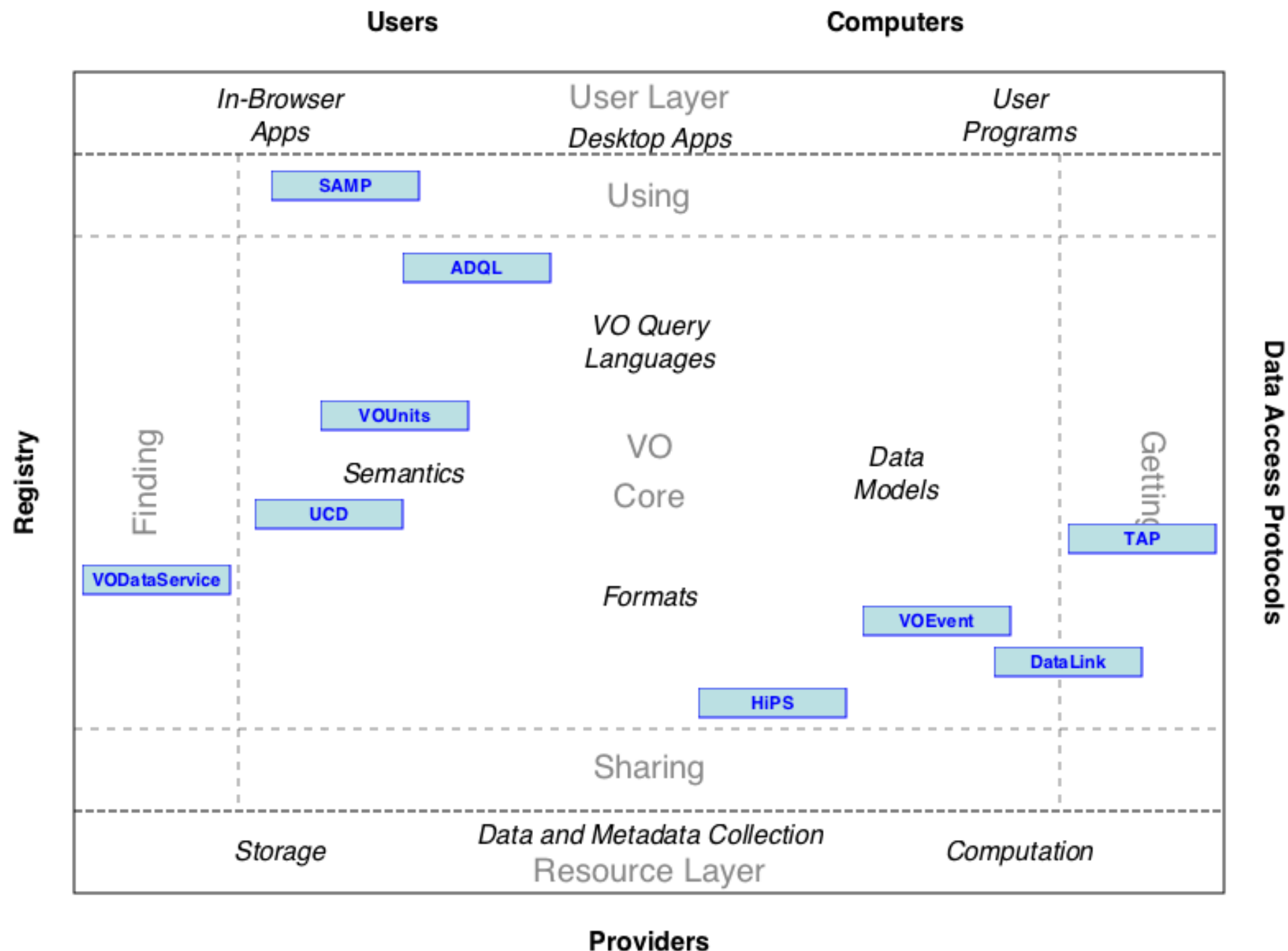
What is EPN-TAP?

- EPN-TAP = EPNcore (metadata dictionary) + TAP (Table Access Protocol, an IVOA standard)
- EPNcore covers most of the needs for data discovery, using science parameters (target, coverage, physical parameter, instrument...)
- A set of mandatory columns ensure homogeneous metadata (columns may be empty) + extra parameters (topical extensions and local custom keywords)
- Quicklook on each data product, so help data browsing.
- TAP is a query on a table (with SQL-like language)
- More details on EPN-TAP:
<https://voparis-wiki.obspm.fr/display/VES/EPNcore+v2>
(IVOA standard in preparation)

Heliophysics in VESPA

Service	data type	product count	targets	instrument
AMDA	time series	1.3M	space plasma	many
APIS	images, spectra	61k	planetary aurora	Hubble, Cassini, Hisaki
BASS2000	images, spectra	315k	Sun	many
CLIMSO	images	820k	Sun	Pic du Midi
cpstasm	derived spectral matrices	11k	in-situ waves	Cluster
expres	modeled time-	77k	Jupiter	model
HFC1AR	catalogue	950k	Sun AR	many
HFC1T3	catalogue	91k	Solar TypeIII	many
Hisaki	spectra	4k	Jupiter	Hisaki
litateHF	time-spectrograms	4k	Jupiter	litate
IMPEX	simulation runs	1.3k	space plasma	many models
IPRT	time-spectrograms	1.4k	Sun	litate
NDA	time-spectrograms	30k	Jupiter, Sun	Nançay
ESA/PSA	mixed	[tbc]	planets	many
Transplanet	simulation runs	1.5k	MIT at Earth	model
thmsm	derived spectral matrices	13k	in-situ waves	Themis
voyager_pra	time-spectrograms	17	giant planets	Voyager
MEDOC	images spectra	SOON	Sun	many
E-callisto	time-spectrograms	SOON	Sun	many

VESPA in the IVOA ecosystem





*International
Virtual
Observatory
Alliance*

EPN-TAP: Publishing Solar System Data to the Virtual Observatory

Version 2.0

IVOA Working Draft 2019-04-02

Working group

SSIG

This version

<http://www.ivoa.net/documents/epntap/20190402>

Latest version

<http://www.ivoa.net/documents/epntap>

Previous versions

This is the first public release

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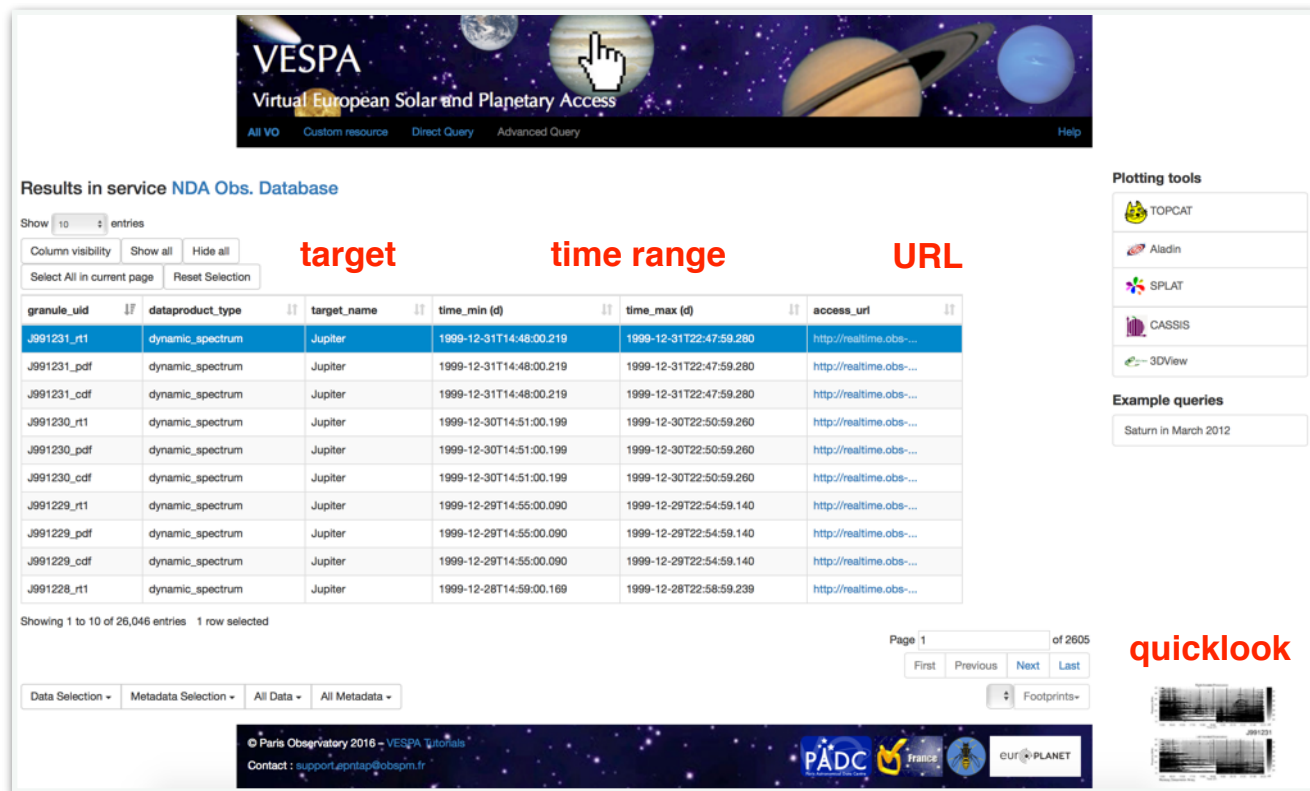
Editor(s)

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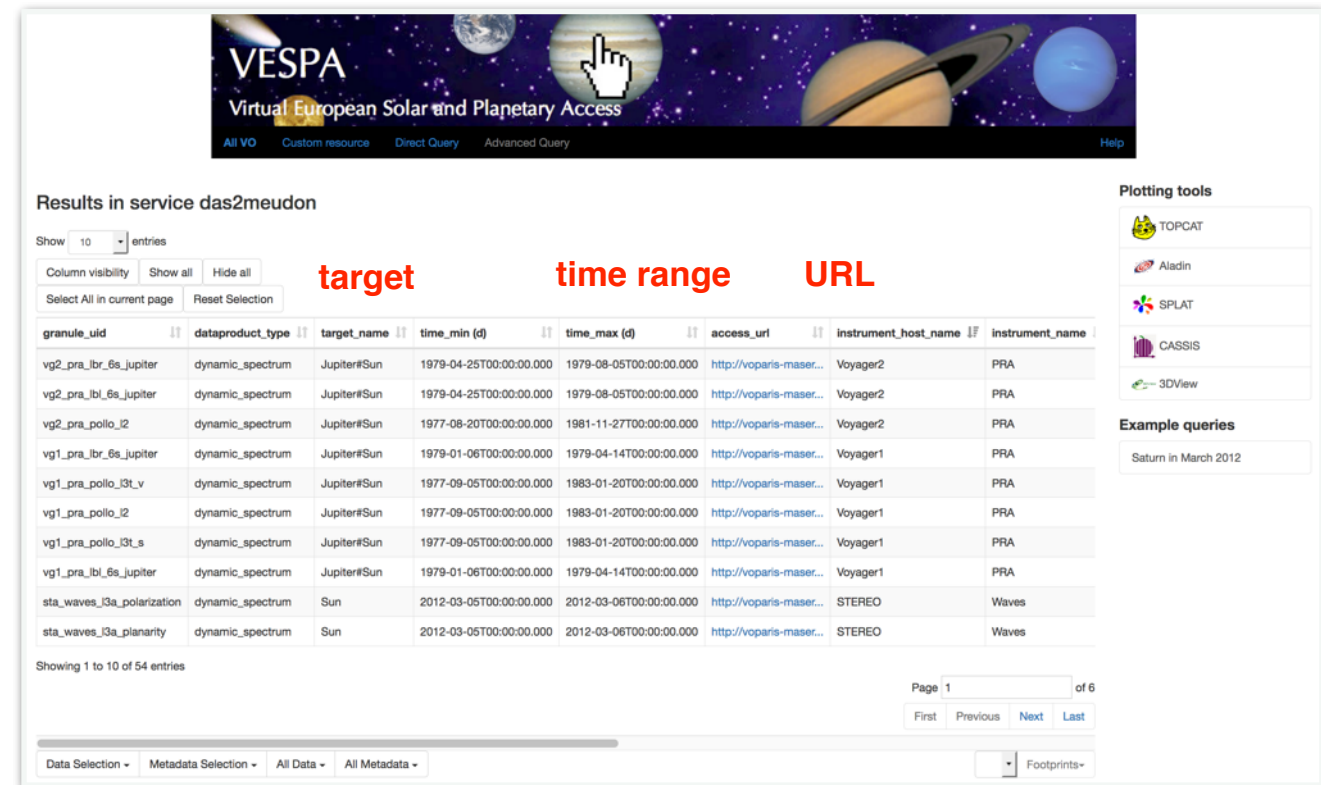
VESPA as a registry of products and resources

- **Example of services developed by Obs. Paris:**
 - ExPRES: modeled radio emission time-spectrograms
 - Voyager/PRA: legacy datasets from various datacenter (NASA/PDS, NSSDC, CNES)
 - Nançay/NDA: 1990-now, Jupiter and the Sun within 10-80 MHz
 - Nançay/NRH: Radioheliographs products (movies, spectra...)
 - HELIO_HFC: heliophysics feature catalogues
 - BASS2000: daily images and spectra of solar activity
 - APIS: calibrated images and spectra for planetary aurora
- **Other ‘non-data’ files:**
 - das2: endpoints to das2 data products
 - autoplot: .vap files with preconfigured setup

VESPA result page in Nançay/NDA EPN-TAP service



VESPA result page for all das2server dataset in Meudon



mtype=load.table.cdf

mtype=load.table.das2

next: distribute .vap files

SAMP hub

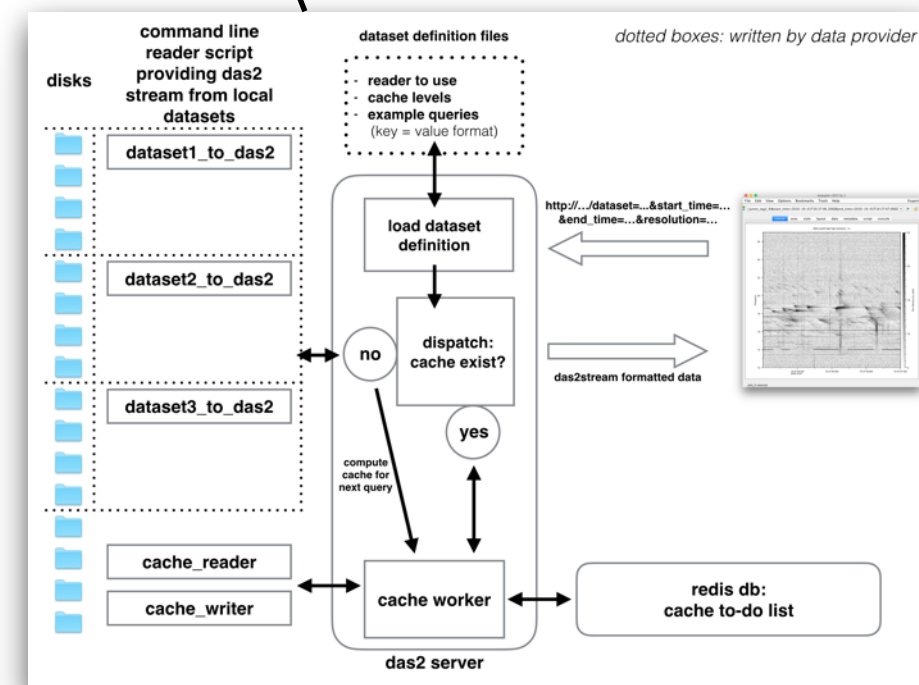
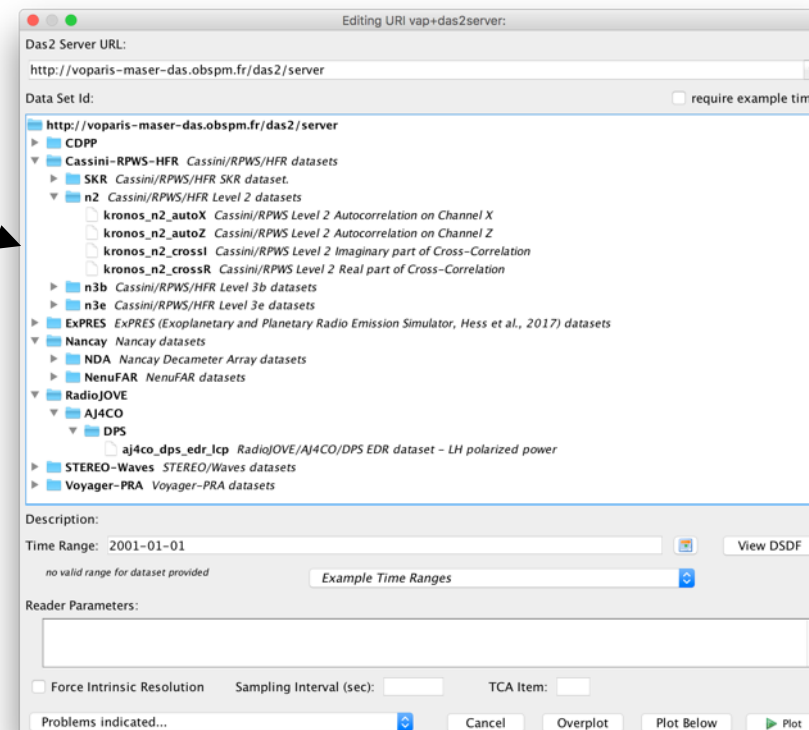
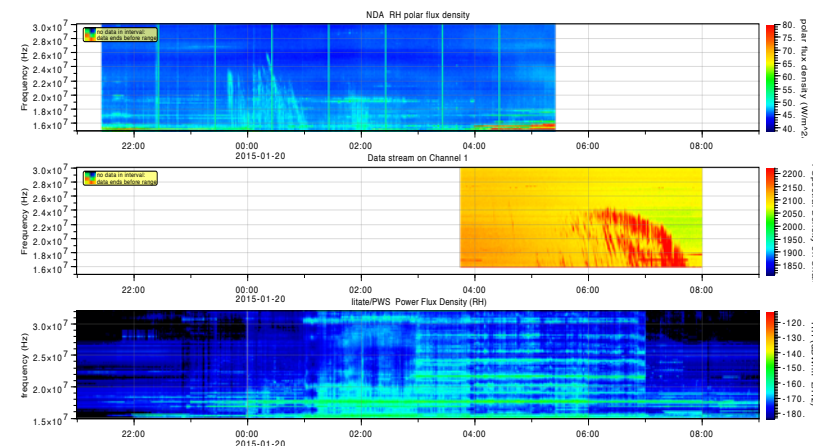
das2 dataset
discovery feature

das2 dataset publication
through VESPA

Das2 server catalog in Autoplot

Plot

Data Selector

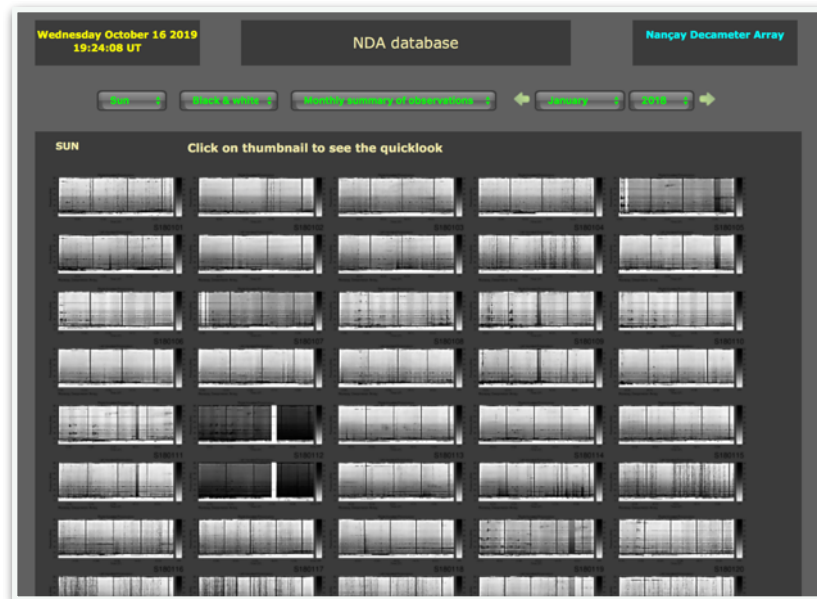


Das2 server block diagram

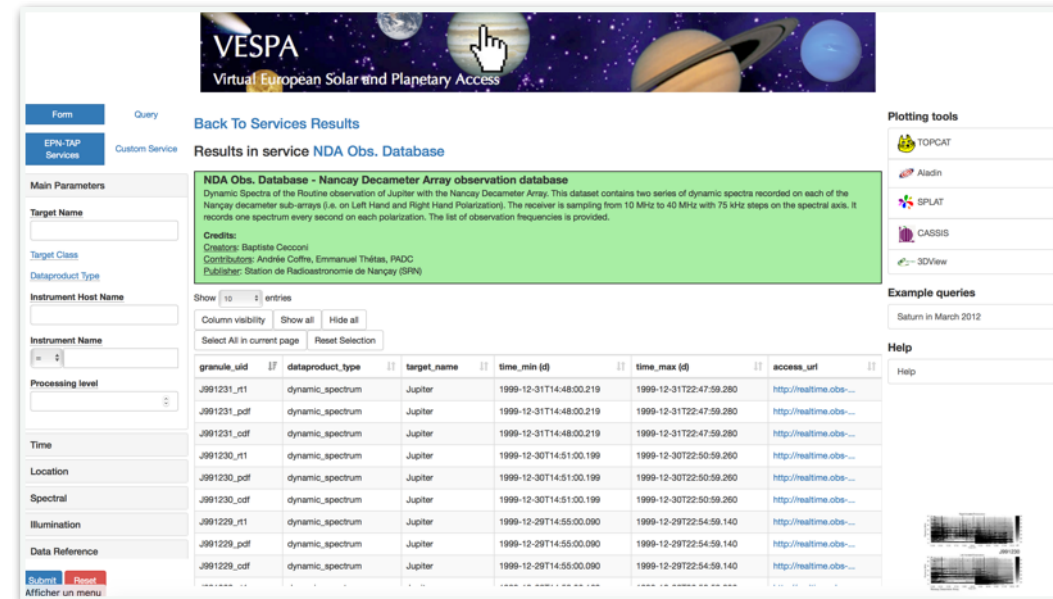
Various access methods

Example for Nançay/NDA

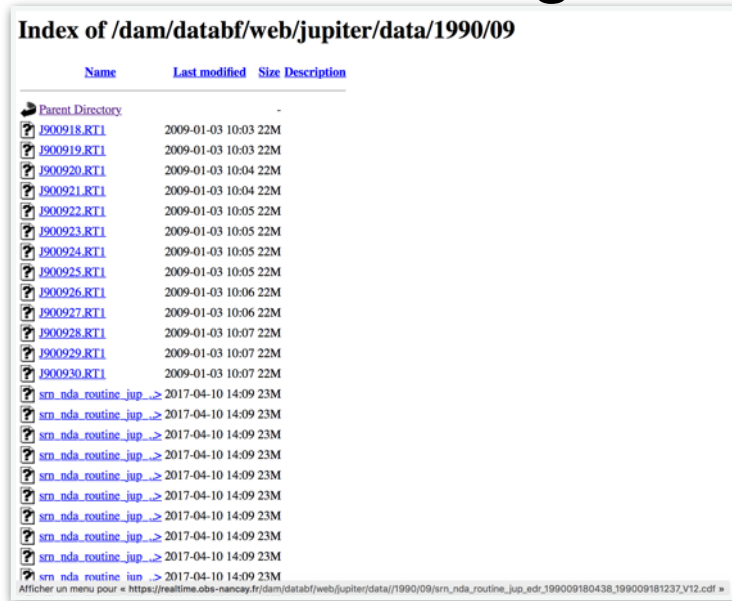
Web Portal



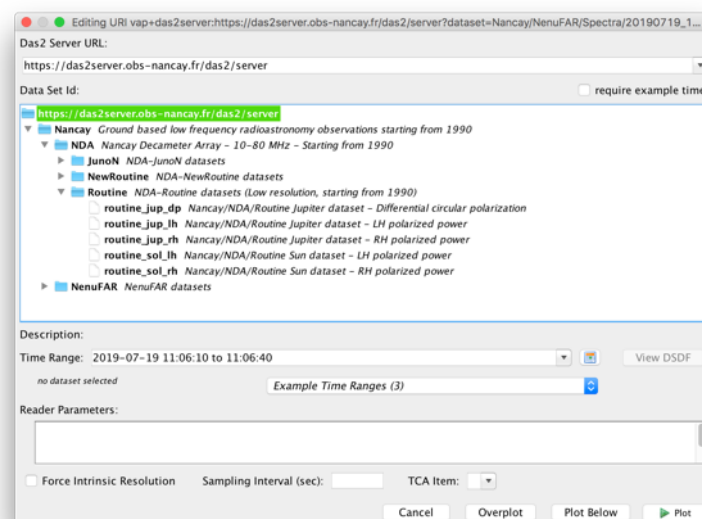
VESPA



HTTP Listing



Das2



soon: HAPI

(endpoint also findable through VESPA)

Summary

- Main goal of VESPA = Data discovery from multiple sources at once
- Common metadata for interoperability + custom keywords
- IVOA ecosystem comes with many tools for quick visualization and analysis
- EPN-TAP is working very well to share heliophysics data products.
Many heliophysics resources already online
(measurements or simulation runs, products or services, remote or in-situ)
- Yearly open call to train providers, selected teams are invited to a 1 week workshop (incl. travel and accommodation)
JPL team invited in 2017 (Cassini), University of Iowa invited in 2018 (MEx)