

JIVE ObsTAP service for the EVN has gone live



Mark Kettenis
IVOA Interop, April 2022



JIVE
Joint Institute for VLBI
ERIC

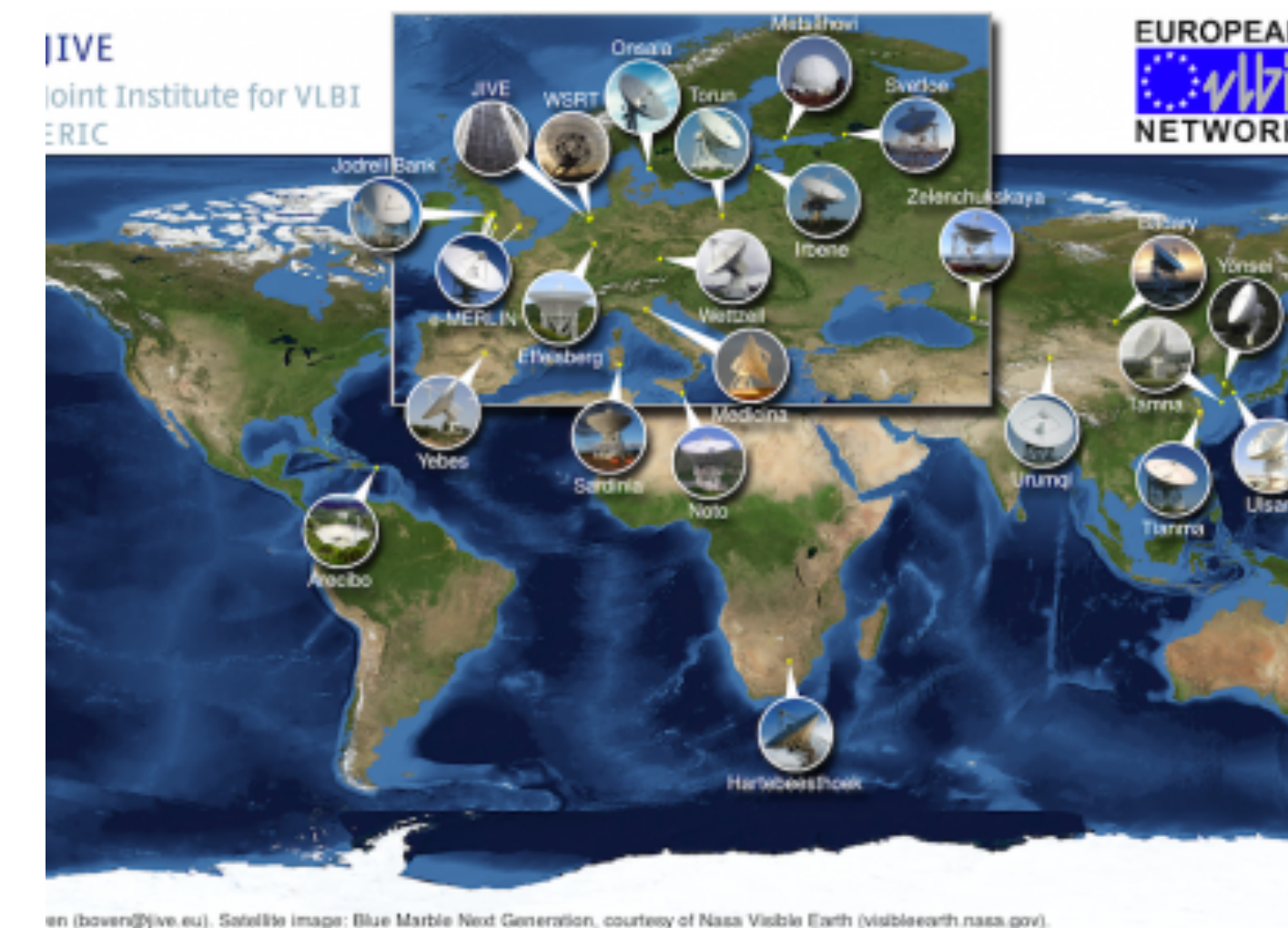


ESCAPE - The European Science Cluster of Astronomy & Particle Physics ESFRI Research Infrastructures has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement n° 824064.

EVN & JIVE



- EVN: European VLBI Network
 - Collaboration between radio observatories in Europe and beyond (South-Africa, Puerto-Rico, China, Korea)
 - Heterogeneous array
 - PI driven
- JIVE: Joint Institute for VLBI ERIC
 - Support institute for the EVN
 - Operates the EVN correlator and hosts the EVN data archive



EVN Archive



Not Secure — jive.nl

JIVE
Joint Institute for VLBI
ERIC

Home Contact Us EVN Intranet Wiki Daily Image

JIVE

- About JIVE
- JIVE management
- ERIC council
- News
- User support
- Visiting JIVE

EVN Correlator

- Correlator overview
- e-VLBI
- Operations
- Software

EVN Data Archive

Select experiment

EVN Data Archive at JIVE

Select EVN experiment

N19K2

Select a sourceposition from EVN experiment N19K2

Ra	Dec	Source	Image	Image
164.6234	1.5663	J1058+0133	sdss	evn
179.8826	29.2455	J1159+2914	sdss	evn

Access to EVN archive

- Show experiment N19K2

Info

- Increase of data since 2000
- Web statistics since June 2004

Access to VO archives

- Aladin Sky Atlas
- Sloan Digital Sky Survey

Not Secure — archive.jive.nl

FITS-finder Tool for the EVN Archive

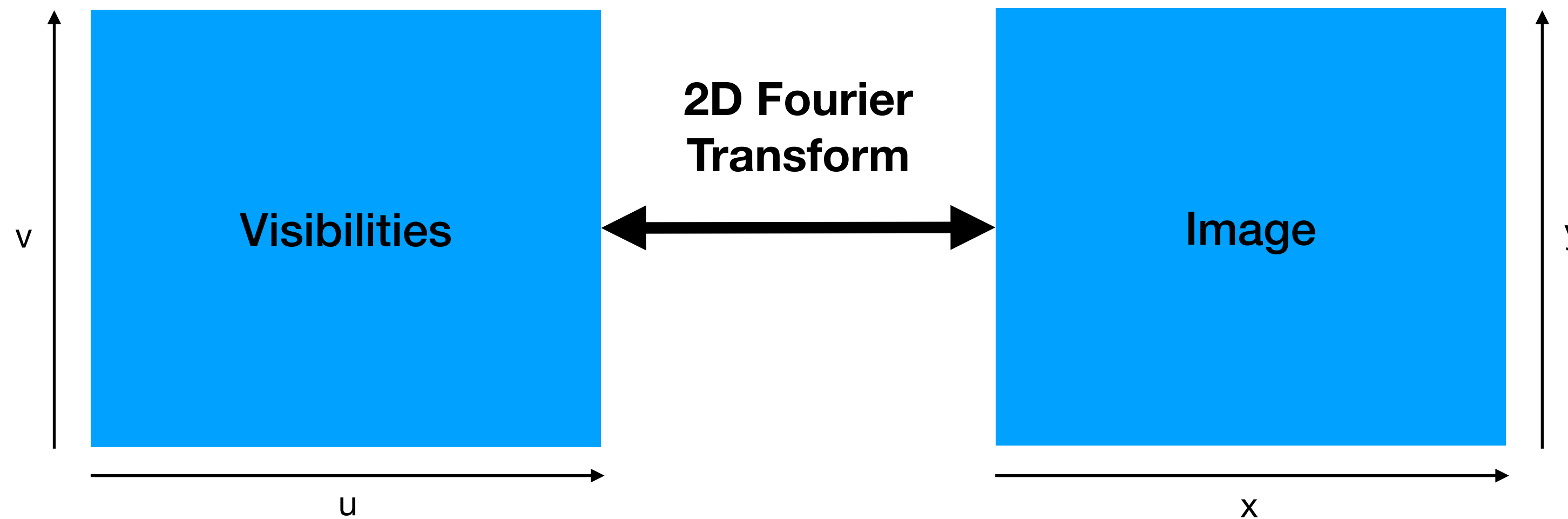
Find FITS files in the EVN Archive matching specified selection criteria, including source name or position.

Show fields		Select values		Sort fields
P. Investigator <input checked="" type="checkbox"/>	Frequency <input checked="" type="checkbox"/>	P. Investigator <input type="text" value="Any"/>	Any	P. Investigator <input type="checkbox"/>
Experiment <input checked="" type="checkbox"/>	Channel width <input type="checkbox"/>	Experiment <input type="text" value="Any"/>	Ar	Experiment <input type="checkbox"/>
Source name <input checked="" type="checkbox"/>	Freq. channels <input type="checkbox"/>	Source name <input type="text" value="Any"/>	Br	Source name <input checked="" type="checkbox"/>
RA <input checked="" type="checkbox"/>	Nr bands <input type="checkbox"/>	Polarization <input type="text" value="Any"/>	Cm	RA <input type="checkbox"/>
DEC <input checked="" type="checkbox"/>	Bandwidth / IF <input type="checkbox"/>	Find sources in Circle <input type="checkbox"/> Box <input type="checkbox"/>	Eb	DEC <input type="checkbox"/>
Equinox <input checked="" type="checkbox"/>	Total Width <input type="checkbox"/>	Find sources in frequency range:	Ef	Observ. date <input checked="" type="checkbox"/>
File name <input type="checkbox"/>	Stations <input type="checkbox"/>	Any band	Fd	Frequency <input checked="" type="checkbox"/>
File length <input type="checkbox"/>	Polarization <input type="checkbox"/>	P-band 90,49 cm	Min. frequency	Total Width <input type="checkbox"/>
File startdate <input type="checkbox"/>	Integr. time <input type="checkbox"/>	L-band 21,18 cm	320 MHz	Freq. channels <input type="checkbox"/>
File starttime <input type="checkbox"/>	Total time <input type="checkbox"/>	S-band 13 cm	Max. frequency	Integr. time <input type="checkbox"/>
File enddate <input type="checkbox"/>	Observ. date <input checked="" type="checkbox"/>	C-band 6,5 cm	50000 MHz	Total time <input type="checkbox"/>
File endtime <input type="checkbox"/>		X-band 2 cm		Polarization <input type="checkbox"/>
		K-band 1 cm		

Offset degr RA,DEC 180 90

Show list Plot list Typed Input Info Defaults Reset

Visibilities & Images



- UV plane is not completely filled
- Visibilities have to be (partly) self-calibrated
- Imaging algorithm choices depend on scientific goal

VO use case



1. Access historic data (“before picture”) for high-resolution follow-up of:
 - Gravitational Wave events
 - Gamma Ray Bursts
 - Fast Radio Bursts
2. Standardized access to archive data for science platform
 - JupiterLab environment

VO protocols that match: ObsTAP and Datalink

ObsCore representation of visibility data



- Multiple targets per observation
 - Multiple ObsCore “rows” with the same **access_url** (but different **obs_publisher_did**)
- Some observations are correlated multiple times with different parameters
 - “continuum” and “spectral line” get its own **access_url** and **obs_publisher_did**
- MPC correlations result in multiple sets of output files
 - Each phase centre gets its own **access_url** and **obs_publisher_did**
- Pulsar binning/gating
 - Each bin gets its own **access_url** and **obs_publisher_did** (including “off-pulse” bin)
- **access_url** is a Datalink

ObsCore datasets



- Use the same obs_id for datasets from the same observation
 - Multiple archive datasets for a single obs_id may exist
 - line/continuum correlations
 - multiple phase center correlations
 - pulsar binning correlations
- Use unique obs_publisher_did for each Obscure dataset:
 - Proposed ObsCore Radio extensions will use obs_publisher_did as primary key.
 - Include target name and “base” frequency in obs_publisher_did
 - Example: `ivo://jive.eu/~?N18C2_180524_1_1_J0555%2B3948_4958.62MHz`

ObsTAP Service



- TAP interface URL: <https://evn-vo.jive.eu/tap>
- Covers all public data in the EVN archive
- Almost 20K ObsCore datasets (for 150 TB of data)
 - From ~2000 EVN observations
-

Datalink



- Single FITS-IDI archive dataset split into several chunks ~2GB
 - Returned in as multiple #this rows
- Calibration data is now added:
 - Amplitude calibration information in ANTAB format (gzipped ASCII)
 - Flagging informal in UVFLG format (ASCII)
 - Returned as #calibration rows (extend vocabulary for Radio?)
- Will add pipeline images as previews
 - Not enabled yet because of http/https inconsistency
- Considering adding some diagnostic plots as secondary datalink
- **JupyterHub EVN data reaction service now uses datalink response to download data and calibration!**

Implementation



- DaCHS 2.5
- DaCHS runs alongside existing EVN archive interface
 - Linking to data products in Existing archive
 - Archive serves data products using Apache
- DaCHS ingests CSV data generated by separate Python “fitscrawler” Tool
 - FITS-IDI stores Important metadata in (large) binary tables
 - “fitscrawler” might be useful for other VLBI archives that use FITS-IDI

Registry




Registry Harvesting Validator x +

← → ↻ Not Secure | rofr.ivoa.net/regvalidate/

International Virtual Observatory Alliance
IVOA Registry of Registries

Registry Interfaces Spec. OAI-PMH Spec. VOResource Spec.



Registering Your Registry

Step 1: Validating the Harvesting Interface

Note that for a large registry, validation can take several minutes.

Enter the base URL for the OAI interface to your IVOA publishing registry:
This should be the HTTP GET version of your OAI interface.

Use built-in schemas (leave checked to register)

Summary of Results

A series of test queries were sent to the service:

- Standard OAI-PMH compliance**
(0 Recommendations, 0 Warnings, 0 Failures)
- IVOA Profile on OAI-PMH compliance**
(0 Recommendations, 0 Warnings, 0 Failures)
- VOResource compliance**
(4 Successes, 0 with Recommendations, 0 with Warnings, 0 with Failures)

Congratulations! Your registry is perfect!

Step 2: Register your Registry

Your registry is ready to be added to the Registry of Registries. Press the register button to complete the registration.

Aladin



The screenshot shows the Aladin v11.0 web interface. At the top, it displays "Available data → 27764", "Command" (a dropdown menu), "Frame Gal", and "Projection Aitoff". Below this, a list of data sources is shown: DSS, PanSTARRS, SDSS, 2MASS, GALEX, Gaia, Simbad, and NED. The main viewing area is a dark grey rectangle containing a dense field of red stars, with a white crosshair in the center. The text "tap" is visible in the top left of the main area, and "360° x 180°" is at the bottom center. To the right of the main area is a vertical toolbar with icons for select, pan, dist, phot, draw, tag, moc, spect, filter, cross, x-y, rgb, assoc, crop, cont, pixel, prop, and del. Below the toolbar is a text box containing "CDS / I / 350 / gaiaed" and "jive.eu / tap". At the bottom of the interface, there are several sliders for J2000, size, dens., opac., and zoom. A search bar is located at the bottom center, and a status bar at the very bottom shows "0 sel / 22195 src 418Mb".

- Does providing spatial coverage for this TAP service make sense?



ESCAPE - The European Science Cluster of Astronomy & Particle Physics ESFRI Research Infrastructures has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement n° 824064.