



# VLBI data

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JIVE

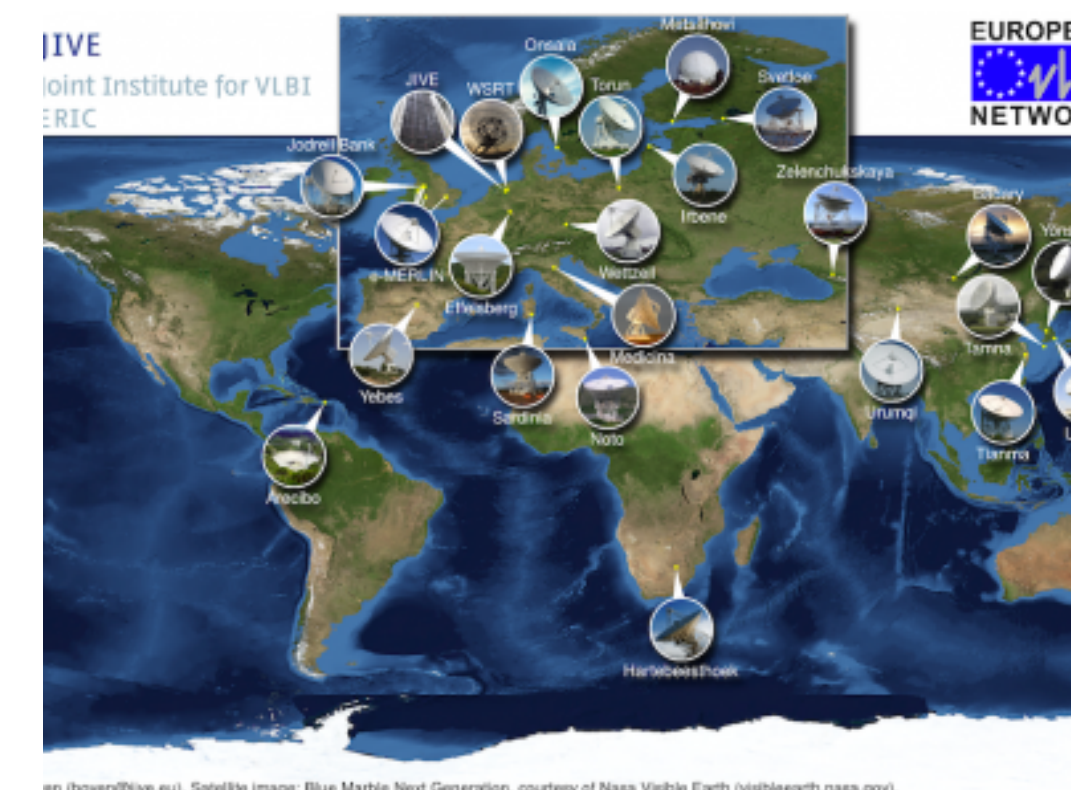
Joint Institute for VLBI  
ERIC



*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.*

# JIVE & EVN

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



# EVN Archive

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

**FITS-finder Tool for the EVN Archive**  
Find FITS files in the EVN Archive matching specified selection criteria, including source name or position.

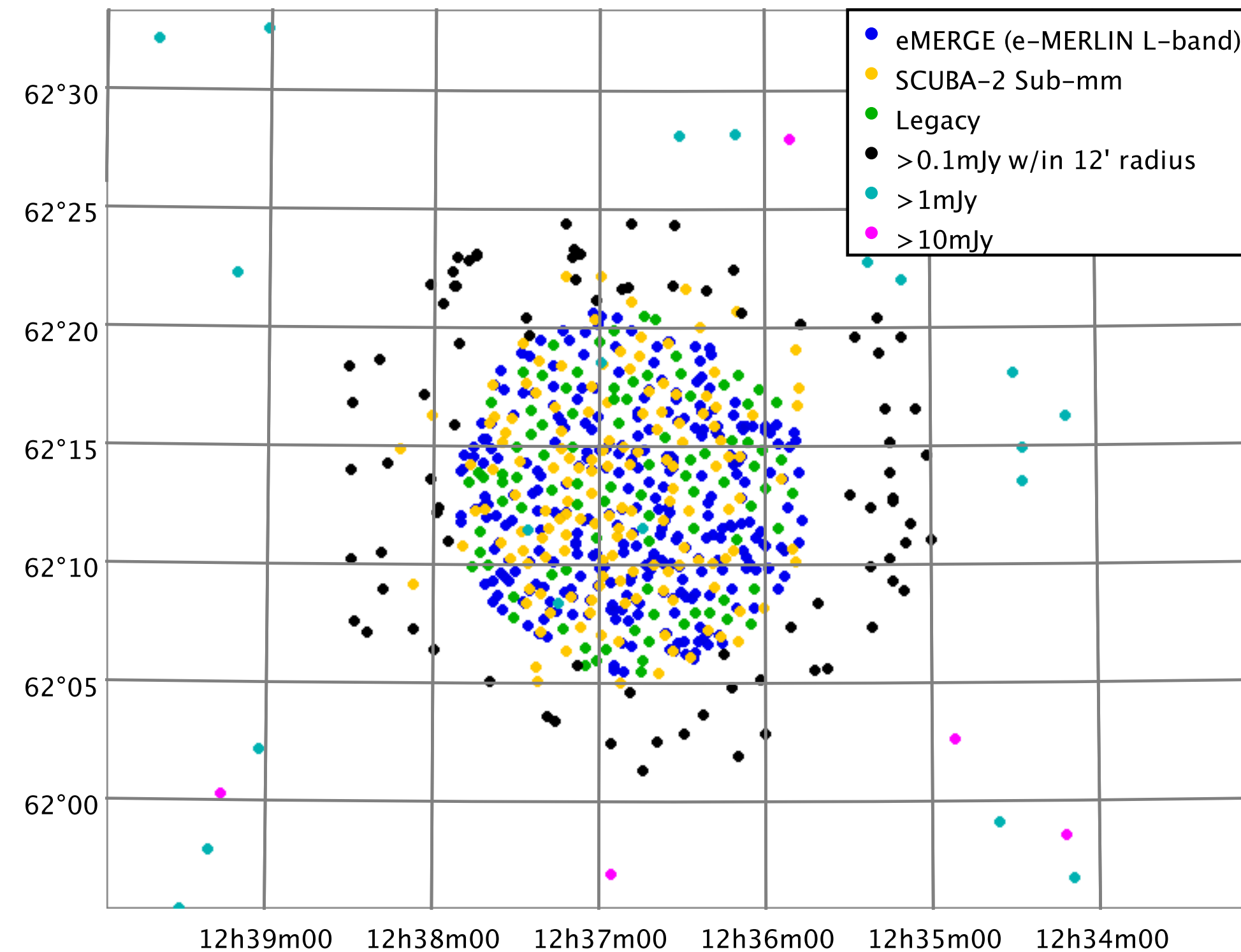
Show fields	Select values	Sort fields
<input checked="" type="checkbox"/> P. Investigator	P. Investigator: Any	<input type="checkbox"/> P. Investigator
<input checked="" type="checkbox"/> Experiment	Experiment: Any	<input type="checkbox"/> Experiment
<input checked="" type="checkbox"/> Source name	Source name: Any	<input checked="" type="checkbox"/> Source name
<input checked="" type="checkbox"/> RA	Polarization: Any	<input type="checkbox"/> RA
<input checked="" type="checkbox"/> DEC	Find sources in Circle: <input type="checkbox"/> Box <input type="checkbox"/>	<input type="checkbox"/> DEC
<input checked="" type="checkbox"/> Equinox	Find sources in frequency range: Any band, P-band 90,49 cm, L-band 21,18 cm, S-band 13 cm, C-band 6,5 cm, X-band 2 cm, K-band 1 cm	<input checked="" type="checkbox"/> Observ. date
<input type="checkbox"/> File name	RA (hh:mm:ss): 12:00:00	<input checked="" type="checkbox"/> Frequency
<input type="checkbox"/> File length	DEC (dd:mm:ss): 00:00:00	<input type="checkbox"/> Total Width
<input type="checkbox"/> File startdate	Radius (degr): 1	<input type="checkbox"/> Freq. channels
<input type="checkbox"/> File starttime	Offset degr RA,DEC: 180 90	<input type="checkbox"/> Integr. time
<input type="checkbox"/> File enddate		<input type="checkbox"/> Total time
<input type="checkbox"/> File endtime		<input type="checkbox"/> Polarization

# Data products

- Visibility data (“UV data”)
  - No in-beam calibrators -> Multiple sources per observation
  - Pulsar observations: multiple bins
  - MPC observations: multiple field centers
- Filterbank data (Pulsars, FRBs)
  - Time-series
- Calibration data
  - Flagging, amplitude calibration, observation schedule, observation logs

# Multiple Phase Centers

Radcliffe et. al.



699 sources in GOODS-N

Two areas:


- 15' central area
- 20' outer annulus

Multi-source Self Calibration

arXiv:1601.04452

# Data formats/models

- FITS-IDI (The FITS Interferometry Data Interchange Format)
  - Documented (AIPS memo 102);  
Updated in 2011 to reflect actual implementation (AIPS Memo 114r)
- UVFITS
  - Uses deprecated random-groups structure
  - Documented; effectively “what AIPS produces”
- Measurement Set (v2)
  - Data model: inspired by RDBMS
  - Data format: Casacore Table Data System (default), ASDM, HDF5
  - **Not a single file**
  - Update v3 under discussion
- Various metadata products
  - Mostly ill-defined ASCII data

VLBA  EUROPEAN  
NETWORK  
LBA



# Open Questions

- “Spatial Coverage” is not as well defined as for images
  - Depends on further processing
  - Can be approximated; consistency among arrays?
- “Spatial resolution”
  - Depends on further processing as well
- “Exposure time”
  - Measure for expected sensitivity? Time on source?
- EVN calculator can calculate these quantities
- What about “image fidelity”?
  - UV coverage is an important factor as well

# Open Questions

- Multi-source data:
  - ObsCore per observation or per target?
  - ObsCore for calibrators as well?
  - ObsCore per field center?
- Pulsar binning:
  - ObsCore per bin?



# Acknowledgement



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