VLBI data

Mark Kettenis
IVOA Interop, Groningen, NL

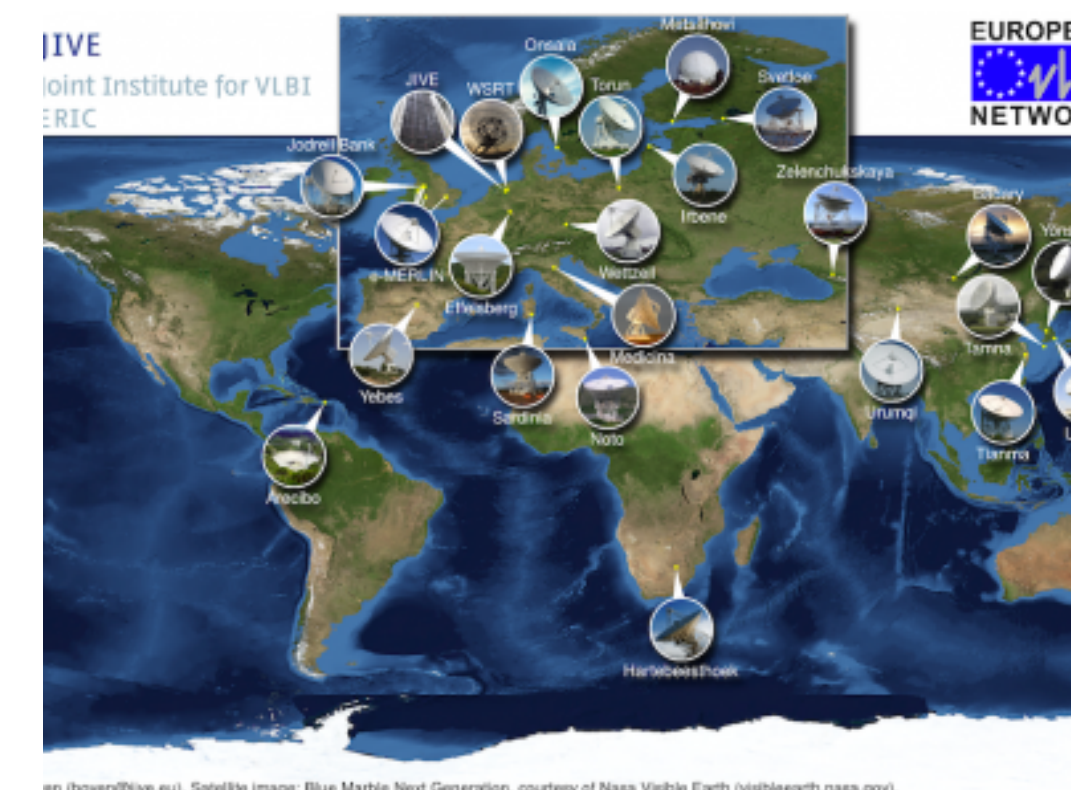# JIVE & EVN

- JIVE: Joint Instutute 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

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.
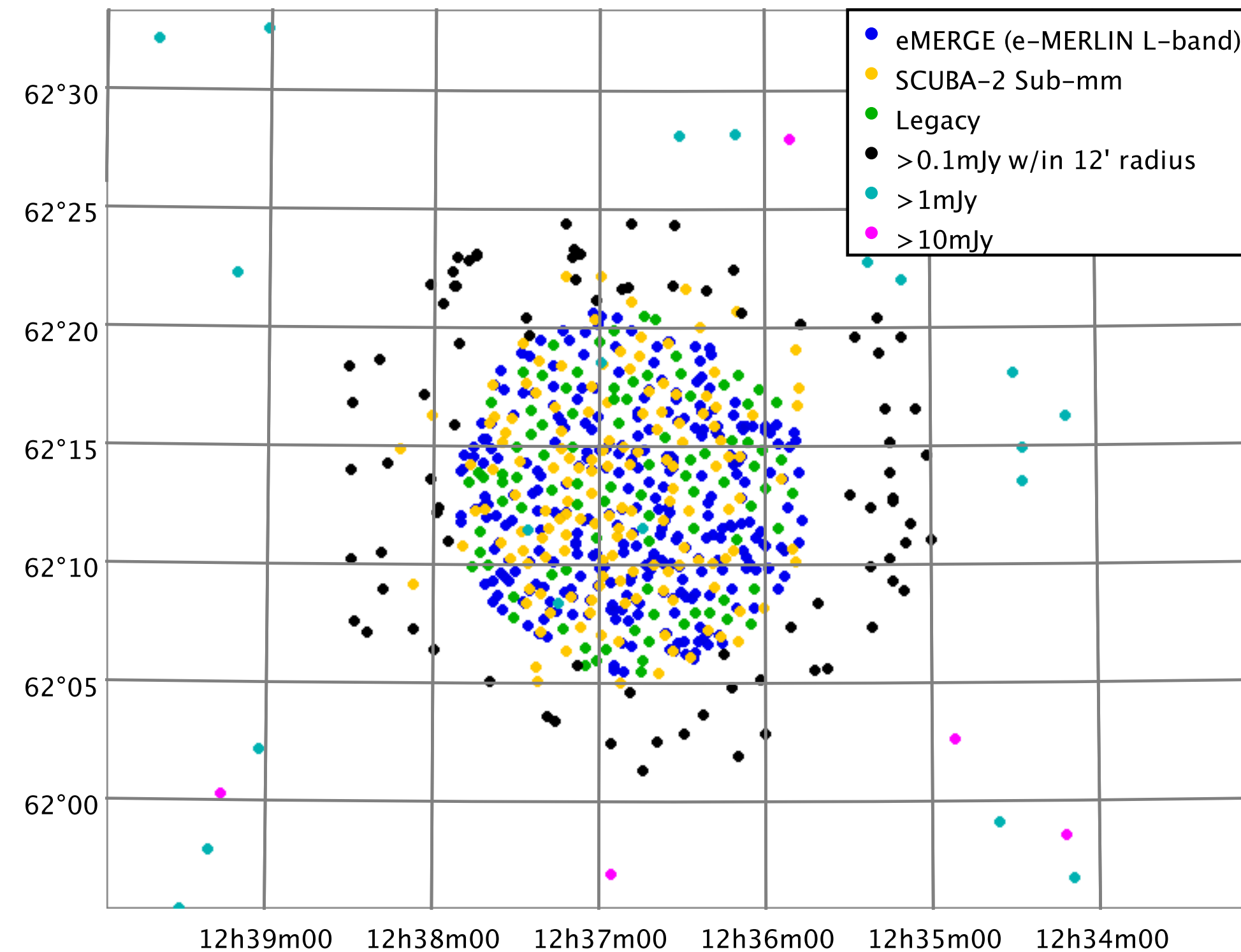
699 sources in GOODS-N

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
vlbi
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 calibraters as well?

  - ObsCore per field center?

- Pulsar binning:

  - ObsCore per bin?

Acknowledgement