



VLBI in Europe and Beyond

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EUROPEAN

NETWORK



EVN: European VLBI Network

- Consortium of radio telescopes
 - Ef, Mc, On, Jb, Cm, Nt, Sr, Tr, Wb, Sh, Ur, Hh, Ar, Mh, Ys, Sv, Bd, Zc, Ro, Ku, My, Wz, Ny, Sr
 - Involving 14 different organizations around the world: Europe, China, Puerto Rico, South Africa, Russia
 - And 12 more antennas for “Global observations” with NRAO
- Covering range of frequencies
 - Workhorse frequencies 18cm, 6cm,
 - Also available: SX, 5cm, 1.2cm
 - And at specific stations 90cm, 21cm, UHF, 50cm, 2cm, 0.7mm
- Reaching mas resolutions
 - From 15mas for 1.4 GHz EVN
 - To 1 mas at 5GHz with Asian, African or American baselines
- Sensitivity of $5\mu\text{Jy}$ in 8hr at 1.4 GHz
 - Combination of Big Antennas and 1 Gbps bandwidth (and soon 2 or 4Gbps)
 - Big antennas also vital for spectroscopy (mJy sensitivity)
- Operational approximately 60 days/year
 - 3 sessions augmented with e-VLBI once a month

Joint Institute for VLBI in Europe

- Promote and advance the use of VLBI for astronomy
 - Central correlation
 - User services
 - Network support
 - Innovation
 - EC liaison/representation
- Founded in 1993
 - Base budget from partners in 9 countries:
 - China, France, Germany, Italy, Spain, Sweden, United Kingdom, South Africa, the Netherlands
 - hosted by ASTRON
- Large number of external projects
 - Many people with temp positions in R&D/Science
 - Space Science
- 30 people, 7 nationalities



EVN Data Archive

http://archive.jive.nl/scripts/arch.php?exp=EA037A_070302

EVN fitsfiles of experiment EA037A

Access status: public

Download: Use right mousebutton -> Save target.
If the connection is slow, try [GNU wget](#). (manual).
It can be obtained from the web, if not available.

A file selection can be made by filling in the wildcard after the -A option.
To get all fitsfiles of EA037A copy next line to your commandwindow:
`wget -45 -11 -r -nd http://archive.jive.nl/exp/EA037A_070302/fits -A "ea037a**"`

The checksum file can be used to verify the checksum of all datafiles using:
`md5sum -c ea037a.checksum` (on unix systems).

Filename	Length x 10 ⁹ bytes
ea037a.checksum	0.000000049
ea037a_1_1.IDI	0.814659840

Select experiment | Jive

http://www.jive.nl/select-experiment

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INSTITUTE FOR VLBI IN EUROPE

http://archive.jive.nl/scripts/avo/fitsfinder.php

Fits Archive EVN Correlator at JIVE

Fitsfinder permits users to find data on the basis of selection criteria including sourcename and position.

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

Buttons: Show list Plot list Typed Input Info Defaults Reset

Select experiment

EVN Data Archive at JIVE

Select EVN experiment

EO011B

Access to EVN archive

- [Show experiment EO011B](#)

Info

- [Increase of data since 2000](#)
- [Web statistics](#) since June 2004

Select a sourceposition from EVN experiment EO011B

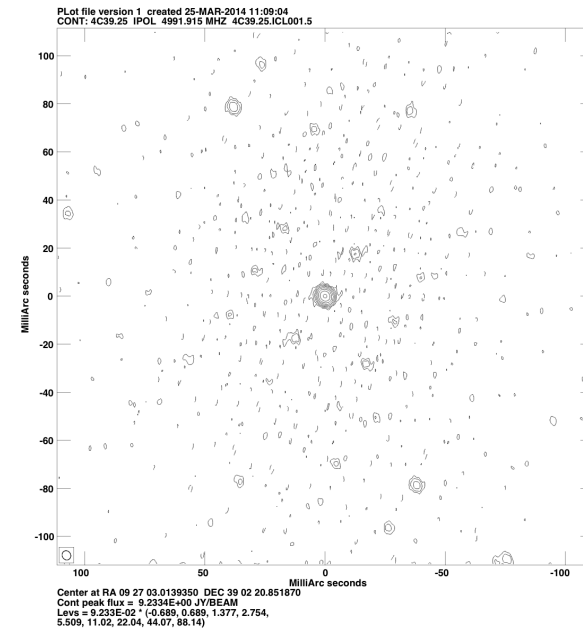
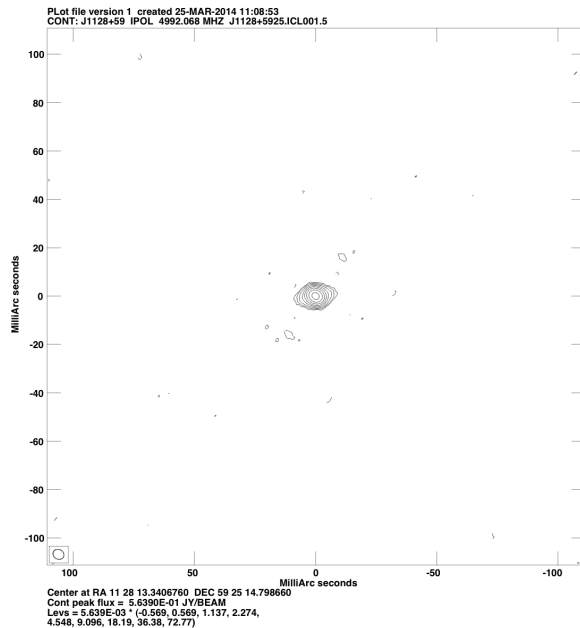
Ra	Dec	Source	Image	Image
82.7351	13.5320	0528+134		evn
99.7785	6.0260	J0639+0601		evn
99.9109	5.8980	NOVA-MON		evn
101.4470	5.6896	J0645+0541		evn

Access to VO archives

- [Aladin Sky Atlas](#)
- [Sloan Digital Sky Survey](#)

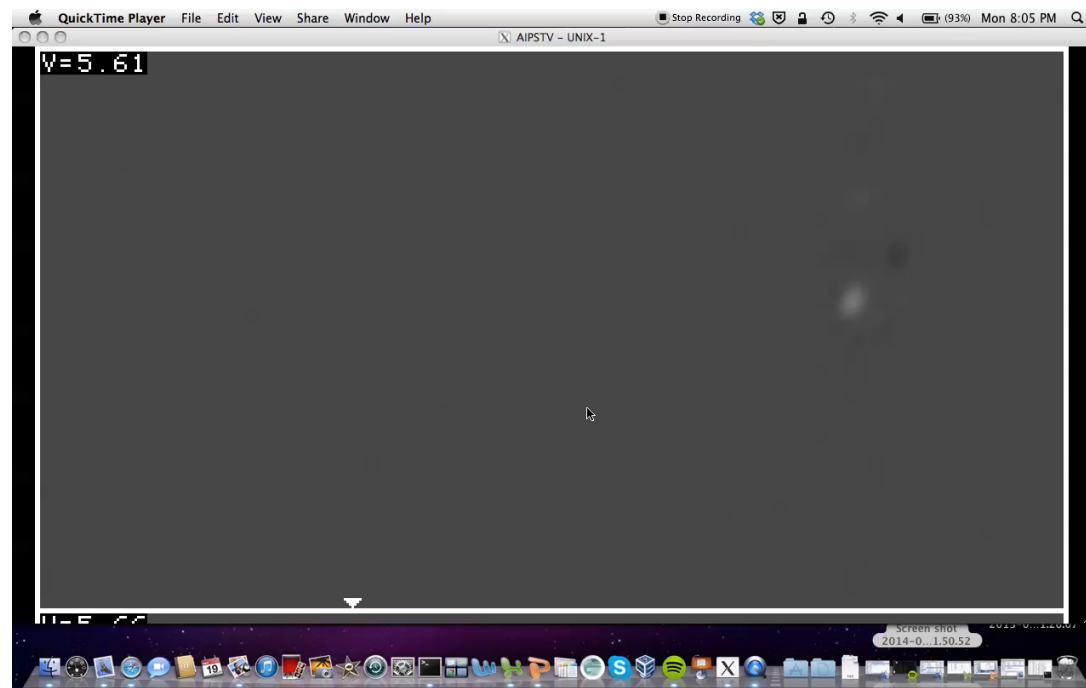
Data products

- UV data (FITS-IDI), typically multi-source
- Calibration data
- Pipeline plots
- **Crude** images (FITS)



Data Cubes in VLBI

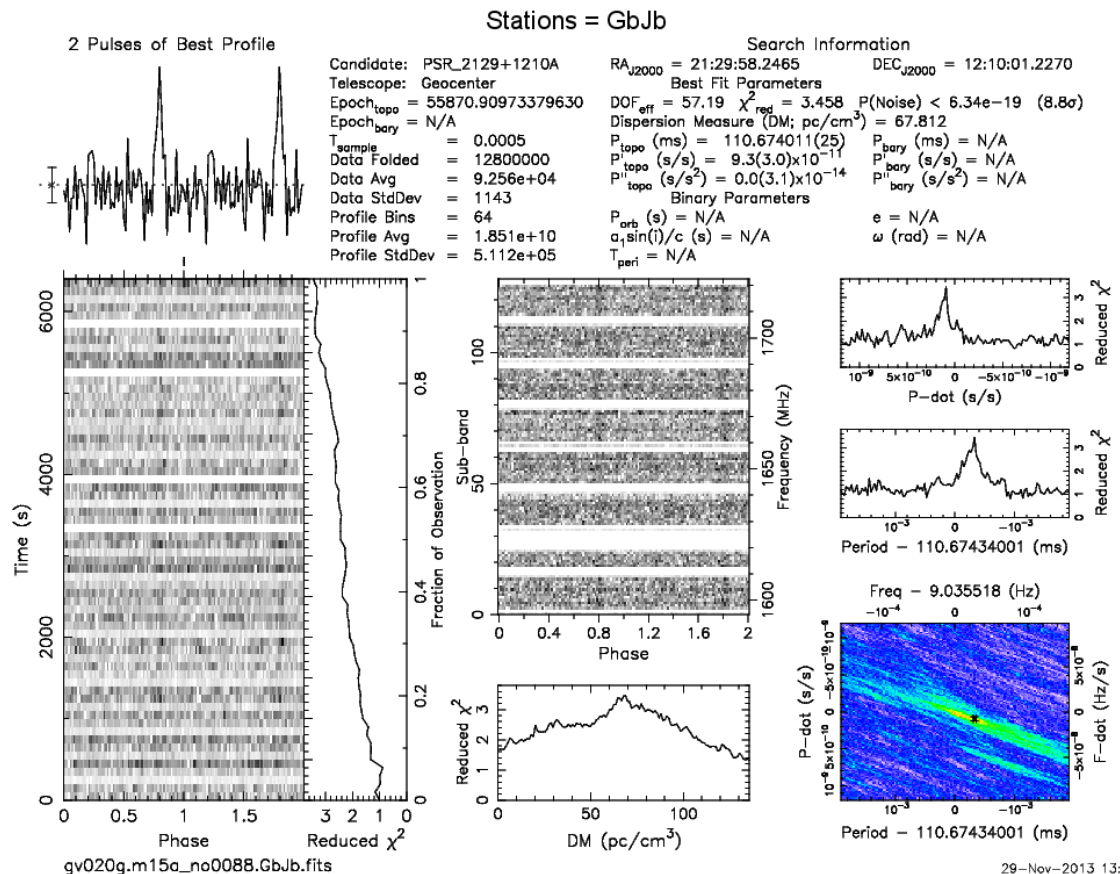
Spectral-line VLBI



Methanol masers in S255
Surcis et al 2013, A&A, 556A, 735

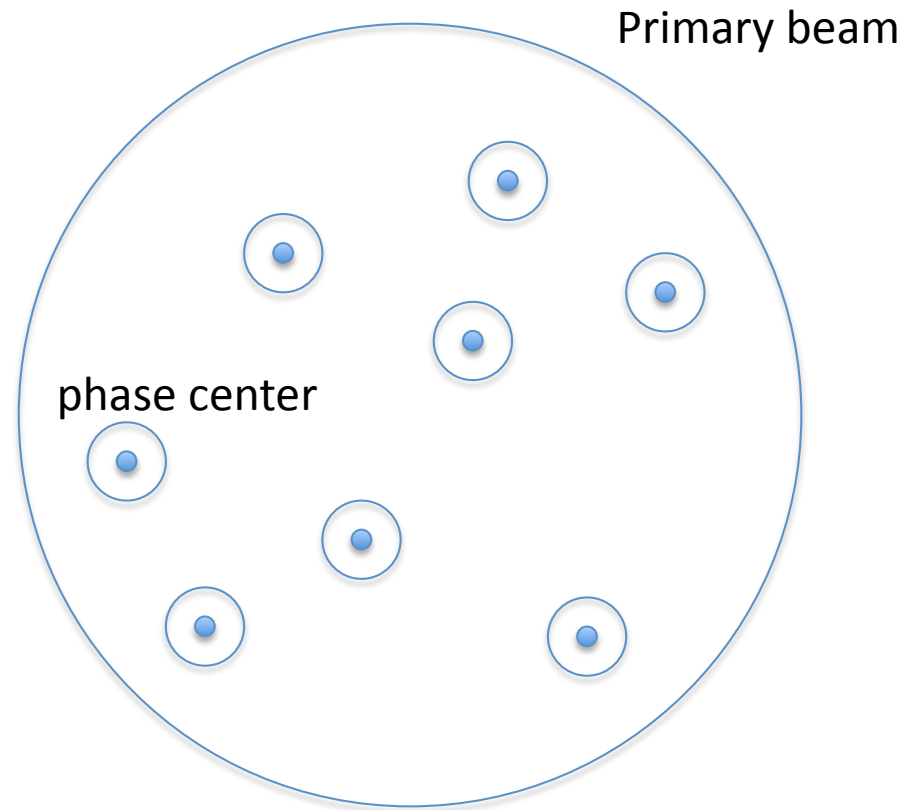
Time domain data

EVN as an earth-sized phased array



Pulse profiles for pulsar M15A (Aard Keimpema)
(baseband data courtesy Franz Kirsten/Wouter Vlemmings)

Wide-Field VLBI



1. Correlate with high time & spectral resolution
2. Shift phases & average down

e-VLBI & Triggers



- Change schedule on short timescale; Transients
- Use VOEvent to trigger observation