Overview of the EVN and its capablities

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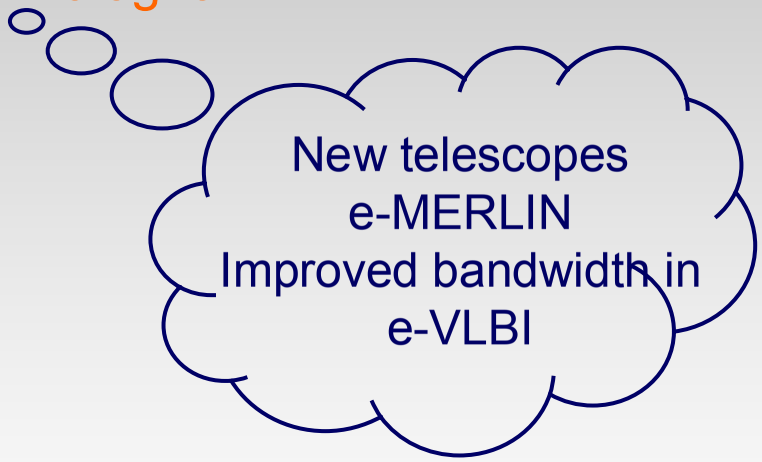
EVN

An evolving array

Current status of EVN and e-VLBI

Progress since the 9th EVN Symposium in Bologna



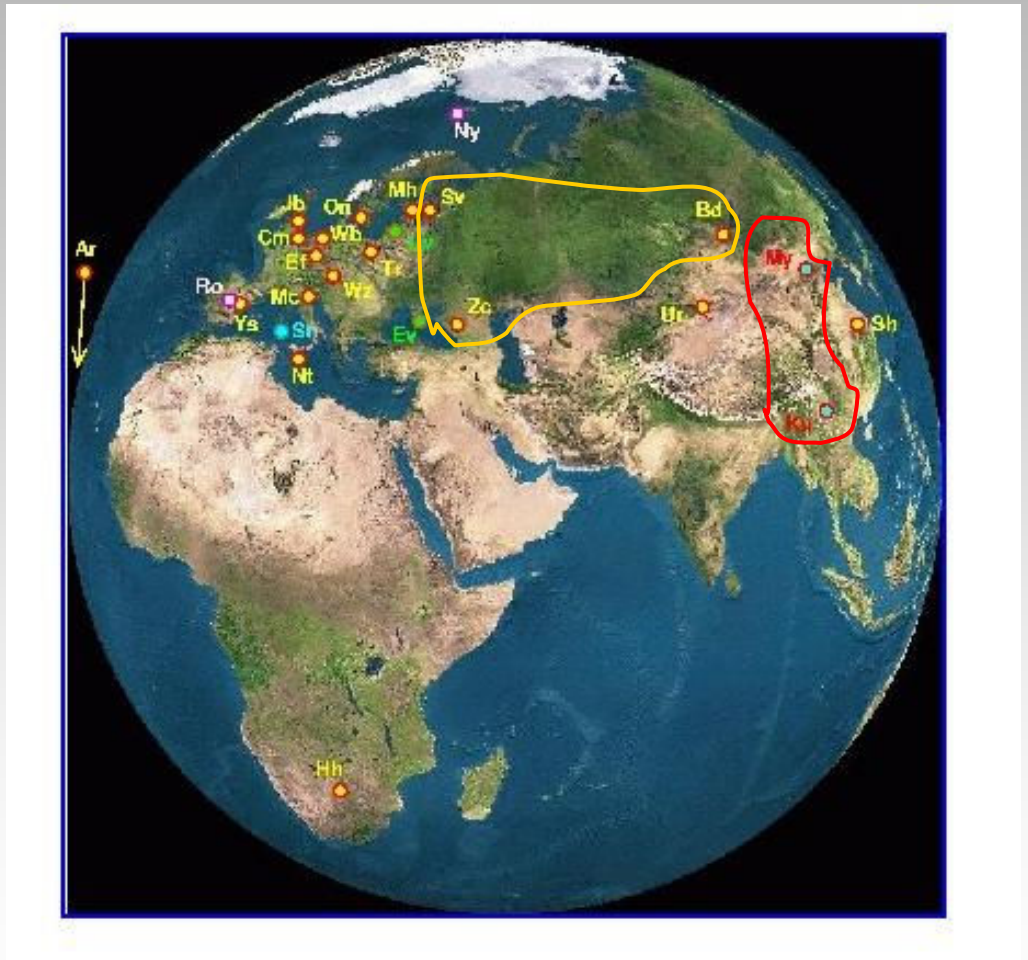
Future perspectives

What is the EVN

Consortium of individual Institutes and Observatories which share an overlapping plan of development and telescope observing time

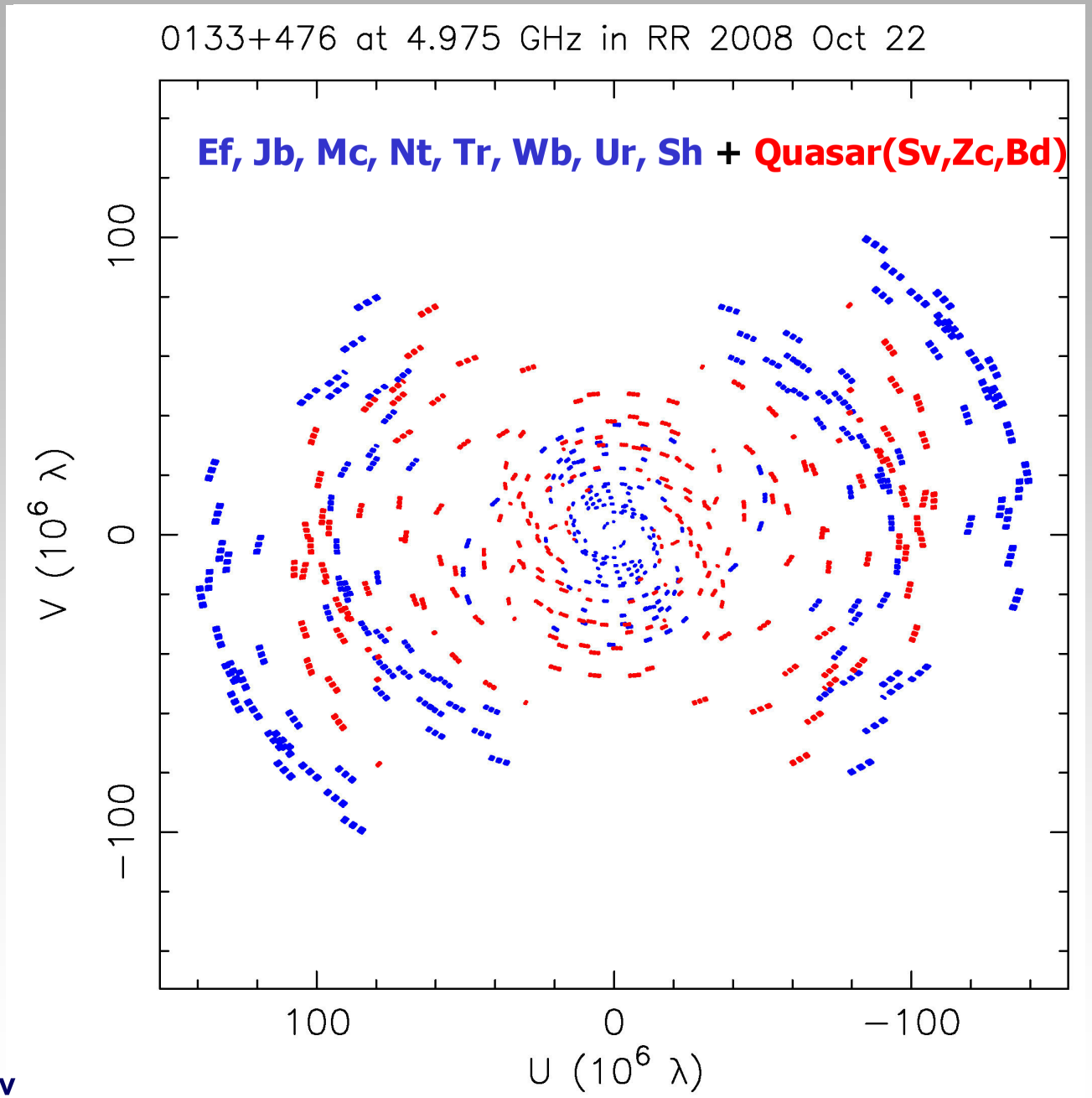
EVN - Present array configuration

- Antennas in operation
- Forthcoming telescopes
- Geodetic antennas
- Existing telescopes to be equipped

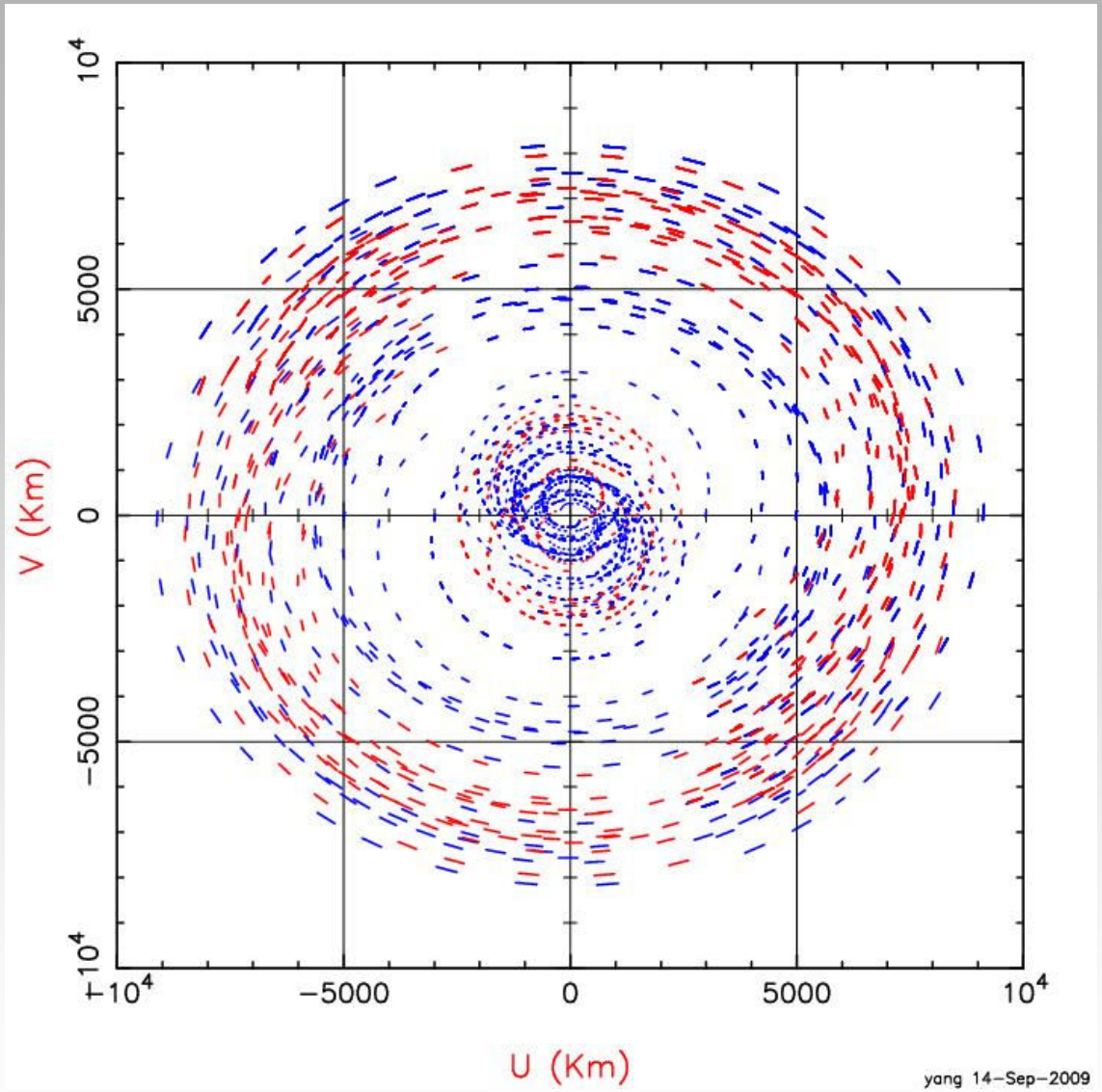


Standard observing on disks (Mark5 system) with correlation at the EVN Correlator at JIVE (Dwingeloo, NL)

u-v coverage for 0133+476 without and with IAA antennas (KVASAR)



Courtesy of Y. Kovalev



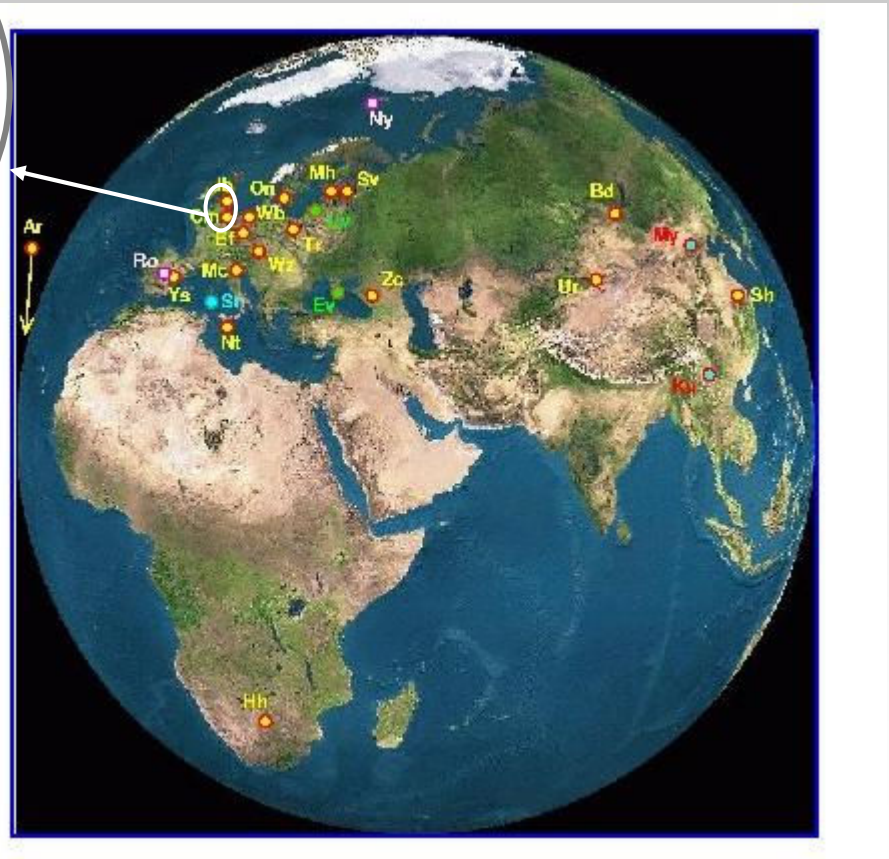
u-v coverage for J1756+5748 at X band

EVN antennas are: Mc,On,Ur,Sh,Nt, Mh,Ys,Ef,Wb

Red points are the baselines to Km and My

Courtesy of Y. Kovalev

(e)MERLIN joins the EVN at a L,C and K band, boosting sensitivity and coverage at short spacings



Current Status

18 radio telescopes – not all available at all frequencies

(e)MERLIN joins at a number of observing frequencies

6 standard bands + 5 non standard

Continuum and spectral line observing

Disk Recording rate up to 1 Gbps **EVN correlator at JIVE**

Standard bands

Waveband	Default central frequency
18 cm	1664 MHz
13 cm	2268 MHz
6 cm	4992 MHz
5 cm	6668 MHz (Methanol), 6030 MHz (OH)
4 cm	8418 MHz
1 cm	22230 MHz

Non standard bands

Waveband	Default Central Frequency
90 cm	327 MHz
50 cm	610 MHz
21 cm	1416 MHz
2 cm	15362 MHz
7 mm	43214 MHz

Angular resolutions in milliarcsec

Array	90 cm	18cm	6cm	3.6 cm	1.3 cm	0.7cm
EVN	-	15	5	3	1	0.6
EVN (inc. Sh/Ur)	30	5	1.5	1	0.3	0.15
EVN+VLBA	19	3	1	0.7	0.25	0.13

Image sensitivity in μJy/b for 128 Mbps (Δv = 64 MHz) and 8 hr on source

Array	18cm	6cm	5cm	3.6 cm	1.3 cm
EVN Array (*)	28	35	148	96	238
+Ro-63	22	-	-	48	148

e-VLBI: Real Time VLBI

EXPReS and NEXPRes Projects

High-speed communication networks operating in real-time and connecting some of the largest and most sensitive radio telescopes on the planet

Number of connected stations increased since 2008

Sustainable rate 1 Gbps at most stations

Current e-EVN Table

Frequency Band	e-VLBI Array
1.4-1.6 GHz (18-21cm)	Ar,Cm,Ef,Hh,Jb,Mc,On85,Sh,Tr,Wb14
5 GHz (6 cm)	Ar,Cm,Ef,Hh,Jb,Mc,On85,Sh,Tr,Ys,Wb14
6 GHz (5cm)	Ar,Cm,Ef,Hh,Jb,Mc,On85,Tr,Ys,Wb14
22 GHz (1.3cm)	Cm,Ef,Hh,Jb,Mc,Mh,On60,Sh,Ys

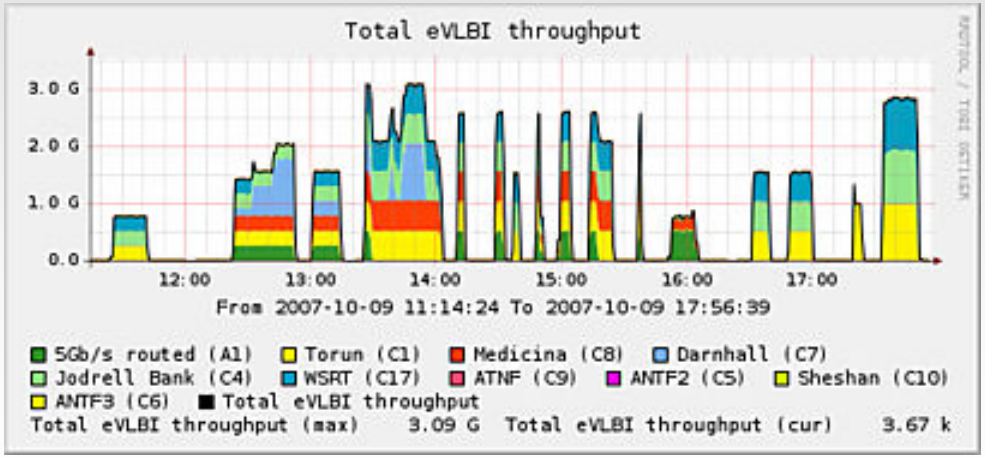
The e-EVN array is competitive with the standard EVN in terms of u-v coverage at almost all frequencies offered, and it is more robust against failure

e-EVN is being chosen by EVN users for a wide number of science projects

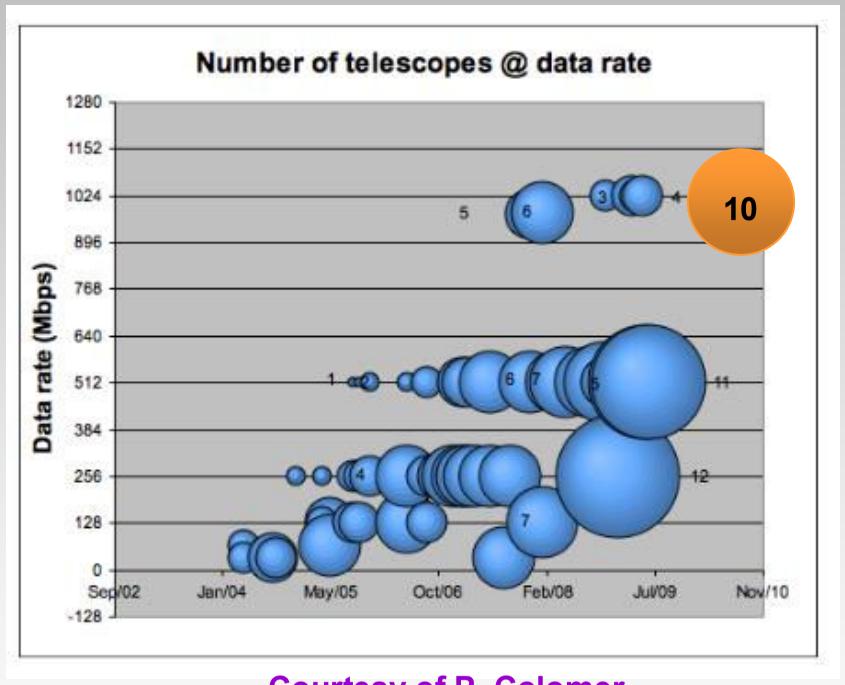
Rapid response science, frequent monitoring (especially in multiband campaigns), quick look observations, and “normal” projects

Gbps recording at most stations in the array and data transfer to the EVN correlator at JIVE

Data Throughput 7-8 July 2010 17-08 CEST

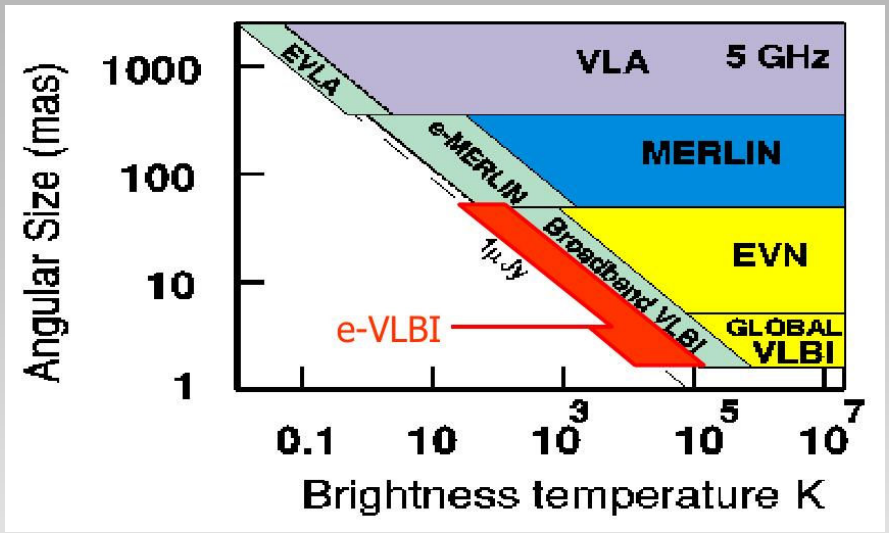


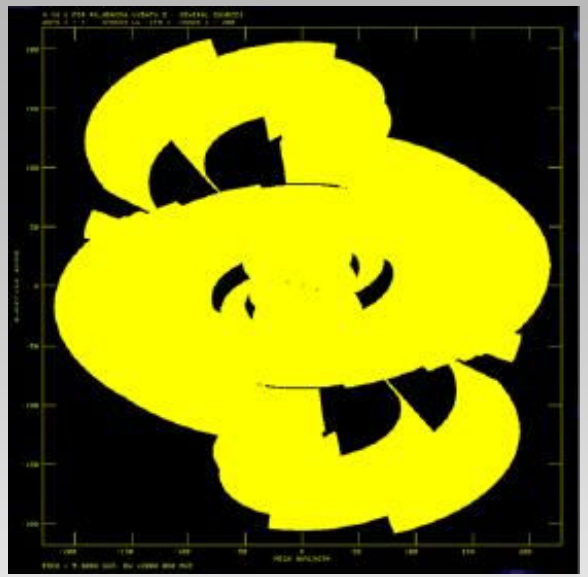
Data Throughput 10 Sep 2007 11-18 CEST

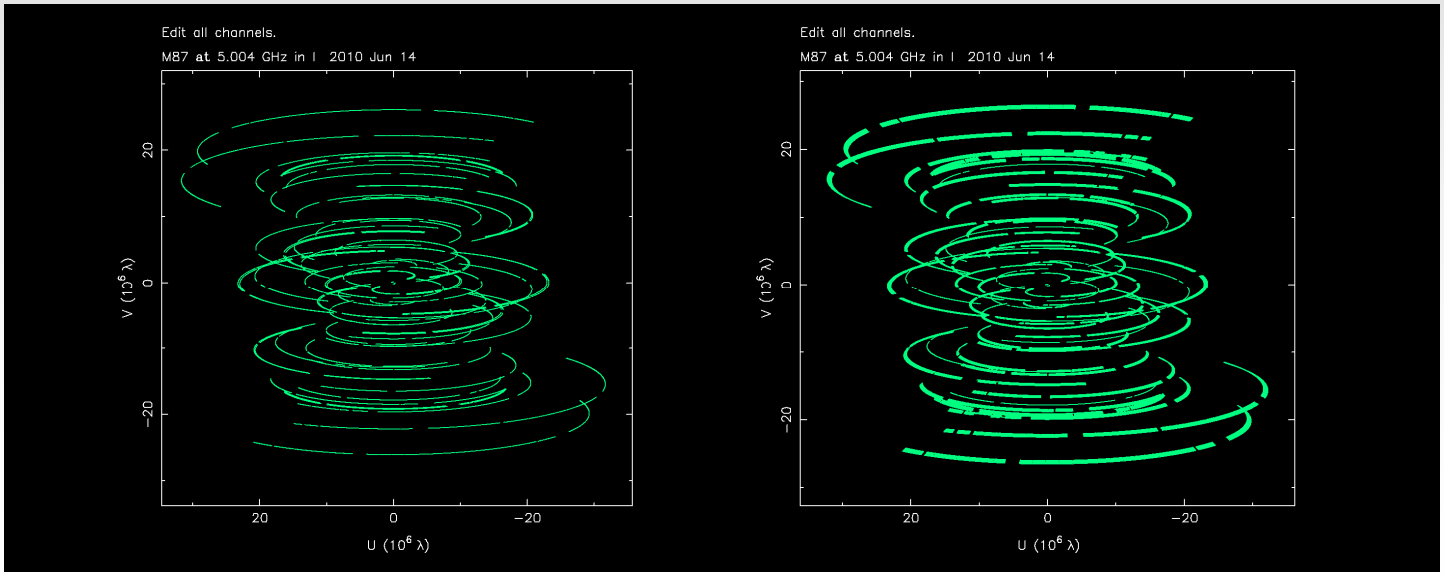


Courtesy of P. Colomer

Aiming at full coverage of the u-v plane







Courtesy of M. Giroletti

Future directions for the EVN

EVN 2015

- Improve current performances

Sensitivity

Frequency agility

Synergy with eMERLIN

- New features

Wider frequency range

New telescopes

Suitable correlator

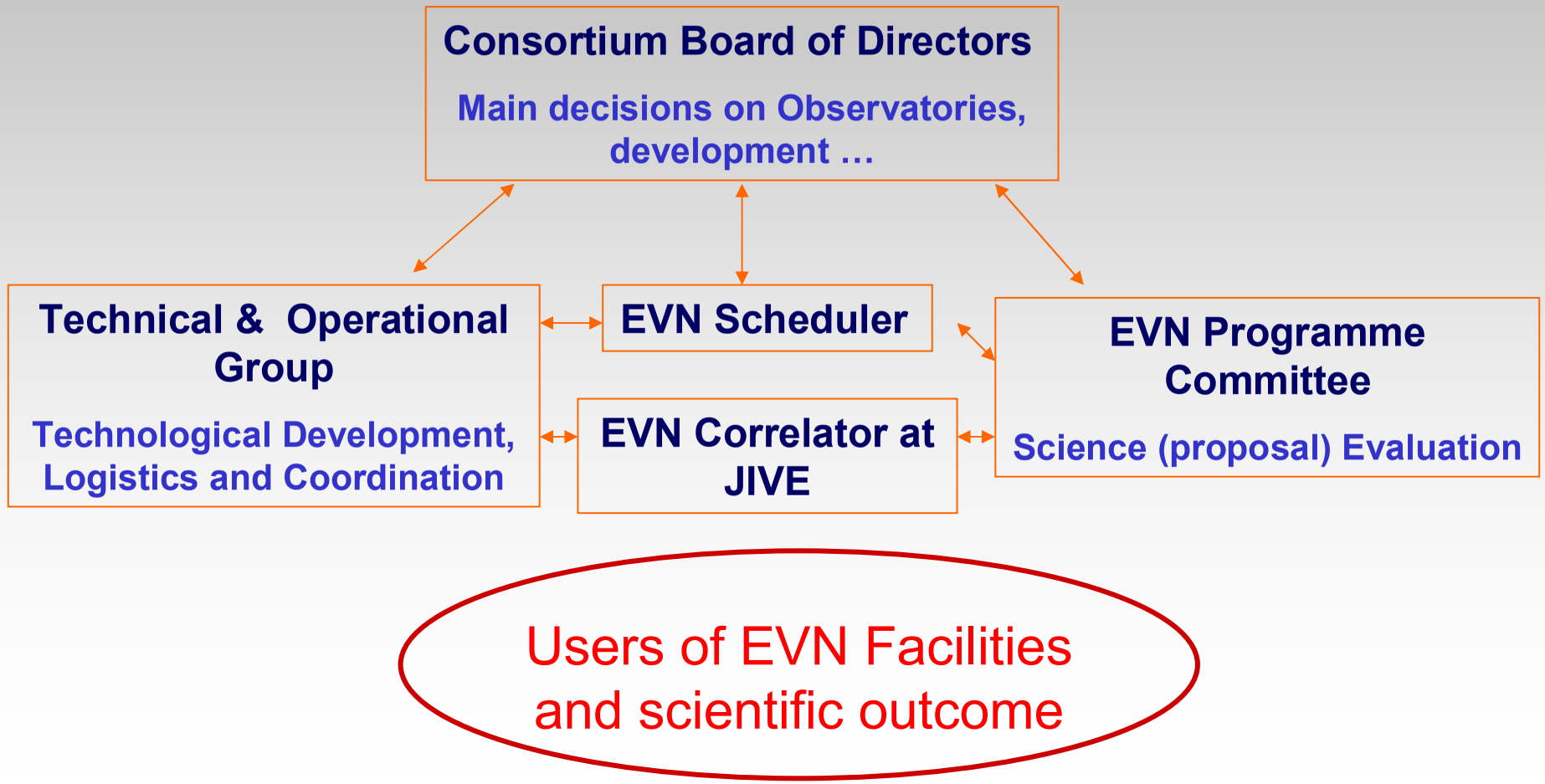
- Easier access to the observations and processed data

Observing sessions

Easier access to the archive

EVN Structure and Bodies

Consortium of individual Institutes and Observatories which share an overlapping plan of development and telescope observing time



Let’s enjoy the 10th EVN Symposium!