

EXPReS continuity

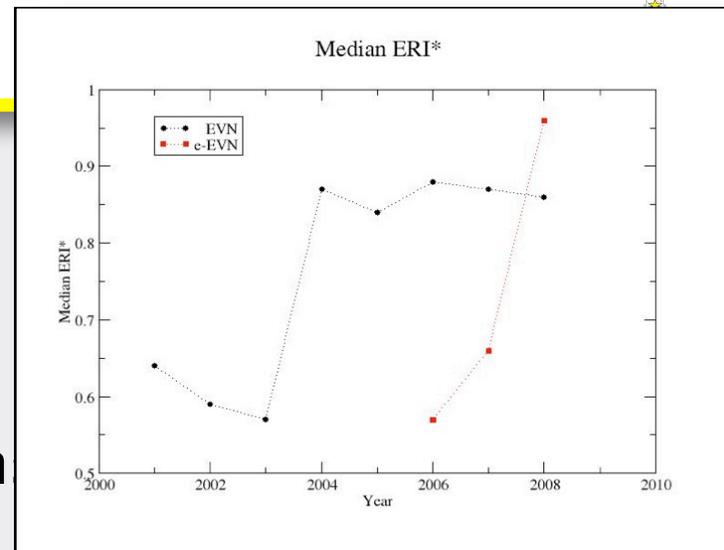


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Joint Institute for VLBI in Europe, Dwingeloo NL

- **Will reach most original (overambitious) goals**
 1. Create an operational, real-time, 16 station VLBI network
 2. Expand the number of European telescopes to 12 at 1Gbps
 3. Include MERLIN telescopes transparently
 4. Support connection of telescopes outside Europe
 5. Service data-streams reliably at the correlator
 6. Enable rapid response and ToO science
 7. Assess networking and computing for 10 - 100 Gbps VLBI
 8. Investigate how MERLIN and E-LOFAR can expand using this technology
 9. Use research networks to create facilities and enhance communication between disciplines
- **Probably made 85% of the eligible costs**
 - But large uncertainties remain
 - Interesting game to end at zero
 - remember we promised a lot of matching

Recent achievements

- **Connecting most 'European' telescopes**
 - Effelsberg and Urumqi joined
 - Anticipating Yebes and Ventspils
- **Demonstrated robust operation**
 - Reliability index actually higher than recorded VLBI
- **Intercontinental connectivity**
 - Reaching routinely into Australia, China
 - Bit harder to South-Africa and Chile
 - set back by Hartbeesthoek failure
 - Would have liked to see more USA
 - bandwidth Arecibo improves
- **New results at EVN symposium**
 - Resulted in good number of proposals
 - Increasing use for Target-of-opportunities
- **Will see more at e-VLBI workshop**



The 8th International e-VLBI Workshop
<http://www.oan.es/expres09/>
 22-26 June 2009
 Madrid, Spain

In recent years real-time, long-baseline, radio interferometry over optical networks has developed from a technical possibility to a mature technique. The time is ripe to bring together all those working on the science and technology of e-VLBI to discuss the state-of-the-art and future prospects.

This week long conference will cover both scientific applications (first half) and technical implementation (second half) with joint sessions in the middle. Participants are welcome to attend a part or the whole of the conference. The conference proceedings will be published electronically. Specific areas to be covered include:

- **Scientific:** Applications of real-time operation to astronomy, geodesy and other fields. How to best coordinate emerging e-VLBI arrays for best scientific return. Connections to transient monitoring in other wavebands including Fermi Gamma-Ray Space Telescope observations.
- **Technical:** e-VLBI test experiments, use of new long distance links, development of techniques including selective packet dropping and novel protocols, search for higher bandwidths, network status and monitoring, distributed processing, and future development.
- **Scientific/Technical:** Technical possibilities of interest in planning future instruments. Desired technical requirements to fulfill scientific goals, science priorities for development.

Scientific Organizing Committee

- Chair: Paul Cornwell, Observatoire de Besençon (France)
- Chair: Roger Perley, Radio Link Center for Astronomy (UK)
- Raju Fender, Southampton University (UK)
- Willem van der Kruit, ICRAN (Italy)
- Alexander J van der Kruit, NASA/MSTP/DRAP (USA)
- Ralf Knapik, Ghent University (Belgium)
- Richard Hildebrandt, IRTF (Hawaii)
- Hajo Van Van Lamsweerde, JIVE, Leiden University (The Netherlands)
- Andrew Wilson, MPA Garching (Germany)
- Zolt Papp, JIVE (The Netherlands)
- Mark Reid, JIVE, MPA Garching (Germany)
- Chris Willingham, CSIRO (Australia)
- Dariusz Szymusik, KESR/ICP (Japan)
- Armin Zieger, JIVE (The Netherlands)
- Steven Tingay, Curtin University of Technology (Australia)
- Frank Hees, CSIRO (Australia)
- Pablo de Vicente, IANIGLA (Spain)
- Alan W. Sault, JIVE (The Netherlands)

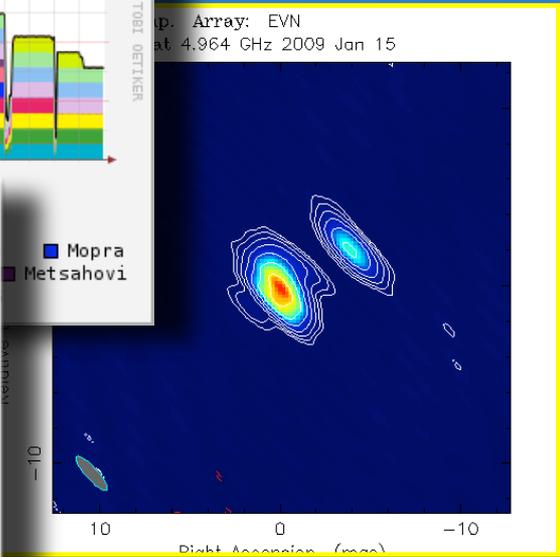
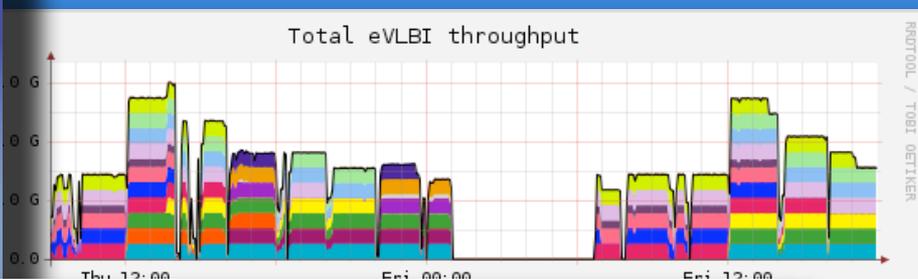
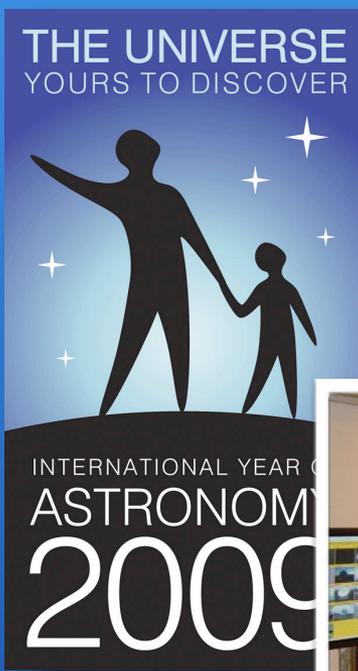
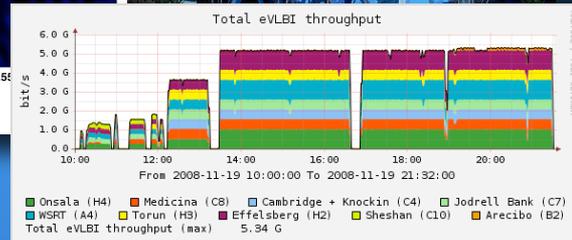
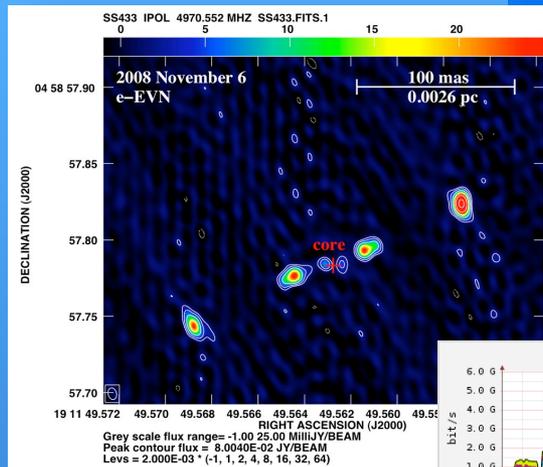
Local Organizing Committee

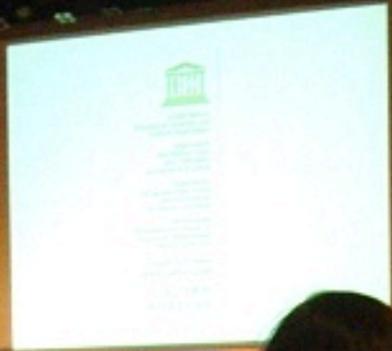
- Chair: Francisco Latorre, IGN (Spain)
- Co-Chair: Juan Barvainis, IGN (Spain)
- Yvonne Kozal, JIVE (The Netherlands)
- Richard Sault, IANIGLA (Spain)
- Willem van der Kruit, JIVE (The Netherlands)

This workshop is sponsored by the Centro Nacional de Información Geográfica - Instituto Geográfico Nacional (CNIG-IGN) of Spain and EXPRES. EXPRES is an Integrated Infrastructure Initiative (I3), funded under the European Commission's Sixth Framework Programme (FP6), contract number 026642.

Outreach effort continues

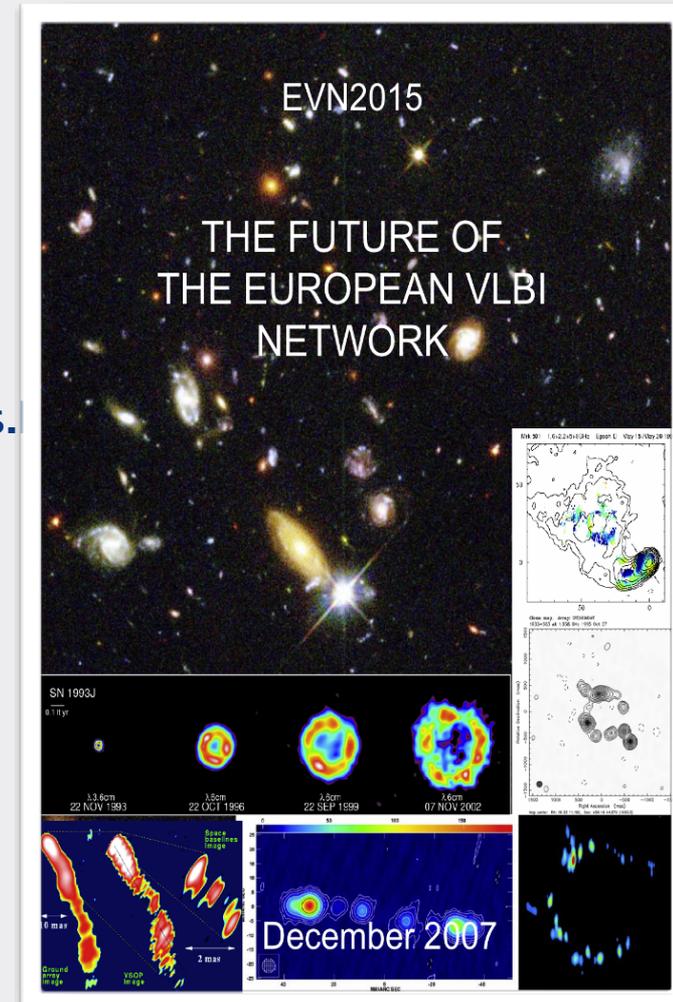
- Effelsberg dedication
- IYA opening ceremony





Significance for EVN

- **EVN CBD supportive**
 - Continues with e-VLBI allocation of days for 2009
 - Encourages normal observations in e-VLBI mode
 - in order to save resources
 - Very lucky to have this program
 - compared to VLBA
- **Features in long term vision**
 - Science case has been developed
 - <http://www.evlbi.org/publications/publications>
- **Target set for 4Gbps observations**
 - Serious work needed for correlator
 - Software correlators bridge gap
 - And DBBC roll-out



- **EVN will have a lot of synergy with new instruments**
 - Follow-up of LOFAR results (transients)
 - Need similar sensitivity to keep up with EVLA and E-MERLIN
- **And is supposed to continue into SKA era**
 - Unique science capabilities at long baselines & higher frequencies
- **As a SKA pathfinder it has a lot of synergy**
 - In technological sense
 - Demonstrator for Long-haul Connectivity
 - Digital processing, data acquisition, transport protocols
 - Future correlators, synergy with next generation processor
 - Data processing software, ParselTongue and beyond in ALBiUS
 - Operations
 - Real time radio-astronomy, user support, data archive
 - Governance
 - Need for a European body in cm astronomy
 - VLBI Science
 - Complementary to SKA science goals
 - Importance of European pathfinders for continuity

- **Must continue to work in collaboration with NRENs**
 - Big success of EXPReS is interdisciplinary collaboration
 - And EC blessing with Network providers
- **Like to keep our place in the INFSOC domain**
 - Requires us to deliver a technically ambitious program
 - aligned with goals of programme
- **Should take shape of Integrating Activity**
 - INFSOC and RTD share common program on these
- **FP7 calls are limited**
 - Not as much volume as anticipated at the start
- **Will result in largish gap, at least 9 months**
 - Could be funded in 2010
 - Proposals in late 2009 (at best)
 - Problems keeping personnel, possibly connectivity

Need for EXPReS 2

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Relevant for
budget discussion

WAS:

- **Rapid response for rapid variability**
 - Fast response to requests
 - Immediate analysis of data, adapt observing parameters

COULD BECOME:

- **e-VLBI for all future VLBI**
 - **Robust: Immediate feedback, but still flexible**
 - will require buffering
 - **More sensitive:**
 - Growth path for more bandwidth
 - **Connectivity: reach Noto, Russia, VLBA?**
 - dynamic connections, fewer consumables & logistics
- **New features could include:**
 - Make some link to E-LOFAR
 - Spacecraft detection
 - Constantly available VLBI network

- **e-VLBI wish-list for Network providers**
 - Dynamically allocation of light-paths
 - To accommodate distributed correlation
 - And around the globe in some uniform manner
 - Must continue close collaboration with NREN
 - And get access to a few new places
- **Make use of 10Gb/s infrastructure!**
- **Introduce buffering**
 - Transparently at both ends?
 - To have both real-time and optimal results
 - Not all telescopes are on-line
 - Many experiments require multiple passes
- **Upgrades in the VLBI Network must keep pace**
 - Implement new digital data-acquisition system
 - And expand the usable IF bandwidth
 - Correlator capacity

- **DG-INFSOC**
 - **Current call**
 - On scientific data repositories
 - ERA-Net on collaboration and policies
 - **Call for 2010 work-programme (200M€)**
 - Data structures, common access methods for science
 - Computing (facilities and access methods mostly)
 - User communities, with focus on new applications
 - **Discussion seemed to take infrastructures for granted**
 - Argued for more innovative applications
- **DG-RTD**
 - **Only targeted call left in FP7**
 - Otherwise over-subscription would only cause frustration (130M€ left)
 - **EXPRoS considered for this**
 - But experts see clash with RadioNet extension, recommend for DG-INFSO
- **Joint program committee expected to resolve this**
 - **Expecting enough room for EXPRoS in DG-INFSO User Communities**
 - push for innovative networking applications

- **Assuming there will be an opportunity before the end of 2009**
 - Aiming for a similar size programme
- **Must address new features, but can re-use lot of structure**
 - Not sure if we want to keep the name EXPRoS
- **JIVE would like to continue to be coordinator**
 - And host Management and Outreach NA
- **Will need some consulting of the EXPRoS partners**
 - And looking for volunteers...
 - Probably needs to wait the contours of the goal

- **Networking, should largely be the same**
 - NA1 management
 - NA2 eVSAG very much needed
 - NA3 NREN forum to be continued
 - NA4 outreach is important
- **Trans National Activities**
 - excluded by EVN presence in RadioNet?
 - or can we sell access to dedicated array? or LOFAR?
- **Service activities**
 - 10 Gbps equipment
 - Buffering, R+D activity at JIVE and for FieldSystem?
 - Connecting Noto, Japan, Russian, Ukranian and NRAO telescopes?
- **Joint research activities**
 - Dynamic light-paths, distributed correlation?
 - Spacecraft detection science?

