



## European VLBI Network Newsletter Number 17 May 2007

[EVN Homepage](#)
[Publications](#)
[Meetings](#)
[User Support](#)
[Proposals](#)
[JIVE Homepage](#)
[Newsletter Archive](#)

### [Contents](#)

1. [Call for Proposals - Deadline 1 June 2007](#)
2. [Message from the Chairman](#)
3. [First 512 Mbit/s e-EVN image; New e-VLBI observing policy](#)
4. [Polarisation VLBI with Nasmyth and E-W mount types](#)
5. [Stirring the Embers: High Sensitivity VLBI Observations of GRB 030329S](#)
6. [Meeting of the VSOP-2 tracking station study group at Yebes](#)
7. [EVN Scheduler's Report from the Last Observing Session](#)

## 1. Call for Proposals - Deadline 1 June 2007

**ALL EVN and GLOBAL PROPOSALS must now be submitted with the [ONLINE PROPOSAL SUBMISSION tool Northstar](#).**

**Email submission is no longer accepted**

[Detailed Call for Proposals](#)

Observing proposals are invited for the [EVN](#), a VLBI network of radio telescopes spread throughout Europe and beyond, operated by an international Consortium of institutes.

The EVN is open to all astronomers. Use of the Network by astronomers not specialised in the VLBI technique is encouraged.

The [Joint Institute for VLBI in Europe \(JIVE\)](#) can provide [support and advice](#) on project preparation, scheduling, correlation and analysis.

### EVN Observing Sessions in 2007-2008

2007 Session 2 May 31 - Jun 20 18/21cm, 6cm, 5cm, S/X  
 2007 Session 3 Oct 18 - Nov 08 18/21cm, 5cm, 7mm, +...  
 2008 Session 1 February-March 18/21cm, 5cm, 1.3cm, +...

Proposals received by 1 June 2007 will be considered for scheduling in Session 3, 2007 or later. Finalisation of the planned observing wavelengths will depend on proposal pressure. Other wavelengths which may be scheduled in 2007-2008 are 90cm, 50cm, 30cm, and 3.6cm.

### Special features for Sessions in 2007-2008

- Proposals at 7 mm are encouraged as this frequency is likely to be available in Session 3/2007.
- Recording at 1 Gb/s (Mark 5A) is now possible for an increasing number of projects. It is planned that this will become soon the standard observing mode for all continuum EVN-only projects.
- MERLIN is now available for joint EVN+MERLIN observations in all sessions, for any EVN wavelengths which MERLIN supports (18/21cm, 6/5cm, 1.3cm). However, limited resources during e-MERLIN construction mean that joint EVN+MERLIN will be scheduled at no more than two of these bands (usually 18/21cm and 5/6cm) in any one session.
- Observing time during additional short 24-hour e-VLBI runs in August, September and October 2007 will also be available. See the [e-VLBI Call for Proposals](#) for details.

### Large projects

Most proposals request 12-48hrs observing time. The EVN Program Committee (PC) also encourages larger projects (>48 hrs); these will be subject to more detailed scrutiny, and the EVN PC may, in some cases, attach conditions on the release of the data.

### How to submit

The [on-line proposal submission tool Northstar](#) now replaces the old Latex-email way of submission for all EVN and Global proposals; EMAIL PROPOSAL SUBMISSION IS NOT POSSIBLE ANYMORE. Global proposals will be forwarded to NRAO automatically and do not need to be submitted to NRAO separately.

To use Northstar, people should [register](#) (only for the first proposal submission), enter the information about the investigators and the technical specifications of the proposed observations (equivalent to that previously in the coversheet) using the on-line forms, and upload a scientific justification in pdf or ps format. The scientific justification should be limited to 2 pages in length. Up to 2 additional pages with diagrams may be included. The deadline for submission is 23:59:59 UTC on 1 June 2007.

### Additional information

The [detailed Call for Proposals](#) has further information on Global VLBI, EVN+MERLIN and guidelines for proposal submission.

The [EVN User Guide](#) describes the network and provides general information on its capabilities.

The [EVN Status Table](#) gives current antenna capabilities.

The [On-line VLBI catalogue](#) lists sources observed by the EVN and Global VLBI.

## 2. Message from the Chairman

Dear Vlbier,  
this issue of the EVN newsletter has been made public immediately after the last EVN Consortium Board of Directors meeting held in Helsinki, hosted by the Metsahovi Radio Observatory. That was the last meeting I chaired. The new Chairman is Rafael Bachiller (OAN - Yebes). Following the tradition, the next EVN CBD will be organized in Madrid in November by the new Chairmans Institute.

The Chairman of the EVN Consortium, a bottom-up organization, acts as a coordinator, with the aim to pursue the decisions taken by the EVN Executive. To achieve results, collaborations of people at the stations and support from the member institutions is essential. The support has been great in the past two years as it usually is. The always present difficulties in finding enough financial support for upgrading and operations of the network, often make the progresses we planned sometime too slow. This is the case for the frequency agility of the telescopes in the array, a project launched long ago with the aim to increase the efficiency of the EVN operations. At present, too few telescopes in the array are flexible in changing the observing frequency in few minutes. On the other hand, the optical fibre link of the telescopes went on much faster than expected. We have now 6 stations able to send data to the EVN JIVE correlator for real-time correlation. Regular tests are organised every six weeks and part of the 24 hours sessions are made available for science observations. The first papers with the results achieved by those observations have been already published. Further progress in eVLBI is expected thanks the EC funded project EXPReS. A policy for Target of Opportunity observations is under discussion by the CBD to take advantage of the new possibility offered by real-time correlation, making the EVN more flexible and ready for observations of transient phenomenon.

EVN has successfully completed the transition from tape drives to Mark5A. The transition phase went on quite smoothly. Now the network is much more reliable and the quality of the data provided to the P.I.s have considerably improved. However, it took more than expected to the stations to achieve the needed amount of disks space for recording. The EVN operations can now sustain 10 days of continuous recording at 1 Gbps, greatly increasing the sensitivity of the array. On the other hand the calibration of the array still represents a problem, which mainly derived by the fact that the telescopes in the network are different from each others. There is also a human component which contributes to make the calibration issue critical. In fact, more attention and careful measurements are desired at each station in doing regular check of the telescope performances and in providing the needed calibration information to the PIs. This is an open action item for the network since the beginning.

A period of great changes in the VLBI world is approaching. The data acquisition system, MKIV and VLBA terminals, are becoming obsolete. Plans has been made to face this serious problem. But again, there are difficulties in coordinating the efforts to move faster towards new solutions. New backends have been designed in the recent past based on the huge progresses made by digital technology. EVN has endorsed a project called Digital Base Band Converters. Haystack is developing the so called DBE and NRAO is working, in collaboration with Haystack, on DBEN. What we would like to have are more reliable and cheaper backends which can substitute the analog devices. A Critical Design Review of DBBCs has been recently organized on behalf of the EVN in Bologna (Istituto di Radioastronomia). The Haystack and NRAO experts took part in the discussion as members of the panel. One of the main outcome of the meeting was the desire for stronger collaborations, exchange of expertise and the need to achieve full compatibility between the various designs. New backends are also needed for stations aspiring to join the EVN like Eupatoria (Ukraine) and Irbene (Latvia) and for the coming new stations like Yebes 40m and Sardinia Radio Telescope.

I should have started this contribution writing about the quality of science done with the EVN, or VLBI in general. In my opinion our community is giving a great contribution in astrophysical studies. This was recently made evident by the success of the 8th EVN Symposium held in Torun in terms of participants, mainly young people, number of participants and quality of the contributions. Possibly, the next VLBI symposium in 2008, will be the 1st International VLBI Symposium as a results of a major integration process between the EVN and the VLBA, which started at the EVN CBD meeting held in Bonn. The first outcome of that discussion was an "Addendum to the EVN Memorandum of Agreement" signed by the EVN Chairman and by the NRAO Director to officially ratify such policy. In the meantime a group of volunteers, supported by young enthusiastic scientists, is elaborating the "EVN2015 Science Vision", a report that will be ready soon for open discussion.

A great future is in our hands.

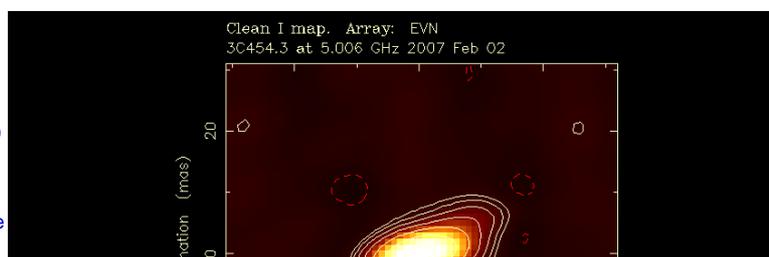
Franco Mantovani - IRA-INAF

## 3. First 512 Mbit/s e-EVN image; New e-VLBI observing policy

On 2 February 2007 we carried out the first successful five station e-VLBI observations at 512 Mbit/s. The array consisted of Cambridge, Jodrell Bank (MkII), Medicina, Onsala and a single dish of the Westerbork array. The target source 3C454.3 was observed for about an hour, without notable problems (see image). Torun was also part of the array, but its data rate was limited to about 480 Mbit/ps.

While the dynamic range of this image is limited by the short observation time and the poor uv-coverage, this is an important milestone on the way towards reaching sensitivities comparable to those achieved with traditional disk-based VLBI. During April a major upgrade of the JIVE local network was initiated, as well as software and hardware upgrades of the Mark5As at the telescopes and at JIVE. This resulted in the first sustained 512 Mbit/s data rates from Torun in the beginning of May.

Besides the six telescopes regularly participating in e-VLBI experiments, additional telescopes will be soon available. On 5 March 2007 we carried out a fringe test at 22 GHz, with Metsahovi participating for the first time in real-time observations with the e-EVN. Fringes were detected to all participating telescopes: Cm, Jb2, Mc, On60 and Mh. The data rate in this test was 256 Mbit/s, but earlier formatter tests showed that reaching 512 Mbit/s from Metsahovi is no problem. At the end of the year other telescopes are expected to join the e-EVN array. These are the 100m Effelsberg telescope, the new 40m telescope at



Yebes, and Shanghai. This expansion will greatly increase the sensitivity, resolution, and image fidelity of the e-EVN.

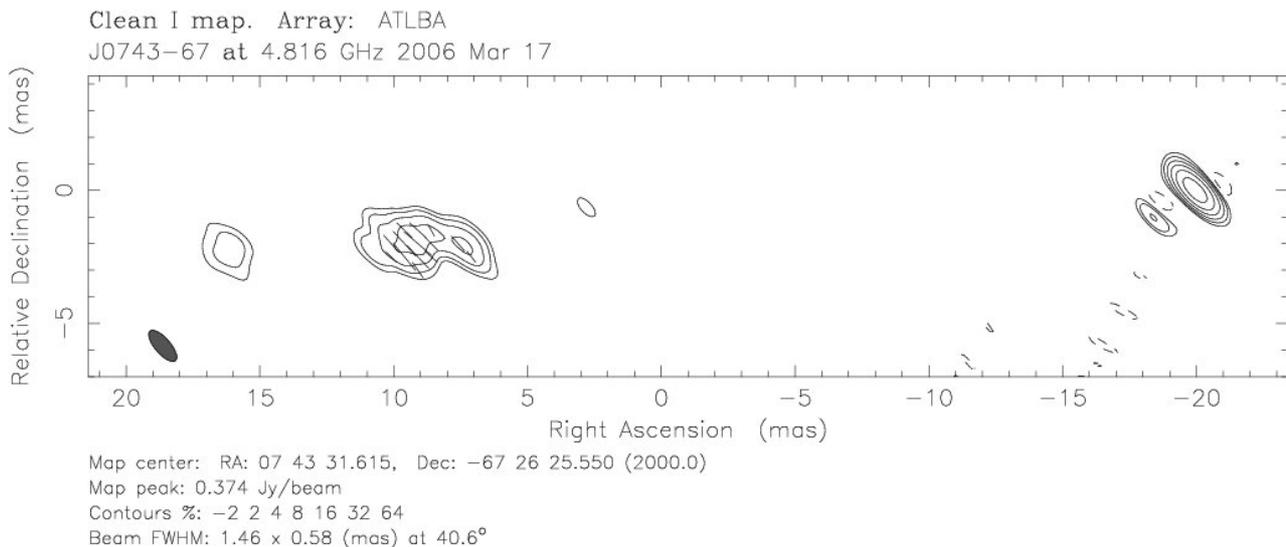
In the meantime the EVN Program Committee and the EXPReS e-VLBI Science Advisory Committee have decided on a new e-VLBI observing policy which has been approved by the EVN Directors. The essence of this new policy is that continuum as well as spectral line projects will be supported. It also provides opportunities for triggered projects (only continuum), which will be observed in case a source is found to be in a flaring state before the e-VLBI run. All proposals have to be submitted by the 1st June deadline (see [http://www.evlbi.org/evlbi/call\\_evlbi.html](http://www.evlbi.org/evlbi/call_evlbi.html)). In case the trigger condition is fulfilled, the EVN PC Chairman has to be notified up to 24 hours before the e-VLBI run. In addition, short observations (less than 2 hours) may be requested from the EVN PC Chairman to check for calibrator or target source compactness, up to three weeks before the run. The coming e-VLBI runs are 25-26 June (for these dates the old policy still holds; see the call for proposals coming out in early June), 21-22 August, 6-7 September, and 9-10 October 2007. We hope that these new rules will open the e-EVN for a much wider range of applications.

Zsolt Paragi, for EXPReS

#### 4. Polarisation VLBI with Nasmyth and E-W mount types

To allow the analysis of polarised VLBI images made with some non-VLBA arrays we have been developing the required new AIPS code. The main driver is to enable polarisation solutions for the new Yebes 40m antenna. This, to allow many simultaneous multi-band feeds, uses the Nasmyth focus. The new code to correct the feed motion of this type has been implemented, along with similar code for the E-W mount type. The E-W mount is used (only, to my knowledge) by the Hobart telescope in the LBA. As the Yebes antenna has not completed commissioning the Nasmyth tests have been run using the Pico Veleta antenna, as part of the GMVA. These all appear to have been successful, although there are further checks needed before merging with the vanilla AIPS distribution. Similarly we are testing of the E-W mount type. We present here an image from the complete LBA, which we believe is the first polarisation image made with it, showing the Southern compact object J0743-67.

The code is still under going final verification, but should be merged with the AIPS code shortly, allowing seamless, full polarisation, observations with Yebes as part of the EVN, Pico Veleta as part of the GMVA and Hobart as part of the LBA.



The image of J0743-67 from experiment V182A. The polarisation vectors are shown overlaid. Absolute polarisation angles can not be derived so the direction is arbitrary. The core (to the West) is unpolarised (< 1%) and the jet (to the East) is smoothly polarised with a polarised fraction of approximately 16%.

Richard Dodson, OAN

#### 5. Stirring the Embers: High Sensitivity VLBI Observations of GRB 030329

by Pihlstrom, Y.M., Taylor, G.B., Granot, J. & Doeleman, S.

We have observed the radio afterglow 806 days after the gamma-ray burst of 2003 March 29 (GRB030329), using high sensitivity VLBI observations at 5 GHz. The observations were coordinated through the EVN, and included the GBT, Effelsberg, Arecibo, WSRT tied array and the 25m Mark II Jb telescopes. These observations clearly demonstrates that the expansion velocity has slowed down over time, with a transition to the non-relativistic regime at about 1 yr. The evolution of the image size favors a uniform external density over a wind-like stratified external medium, although the latter model cannot be completely ruled out yet.

For more detailed information on the scientific results, please see the astro-ph server: <http://arxiv.org/abs/0704.2085>

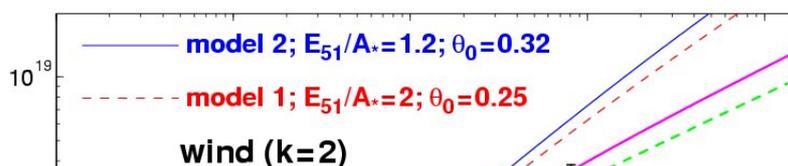


Figure caption: Tentative fits of theoretical models for the evolution of the source size to the image size of the radio afterglow of GRB030329. In model 1 there is relativistic lateral spreading of the jet, while in model 2 there is no significant lateral expansion until the jet becomes non-

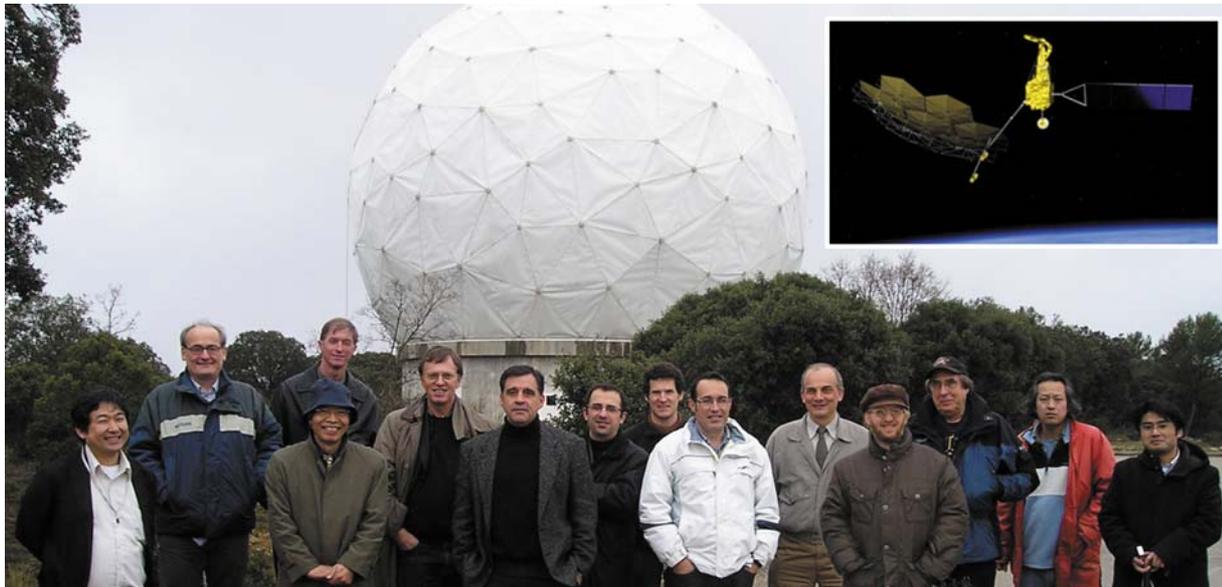
uniform, and the wind model uses a  $r^{-2}$  profile.

relativistic. The ISM models the external density is

## 6. Meeting of the VSOP-2 tracking station study group at Yebes

The Japanese space mission ASTRO-G (also known as VSOP-2) consists in a deployable 9-m antenna in a 25.000 km orbit, in order to perform astronomical VLBI observations together with the larger ground radiotelescopes. Because of the huge spatial resolution achievable, ASTRO-G is expected to contribute to discoveries that will transform several fields in Astronomy. The project was approved last year by the Japanese Space Agency (ISAS/JAXA), for an expected launch in 2013.

A meeting was held at the headquarters of the National Astronomical Observatory (OAN) of Spain in Madrid, and the Yebes Astronomical Center (CAY) on February 19-20 2007, where representatives of ISAS/JAXA, ESA, NASA, JIVE and OAN attended, focused on the planning of tracking stations for ASTRO-G. The satellite will link to Earth at frequencies around 40 GHz, so a possible tracking station segment would include the 10-m antenna at Usuda (Japan), 20-m at Green Bank (USA), and 14-m at Yebes.



Pictures: Photo group of the participants in the VSOP-2 tracking-station meeting at Yebes. The 14-m antenna could be used for tracking, while the new 40-m radiotelescope will participate in the ground network.

Francisco Colomer - OAN

## 7. EVN Scheduler's Report from the Last Observing Session

2007 Session 1: 28 Feb - 21 March

Wavelengths: 6cm (+MERLIN), 1.3 cm, 18/21 cm (+MERLIN), 5cm

This session followed the very short session 3 of 2006. At the time of scheduling it was foreseen that both Urumqi and Shanghai might be unavailable for session 2 (they would be needed for tracking the Chinese Lunar Explorer space mission), thus limiting the capabilities of that session. For this reason session 1 was long, using the entire 3-week reserved period. Arecibo was not available for this session, preventing 1 global project from being scheduled. Before the session the Jodrell Lovell Telescope was found to have a serious crack in one of its wheels and had to be withdrawn from the session. Projects were observed with the Mk2 telescope instead. The Effelsberg telescope was back in operation for the EVN, following the replacement of the sub-reflector and modifications to the prime focus cabin in autumn 2006.

The session contained 1 global project (at 21 cm), and 3 observations using MERLIN. The 1.3cm section contained only a single user observation. This was for a monitoring project requiring an urgent epoch, which could not be observed in session 3 2006 due to the unavailability of Effelsberg and the Chinese antennas. A number of projects were observed using the most sensitive recording mode at 1 Gb/s, including studies of samples of both SDSS quasars and Type II quasars. At 6cm, the X-ray binary LS 5039 was observed at 3 epochs, with a spacing between epochs of 2 days. At 5cm a 2nd epoch was observed of a 5-epoch project to measure the parallax and proper motion of Galactic methanol masers.

[Richard Porcas, EVN Scheduler](#)