



European VLBI Network Newsletter Number 18 September 2007

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1. Call for Proposals - Deadline 1 October 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 3 Oct 18 - Nov 08 18/21cm, 5cm, S/X, 7mm

2008 Session 1 Feb 28 - Mar 20 18/21cm, 5cm, 1.3cm, +...

2008 Session 2 May 29 – Jun 19 6cm, +...

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

Special features for Sessions in 2008

- Proposals at 7 mm are encouraged as this frequency is likely to be available in Session 1/2008
- Observing time during additional short 24-hour e-VLBI runs in November, December 2007 and January, February 2008 is also be available. See the [e-VLBI Call for Proposals](#) at http://www.evlbi.org/evlbi/call_evlbi.html for details.
- MERLIN is 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.

- 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.

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 October 2007.

Additional information

The [detailed Call for Proposals](http://www.obs.u-bordeaux1.fr/vlbi/EVN/call-long.html) (<http://www.obs.u-bordeaux1.fr/vlbi/EVN/call-long.html>) has further information on Global VLBI, EVN+MERLIN and guidelines for proposal submission.

The [EVN User Guide](http://www.evlbi.org/user_guide/user_guide.html) (http://www.evlbi.org/user_guide/user_guide.html) describes the network and provides general information on its capabilities.

The [EVN Status Table](http://www.mpifr-bonn.mpg.de/EVN/EVNstatus.txt) (<http://www.mpifr-bonn.mpg.de/EVN/EVNstatus.txt>) gives current antenna capabilities.

The [On-line VLBI catalogue](http://db.ira.inaf.it/evn/) (<http://db.ira.inaf.it/evn/>) lists sources observed by the EVN and Global VLBI.

Patrick Charlot - Chairman of the EVN Program Committee

2. Call for EVN e-VLBI science proposals - Deadline 1 October 2007

Proposals for EVN eVLBI observations on pre-scheduled dates in late 2007/early 2008 are invited for submission for the Oct 1st EVN deadline. New features and possibilities for eVLBI observing include the following.

- Based on recent tests (see http://www.express-eu.org/512Mbps_6tel.html) it is expected that a 512Mbit/s bit rate can be achieved.
- A special 'double header' observation is scheduled for January 2008, with two eVLBI runs three days apart in which the schedule for the second run can be changed based on the results of the first run.
- A new class of 'triggered' e-VLBI proposal is now defined in which a pre-approved project can be activated up to 24 hours before a scheduled eVLBI run based on a trigger criterion being met. In addition other 'standard' eVLBI proposals are no longer restricted to rapid response science.
- Spectral line observations are now supported.
- 1.3cm band observations can now be proposed for.

Scheduled e-VLBI runs for which observations can be proposed for the October 1st EVN deadline are:

Run start	Run end
Thur 15 Nov 13:00 UTC	Fri 16 Nov 13:00 UTC
Tue 11 Dec 13:00 UTC	Wed 12 Dec 13:00 UTC
Mon 21 Jan 13:00 UTC*	Tue 22 Jan 13:00 UTC*
Thur 24 Jan 13:00 UTC*	Fri 25 Jan 13:00 UTC*
Tue 5 Feb 13:00 UTC*	Wed 6 Feb 13:00 UTC*

Note * indicates a provisional date to be confirmed). Participating EVN antennas are the following seven stations, Wb14 (tied array, except 5cm), Tr, On85, Mh, Mc, Jb2 and Cm. Wavelength bands covered are 18/21cm, 6cm, 5cm and 1.3cm. Please see http://www.evlbi.org/evlbi/e-vlbi_status.html for the availability of different eVLBI stations per observing band. Note that because of on-going engineering work participation of Jb2 and Cm cannot be guaranteed and/or they may be replaced by other MERLIN telescopes.

NOTE That the sessions in early 2008 are scheduled close together and proposals making creative use of these runs are highly encouraged. In particular it will be possible to use the two runs in January for 'adaptive observing' where the schedule for the second run is changed in response to the results of the first run. For such an adaptive observation the PIs will be expected to visit JIVE for the observations. Note however that the January sessions are not exclusively reserved for observations in this adaptive mode and other types of proposals are also encouraged.

TECHNICAL DETAILS

CONTINUUM OBSERVATIONS - will be run at the highest possible reliable bit rate. Based on recent experience it is expected that 512 Mbit/s is very likely to be achieved and 256 Mbit/s virtually certain (however Cm is presently limited to 128 Mbit/s of useful data by its microwave link). Continuum observations can be proposed for only one of the bands 18, 6 and 1.3cm in any given 24hr session.

SPECTRAL LINE OBSERVATIONS - can be carried out at recording rates between a minimum of 32 Mbit/s and a maximum of 512Mbit/s. For two-bit, dual-polarisation observations, the lower limit implies at least 4 channels of 4 Msample/sec sampling (Nyquist channel bandwidth = 2MHz; with oversampling possible down to spanned channel bandwidths of 0.5MHz). Observations may be proposed for the 18cm/21cm, 5cm and 1cm bands. Note that only standard and short observation proposal types (see below for definitions) are allowed for spectral line observations. Triggered spectral line proposals will not be accepted.

e-VLBI OBSERVATION CLASSES

The new eVLBI submission policy defines three classes of EVN eVLBI observation. Time within the first two classes will only be allocated in response to proposals submitted for the standard EVN proposal deadlines of 1st Feb, 1st June and 1st Oct. PI's should make clear in the proposal text which class of observation is being requested.

1) Standard e-VLBI proposals

Any proposal requesting e-VLBI observing time during one or several e-VLBI sessions, excluding triggered response science. Such proposals may also request observing time during regular EVN sessions using disk recording. Monitoring proposals may be submitted but observations cannot be guaranteed in every requested session as they may be overridden by higher rated, triggered e-VLBI proposals. Standard proposals can be either continuum or spectral line.

Scheduling will be done by JIVE staff using the technical information included in the proposal; it is therefore vital that all technical aspects are fully specified in the proposal.

2) Triggered e-VLBI proposals

A proposal is to be scheduled during an e-VLBI run only if a specific triggering criterion is met. Accurate source coordinates need only be included in the trigger request, not the original proposal. Only continuum observations can be proposed for within this class. Triggered proposals must include a precise and justified triggering criterion and a minimum number and configuration of telescopes required.

PIs of successful proposals in this class will be informed after proposal review that their trigger requests will be accepted. Such trigger requests should be sent by e-mail to the EVN PC Chair (Patrick Charlot <charlot@obs.u-bordeaux1.fr>) with copies to the EVN Scheduler (Richard Porcas <porcas@mpifr-bonn.mpg.de> and JIVE/EXPREs (Bob Campbell <campbell@jive.nl>, Zsolt Paragi <zparagi@jive.nl>). These trigger requests must be received no later than 0800 UT the day before the eVLBI run. The email should provide evidence that the trigger criterion in the original proposal has been met and give the exact GST range and source position requested. All requested technical parameters must match those in the original proposal. The PC Chairman will evaluate the trigger request (and decide on priorities if more than one conflicting trigger request is received) and will inform the PI by 1700UT whether their experiment is to be observed. The experiment will then be scheduled by JIVE staff in accordance with the instructions given in the original proposal.

3) Short e-VLBI observations

Short e-VLBI observations may be requested for checking calibrator or target source compactness in preparation for a larger VLBI observation or proposal. These projects are limited to less than 2 hours in length. Such requests may be submitted up to three weeks prior to the start of any e-VLBI run directly to the EVN PC Chairman. There is no need to submit a full proposal via Northstar but the email to the Chairman must clearly indicate the purposes and observing details of the proposed observation including all information needed for scheduling (including position information of targets and calibrators).

PROPOSAL DETAILS

Proposals requesting observing time for the above runs should be submitted by the 1 October 2007 deadline. Proposals can be made for any length of time within the above advertised slots up to 24 hours in length. Short time requests (defined above) of up to 2 hours in length can be submitted directly to the PC Chairman up to three weeks before each run. Proprietary rights on all eVLBI data are the standard ones of one year after data distribution (see archive policy at http://www.evlbi.org/user_guide/archive_policy.html). All standard and triggered proposals must use the Northstar online submission tool (see details below).

Because detailed scheduling of eVLBI runs will be done by JIVE staff all eVLBI proposals must include the observing frequency, the requested GST range, the minimum bit rate and a minimum number and configuration of telescopes required. It is essential that standard proposals also include accurate target and calibrator positions. For triggered proposals as much information as possible should be given about potential targets and their calibrators, which will ease in evaluating the technical feasibility of the proposed observations. The technical details of all proposals should be discussed with JIVE staff prior to submission to ensure proper and efficient scheduling (contact Bob Campbell <campbell@jive.nl>).

HOW TO SUBMIT

The on-line proposal submission tool Northstar replaces the old Latex-email way of submission for all proposals which involve the EVN, including proposals for e-VLBI runs.

To use Northstar proposers should register at <http://proposal.jive.nl> (only for the first proposal submission), complete the technical information on-line (equivalent to that previously in the cover-sheet) and upload a scientific justification in pdf or ps format. Standard page limitations apply and will be enforced. If advice is needed about submitting via Northstar please contact Cormac Reynolds (reynolds@jive.nl) or other JIVE staff. **The deadline for submission of standard and triggered proposals is 23:59:59 UTC on 1st October 2007.**

ACKNOWLEDGEMENT

The continuing development of e-VLBI within the EVN is made possible via the EXPRoS project funded by the EC FP6 IST Integrated infrastructure initiative contract #026642 - with a goal to achieve 1 Gbit/s e-VLBI real time data transfer and correlation.

John Conway - Chairman EVN eVSAG (eVLBI Science Advisory Group)

3. Message from the Chairman of the EVN Board of Directors

This is the first issue of the EVN Newsletter edited in Spain. Paco Colomer (OAN) has agreed to become the Newsletter Editor for a period of two years. During this period the newsletter will continue to be published prior to each VLBI proposal deadline with the aim of (i) informing astronomers interested on VLBI about the current capabilities of the EVN array, (ii) bringing EVN users up to date with recent and planned enhancements, and (iii) underlining the excellent scientific results being obtained with VLBI. All EVN users are encouraged to communicate their recent scientific results to Paco (f.colomer@oan.es) making his work easier and this publication more interesting.

I was appointed Chairman of the EVN Consortium Board of Directors on June 2007 and will hold this position until May 2009. Simon Garrington (JBO) was appointed vice-chairman for the same period. This will be an extremely exciting time for our network. The enormous technological enhancements that have been and are being implemented during the last years (successive upgrades of the receiving/recording systems, optimization of the software and of the JIVE correlator and, most notably, the put in operation of the e-VLBI) are already providing excellent scientific fruits, and are expected to give full reward in the next future. In addition, we are facing big challenges such as the insertion of new large telescopes (Yebes, Sardinia, and other dishes) into the array, the extension and routine operation of the e-EVN, the increase in agility of the array (both in frequency and for transient phenomena), the culmination of the European DBBC development, the planning of a new correlator at JIVE, etc. In summary: we are approaching an exciting time of improvements and changes.

This newsletter informs about the recent appointment of Huib van Lagevelde as new director of JIVE. I congratulate Huib for his appointment and send my best wishes of success in his new position. Moreover I take this opportunity to underline how crucial is for EVN the work done by all JIVE staff and by the EVN bodies and officials. The EVN Programme Committee, currently chaired by Patrick Charlot, is of top importance in order to select the best projects and optimize the scientific return. The work of the scheduler, Richard Porcas, is as well of primordial importance to have a well coordinated array. The EVN could not tackle all the technical developments mentioned above without the excellent work of its Technical and Operations Group (TOG), currently chaired by Walter Alef.

The European Framework Programmes are providing an outstanding opportunity for the EVN institutes to strengthen both the links among us and our links with other institutions. In the coming months we will pursue and develop the initiatives of RadioNet, EXPRoS, etc, which are intricately linked to the EVN activities. Preparing, coordinating and developing such complex proposals will require the contribution of many of the EVN astronomers. We are also finishing now a science vision document for the EVN in the horizon of 2015, which will be the reference for the future of the network.

All the issues mentioned here will constitute the central discussions at the next meetings of the CBD to be organized by OAN in Madrid on November 13. All astronomers, engineers, and technical personnel involved in the EVN will become affected by the coming improvements and changes. All of them are warmly requested to contribute to keep a EVN array which is unceasingly increasing its performance.

Rafael Bachiller, OAN-IGN

4. EVN Scientific Highlights

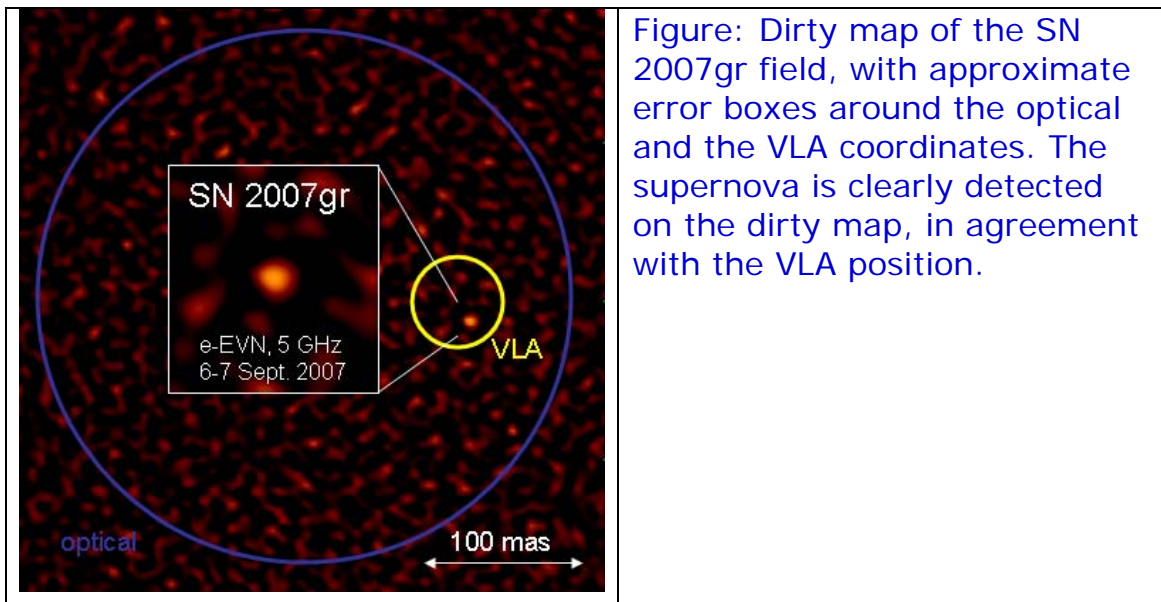
• e-VLBI Detection of SN 2007gr

SN 2007gr was discovered at magnitude 13.8 with KAIT on August 15.51 UT, 2007 in the bright spiral galaxy NGC 1058 at a redshift of $z = 0.001728$ (Madison and Li, CBET 1034, 2007) which corresponds to a distance of about 7.3 Mpc. The source was at discovery the 3rd brightest SN of the year, and was classified as Type Ib/c (and a possible Hypernova). This type of supernova is thought to arise from the core collapse of a Wolf-Rayet star, and has drawn increasing attention in recent years owing to their sparse association with long duration gamma-ray bursts. Since such core collapses are believed to generate ultra-relativistic jets, observable among other wavelengths in the radio, the only means to confirm or rule out potential jet superluminal expansions in these sources, is very high sensitivity and high resolution afforded only with VLBI imaging.

Radio observations of SN 2007gr with the VLA on Aug 17.41 UT indeed revealed a radio source with a flux density of 610 microJy (Soderberg Atel 1187, 2007). We organised Target of Opportunity e-VLBI observations to attempt milliarcsecond-scale detection of this supernova. These took place on 6-7 September for 12 hours (21:00-09:00 UTC) at 4.97 GHz with the array of Darnhall, Jodrell Bank (MkII), Medicina, Onsala, Torun and Westerbork (phased array)

telescopes. Each telescope sent data to the correlator at a rate of 256 Mbps, except for Darnhall which contributed with an effective data rate of 128 Mbps due to microwave link limitations. There were 4*8 MHz subbands observed in both RCP and LCP polarizations. The target was phase-referenced to the nearby calibrator J0253+3835. Further calibrators were observed that were used to calibrate the flux scale of the VLBI dataset by comparing the WSRT synthesis array data and VLBI amplitudes. The achieved rms noise level was 75 microJy/beam.

The supernova was detected with a flux density of 422 microJy, corresponding to a signal to noise ratio of 5.6. Its position was in agreement with the VLA coordinates (see figure). At the epoch of the observations the source was apparently unresolved. This result has been quickly published in the Astronomer's Telegram (ATel 1215 - <http://www.astronomerstelegam.org/?read=1215>). Future high resolution observations are planned to follow the expansion of SN 2007gr. If detected as an extended radio image in its early evolutionary phase, this might be the first case of a relativistic jet found in a nearby core collapse supernova, and it is therefore, extremely interesting for both the supernova and the GRB communities.



Z. Paragi (JIVE), C. Kouveliotou (NASA/MFSC), M.A. Garrett (Astron), E. Ramirez-Ruiz (Univ. Santa Cruz), H.J. van Langevelde (JIVE/Leiden), A. Szomoru (JIVE), M. Argo (JBO)

- **Massive star-formation in G24.78+0.08 explored through VLBI maser observations**

The hypercompact HII region G24.78+0.08 A1 is ionized by an O9.5 (20 M_{sun}) star and located at a distance of 7.7 kpc. Previous interferometric observations in a variety of tracers have shown that this star powers a bipolar molecular outflow and lies at the center of a massive toroid rotating around the outflow axis. Recent VLA + Pie Town 7mm continuum observations complemented by VLBA proper motion measurements of H₂O 22.2 GHz masers have revealed that the hypercompact HII region is expanding on a very short time scale, on the order of about 40 yr only. Note that the age estimate is distance independent, as it depends on the ratio between the angular radius of the HII region and the maser proper motion in the plane of the sky. Using EVN we have observed the CH₃OH 6.7 GHz masers and found several emission centers distributed around the hypercompact HII region, with a larger angular separation from the ionizing star than that of the water masers. Two alternative interpretations are suggested: 1) methanol masers trace ambient gas not yet perturbed by the expanding outflow traced by the water masers; 2) methanol masers trace the same outflow as water masers do. Future EVN epochs at 6.7 GHz (with a time baseline of 1-2 yr) will allow us to measure the proper motion of the CH₃OH masers and to discern between the two different interpretations.

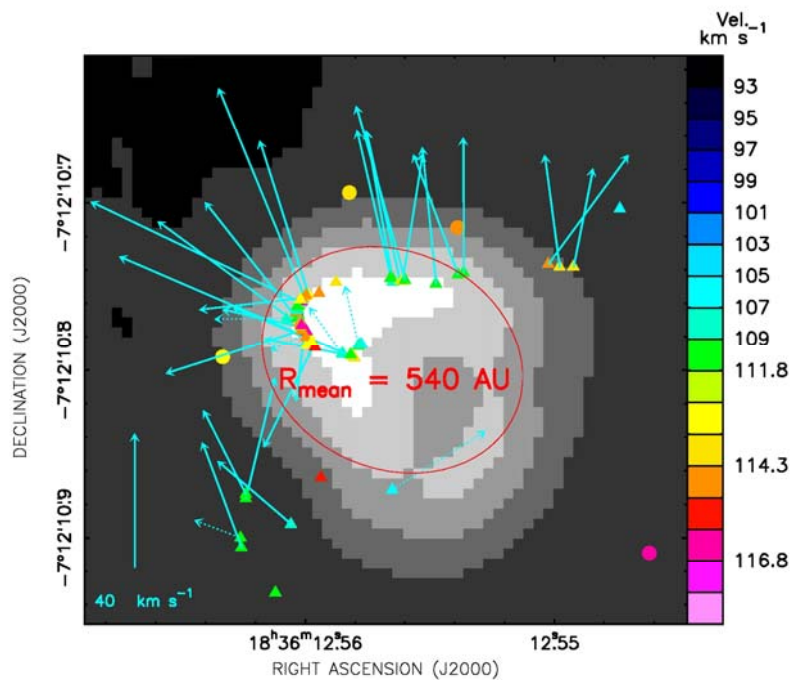


Figure: 7mm continuum image of the hypercompact HII region G24 A1 (grey scale) obtained with the VLA plus Pie Town link. The red ellipse shows the Gaussian elliptical fit of the continuum emission, resulting into a mean radius of 540 AU. Triangles denote water maser spots observed with VLBA, with measured proper motions shown by arrows. The amplitude scale of the proper motion is shown on the bottom-left corner of the plot. Dots denote methanol maser spots observed with EVN. Symbol colours refer to different spot line-of-sight velocities as given in the wedge on the right-hand of the plot.

Luca Moscadelli (Arcetri Astronomical Observatory, Italy)

5. EVN Technical Development and Operations

• EVN Scheduler's Report from the Last Observing Session

2007 Session 2: 31 May - 20 June.

Wavelengths: 6cm (+MERLIN), 18 cm (+MERLIN), 5 cm (+MERLIN), 13/3.6 cm

This session was originally planned without Urumqi and Shanghai, since these telescopes were to take part in tracking the Chinese Lunar Explorer space mission Chang'E-1. However, delays to that mission resulted in a shift of these activities to session 3 (October/November) which will be without these antennas. Consequently, it became desirable to schedule as many projects as possible requiring these antennas in session 2. Unfortunately, not all such projects could be scheduled due to limitations in the MK5A disk supply. An additional constraint was that the Jodrell Lovell Telescope was unavailable for daytime observations after June 10th, due to its summer painting program. It proved possible to match this unavailability with "GST gaps" forced by the approved projects, and by scheduling the 5cm section (which uses only the MK2 telescope at Jodrell) at the end of the session. The GBT was not available for this session, preventing 1 global project from being observed.

A single global observation was scheduled (observations of the 1612 MHz OH maser line in the circumstellar envelope of W43A). All currently approved 5cm projects were scheduled in this session, including a number which could not be observed before as they required MERLIN. The dual S/X-band section contained a single, 48-hour, 1 Gb/s project to identify faint compact radio sources which are also optical quasars, in order to increase the sample of sources which can be used to link the radio and optical (GAIA) reference frames.

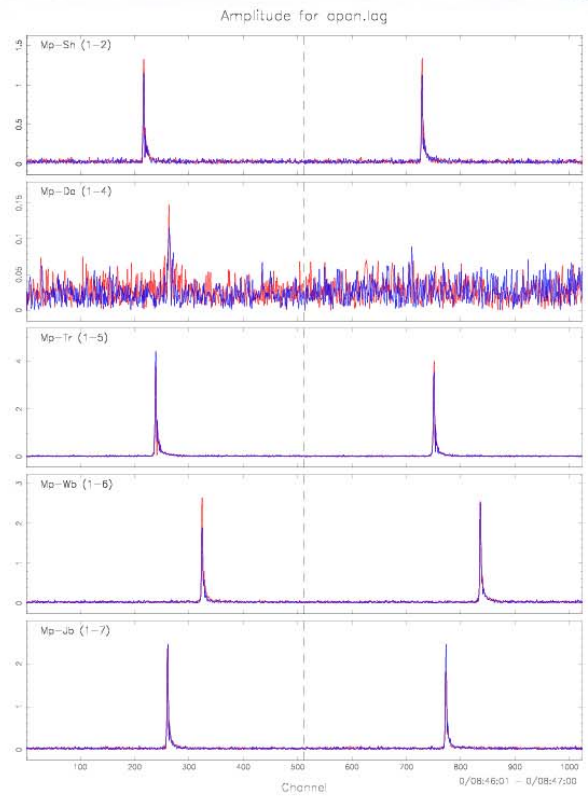
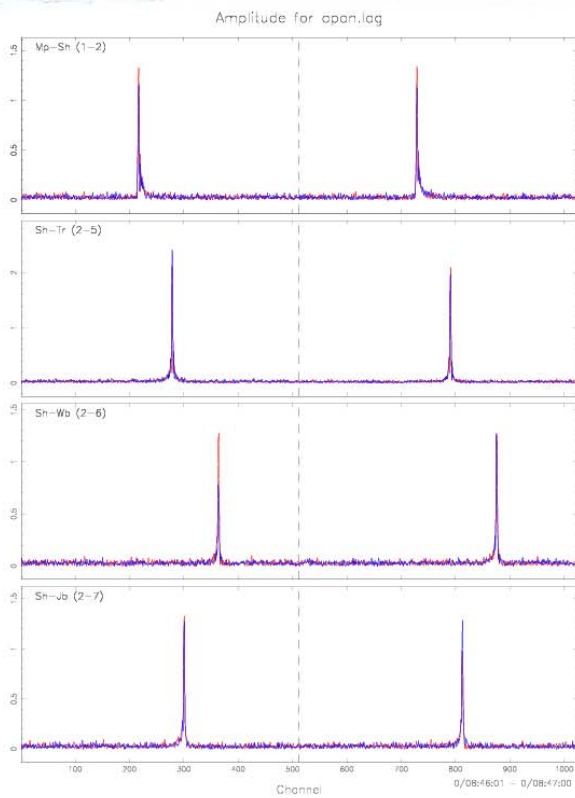
Richard Porcas (EVN Scheduler)

- **First e-VLBI data from China-Australia, China-Europe and Australia-Europe baselines**

On 28 August, collaborators in the EXPReS project conducted the first successful real-time correlation of e-VLBI data from China-Australia and China-Europe baselines during a demonstration at the Asian-Pacific Advanced Network meeting in Xi'An, China. As an added bonus, fringes from source 3C273B were obtained at the end of the run from Mopra and European telescopes. The Mopra-Darnhall baseline is one of the longest earth baselines ever, and the demonstration as a whole marked the culmination of considerable progress in data streaming solutions and coordination among numerous network providers.

EXPReS would like to extend congratulations and appreciation to everyone who made this e-VLBI run possible, including: the staff of participating telescopes Mopra, Sheshan, Darnhall, Jodrell Bank, Medicina, Torun and Westerbork; network providers AARNet, CANARIE, CERNET, CSTNET, DANTE and SURFnet; and the correlator staff at JIVE.

Kristine Yun, for EXPReS



- The 22 GHz first-light receiver at the 40-m radiotelescope in Yebes, Spain.

The new 40-m Radiotelescope of the National Astronomical Observatory (National Geographic Institute of Spain) at Yebes will cover the frequency range from 2 to 120 GHz. Initially it will be equipped with four receivers covering the K, S, CH and X bands. The 22 GHz is the first installed receiver which is being used for commissioning the telescope, and later will be available for single dish and VLBI observations. This receiver is cooled, low noise, dual circular polarization RCP/LCP). Two operational modes can be selected:



- In VLBI mode: An Upper Band, from 23.35 - 24.45 GHz, and a Lower Band, from 21.75 - 22.85 GHz.

- In SD mode: An Upper Band, from 23.57 - 24.27 GHz, and a Lower Band, from 21.97-22.67 GHz.

The 22GHz receiver is a superheterodyne receiver. At VLBI mode the receiver has two frequency conversions and an IF output bandwidth of 500MHz (from 500 to 1000MHz). At SD mode, it has three frequency conversions and an IF output of 100MHz (from 170 to 270MHz).

The corrugated horn, plane-hyperbolic lens, polarizer, directional coupler and low noise amplifiers are cooled down to cryogenic temperatures inside a cryostat, made in our labs. The cryostat has two stages, the coolest one at 12 Kelvin and an intermediate radiation shield at 66 Kelvin. The low noise amplifiers are made in InP technology at the labs in Yebes, with a noise temperature about 9 k. The measured noise temperature of the receiver is about 21 k. In addition the 22GHz receiver is provided with a Noise Source for gain calibration in VLBI mode which can be switched on/off at 80Hz.

6. Huib Jan van Langevelde named new director of JIVE



As of September 1, Dr. Huib Jan van Langevelde is the new director of JIVE. Huib has been a member of the JIVE staff for 12 years, holding various positions. Recently he has managed various international projects related to astronomical user software and computing, including FABRIC (Future Arrays of Broadband Radio-telescopes over Internet Computing) for the EXPReS project and ALBUS (Advanced Long-Baseline User Software) within the RadioNet consortium. His astronomical research focuses on the circumstellar matter around young and old stars, with an emphasis on astrophysical masers.

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