European VLBI Network Newsletter
Number 10
January 2005

EVN Homepage Publications Meetings User Support Proposals JIVE Homepage Newsletter Archive

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1. Call for Proposals - Deadline 1 February 2005

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 (http://www.evlbi.org/). 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. See EVN User Support at http://www.jive.nl.

EVN Observing Sessions in 2005

2005 Session 1 Feb 17 - Mar 10 18/21cm (+MERLIN), S/X, 6cm, 1.3 cm +...
2005 Session 2 Jun 02 - Jun 20 18/21cm (+MERLIN), 6cm + ...
2005 Session 3 Oct 20 - Nov 10 18/21 cm +...

Proposals received by 1 February 2005 will be considered for scheduling in Session 2, 2005 or later. Other wavelengths which may be scheduled in 2005 are: 90cm, 50cm, 30cm, 5cm, 3.6cm 1.3cm 7mm. Finalisation of the planned observing wavelengths will depend on proposal pressure.

More information can be found at http://www.obs.u-bordeaux1.fr/vlbi/EVN/call.html

2. Huygens Titan Probe under a VLBI magnifier

If asked in the middle of night 'what is the main formula describing VLBI in a nutshell' each VLBIer ought to say 'lambda over B'. But what about "B-squared over lambda', the distance dividing near- and far-field zones? Well, in our normal VLBI life this distance is not topical: objects of our usual interest (even the nearby stars) are in the far-field zone. This was not the case for a large group of radio astronomers unified under the aegis of the global VLBI project GG057. The events of last week happened very much in the near-field zone, just over 1 billion kilometres away, in the picturesque surroundings of Saturn.

On 14 January 2005, a new chapter in the exploration of the Solar system has begun. After a seven-year trip, the European spacecraft Huygens has reached its destination, the mysterious Saturnian moon, Titan. This achievement, part of the joint NASA-ESA-ASI mission, is arguably mankind's most sophisticated interplanetary endeavour to date. At least this is how the mission is described in the messages of congratulations from major Space agencies of the world received at ESA.

Radio astronomers provided crucial support to this mission by organising and conducting global VLBI tracking of the Huygens spacecraft during its plunge into the atmosphere of Titan, and after reaching the planet's surface (see articles in previous EVN Newsletters).

The leading radio telescope of the Huygens radio astronomy network, the R.C.Byrd Green Bank Telescope of the National Radio Astronomy Observatory, equipped with a JPL-supplied Radio Science Receiver provided the first confirmation of the healthy state of the Huygens spacecraft after its arrival in the atmosphere, some 6 hours before deep space network facilities began reception of the Huygens signal via Cassini. This confirmation was an invaluable and independent verification of the overall status of the mission.

VLBI data will enable the realisation of one of the major objectives of the mission – investigation of the wind dynamic of Titan's atmosphere. Closely coordinated with the VLBI project effort, a group from JPL conducted Doppler monitoring of the Huygens' carrier signal using a sub-set of telescopes involved in the VLBI observations. After the unfortunate failure of one of two communication channels between the Huygens and Cassini spacecraft, these Earth-based observations become particularly important.

According to the original mission scenario, Huygens was communicating to the Cassini spacecraft during the first three hours in the atmosphere of Titan. However, as confirmed by another member of the global Huygens VLBI network, the venerable Parkes radio telescope of the Australia Telescope National Facility, the Huygens spacecraft continued to transmit signals from the Titan's surface after completion of the data link with Cassini. When this longevity of Huygens became clear, a frantic attempt was made to observe Huygens at several Mk5-equipped VLBI telescopes in Europe, notably Onsala, Medicina, Westerbork and Wettzell. Even a few hours before the event, nobody dreamed of having Huygens observable from Europe! It is now clear that the data stored on VLBI Mk5 recorders from the GG057 run is the only source of unique information collected over at least the last two hours of the mission on Titan's surface.

"Express-analysis" of short sections of VLBI data acquisition conducted by JIVE in the first hours of the mission included:

> High-resolution single-dish spectral analysis of the Huygens' carrier signal; the spectrum confirmed excellent quality of the data and assured that the data acquisition setup was right (Fig. 1).

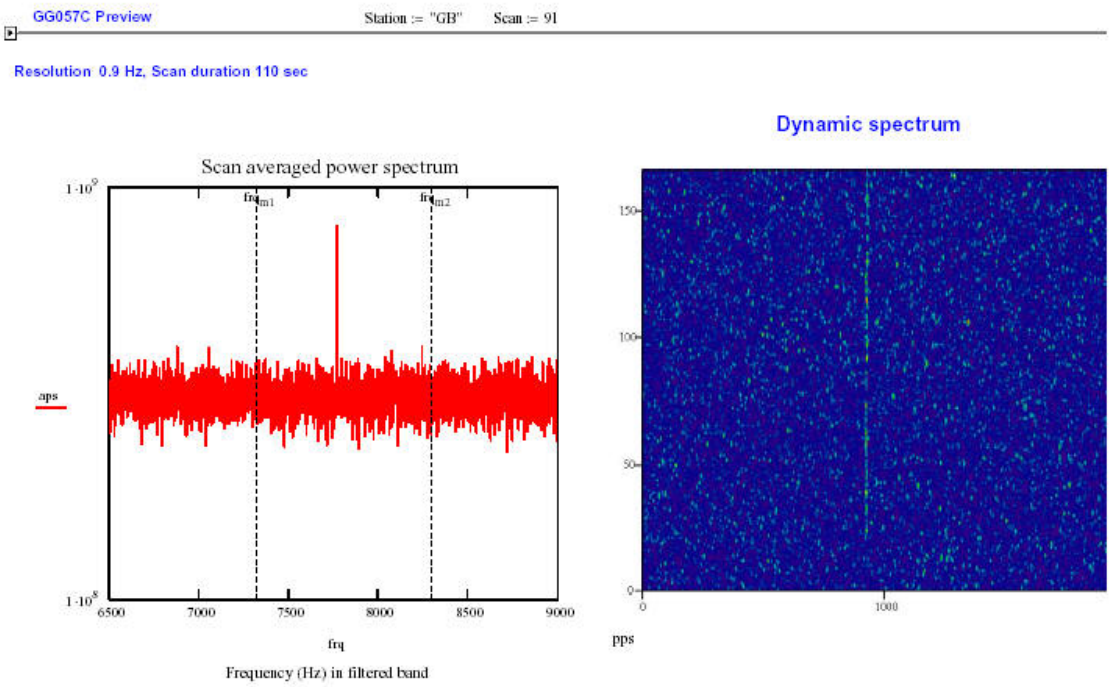


Fig. 1. (left) The spectrum of the Huygens carrier signal at 2040 MHz with the resolution of 0.9 Hz obtained via Mk5 VLBI acquisition at the NRAO's R.C.Byrd Green Bank Telescope. (right) Dynamic spectrum of the Huygens signal over 3 min. The data are from the GG057 data set.

Detection of VLBI fringes from a natural calibrator source (quasar) during the Huygens VLBI observation on the baseline Parkes-Miopra (Australia). The detection was obtained with the data delivered to Dwingeloo from Australia via several high-capacity networks in Australia, Canada, USA and Europe - a remarkable achievement in its own right (see the article by S.Parsley in this issue of Newsletter).

Fig. 2. A small fraction of the Huygens VLBI Tracking Team at JIVE, 18 January 2005.

Both results of this "express-analysis" were delivered to the Huygens Mission Control several hours after the observations ended. The results took central stage at the major ESA press conference on 15 January 2005, the day after the successful touch-down on Titan.

The project, led by JIVE, involved investigators and radio astronomy groups from Australia (Australia Telescope National Facility, University of Tasmania and Swinburn University), China (National Radio Astronomy Observatories of China - Urumqi and Shanghai Astronomical Observatory), Finland (Helsinki University of Technology), Germany (University of Bonn and Bundesamt fűr Kartographie und Geodäsie), Italy (Institute of Radio Astronomy), Japan (National Institute for Information and Communication Technologies), the Netherlands (ASTRON and ESTEC), Sweden (Onsala Space Observatory), the United States (National Radio Astronomy Observatory, Jet Propulsion Laboratory).

The Huygens mission is a historic scientific milestone. The Huygens VLBI team is proud to be a part of the mission and is looking forward to exciting discoveries.

On behalf of the Huygens VLBI tracking team:

Leonid Gurvits (Huygens VLBI Project Manager), Sergei Pogrebenko (Huygens VLBI Project Scientist)

3. e-VLBI current status

The first e-EVN science observations, reported as "breaking news" in the September newsletter, yielded the image shown below (Richards et al. JBO). On the left, a low-resolution image of IRC+10420 taken with the UK's MERLIN radio telescope array shows the shell of 'maser' emission at a frequency of 1612 MHz. The higher resolution EVN e-VLBI image (right) reveals fine structure in the maser spots. This image was presented at the 3rd e-VLBI Workshop, held in Tokyo in October and again at the EVN Symposium in Toledo. A more detailed report was also given in a press release.

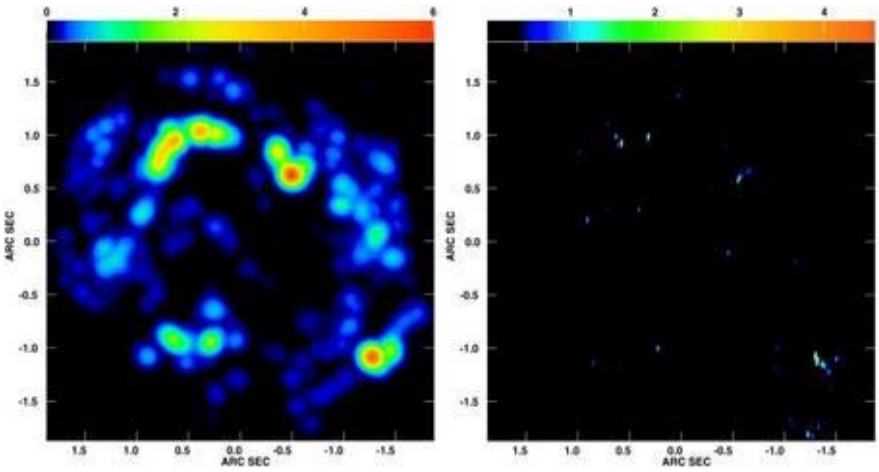


Figure: First e-VLBI Science image, courtesy Richards et al. JBO. A low resolution image taken with the MERLIN (left) shows the shell of maser emission at the frequency of 1612 MHz. The corresponding e-VLBI image (right) shows the much finer structure of the masers. IRC+10420 is a supergiant star, with a mass about 10 Msun, at a distance of ~5kpc. Recent estimates (Klochkova et al. 1997) put its temperature at 8500 degrees, a much higher temperature than usually associated with molecular winds. However, in the 1970's it had a spectral type G0-F8, (Humphreys et al. 1973), a bit hotter than the Sun. In 20 yr it has undergone an extraordinary temperature rise of ~3000 degrees.
It has a mass-loss rate equivalent to ~200 Mearth/yr. The OH maser shell is 7500 au in radius with an expansion velocity of about 40 km/s implying that the matter was ejected from the star about 900 years ago, when it was presumably still a late M-type red supergiant.
VLBI resolves the individual maser clumps for the first time and will help us understand how dusty knots can protect molecules from the overheated star.

The 3rd e-VLBI Workshop, hosted by Kashima Space Research Centre, attracted 67 people from 13 countries. Up-to-date presentations were given by e-VLBI practitioners, high energy physicists and network developers. Many successful demonstrations of e-VLBI had been realized since the last workshop in Dwingeloo and it was agreed that e-VLBI technology is advancing at a very satisfying pace. In addition the participants were treated to an earthquake (Richter scale 5.7) on the first day of the conference and, just after the meeting finished, a strong typhoon stopping many planes from departing. In spite of this everyone managed to get home without too much difficulty. The next workshop will take place in July 2005 in Sydney, hosted by ATNF, CSIRO.

In December 2004, Jodrell Bank's new 2.5 Gb/s connection was used in an e-VLBI test for the first time. Real-time fringes to Jodrell were detected from Westerbork, at 128Mb/s, and from Torun at 256Mb/s. These were the highest real-time e-VLBI data rates achieved in Europe so far, quadrupling the previous record. A series of further e-VLBI tests are planned for 2005, at intervals of about six weeks. To better understand the factors that have limited data rates in previous tests, JIVE is busy deploying a network monitoring tool called BWCTL (bandwidth control), developed by Internet2. BWCTL is used to determine the available bandwidth between a pair of hosts without the need of user accounts on these systems, or the help of administrators at remote hosts. So far this tool has been installed at JIVE, Westerbork, Onsala and the Swedish POP at Chalmers University, Göteborg. In the

future we hope to add nodes along the paths to each telescope so as to be able to pinpoint network bottlenecks.

The e-VLBI highlight of January 2005 was the transfer of Huygens data from Australia to JIVE. Nine organisations from four countries were involved in setting up a dedicated "light-path" specifically for the Huygens, e-VLBI attempt. Data stored on disk, from Mopra and Parkes telescopes, were flown to ATNF in Sydney. From there they were delivered to JIVE via Seattle, New York and Amsterdam. AARNet, Australia's Academic & Research Network, provided the coordinating role for setting up the dedicated link between Australia and JIVE. An AARNet press release details this achievement from the networking perspective. Two, thirteen minute scans from Mopra and Parkes were transferred at a data rate of about 450Mbps. They were then reformatted and correlated to show fringes, giving strong confirmation that the Huygens VLBI observation had been successful. This news was applauded at the major European Space Agency press conference at the Mission Control Center on 15 January 2005. Further information about VLBI participation in the Huygens mission can be found elsewhere in this newsletter.

Steve Parsley & Arpad Szomoru (JIVE)

4. Erection of the main reflector and subreflector at the Yebes 40-m telescope

The erection of the new 40m radiotelescope in Yebes has progressed substantially. In december 2004 the main reflector and the subreflector were lifted. The total flight time for the parabola was less than one hour. The construction of the telescope is expected to be finished in the next months. After installation of the holography
receiver (primary focus) and 22 GHz receiver (in Nasmyth focus), comissioning will start.First light is expected before the end of the year.

More information on the website (in spanish):

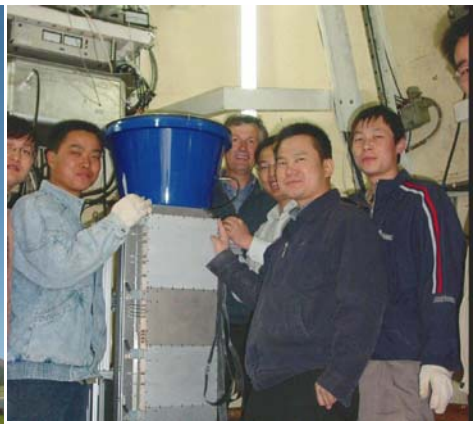
http://www.oan.es/

5. Report on the new Urumqi 6cm receiver

MPIfR has built and installed a new 6cm receiver at the Urumqi 25m antenna. The system is designed for low noise with excellent total-power stability for continuum observations and is also intended for spectral and VLBI use. The system was built at Effelsberg by O. Lochner and gives a system temperature of around 22K. Several other members of MPI staff were on the team visiting Urumqi in

August, working on the receiver and on related online software. A VLBI test was performed using Mark5 on 19th August between Urumqi and Effelsberg. An initial fringe verification was performed by ftp transfer on 20th August followed by later correlation of the Mk5 disc packs. This confirmed the expected excellent SEFD of about 200Jy and very low cross-polarisation of the system. More details and a report on the VLBI test can be found on http://www.mpifr-bonn.mpg.de/EVN/urumqi_report.pdf .

David Graham (p062gra@mpifr-bonn.mpg.de)



6. Status of the Miyun and Kunming VLBI station

For the Chinese first lunar exploration project, named CHANG'E-1 Project, two new ground stations, Miyun and Kunming stations is under construction. These two ground stations will also be used for VLBI observations. Their locations and main parameters are listed as follows:

Miyun VLBI Station

- Location: Lat.: 40°33′ N, Long.: 116°58′ E.
- In the Miyun County, Beijing; about 150 km far away from the downtown of Beijing.
- Antenna diameter: 50 m
- Antenna type: Primary focus system; inner 30m: full panel; 30-50m: mesh
- Bands and Antenna efficiency: 92cm(0.55), 18cm(0.5),
    - 6cm(0.5 for inner 30m),
    - 13cm(0.5)/3.6cm(0.48 for inner 30m)
- Data Acquisition System: DBBC and VLBI MK V Recording System
- Frequency standard: SHAO hydrogen maser
- Availability: in the end of 2005

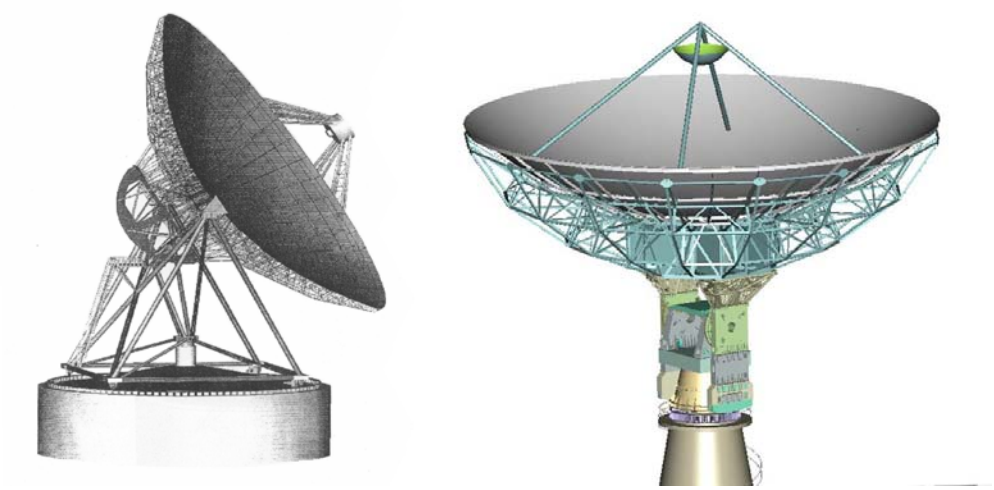


Figure illustrating the design model of the 50m antenna of the Miyun Station (left) and of the 40m antenna of the Kunming Station.

Kunming VLBI Station

- Location: Lat.: 25°03'N, Long.: 102°48' E. Nearby the Campus of Yunnan Astronomical Observatory, NAOC in Kunming, Yunnan Province, China
- Antenna diameter: 40 m
- Antenna type: Cassegrain configuration; inner 26m: full panel; 26-40m: mesh
- Bands and antenna efficiency: 13cm(0.6)/3.6cm(0.4)
- Data Acquisition System: DBBC and VLBI MK V Recording System
- Frequency standard: SHAO hydrogen maser
- Availability: In the first half of 2006

Picture of the site of the Miyun VLBI station

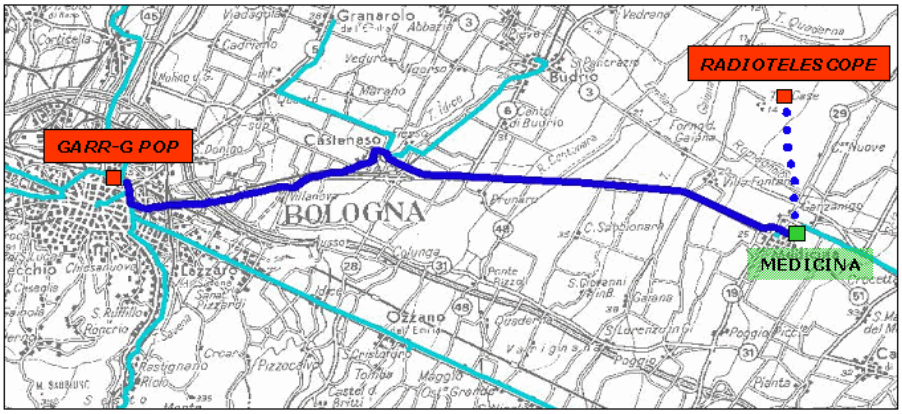
Xiaoyu Hong (xhong@shao.ac.cn)

7. Medicina connected to JIVE and the e-VLBI network at 1Gbps in Spring 2005

In Italy, the Emilia-Romagna Region has started a plan of technological modernization of the data network for the Public Administration. In the next year, "LEPIDA Network" will provide the connection, with wide band technologies, for Municipalities, Provinces, Mountain Communities and regional sites of Universities. Fiber optic will be used in the flat areas, while satellite links will be necessary in the hills and mountains.

Thanks to an agreement between Emilia-Romagna Region, National Institute of Astrophysics (INAF) and GARR, the "Lepida Network " will also provide the connection between the Medicina VLBI antenna and the Bologna Node of the Garr/Geant Network. In the first 30 Km, a couple of fibers of the Bologna-Ravenna backbone will be used. In addition to this, Lepida will dig the last 6 Km, between Medicina town and the radio telescope (for an equivalent amount of 200.000 Euro). The agreement requires that in return the Institute of Radio Astronomy will realize the instruments to test the Lepida network up to a speed of 1 Gbit/sec.

The fiber connection between the Medicina antenna and the Bologna Garr POP will be set up in the spring of 2005. With this link the connection of the radio telescope to JIVE and to the e-VLBI network will be completed. Preliminary transmission tests between Bologna Garr POP and JIVE were done in the October 2003 with a UDP speed of 600 Mbit/sec.



Mauro Nanni (nanni@ira.cnr.it)

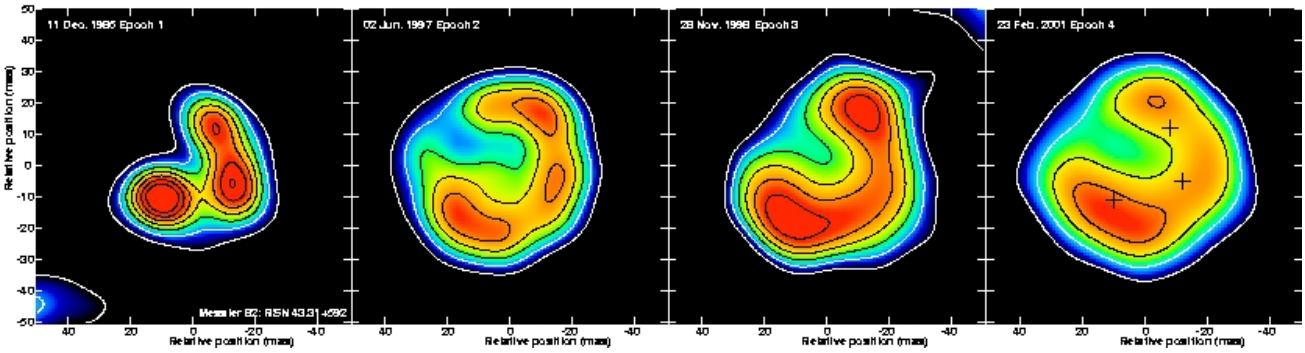
8. Four epochs of expansion of the Supernova remnant 43.31+592

Radio studies of extragalactic supernova remnants (SNR) are currently limited by sensitivity and to some extent angular resolution. However such studies are essential as they provide unique insights into the early evolution of radio supernovae and supernova remnants. Within starburst galaxies such studies have several distinct advantages, the first of which is the inherently high starformation rates. This allows a relatively large number of SNR to be studied at the same time. These sources tend to have ages that can be measured in decades rather than centuries which are more applicable to galactic remnants. Additionally, because the area over which the starburst occurs is typically a kiloparsec or so in extent, and as the distances to the nearest starburst galaxies are a few Mpc, the relative distances to each individual SNR will only vary by a fraction of a percent. Consequently radio interferometric studies of starburst galaxies offer an ideal opportunity to study samples of SNR at the same distance, with a constant linear resolution and surface luminosity limit.

Over the last 18 years we have been regularly using VLBI to observe the radio structure and expansion of the SNR within the nearby prototypical starburst M82. The next epoch of these observations is scheduled for March 2004.

Within M82 ~50 compact radio sources have been observed, with roughly two thirds of these identified as SNR. However when observed with VLBI only a few of these sources are detected. One of these source is the compact shell-like remnant 43.31+592 (fig. 1). In the latest of this series of observations we demonstrate that the shell of RSNe 43.31+592 is freely expanding at a rate of 7350+/-2100 km/s. This is consistent with our previous epochs and contrary to the theoretically predicted expansion rates of ~500km/s expected for RSNe in the high pressure environment of the M82 starburst region.

The next epoch of observations, scheduled for later this spring, will help to constrain further this expansion
rate, as well as possibly allowing the detection of any deceleration.



False-colour images of 4 epochs of VLBI observations of the RSNe 43.31+575. All images have been convolved with a circular 15mas beam in order to match the earliest 1986 EVN-only epoch. The crosses marked on epoch 4 represent the positions of the three compact knots observed in epoch 1.

Rob Beswick (Robert.Beswick@manchester.ac.uk)

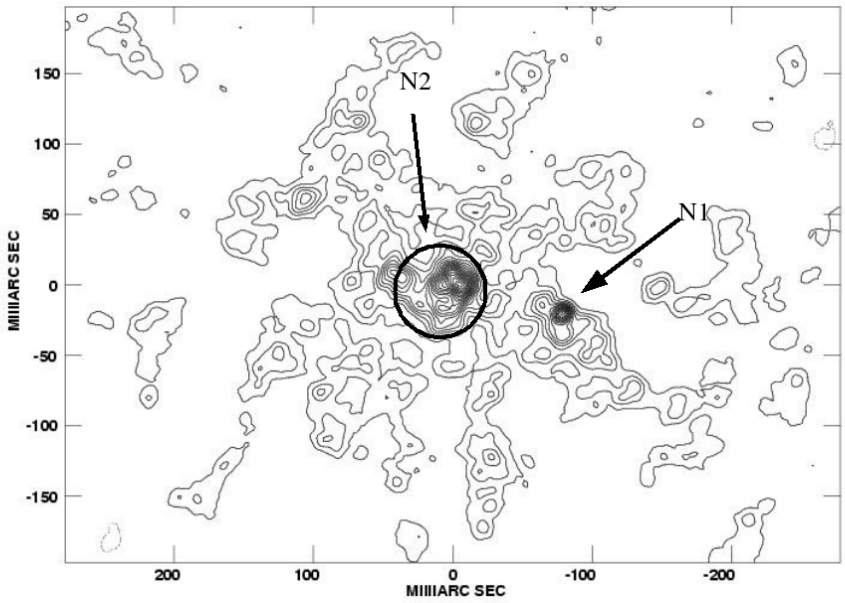
9.A detailed study of the nuclear region of Mkr 273

EVN+MERLIN observations of Mrk 273 component N at 5 GHz obtained in February 2004 at 512 Mbit/s. The image has been restored with a 10 mas circular beam. Contours are -1,1,2,3,4, ... x 0.04 mJy/beam. The peak surface brightness is 0.74 mJy/beam and the off-source noise is 15 microJy.

Component N1 --often pinpointed as a possible AGN-- has a very steep spectral index (alpha~ 1.2; S~ nu^-alpha) between 1.4 and 5 GHz. Such a steep spectral index is very difficult to reconcile with N1 being an AGN, but rather suggests a SN origin for the non-thermal radio emission.

Component N2 shows a more complex morphology, it is partly resolved in several compact radio sources, whose integrated spectral index is flat (alpha ~ 0.15). Such a flat spectrum could be due to a superposition of several, unresolved components with peaked spectra and/or free-free absorption.

The spectral index of the extended emission in component N is typical of non-thermal optically thin radio emission (alpha ~ 0.8), and its luminosity is quantitatively consistent with being produced by relativistic electrons diffused away from supernova remnants in a luminous starburst.



Marco Bondi (bondi@ira.cnr.it),Dallacasa D., Perez-Torres M., Muxlow T.

Reports from the Meetings

1. 7th EVN symposium on New Developments in VLBI Science and Technology

The Observatorio Astronomico Nacional (OAN) of Spain, on behalf of the European VLBI Consortium, hosted the 7th European VLBI Network Symposium on New Developments in VLBI Science and Technology and EVN Users Meeting on October 12-15 2004 in Toledo, Spain.

A total of 97 scientists from all around the world attended the conference, mainly from Europe, but with a large representation of colleagues from Japan, China, Korea and Australia. The scientific program was organized in sessions devoted to:

* Galaxies: AGN and their environment, variability, gravitational lenses, megamasers.
* Stars: circumstellar AGB envelopes, star-forming regions, masers,supernovae, microquasars.
* Instrumentation: VLBI software and hardware, telescopes, new data transport infrastructures (e-VLBI).
* Techniques: Geodetic VLBI, astrometry and phase-referencing, wide-field mapping, mm-VLBI.

We enjoyed 64 oral contributions, including 7 review talks and 12 invited talks, and 28 posters. Many authors have made available their talks on the symposium website:

http://www.oan.es/evn2004/WebPage/proceedings.html

The symposium proceedings have been edited by Rafael Bachiller, Francisco Colomer, Jean-Francois Desmurs, and Pablo de-Vicente (OAN), and were distributed during the conference. The online version of the proceedings book is available at the symposium website, and also on astro-ph.
The participants could visit the Yebes observatory (where the Users meeting was held) and check the status of construction of the new 40-m radiotelescope, where a group picture was taken.

Scientific Organizing Committee: Willem Baan (Co-chairman, WSRT/ASTRON, NL), Jesús Gómez-González (Co-chairman) (IGN, ES), Francisco Colomer (Secretary) (IGN, ES), Antxon Alberdi (IAA, ES),Rafael Bachiller (IGN, ES), Roy Booth (OSO, SE), Robert Brown (NAIC,USA), Patrick Charlot (Obs. Bordeaux, FR), Phillip Diamond (MERLIN/JBO, UK), Mike Garrett (JIVE, NL), Justin Jonas (HRAO, ZA), Andrzej Kus (TCfA, PL), Franco Mantovani (IRA, IT), Wolfgang Schlueter (IfAG, DE), Richard Strom (ASTRON, NL), Merja Tornikoski (MRO/HUT, FI), Liao Xinhao (SHAO, CN), Anton Zensus (MPIfR, DE), Jin Zhang (UAO,CN)

Local Organizing Committee: Francisco Colomer (Chairman), Victoria Alobera, Rubén Bolaño, Jean-Francois Desmurs, Isaac López Fernández, Florencio Martín, María Rioja, Rebeca Soria Ruiz, Pablo de Vicente (OAN).

Web address of the Symposium: http://www.oan.es/evn2004/

Group photo of the EVN symposium (with the Yebes dish still on the ground!) and the User Meeting

2. Report on EVN User meeting

An EVN Users meeting was held during the EVN Symposium in Toledo. The meeting took place in the newly-opened visitor center of the Yebes station on 13 October 2004. There were about 80 attendees. The meeting, chaired by Patrick Charlot, consisted of short talks with ample time for discussion all along, resulting in fruitful exchanges. The following summary is based on notes provided by Richard Strom and Richard Porcas.

Patrick Charlot described the overall EVN organization, indicating the specific role of each EVN body (Consortium Board of Directors, Programme Committee, scheduler, Technical and Operational Group, observatory friends, JIVE). He then focused on describing the proposing and reviewing process for the EVN projects. Of interest to the users was an histogram showing the distribution of proposal grades as assigned by the EVN Programme Committee (see Figure below). This raised questions about the oversubscription rate and reasons for proposal rejection or resubmission. It was pointed out that the EVN sensitivity calculator is extremely useful for preparing proposals and should be used systematically when observing weak targets. There was a consensus for requesting a "human"

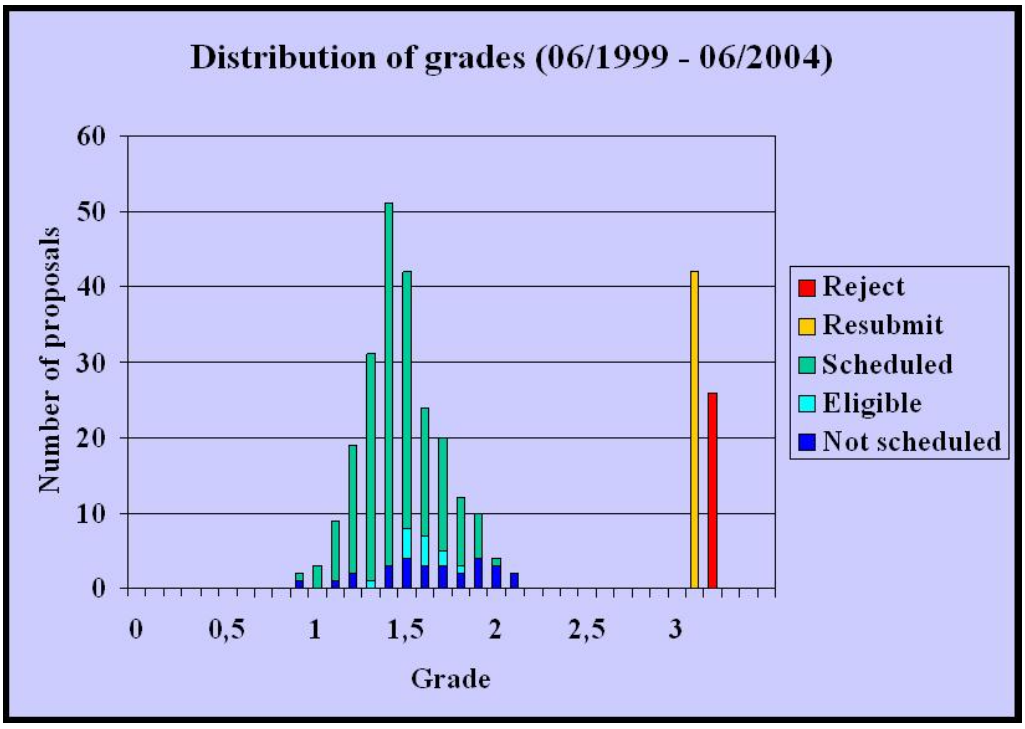
confirmation after each proposal submission to ensure that all proposals have been correctly received and registered. Improving the process with a web-based tool is being considered for the future.

Richard Porcas summarized the job to prepare the EVN/global block schedule prior to an observing session. He especially mentioned the various constraints that need to be considered in setting up a session (availability of frequencies, availability of specific telescopes, constraints on dates, etc...). The EVN users urged more frequency agility within the EVN (currently only available at some telescopes and/or some frequencies), as well as a simplification of the recording mode specification. During a discussion about the availability of the 43 GHz frequency band,
it was restated that scheduling specific wavelengths depends only on proposal pressure.

Cormac Reynolds described what happened to the EVN data at the correlator and after, while Huib van Langevelde presented future correlator capabilities and software developments that are carried out in the framework of the ALBUS project. It was emphasized that all EVN data correlated at JIVE are publicly available from the archive one year after correlation. Calibration issues were also discussed, e.g. the requirement to get an absolute flux scale, the inclusion of ionospheric corrections for phase-referencing, and the restoration of the correlator model for astrometry. Priorities
will have to be set in implementing such improvements. Overall, it was pointed out that the EVN reliability has dramatically improved in recent years (the present failure is < 1 station/experiment).

Willem Baan presented the road map to EVN2010. A strong emphasis will be put on increasing further the EVN sensitivity with the implementation of new capabilities permitting recording rates > 1 Gb/s (Mk5B, digital baseband converters). Along the road is also the development of a real-time e-VLBI array, offering more robust and automated operations and perhaps lower operating costs. Joint e-EVN and e-MERLIN operations will be considered along with
expansion of the network, taking advantage of the new telescopes that are being built (Spain, Italy, China) and of much unused antenna surface. The EU FP6 RadioNet project is a first step towards building a European Radio Observatory. In the longer term, the goal is to prepare the integration of the VLBI component into SKA.

In parallel with the organization of this EVN Users meeting, a questionnaire for evaluating EVN operations and future needs was sent out. A total of 81 replies (corresponding to a response rate of 45%) has been received. The EVN Programme Committee Chairman would like to gratefully acknowledge those EVN users who have responded to this survey, the results of which (when fully processed) will be made available to the EVN decisional bodies.



Patrick Charlot (charlot@obs.u-bordeaux1.fr)
Chairman, EVN Programme Committee

3. EVN Technical & Operations Group (TOG) Meeting

The EVN TOG meeting was held on 22nd November 2004 at Jodrell Bank Observatory, UK. Approximately 30 people attended the meeting from the EVN institutes and beyond. The main topics of discussion were
EVN reliability, amplitude calibration, disk-based observing and developments in e-VLBI.

EVN operations are running smoothly. Schedule checking at JIVE seems to work very well, with plenty of time to sort out problems. The TOG recommended that the 'three week rule' for schedules is retained in order to sustain reliability. An upcoming release of SCHED will be able to schedule Mk5 up to 1 Gbps (but is awaiting
a Field System upgrade). A straightforward FTP fringe-finder and e-VLBI scheduling option should also be offered. In the future, SCHED should be able to use VLBA-style 'autoallocate' for disk stations to remove scans outside of telescope limits. Also, a 'super-simplified' continuum setup selection will be offered whereby users select only 'band' and 'total bitrate'. A better model of telescope slewing will also be considered shortly.

The EVN seems to be continuing to improve its performance statistics. Session 2/2004 went very well in general. The only outright telescope failure was the loss of Urumqi in the UHF-session. Urumqi also could not participate in most of the experiments because of the installation of their new 6cm receiver. There were 3 NMEs (N04C2, N04U1, N04L2) which have all been correlated and pipelined. In the C-band there was a successful Gbit test, and a special test for Mk2/Lovell at Jodrell Bank. Altogether there were 5 ftp fringe tests that went very well.

In general session also 3/2004 went very well. In most cases, the ftp fringe tests were successful. In the K-band session Medicina, Noto and Urumqi did not produce ftp fringes and the disks have not been checked yet. Bad weather at the stations may be partly responsible for this. In Shanghai the 6cm ftp fringe test failed (file transfer problems). The Sh new 6 cm receiver worked well, but the polarizations were swapped. Jb also had swapped polarizations (this was not realized during the ftp test since Jb produced fringes, and the RL plots were not made for the C-band test).

Disk-based recording is now working remarkably well. 1 Gbps recording has now been tested at many stations and few problems have been encountered. As usual,the current problems involve the availabillity of disk-packs but this will
be addressed by the stations during 2005. Conduant, the manufacturer of the Mk5 units, is proceeding to build a SATA prototype upgrade kit. This will involve a new backplane but SATA and PATA modules will be interchangeable in the Mk5. Nearly all planned features in the Mk5 software are now supported with the exception of automatic bank switching, which will be available very soon.

Developments in e-VLBI are continuing. Currently, 1Gbps connections are supported to Jodrell Bank, Westerbork, Torun and Onsala - with other stations following shortly. JIVE tests have shown that dramatic improvements in TCP
performance are possible by adjusting the default settings. Various tests have been performed using iperf, in2net and disk2net. The first real-time e-VLBI EVN image was produced in September 2004 and a high-bandwidth test was also
carried out in December.

The full report is available at the following URL: http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/togreps04/togminutesJodrell.txt

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4. Workshop "Multiband approach to AGN"

The workshop "Multiband approach to AGN" was held in Bonn from 30 September to 2 October 2004, and it was attended by 56 participants, who gathered from all over the world to discuss the nuclear activity in galaxies, from different perspectives. The meeting was sponsored and organized by the EU Consortium RadioNet together with the Max-Planck-Institute fur Radioastronomie, as part of the RadioNet Scientific Workshop Program.

The origin and cosmological evolution of AGNs, their statistics, and the connection with similar

phenomena taking place in galactic objects, were faced from a theoretical and observational perspective in a number of invited and contributed talks. Each talk was followed by discussion, stimulated by questions from the audience. Discussion and interaction among the participants was also lively during the coffee breaks, which were held in the same place where contributed posters were also displayed.

Participants came from all over Europe, United States, Australia and China. The workshop programme was divided into 4 sessions, each of them including review talks and contributed talks. In particular, we had 7 reviews and 23 contributions. Furthemore, 18 poster contributions were presented.
Each invited speaker presented the status of the art, as well as the open questions and the steps forward which are expected over the next few years. The overall idea of the workshop, i.e. looking at the AGN phenomenon from different perspectives and a multiwavelength approach, was taken into account by the invited speakers. Alan
Marscher reviewed all the multiband observational tools, and showed how a complete understanding of the AGN phenomenon can be ensured only by coupling all this information. From the theoretical reviews by A. King and M. Camenzind, and from a number of contributed talks, it is clear that our knowledge and understanding of the inner regions of AGNs has improved over the past few years, however many questions are still open, such as for instance the origin and constituents of relativistic outflows in AGNs. The incredible amount of observational data available with GOODS (The Great Observatories Origin Deep Survey) makes it possible to carry out evolutionary studies of AGNs by means of multiwavelengh information coming from the deepest HST, Chandra and Spitzer images.
A review of the AGN evolution from the optical perspective was given by C. Wolf, based on a number of optical surveys going as far as $z=6$ and as deep as $R<25.5$. Some evolution is seen in the optical luminosity function, however other properties, such as emission lines, spectral index and host galaxies, do not seem to evolve with the redshift.
In connection to this topic, P. Cox reviewed the properties of quasars and host galaxies at high redshift. Based on sub-mm and FIR observations, the star formation history, the physics of the interstellar medium at high redshift and the relation between the formation of black holes and stellar bulges in galaxies were illustrated to the audience.
Among the many contributed talks, the detailed study of Sag A* presented by R. Schoedel, the centre of our own Galaxy, was very impressive.New insights on many well known open problems in AGNs, such as for instance understanding of features in the SED, the origin of BL Lac phenomena, the properties of obscured AGNs, were provided in the contributed talks and posters.

Tiziana Venturi (tventuri@ira.cnr.it), Andrei Lobanov

Announcements

1. First RadioNet Software Forum Meeting on Advanced Interferometry Software (Jodrell Bank, UK
March 1 - 3, 2005)

This meeting is to bring together people developing and using software for interferometry at radio and millimetre wavelengths to discuss future directions, needs, and specific issues.We invite contributed talks and plan time for discussion forums.

Preliminary Agenda:
* Choice of coding platform for future software systems
* Review of ongoing software efforts, eg the ALBUS project
* Non-isoplanatic patch effects in wide-field imaging
* Cause of the image dynamic range limits in existing synthesis arrays
(important also for LOFAR and SKA design)
* Approaches to parallel processing
* Radio/Virtual Observatory and archives
* Other (ALMA, astrometry)

Registration deadline February 15, 2005

For more information visit the meeting web site:
http://www.radionet-eu.org/rnwiki/FirstSoftwareForumMeeting

Any further enquires can be directed to Alan Roy at aroy@mpifr-bonn.mpg.de

2. Dwingeloo Summer Students Programme 2005

As every year, a limited number of grants is available to enable astronomy students (graduate or advance undergraduate) to spend the summer (10 to 12 weeks) in Dwingeloo conducting astronomical research under the supervision of ASTRON or JIVE staff members.

More information can be found at www.astron.nl/wsrt/summer.html. The deadline for application for the Summer Student Programme is the 15th of february.

The European VLBI Network (EVN) website (http://www.evlbi.org/) is hosted by the Joint Institute for VLBI in Europe (http://www.jive.nl/).