



European VLBI Network Newsletter

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Message from the Chairman of the EVN Board of Directors

Dear Colleagues in the European VLBI Network,

This is the first Newsletter of 2015 and so it is timely to look back at events of last year, and forward to new opportunities.

A major change in the organisation of international funding for JIVE came to fruition on 12 December with a decision by the European Commission to allow JIVE to become an ERIC (European Research Infrastructure Consortium). Whilst JIVE's core tasks (correlator operations and EVN user support) remain unchanged, the new structure paves the way for funding to be secured at the level of national governments. A formal JIVE-ERIC dedication ceremony is planned for 21 April.

From October 7-10th the 12th EVN Symposium was held in Cagliari, in Sardinia, with 140 participants. As usual at these major events, the participants were treated to a wealth of presentations on exciting new astronomical results. An EVN users meeting was also held, with presentations on a number of issues relating to the EVN and possible future developments. And, of course, there was the traditional football match between a home team and guests (agreed score 1:1).

A further highlight was a trip to the site of the new 64m Sardinia Radio Telescope (SRT), which will become an increasingly important component of EVN observations. I would like to take this opportunity to thank both the local and scientific organizing teams for their hard work in producing such a well-planned and stimulating Symposium.

On 5th November the Directors of the EVN Consortium (CBD) convened in Bologna for their twice-yearly meeting.

As previously reported in the May Newsletter, the EVN PC Chair, Tom Muxlow, has stepped down after an extended period of office, and his replacement (from 1 January) is Michael Lindqvist. Michael was the Chair of the Technical and Operations Group (TOG) until the end of 2014. I wish to thank him for the diligence and commitment he showed in that office, and I am confident he will bring the same level of dedication to his new role as PC Chair. This had left a vacancy for the TOG Chair and I am very happy to report that the CBD appointed Pablo de Vicente from Observatorio Astronómico Nacional (OAN). Pablo has been the technical friend of VLBI at Yebes for many years, and brings a wealth of EVN technical experience to the office. I wish him well in this task and look forward to a fruitful interaction between the TOG and the CBD.

One of the technical goals for 2015 is the introduction of 2-Gbps recording for EVN observations, with a target of the 1 June 2015 proposal deadline for offering this capability to users. At the CBD meeting the Directors agreed to jointly finance software development to ensure that the digital backends now in place across the EVN can support 2-Gbps, and provide greater flexibility of setups, facilitating compatibility between the variety of different backends at EVN and other observatories.

2015 has now started and both the SRT and the new 65-m Tianma telescope of the Shanghai Observatory are scheduled for projects in EVN Session-I. This extremely significant increase in the total collecting area of the EVN makes an excellent start to this year's observations.

In addition to the EVN Call for Proposals for the 1 February deadline note also that a 3rd Announcement of Opportunity (AO3) for RadioAstron proposals has been issued, with a deadline of 26 January. The EVN will continue its efforts to provide a supporting ground array for RadioAstron projects where this is requested in a successful EVN proposal.

Let me end by wishing everyone a prosperous New Year and I look forward to hearing presentations of interesting new EVN results during the course of 2015.

*Anton Zensus,
Chairman, EVN Consortium Board of Directors*

Call for the EVN Proposals

European VLBI Network
Call for Proposals
Deadline 1st February 2015

This text is also available on the web at <http://www.oso.chalmers.se/evn/call.txt>

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 observations may be conducted with disk recording (standard EVN) or in real-time (e-VLBI).

The EVN facility 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>.

Future Standard EVN Observing Sessions (disk recording)

2015 Session 2 May 28 - Jun 18 18/21cm, 6cm ...
2015 Session 3 Oct 15 - Nov 05 18/21cm, 6cm ...
2016 Session 1 Feb 26 - Mar 19 18/21cm, 6cm ...

Proposals received by 1st February 2015 will be considered for scheduling in Session 2, 2015 or later. Finalisation of the planned observing wavelengths will depend on proposal pressure. The dates for Session 1 2016 are as yet provisional.

Future e-VLBI Observing Sessions (real-time correlation)

2015 Mar 24 - Mar 25 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm
2015 Apr 14 - Apr 15 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm

2015 May 12 - May 13 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm
2015 Jun 23 - Jun 24 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm

Please consult the e-VLBI web page at http://www.evlbi.org/evlbi/e-vlbi_status.html to check for possible updates, and for the available array.

Successful proposals with an e-VLBI component submitted by the October 1st deadline will be considered for scheduling in the above e-VLBI sessions starting from Mar 24th 2015.

Note that only one wavelength will be run in each e-VLBI session, depending on proposal priorities.

See http://www.e-merlin.ac.uk/vlbi/evn_docs/guidelines.html for details concerning the e-VLBI observation classes and observing modes

Features for the Next Regular EVN and e-VLBI Sessions

* Both Jb1 and Jb2 will be available for EVN recording, as will simultaneous EVN+e-MERLIN operations with home-station EVN recording. For such simultaneous EVN+e-MERLIN operations, VLBI data from Cm will be made available at up to 512 Mbps (e.g. 64 MHz in both hands of circular polarization) on a best efforts basis.

For updated information please consult the web at: <http://www.e-merlin.ac.uk/vlbi/>

* Please consult http://www.evlbi.org/evlbi/e-vlbi_status.html and the EVN User Guide http://www.evlbi.org/user_guide/user_guide.html for updates on the current EVN and e-VLBI array, availability of different stations per observing band and for the dates of the e-VLBI observing sessions.

Global VLBI Proposals

* Global proposals can be proposed up to 1 Gb/s including VLBA, GBT, JVLA

* Some modes may require different bandwidth channels from EVN & NRAO telescopes; correlation at JIVE can handle this.

* JIVE support staff and Amy Mioduszewski at Socorro will assist during the scheduling process of such observations.

* Global observations will be correlated at the SFXC correlator at JIVE (default) or at the DiFX correlator in Bonn (if appropriate justification is given in the proposal).

RadioAstron Observations

* Proposals requesting the EVN as ground array support for RadioAstron proposals for the AO3 period (1 July 2015 - 30 June 2016) should be submitted at this deadline.

Large EVN 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.

Availability of EVN Antennas

* Medicina and Urumqi should return to the EVN from Session 1, 2015 onwards. The Sardinia 64m telescope (SRT) remains in a commissioning phase but is available on a "best efforts" basis from Session 1, 2015. Robledo 70m telescope is occasionally available for EVN observations. From Session 1, 2015, the availability of WSRT as a phased array is not certain and WSRT may be participating with a single telescope.

* Tm65 is the new 65 m telescope at Tianma, about 6 km away from the current 25 m Shanghai telescope. Both of these telescopes can observe at 21, 18, 13, 6, 5, 3.6, and 3.6/13 cm. For now, Sh remains the default choice. Tm65

can be selected instead of (or in addition to) Sh, with the motivation for this choice discussed in the scientific justification. If you select both, you should also discuss the motivation for the very short baseline. See the EVN Status Table for details: http://www.evlbi.org/user_guide/EVNstatus.txt.

Use of Korean VLBI Network Antennas

* The Korean VLBI Network (KVN) has now become an Associate Member of the EVN (as from January 2014). KVN telescopes may be requested for EVN observations at 1.3cm and 7mm wavelengths. For more details regarding the KVN, see: http://kvn-web.kasi.re.kr/en/en_normal_info.php.

Use of Australian VLBI Network Antennas

* It is planned that starting in Session 1 2015, some Australian Long Baseline Array (LBA) time will be made available for simultaneous scheduling with the EVN, thus enabling the possibility of joint LBA/EVN observations in that and future disc sessions. The easternmost stations of the EVN are in a similar longitude range to the LBA telescopes, and for sources in equatorial regions, baselines to western European stations are also achievable. Joint LBA time is likely to be heavily oversubscribed, and authors are requested to note whether they are prepared to accept scheduling without LBA antennas being present.

Any proposals for joint EVN+LBA observations submitted to the LBA by its 15 December 2014 deadline should also be submitted to the EVN by the 1 February 2015 deadline and will first be eligible for scheduling in EVN Session 2/2015.

For more details regarding proposing time on the LBA, see: <http://www.atnf.csiro.au/observers/apply/avail.html> & <http://www.atnf.csiro.au/vlbi/index.html>.

EVN+LBA observations should be possible at all principal EVN wavebands from 21 cm to 1.3 cm.: See: (http://www.evlbi.org/user_guide/freq_cov.html).

Out of Session Observing

* Out-of-Session observing time (up to a maximum of 144 hours/year), is now available to all proposals. Proposals requesting Out-of-Session observing time must provide full scientific (and technical if appropriate) justification as to why observations must be made outside regular sessions. Out-of-Session observing blocks should be no less than 12 hours in duration (although individual observations can be shorter), and occur no more than 10 times per year (up to a maximum of 144 hours). Proposals should specify which dates/GST ranges are being requested and indicate the minimum requirement in terms of numbers of telescopes (and any particular telescopes). Proposals will only be considered for dates occurring after the regular EVN session that follows the proposal deadline. Observations requiring much shorter lead times should be submitted as "Target-of-Opportunity" proposals.

How to Submit

All EVN and Global proposals (except ToO proposals) must be submitted using the NorthStar on-line proposal submission tool. Global proposals will be forwarded to NRAO automatically and should not be submitted to NRAO separately.

When specifying your "Recording format" for Global modes in the EVN proposal tool, select 32, 64, 128, 256, 512, or 1024 Mbps from the "Specify aggregate bitrate (use network defaults)" menu.

New proposers should register at <http://proposal.jive.nl>.

The SCIENTIFIC JUSTIFICATION MUST BE LIMITED TO 2 PAGES in length. Up to 2 additional pages with diagrams may be included.

When specifying requested antennas from the LBA, please specify 'LBA' under the "other" row in the telescope-selection box - this selects all that are available for joint observations.

The deadline for submission is 23:59:59 UTC on 1st February 2015.

Additional information

Further information on Global VLBI, EVN+MERLIN and e-VLBI observations, and guidelines for proposal submission are available at: http://www.e-merlin.ac.uk/vlbi/evn_docs/guidelines.html.

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

The current antenna capabilities can be found in the status tables. For the standard EVN see http://www.evlbi.org/user_guide/EVNstatus.txt. For the e-EVN array see http://www.evlbi.org/evlbi/e-vlbi_status.html.

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

Michael Lindqvist, Onsala Space Observatory, EVN PC Chairman

EVN Science Highlights

First Detection of Proper Motion in a Jet at a $z>5$

Despite the relatively large number of known blazars – radio-emitting active galactic nuclei prominent in the radio and other wavebands as well – their detections are still very rare at extremely high redshifts ($z>5$). One of the three $z>5$ blazars known at present is the blazar J1026+2542 located at $z=5.266$. It stands out with its prominent jet with multiple components extending out to tens of milli-arcseconds (mas). It is also unique because its first VLBI imaging observations at 5 GHz date back to 2006 (VLBA Imaging and Polarimetry Survey, Helmboldt et al. 2007, ApJ, 658, 203). The rich jet structure and the first-epoch reference measurement prompted us to look for possible changes in the radio jet of J1026+2542, by means of repeated VLBI imaging at the same observing frequency.

New observations of J1026+2542 were made with the EVN at 5 GHz on 2013 May 28, and at 1.7 GHz on 2013 June 4 (Fig. 1). The resulting VLBI images are shown in Figs. 1 and 2. Due to its optically thin steep-spectrum emission, the diffuse end of the jet can be traced out to ~ 50 mas in the 1.7-GHz EVN image, corresponding to ~ 300 pc projected linear size. At 5 GHz, the second-epoch imaging gives a time baseline of 7.33 yr with respect to the earlier VLBA observations. In the rest frame of the source, due to the time dilation caused by the expansion of the Universe, this corresponds to a period shorter by a factor of $(1+z)$, i.e. 1.17 yr.

Combining the new images with the archival data from 2006 enables tracking structural changes in the jet (Fig. 3) to be made, which yields an estimated apparent proper motions (0.09-0.11 mas/yr) for three of the jet components. These correspond to superluminal

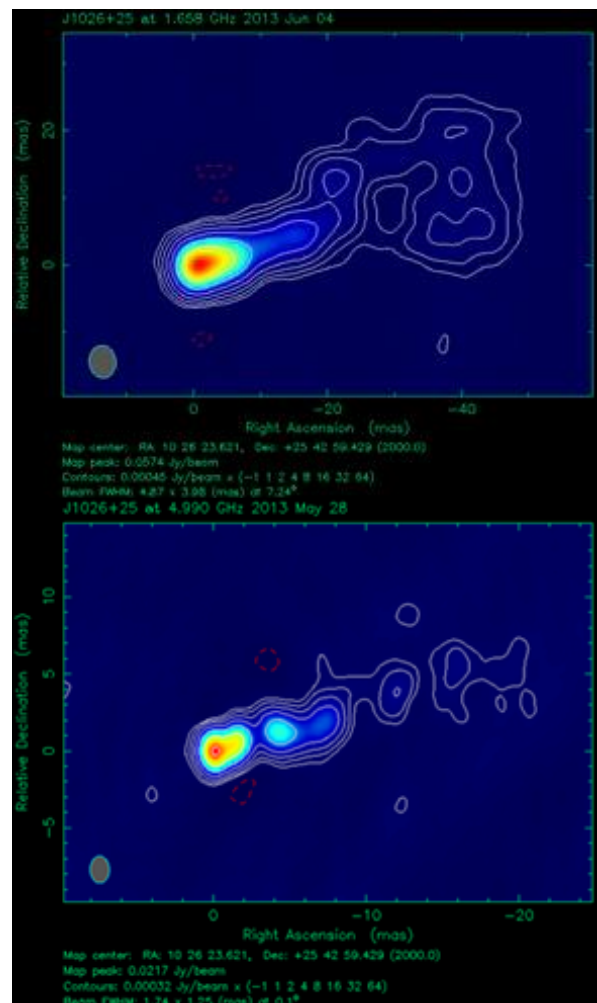


Figure 1. New EVN images of J1026+2542 at 1.7 GHz (top) and 5 GHz (bottom)

apparent transverse velocities of $\sim 11-14c$. Such proper motion estimates, although not being able to compete with densely time-sampled VLBI monitoring observations of low-redshift sources, are made for the first time for any AGN at $z > 5$. The moderate component proper motions agree with what is expected in a relativistic cosmological model for a source at that high redshift.

The new EVN observations also provide a more stringent constraint on the size of the compact VLBI core. The lower limit to the core brightness temperature is $\sim 2.3 \times 10^{12}$ K. The parameters derived for the inner radio jet from the EVN data are consistent with an independent estimate of the Lorentz factor ($\Gamma_j = 13$) and the viewing angle ($\theta_j = 3$ deg) from high-energy measurements and the spectral energy distribution (Sbarrato et al. 2013, ApJ, 777, 147).

Reference: Frey, Paragi, Fogasy, Gurvits (2015), MNRAS, vol. 446, p. 2921.

Sándor Frey, Institute of Geodesy, Cartography and Remote Sensing, Satellite Geodetic Observatory, Budapest, Hungary

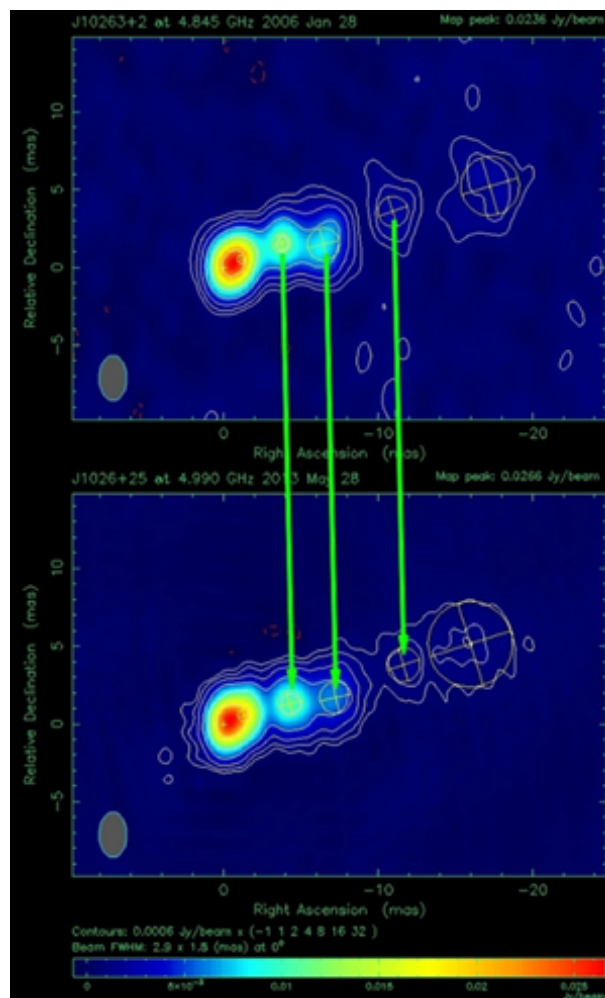


Figure 2. 5-GHz VLBI images of J1026+2542 restored with the fitted model, a central point source and five additional circular Gaussian components. For easy comparison, the VLBA image from 2006 (Helmboldt et al. 2007) and the new EVN image are restored with the same VLBA beam, and the contour levels are the same. The three components with well-determined displacements are indicated with arrows.

EVN/JIVE Technical Developments

JIVE Goes ERIC

The decision that allows JIVE to continue as an international research infrastructure (ERIC) was signed by the president of the European Commission Jean-Claude Juncker on December 12, 2014 (the front page is shown below). Subsequently, it was published in all the 23 official languages of the EC on the 18th (<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2014:363:TOC>). Three days later, on 21 December 2014 the ERIC became a legal reality. Remarkably, that very same date was also the 21st birthday of JIVE.

COMMISSION IMPLEMENTING DECISION

of 12 December 2014

on setting up the Joint Institute for Very Long Baseline Interferometry as a European Research Infrastructure Consortium (JIV-ERIC)

(2014/923/EU)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Council Regulation (EC) No 723/2009 of 25 June 2009 on the Community legal framework for a European Research Infrastructure Consortium (ERIC) ⁽¹⁾, and in particular point (a) of Article 6(1) thereof,

Whereas:

- (1) The French Republic, the Kingdom of the Netherlands, the Kingdom of Sweden and the United Kingdom of Great Britain and Northern Ireland requested the Commission to set up the Joint Institute for Very Long Baseline Interferometry as a European Research Infrastructure Consortium (JIV-ERIC).
- (2) Those Member States have agreed that the Kingdom of the Netherlands will be the Host Member State of JIV-ERIC.
- (3) The measures provided for in this Decision are in accordance with the opinion of the Committee established by Article 20 of Regulation (EC) No 723/2009.

HAS ADOPTED THIS DECISION:

Article 1

1. The Joint Institute for Very Long Baseline Interferometry as a European Research Infrastructure Consortium (JIV-ERIC) is hereby established.
2. The Statutes of JIV-ERIC are set out in the Annex. The Statutes shall be kept up to date and made publicly available on the website of JIV-ERIC and at its statutory seat.
3. The essential elements of the Statutes for which amendments shall require approval by the Commission in accordance with Article 11(1) of Regulation (EC) No 723/2009 are provided for in Articles 1, 2, 18, 20-25, 27 and 28.

*Article 2*This Decision shall enter into force on the third day following its publication in the *Official Journal of the European Union*.

Done at Brussels, 12 December 2014.

For the Commission
The President
Jean-Claude JUNCKER

The front page of the European Commission decision establishing the JIVE as a European Research Infrastructure Centre (ERIC).

So we entered 2015 with two kinds of JIVE in existence, the Dutch foundation and the new European Research Infrastructure Consortium. At the moment all the operations continue under the old structure, but we are busy at JIVE to prepare a smooth transfer of all activities and responsibilities, assets and liabilities. You can imagine this can be quite involved, even though most things remain the same. On the surface, users and employees of JIVE should not notice any changes of this transition. The activities will continue in much the same way, even though under a different banner. Although the formal full name of JIVE changes in this process, we prefer to be called "JIVE", just like before.

In the end the ERIC construct will offer a more stable and more effective structure for the mission of JIVE; the ERIC has a more clear relation to the partner nations and we expect that it will be beneficial to be a recognized European research infrastructure. A clear advantage is also that we will have a VAT exemption for some of our VLBI activities.

The ERIC is a European legal entity that is recognized by all countries in the European Union after the publication by Brussels. The possibility to form this new kind of consortium was adopted by the EU in 2009. It is aiming to facilitate forming international organisations relatively easily, recognising that establishing international treaty

organisations like ESO is a gigantic task. JIVE is the 10th ERIC. The others focus on a very large range of topics, often related to the ESFRI list of European priorities for research facilities, which also lists the SKA. The JIVE partners started considering this option in 2007, so it still took many meetings and iterations on the detailed proposal and statutes.

At the moment four countries are members of the new ERIC: the Netherlands, the UK, Sweden and France. Five additional countries, Italy, Spain, South Africa, Germany and China, will contribute to JIVE as well and the membership is expected to increase in the coming years. One major accomplishment is that through the new organisation new funding commitments for JIVE are made, in most cases for a 5-year period.

A symposium, inaugural ceremony and council meeting will be held on 20 - 22 April 2015 in Dwingeloo. Invitations for these events are in the works.

Huib van Langevelde, Joint Institute for VLBI in Europe, Dwingeloo, The Netherlands

EVN Technical Operations Group Report

The Technical Operations Group (TOG) of the EVN, known as TOG, is composed of technical personnel from the stations and the correlator and they are in charge of VLBI observations at the EVN telescopes and the JIVE and Bonn correlators.

The TOG met twice in 2014. The first meeting was held at Wetzell in January 23-24 and the second one in Cagliari in October 5-6. The minutes from both meetings can be looked up at the EVN web page: <http://www.oan.es/evn/togmins/togmins.html>.

In these meetings the last three EVN sessions are reviewed by the JIVE correlator who provides feedback to stations with the goal of improving the reliability and quality of the data. Ongoing and future developments in different fields are presented and discussed among the participants. Operations are also discussed. These meetings are usually fruitful and allow direct communication among the different technical friends which is beneficial for the operations of the network along the year.

During 2014 several stations have migrated their legacy VLBI backends to DBBCs. The migration requires performing parallel observations in the NMEs at each station so that the correlator can compare the results from both backend systems. Once the correlator validates the DBBC, old backends are dropped in favour of the former. Stations that migrated during 2014 were Torun and Yebes. Medicina and Seshan tested their DBBCs but have not completed the transition yet.

During this last year most of EVN stations have finally replaced Dimino by jive5ab as the software for currently managing Mark5B, Mark5C and Flexbuff recorders. This software is developed and maintained at JIVE and among other characteristics enables e-VLBI and extraction of live data from a recording, sending it through the internet for verification. It also eases e-shipping data from stations to the correlator.

The FS version by NASA-NVI in use in most stations is 9.11.6. The latest DBBC firmware released by HAT-Lab in collaboration with MPIfR is available in two modes: DDC mode (version 104) and PFB mode (v14). Some test observations in PFB mode were ran during this year.

During 2014, tests have continued to implement and debug control software for triggered e-VLBI observations. The goal is to observe sources which require a very fast response from the EVN. This effort, mainly developed by Onsala and JIVE in the EVN is showing good results and will probably lead into having these observations as standard in the near future.

Works at some stations have also started towards locally recording and storing data and later transferring these data to the correlator to avoid shipping diskpacks. Flexbuff and Mark6 are the best candidates for these operations.

Finally one of the most important projects for the near future is implementing the 2 Gbps recording mode which will provide two circular polarization bands of 256 MHz bandwidth. This is an ongoing work currently in a test phase and we aim to offering this mode in the June EVN call for proposals. Hopefully session 3/2015 will be the first session to include this mode.

Pablo de Vicente, Observatorio Astronómico Nacional, Yebes, Spain, EVN TOG Chairman

EVN Scheduler's Report

Time allocations and resources used for recent EVN, Global VLBI, and e-VLBI observations:

2014 Session 3: 16 October - 05 November

Wavelengths: 5, 0.7, 6, 18/21, 3.6cm

Number of different user experiments observed: 21

Session Duration: 20.0 days Efficiency: 44.9%

Breakdown of observations by type and correlator. TBYTES indicates the estimated disk usage (in TB) at EVN telescopes.

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oct14          N-OBS      HOURS      DAYS      T-BYTES
-----
TOTAL          30          215.5      9.0       1040.0

EVN-only      13          102.0      4.3       437.3
Global        8           94.5      3.9       553.0
Short Obs.    0           0.0       0.0       0.0
Tests         9           19.0      0.8       49.7

EVN Correlator 28          173.5      7.2       841.5
Bonn Correlator 0           0.0       0.0       0.0
VLBA Correlator 2           42.0      1.8       198.5
eEVN Correlator 0           0.0       0.0       0.0
Other Correlator 0           0         0.0       0.0       0.0
CAL-only      4           16.0      0.7       0.0

MERLIN        0
Arecibo       0
VLBA          7
GBT           4
VLA           5
Robledo       0
Goldstone     1
RadioAstron   1
    
```

2014/2015 e-VLBI Observations

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          e-VLBI  PROPOSAL  TYPE
RUN  DATE  WTH  HRS  Normal Short  Disk ToO  Trigger
-----
14e08 08OCT14 18cm 24  1    0    -    0    0 sched 0 trig
14e09 18NOV14 6cm  24  1    1    -    2    2 sched 0 trig
14e10 02DEC14 18cm 24  1    2    -    0    0 sched 0 trig
15e01 13JAN15 18cm 24  2    0    -    0    0 sched 0 trig
    
```

Alastair Gunn, University of Manchester, EVN Scheduler

Recent and upcoming meetings

The 12th EVN Symposium and Users Meeting (Cagliari, 7-10 October 2014)

The 12th European VLBI Network Symposium was jointly organized by the Istituto di Radioastronomia (IRA) and the Osservatorio Astronomico di Cagliari (OAC) of the Istituto Nazionale di Astrofisica (INAF). It was sponsored by Radionet, INAF, IRA and OAC, and was held at the Hotel Regina Margherita, in the center of Cagliari (Italy) from 7th to 10th October 2014. The purpose of the symposium was to discuss the latest scientific results and technical developments from VLBI, and, in particular, e-VLBI and space-VLBI (RadioAstron).



The timing of this meeting coincided with the first successful observational tests of the Sardinia Radio Telescopes (SRT) within the EVN, and with a number of results from new and upgraded radio facilities around the globe, such as e-MERLIN, ALMA, and the SKA pathfinders. The symposium also incorporated the EVN Users Meeting.

The conference was attended by a total of 133 participants from 39 institutes in 16 countries world-wide. About 25 students and young postdocs attended the symposium and had the chance to present oral talks on their current works. There was a massive participation of the Asian Community, with 20 delegates from Japan and Korea. Germany had the largest number of participants (27), followed by Italy (23), The Netherlands (14) and Spain (12). The presence of women was remarkable: more than 20%, with the highest percentage from Italy (40%).

The program of the meeting was organized in 9 scientific sessions, covering a wide range of topics in both galactic and extragalactic astrophysics, e.g. AGN, starburst galaxies, stellar evolution from birth to death, astrometry, planetary science, as well as technological developments and future international collaborations. There were 70 oral presentations (including 8 invited speakers) spread over the 3.5 days of the conference along with 52 posters. The meeting was opened by the very comprehensive talk of Anton Zensus, Chair of the EVN CBD and Radionet Coordinator, about the present and future of EVN, and was closed by the JIVE Director, Huib van Langevelde, who reviewed the conference scientific results and social events with an enjoyable speech, supported by more than 100 pictures taken during the conference.

The scientific program also included a visit to SRT. A session of talks about the status and development of SRT was hosted by the local municipalities of the sardinian territory where SRT is located, and was started by the mayor of San Basilio, Maria Rita Rosas, and the mayor of Silius, Giuseppe Erriu.



Photograph of the participants of the 12th EVN Symposium made during a visit to the recently inaugurated Sardinian Radio Telescope.

The EVN Users Meeting was chaired by Tom Muxlow, Chair of the EVN Program Committee and gave to astronomers the opportunity to provide useful feedback on various matters regarding EVN operations, from proposal evaluation to data correlation. A main social event was the traditional football match opposing the local team to an international team of symposium participants. The final score was 1-1. The match was followed by the conference dinner at the restaurant of the "Hotel Panorama" of Cagliari, which served fabulous typical Sardinian dishes.

The proceedings of the symposium will be published in Proceedings of Science (<http://pos.sissa.it>).

Sincere thanks are addressed to the members of the Scientific Organizing Committee and of Local Organizing Committee, to the technical and administrative staff of IRA and OAC, and to all who have worked together to make this symposium a great success.

Luigina Feretti, Istituto di Radioastronomia, Bologna, Italy

Workshop on “Perspectives of Very Long Baseline Interferometry at Extreme Precision”

On November 26, 2014, a one-day workshop was held at the Max-Planck-Institut für Radioastronomie in Bonn, aiming at reviewing historic developments of precision measurements with VLBI and discussing prospects in this area of research for the coming decade and in view of the continued evolution and improvement of VLBI instrumentation and observational techniques. The workshop was attended by 52 participants from a number of European institutes and observatories. The presentations and discussions held at the meeting addressed many of the current developments in high-precision VLBI measurements, including novel approaches to astrometric measurements, extending the frequency reach to metre- and submillimetre-waves, driving the baseline length to hundreds of thousands of kilometers, and using new broadband recording techniques to give a more than an order of magnitude boost to sensitivity of observations.



The workshop official photograph, taken at the entrance to the MPIfR (courtesy of Eduardo Ros).

The workshop served also as a venue to celebrate the long-standing contributions and the impact made in these fields by Richard Porcas, a staff scientist at the MPIfR and a dedicated supporter of VLBI developments in Europe and throughout the world. Richard's scientific career has taken him through a number of pivotal developments in the VLBI world. These include, among others, the creation of the European VLBI Network, detailed VLBI studies of gravitational lenses, technical developments in astronomical and geodetic VLBI, investigations of superluminal motions in quasars and radio galaxies, and advancement of phase-referencing and astrometric methods. Richard was also strongly engaged in the operations of various VLBI networks and instruments, serving in various formal capacities and always being ready to give advice and provide help to his VLBI colleagues.

A special recognition of one of these engagements was made at the workshop by Yuri Kovalev, who presented Richard with the RadioAstron gold medal, honoring Richard's important contributions to forming the scientific programme and scheduling observational segments of the RadioAstron mission.



Yuri Kovalev presents Richard Porcas with the RadioAstron gold medal.



Richard Porcas and the next-generation VLBIers during the less formal part of the workshop

A Workshop on “Multi-Frequency VLBI Studies of AGN Core-Shift”

A workshop on “Multi-Frequency VLBI Studies of AGN Core-Shift” was held in the Korea Astronomy and Space Science Institute on December 18 to 19th 2014. It focused on the methods to observe core-shifts and science implications of these observations, with a particular stress on the contributions that simultaneous multi-frequency VLBI would provide. The Korean VLBI Network was designed around an implementation of a simultaneous multi-frequency receiving system at mm-wavelengths and the performance has been impressive (for example see Rioja et al 2014). Compatible systems are now being implemented in a number of other VLBI sites: ATCA, VERA & Yeves.

The important points from the meeting were that if the basis of the core-shift is Synchrotron Self-Absorption (SSA), the shifts would be at the few micro-arcsecond level for mm-wavelengths. mm-VLBI would be the best tool to discover where the SSA regime breaks down, and simultaneous multi-frequency global VLBI observations would therefore be the best approach to discover the deviations from the low frequency model. Deviations from SSA are nearly always towards smaller core-shifts, increasing the accuracy required. These deviations could be: the exposure of standing shocks, the deviation from conical jets or the exposure of non-radiating regions where the Poynting flux dominates. This underlines the importance of the global baselines. An interesting comparison was of effective resolution of the EHT and a putative global 43/86GHz mm-VLBI array. Both would have the same effective resolution; the lower resolution from observing at the lower frequency was compensated by the better uv-coverage and phase stability.



The rogues gallery of the attendees at the KASI coreshift workshop

Four capabilities of the KVN-like systems were highlighted: Simultaneity, Coherence, Polarisation and Astrometry. Simultaneity advances sciences which need to monitor rapidly changing events over a wide spectrum. Coherence allows coherence times at the higher frequencies to be extended almost infinitely. Astrometry comes from Source/Frequency Phase Referencing and provides astrometric observations at these high frequencies.

Polarisation, and particularly Faraday Tomography across a very wide frequency span, allows for the investigation of very high rotation measures changing on very fine angular scales.

Related to this is that there is an upcoming RadioNet3 ERATec workshop covering Software Controlled operation and Implementation of Simultaneous observations at mm-wave bands on Radio Telescopes is being planned for October 5–7, 2015 at the Osservatorio Astronomico di Arcetri, Florence. Here discussions will focus on what the best methods would be for European telescopes to implement simultaneous multi-frequency VLBI capabilities.

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Richard Dodson, Maria Rioja, International Center for Radio Astronomy Research, Perth, Australia

Upcoming Meetings in 2015

A number of scientific conferences and workshops which are planned to be held in 2015 will provide ample opportunities for presenting and discussing results from VLBI studies of a broad variety of astrophysical phenomena. A subset of these meetings, covering the first half of 2015, is briefly introduced below:

20-24 April: A conference on [“Relativistic Jets: Creation, Dynamics, and Internal Physics”](#) will continue the series of conferences that have been held in Krakow (Poland) over the past 12 years, focusing on detailed discussions of the progress in theoretical and observational studies in the field of relativistic jets.

11-12 May: A COST Workshop on [“Polarization and Active Galactic Nuclei”](#) in Strasbourg (France) will address a broad range of topics connecting polarimetric studies in different domains of electromagnetic spectrum, including high-resolution radio observations of relativistic jets and nuclear regions in active galaxies.

27-29 May: The [5th Workshop on Compact Steep Spectrum and GHz-Peaked Spectrum Radio Sources](#) will be held in Rimini (Italy), focusing on one of the “canonical” topics of VLBI observations and reviewing the progress in observational and theoretical understanding of the CSS and GPS radio sources.

22-26 June: The [European Week of Astronomy and Space Science \(EWASS-2015\)](#) will be held in La Laguna (Spain), with a number of meetings and splinter sessions on topics in which VLBI studies provide strong impact. EWASS-2015 will also host a meeting of the European Interferometry Initiative (EII) Science Council Meeting, which focuses on long baseline interferometry in the optical regime, which may have interesting potential synergies with long baseline studies in the radio. The ASTRONET 2015-2025 discussion at EWASS-2015 will present another potentially important forum for reviewing the prospects for the European astronomy.