European VLBI Network Newsletter

Number 33

September 2012

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1) Message from the EVN chairman

Dear Colleagues,

Many of you will already know that Sir Bernard Lovell, one of the pioneers who created the whole science of radio astronomy, died in August at the age of 98. The development of Jodrell Bank, culminating in the construction of the 76-m telescope which now bears Sir Bernard's name was a triumph, entirely due to his ambitious vision, tireless effort and tenacity. At the same time, Sir Bernard brought together and inspired the team who would develop the technique of long baseline interferometry. Led by Henry Palmer, the Jodrell Bank team used radio links to connect telescopes over distances of up to 100km. Their results were eagerly awaited by the Caltech group, who pursued the most compact objects: what had looked like unusual stars were identified as distant and powerful quasars. Sir Bernard recognised their importance and fostered the development of MERLIN to be able to study radio galaxies and quasars in more detail.

Sir Bernard was a powerful advocate of international cooperation in science, and during one of his early visits to the Soviet Union in 1963, he discussed the possibility of what we now call VLBI with Nikolay Kardashev, Leonid Matveenko and others. The Lovell telescope was involved in many of the earliest European VLBI experiments and Jodrell Bank was a founder member of the EVN.

Sir Bernard maintained his regular presence at Jodrell Bank until only a couple of years ago, always keen to follow developments in radio astronomy technology and science. We all owe him a great deal, and he will be very greatly missed.

We are all looking forward to the EVN Symposium in Bordeaux - the packed programme includes a wide range of exciting talks with many new members of the VLBI community.

Congratulations to all the team who have been working on the Sardinia Radio Telescope which captured its first light in August and we look forward to it taking part in EVN sessions.

Congratulations also to the team at JIVE and partners from the Nexpres and Uniboard projects, who have sucessfully demonstrated real-time fringes at 4 Gb/s and fringes with the prototype FPGA-based Uniboard correlator; together these show the clear path to the future EVN with 4-10 Gb/s bandwidth and beyond. More details are below.

And finally, congratulations to the RadioAstron team, who have now demonstrated fringes at 22 GHz, with a projected baseline of just over 1 Earth diameter; the first announcement of opportunity for observing with Radioastron has just been released.

Simon Garrington

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2) Call for EVN Proposals

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European VLBI Network

Call for Proposals

Deadline 1 October 2012

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This call for proposals is also available on the web as text

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 specialized in VLBI techniques 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)

- 2013 Session 1 Feb 21 - Mar 14 18/21cm, 6cm ...
- 2013 Session 2 May 23 - Jun 13 18/21cm, 6cm ...
- 2013 Session 3 Oct 17 - Nov 07 18/21cm, 6cm ...

Proposals received by 1 October 2012 will be considered for scheduling in Session 1, 2013 or later. Finalisation of the planned observing wavelengths will depend on proposal pressure.

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

- 2012 Nov 13 - Nov 14 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm
- 2012 Dec 04 - Dec 05 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm
- 2013 Jan 15 - Jan 16 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm
- 2013 Feb 05 - Feb 06 (start at 13 UTC) 18/21cm, 6cm, 5cm or 1.3cm

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

To enable proposals that contain both e-VLBI and disk-based components, the NorthStar on-line EVN proposal tool has consolidated the e-EVN and EVN+MERLIN proposal classes. A single EVN+MERLIN proposal can now request e-VLBI or disk-based observations. You can choose each "observation" within the proposal to be e-VLBI or disk-based, independently of any other observations it may contain.

Proposals submitted by the October 1st deadline will be considered for scheduling in the above sessions starting from Nov 2012.

Note that only one wavelength will be run in each e-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 the observing modes.

Features for the next regular EVN and e-EVN sessions

* e-VLBI updates: e-VLBI is now available with Noto telescope at 512Mbps. Full 1Gbps e-VLBI data transmission is now possible from Medicina.

* From Session 3 2012, 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 for Cm will be made available at up to 512Mbps (e.g. 64MHz 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 for updates on the current EVN and e-EVN array; availability of different stations per observing band and for the dates of the e-EVN observing sessions.

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.

How to submit

All EVN, Global and e-VLBI 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. 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.

The deadline for submission is 23:59:59 UTC on 1 October 2012.

Additional information

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

The EVN User Guide 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 lists sources observed by the EVN and Global VLBI.

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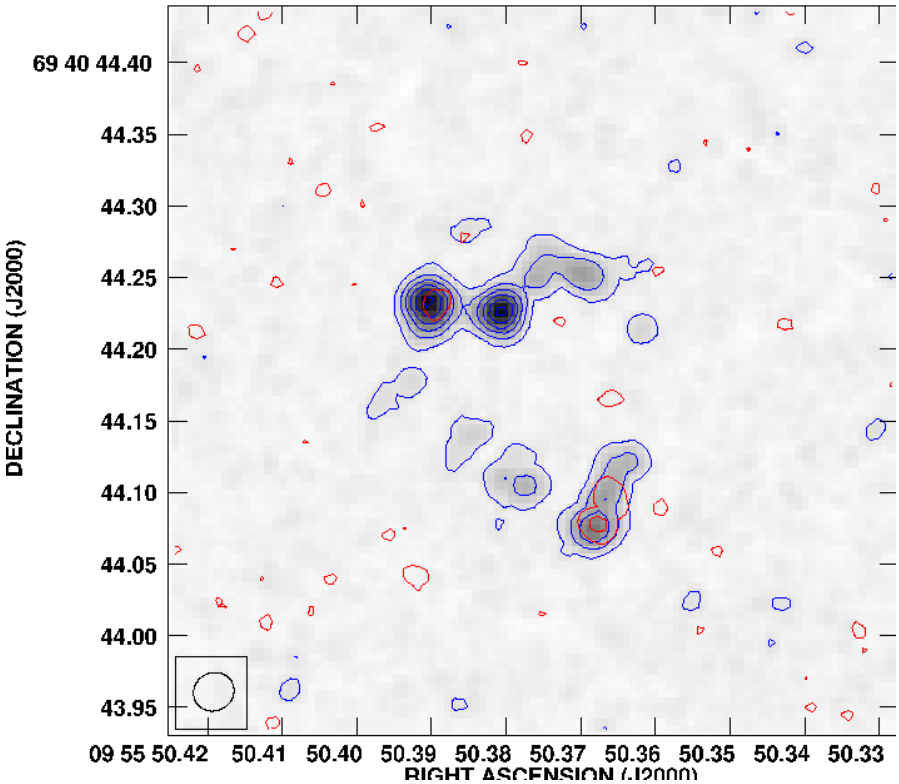
3) EVN Science Highlights

a) Resolved simultaneous obervations of 1665 and 1667MHz OH masers in M82

The nearby starburst galaxy M82 has been well-studied over the years. Many radio observations have focussed on either the continuum objects (McDonald et al 2002; Beswick et al 2006; Fenech et al 2010; Gendre et al 2012), or the extent and velocity distribution of the gas (Wills et al 2000; Pedlar et al 2003; Seaquist et al 2006). Despite being known about since the 1970s (Rieu et al 1976), surprisingly little is known about the OH maser emission in this archetypal starburst.

Over the last ten years, we have carried out several studies of the OH gas in M82. Starting with a VLA A-array observation in 2002, intended primarily to investigate how the molecular gas (traced by the OH absorption) compares with the neutral HI gas in the central radio-bright starburst (Pedlar et al 2003), a catalogue of OH main line masers was compiled. Despite the observational setup being optimised for broad absorption features, and hence far from ideal for the detection of narrow maser features, several features were detected (Argo et al 2007). These low-velocity resolution observations were later followed up by higher spectral resolution observations, also with the VLA in A-array. These follow-up observations (Argo et al 2010) showed that some of the maser spots were resolved in frequency, splitting into several velocity components. This fact, combined with brightnesses some 10^3 times greater than typical Galactic OH masers, supports the assertion that (at least some of) these so-called ``kilomasers'' are in fact the superposition of numerous weaker (possibly Galactic-strength) maser regions within the VLA beam, although the exact nature of these masers (self-amplified narrow-beam masers, or amplified masers superposed on background continuum) so far remains unclear.

EVN observations at high spatial and velocity resolution have now confirmed that several of these maser regions are in fact spatially resolved on scales of a few milliarcseconds. The figure shows the brightest of the masers in M82 as observed with the EVN; red and blue contours show the 1665 and 1667 MHz emission respectively, superimposed on a map of the integrated 1667 MHz line emission. Several spatial components are clearly seen, as predicted from the VLA spectrum of the source which showed several velocity components for this source. In this case, all of the components are stronger at 1667 MHz than at 1665 MHz with most not visible above the noise in the lower line. The region is ~3.5 parsecs in diameter and is co-located on the sky with a known HII region, although no continuum emission is seen on EVN scales in these data. Investigations are underway comparing the maser emission with background continuum emission, and further observations are scheduled for the upcoming EVN session to investigate variability and morphological changes since the last observation.

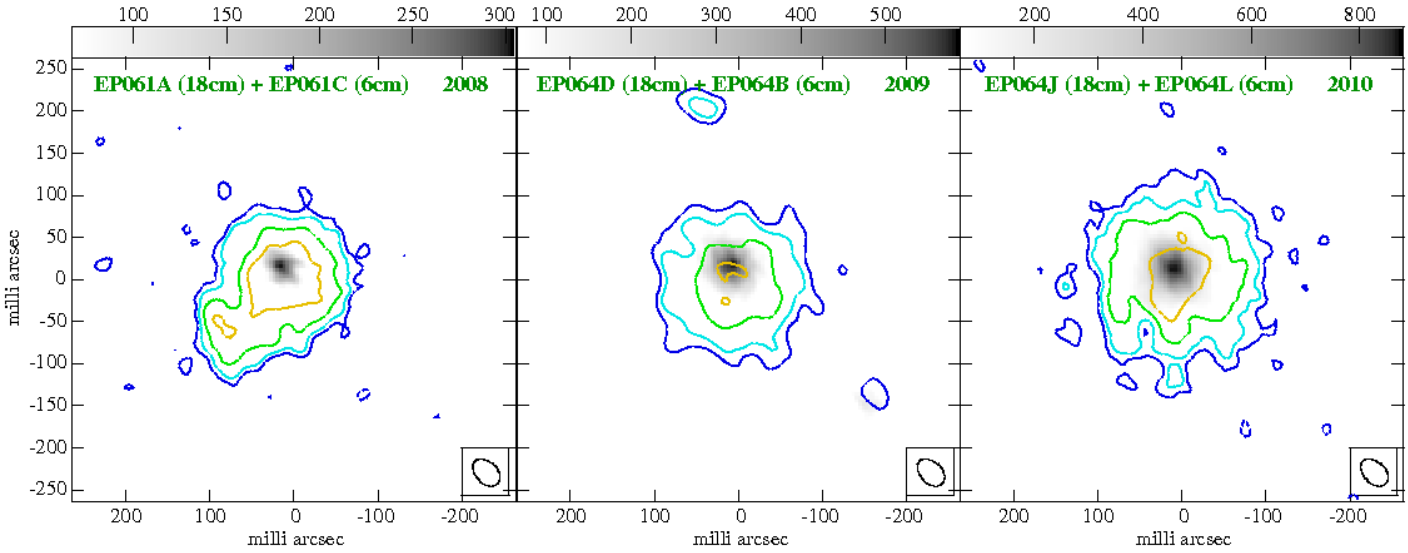


Resolved OH 1665 and 1667MHz masers in M82. Red = 1665MHz OH emission, Blue = 1667MHz OH emission.

Megan Argo (ASTRON), Rob Beswick (JBCA), Danielle Fenech (UCL), Tom Muxlow (JBCA), Melanie Gendre (JBCA)

b) EVN observations of the farthest and brightest ULIRG in the local Universe

IRAS 23365+3604 is one of the farthest (252 Mpc) and brightest (L_IR = 1.35E+12 L_sun) ultra luminous infrared galaxies (ULIRGs) in the local Universe. The resolution we attained using a maximum baseline length of approximately 7000 km is not enough to resolve individual compact sources (e.g. SNe, SNRs and AGN) from each other in the innermost regions of this ULIRG, however, by monitoring variations of total flux density and spectral index distribution, we have found that the nuclear region (~200pc in linear size) is composed of at least two zones dominated by distinct populations of radio emitters. One of the zones has a composite spectrum due to ongoing non-thermal activity (probably due to recently exploded SNe and the presence of an AGN); the other zone has a steep spectrum, likely dominated by an old population of radio emitters, such as SNRs.



IRAS 23365+3604 18cm contours overlaid on grey-scale 6cm images in three different epochs with the EVN. The project codes (PI: M. A. Perez-Torres) are indicated in each figure.

Cristina Romero-Canizales, Miguel Perez-Torres, Antxon Alberdi (IAA, Granada)

4) EVN Technical Developments

a) 4Gbps EVN demonstration

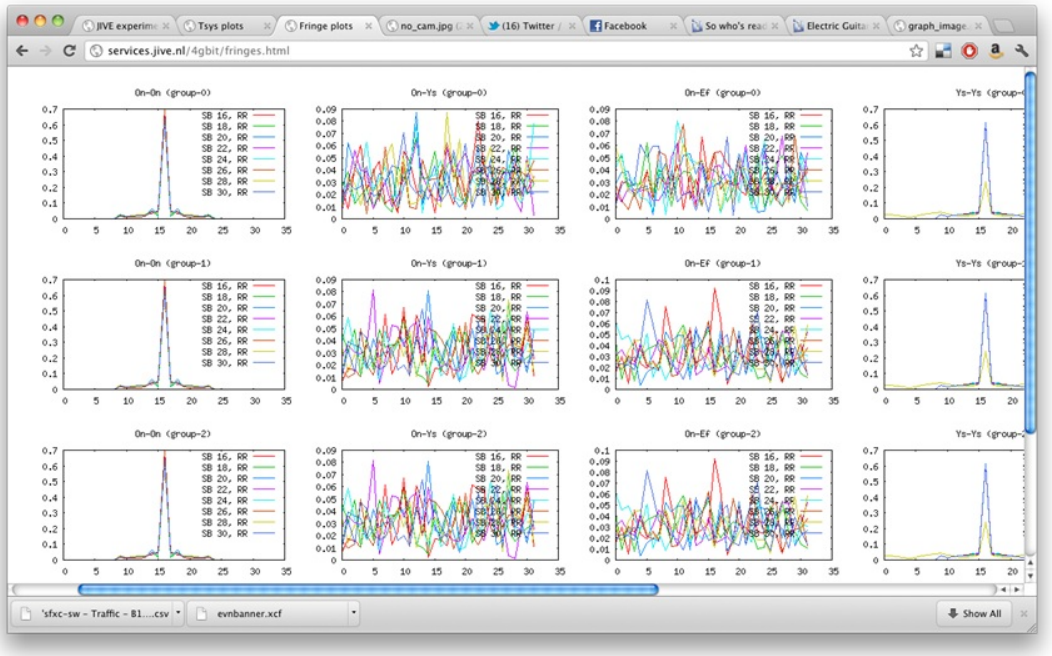
One of the aims of the EC-funded NEXPReS project is to prepare the EVN for the higher bandwidths that are becoming available. With the rollout of DBBCs throughout the EVN and the steady increase of international network capacity, 4Gbps operations may soon become a reality, both recorded and in real-time. As part of one of the deliverables of the project, a first-ever 4Gbps EVN test observation was set up to take place in June 2012. This involved the telescopes at Effelsberg, Onsala and Yebes, in collaboration with the NORDUnet, SURFnet, RedIRIS and GÉANT research networks.

The specific aim of the demo was to exercise the new observational modes that will become the standard in the EVN in the next years. The first of these was the combination of high-speed recording (2 and 4 Gbps) on disk packs at the stations, while simultaneously transferring a subset of the data in the form of a 1-Gbps data stream to the correlator in Dwingeloo. In the future, this mode will become important for those stations that have 4Gbps-capable receiving and recording equipment but limited connectivity. The second mode was to be real-time correlation of the full data streams at 2 and 4 Gbps, with or without recording at the stations.

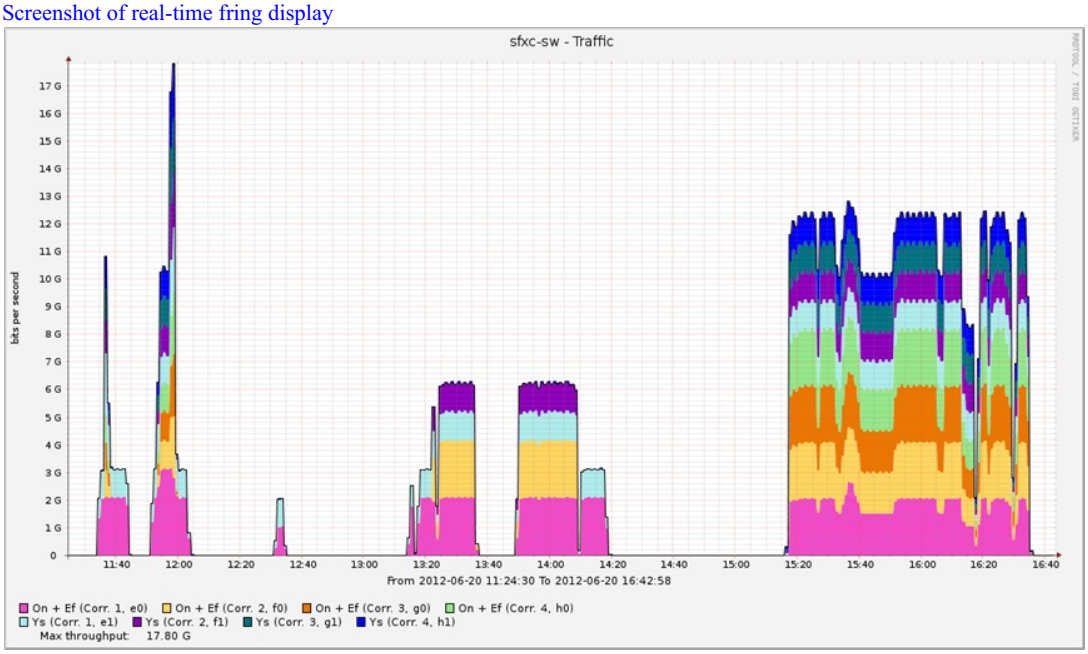
Note that at the time it was decided to have this demo (January 2012), the Mark5Cs in the EVN had not been tested at 4Gbps, ever, that the Fila10G boards, needed to output DBBC data on a 10GE connection, only could produce Mark5B format data at 2Gbps, that only the DBBC at Ef was equipped with a Fila10G, that only three Fila10G boards were available in all of Europe (one of which was consequently sent to Chile for testing with APEX), that the DBBC at Yebes needed repairs, that there was no Mark5C at Yebes and that the new fibre to Yebes had not been lit yet. During the period January -- June 2012 countless telecons took place involving the Mark5C and DBBC designers, VLBI friends and operators at the telescopes and JIVE staff. Immense numbers of emails were generated, and at a certain point so many programmes, instructions and scripts had to be distributed amongst the group members that a part of the NEXPReS wiki was reserved for this purpose. New software and firmware was written, new modes of the DBBC tested, a Mark5C was shipped from JIVE to Yebes, powerful 1U server computers with multiple 10G interfaces (Harroboxes) purchased and installed at the stations, optical modules, cables and various bits of equipment shipped across Europe. The final missing Fila10G board was brought back from Chile as hand luggage to Germany, where it was promptly impounded by customs. Fortunately, it only took about a week to resolve that problem. To top it all, the work package leader decided to take 3 weeks vacation at the end of May. What could possibly go wrong.

Although a lot of tests of equipment and network connectivity were done offline, tests using real observations were of course needed as well. As the EVN block session immediately preceded the demo, suitable gaps in the schedule had to be found, during which all three telescopes would be available for several hours. During these tests an amazing number of problems were found and solved, ranging from pure software bugs to issues of configuration, scheduling, and even the maximum length of CX4 cables that could be used. During these many hours the standard (1Gbps) observing mode was exercised, but the many problems that had to be dealt with meant that the PFB mode of the DBBC could not be verified.

The demo took place on June 20, and started around 10 CET. A number of minor issues had to be dealt with immediately. After this, basically everything worked out of the box. Data were recorded at the stations at 4Gbps and simultaneously transferred to JIVE for real-time correlation on the SFXC software correlator, at 1, 2 and even 4Gbps. The networks performed flawlessly, barring some local problems with flooding. Unfortunately though, no fringes were found.



Screenshot of real-time fring display



Data throughput at JIVE. The peak of 18Gbps is caused by internal flooding at the correlator

Most of the time that day was spent on trying to find fringes, ftp'ing bits of data from the Mark5C recorders to JIVE to explore different combinations, different time delays, but to no avail. The most likely culprits are the time synchronisation of the Fila10G, or the configuration of the DBBCs. Considering we were using practically brand-new equipment in never before tried modes, this is not altogether surprising. But once this final problem is sorted, this mode will be ready for operational use, as we have shown that all parts of the equipment, from the stations to the correlator, can handle and process these data streams.

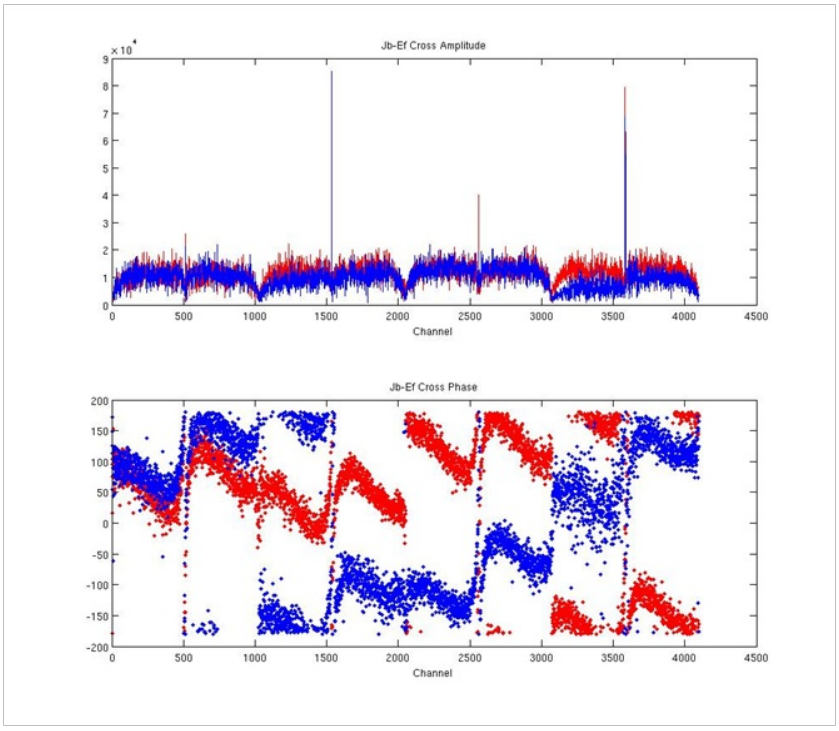
In spite of the lack of fringes, the demonstration was a technological success. And although the preparations of the demo at times caused a lot of stress for operators and engineers at the stations and JIVE, it was also an excellent opportunity for the EVN staff to showcase their technical competence and inventiveness as well as a demonstration of the strength of the international collaboration that forms the basis of the EVN.

b) UniBoard Correlator fringes and UniBoard-2

The JIVE-led UniBoard project, part of RadioNet FP7, has successfully produced an FPGA-based, generic, high-performance computing platform for radio astronomy. Several of the project partners are developing various applications for the UniBoard. As an example ASTRON, responsible for the design of the board, has implemented and built an Apertif beam former combining four UniBoards, eight Analogue-to-Digital converters and one clock board in a custom-made frame. INAF, in collaboration with MPG, is working on a digital receiver application dedicated to a pulsar-timing machine, composed of a dual-channel Tektronix 8-bit ADC and one UniBoard.

Front and back view of Apertif beamformer sub-rack.

At JIVE, the focus has been on the development of a VLBI correlator. Also in June, just days before the formal end of the project, the first fringes on a baseline between Jodrell Bank and Effelsberg were produced, successfully demonstrating the end-to-end functionality of the design.



First UniBoard cross correlations on a JB-Ef baseline

Work is now concentrating on improvements to the filter bank, the inclusion of the delay module and the timing and control mechanisms of the correlator, with the intention to have a first operational UniBoard-based prototype correlator at the beginning of 2013. A pulsar-gating module will also be added to the design.

Meanwhile, the RadioNet3 UniBoard2 project has kicked off on the first of July 2012. The timeline of this project straddles two generations of FPGA technology, 28nm and 20nm, with the release of the first 20nm devices about to be announced. Because of this, the decision was made to delay the actual start of the board design as much as possible (although not by more than one year). In this way we hope to be able to skip one generation of FPGAs between the two UniBoards, and develop a board that will make use of the latest and most power efficient devices available.

5) EVN Scheduler's Report

a) SESSIONS SCHEDULED SINCE THE LAST NEWSLETTER

2012 Session 2: 24 May - 14 June
Wavelengths: 3.6/13, 6, 1.3, 18 cm
Number of different user projects observed: 14
SESSION DURATION: 21.2 days
Scheduling efficiency: 55.5 %

Breakdown of observations by type and correlator. T-BYTES indicates the estimated disk useage (in TB) at EVN telescopes.

	N-OBS	HOURS	DAYS	T-BYTES
TOTAL	31	282.5	11.8	539.3
EVN-only	16	126.5	5.3	299.3
GLOBAL	3	120.0	5.0	191.6
Short Obs.	0	0.0	0.0	0.0
Tests	12	36.0	1.5	48.4
User: Cont.	16	227.0	9.5	432.1
User: Line	1	8.0	0.3	4.6
User: Pulsar	3	14.5	0.6	66.6
EVN-Corr.	19	136.5	5.7	404.9
Bonn-Corr.	2	78.0	3.3	134.4
VLBA-Corr.	0	0.0	0.0	0.0
eEVN-Corr.	5	52.0	2.2	
Other-Corr.	0	0.0	0.0	0.0
CAL-only	5	16.0	0.7	
MERLIN	0			
Arecibo	0			
VLBA	3			
GBT	0			
VLA	0			
Robledo	2			
Goldstone	0			

b) e-VLBI SCHEDULING

SESSION	DATE	WAVELENGTH	HOURS	e-VLBI	PROPOSAL	TYPE
				Normal / Short	Disk / ToO	Trigger
12e06	19JUN12	6cm	16h	2 / 1	- / -	1 sched 0 trig
12e07	17SEP12	6cm	24h	2 /-	- / 1	2 sched 0 trig

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6) NEXPReS receives "excellent" rating in second annual review

We are pleased to report that NEXPReS received a preliminary rating of "excellent" in its second annual review in September. Formal, written results are expected from the reviewers in october. Results of the project's second period were presented by Norbert Meyer (chairman of the board), Huib Jan van Langevelde (project coordinator), Ari Mujunen (WP8), Arpad Szomoru (WP5), T. Charles Yun (project manager WP1) and Yvonne Kool.

The review began with an overview of the project, including its main objective: Correlate in real time what you can, correlate later what you need.

Highlights from this period (July 2011 - June 2012) include:

- 24 deliverables completed
- 4Gbps recording / 1Gbps real-time demo
- Demonstration of international Bandwidth on Demand (BoD) at 4Gbps
- Configuration of 10Gbps BoD for the LOFAR Long-Term Archive
- Automated Correlation demonstration with Hartebeesthoek, Yebes, Torun
- "FlexBuff" (High-Bandwidth, High-Capacity Networked Storage) performance tests at AALTO, JIVE, Onsala, JBO

Van Langevelde also reported on suggestions from the previous year's review, including working more closely with EVN users to identify requirements, optimise usefulness of the system, and persuade them to publish e-VLBI results more quickly. Some suggestions are more easily implemented than others!

With just one year of the project remaining, we're turning the corner from system design and testing to full implementation. By July 2013 we aim to have successfully eliminated the distinction between "traditional" recorded VLBI and e-VLBI, to offer "mixed" VLBI as a regular service from the EVN.

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7) EVN exhibits at IAU General Assembly in Beijing

The IAU held its 28th General Assembly in August in Beijing. With the increasing global visibility of the EVN and the prominent role of VLBI in China, this meeting provided an excellent opportunity for the EVN to make its "world debut" by sponsoring and exhibiting at the assembly. Staffed by young radio astronomers WU Fang and YAN Zhen, the booth presented the realm of European VLBI, as well as the NEXPReS and RadioNet projects, and drew considerable attention by the attendees.

We'd like to thank Prof. HONG (ShAO) for making staffing arrangements, WU Fang (ShAO) and YAN Zhen (ShAO) for their enthusiasm at the booth, and EVN partner institutes for their contributions.

EVN exhibits at IAU General Assembly in Beijing

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8) Future Meetings

Coming up in the next few months several science and more technically orientated meetings are occurring. Not least of these is the 11th EVN Symposium which will be held in Bordeaux between 9th-11th October 2012, and already (judging from the programme alone this promises to be an exciting meeting showcasing science with the EVN). Below we list several other upcoming meeting which may be of interest to the community.

a) ADVANCED RADIO ASTRONOMY
Commissioning Skills and Preparation for the SKA

13 November to 16 November 2012
JBCA, University of Manchester, UK

http://www.alma.ac.uk/events/radionet-advanced-radio-astronomy

The number of prospective radio interferometry users is increasing very rapidly, thanks to new and upgraded radio interferometry arrays coming into operation (ALMA, e-MERLIN, JVLA, KAT7, LOFAR ...) and those planned or under construction (ASCAP, MeerKAT, NOEMA, SKA etc.). All these telescopes aim to make their data accessible to astronomers with an interest in the science, not necessarily in the dirty details of techniques. Nonetheless, there is still a need for a core of experts to lead ambitious science projects and to test, operate and develop radio instruments.

This workshop will communicate skills that you need to help comission a radio interferometry array or work on early science data. The new arrays coming into operation have all found a shortage of scientists able and willing to help troubleshoot early science. Talks and discussion sessions will share best practices between people working on the arrays, lessons from comissioning scientists and the experiences of working on early science data.

Real issues which have arisen at individual arrays will be used as examples for problem-solving group sessions, but the skills of improvisation, troubleshooting and working at the interface between astronomer and engineers, are very widely applicable.

There are no fixed qualifications for attendance but in case of over-subscription, people with some radio astronomy experience will be prioritised. There will be opportunities to contribute your experience, with a few slides if wanted.

Sessions will be led by expert astronomers and engineers from these arrays; so far confirmed: Robert Laing (ALMA), Simon Garrington (e-MERLIN/VLBI), Rick Perley (JVLA), Michiel Brentjens (LOFAR), Anita Richards (RadioNet), Roshene McCool (SKA)

There is no registration fee but please register as soon as possible at since capacity is limited.

Conference email : RadioNetARICSNov2012 [at] jb.man.ac.uk

b) THE MODERN RADIO UNIVERSE 2013

22 - 26 April 2013
Bonn, Germany

https://indico.mpifr-bonn.mpg.de/indico/conferenceDisplay.py?confId=21

80 years ago, in spring 1933, Karl Jansky published his discovery of cosmic radio emission. This paved the way not only for a new discipline, radio astronomy, but also for an exploration of the universe that now encompasses almost the entire electromagnetic window.

Nowadays, radio astronomy is about to enter into yet another "golden era" with a number of new or upgraded radio facilities coming online and major new initiatives, like the SKA, are starting up. This conference will try to highlight the original and exciting science currently being produced by radio astronomical facilities, such as the Effelsberg telescope, the GBT, LOFAR, ALMA, the Karl Jansky VLA, eMERLIN, EVN, VLBA, as well as the pathfinder experiments of the Square Kilometre Array (SKA), and others.

The advanced science delivered by the radio astronomical community will improve our current knowledge of the universe, highlight new trends, and address key questions in modern astrophysics that may lead us to even more ambitious science goals to be targeted by future radio facilities like the SKA.

Science areas that will be discussed are among others: Cosmology, galaxy evolution, AGN and compact objects, star formation, interstellar medium, The Milky Way and Galactic science, radio transients, fundamental and astroparticle physics, extreme physics and associated theory. In particular:

- From the dark ages to cosmic large scale structure (EoR, dark energy, HI web)
- Galaxies and galaxy evolution (HI, radio continuum, magnetic fields)
- Stars and star formation (masers, radio stars, planetary radio emission, disks)
- Interstellar and Intergalactic Medium (physical processes in the ISM and IGM)
- Compact Objects (AGN, X-ray binaries, neutron stars, radio transients)
- Tests of fundamental physics (pulsars, fundamental constants)

The last Modern Radio Universe took place 2007 in Manchester commemorating 50 years of the Lovell telescope and looking forward towards the SKA. This issue of the conference commemorates the groundbreaking work of Karl Jansky 80 years ago and comes 40 years after the Effelsberg 100m telescope started operations.

The conference will consist of invited talks (approx. 20 min) and 15 min contributed talks (potentially a few 30 min review talks) plus posters. In short, combining past and future of radio astronomy, the main focus of the science presentations, will be to make an inventory of outstanding science results that are presently being obtained by the newly upgraded or constructed facilities.

SOC:M. Kramer (chair; MPIfR), H. Falcke (chair; Radboud Uni Nijmegen), F. Bertoldi (AIfA), F. Combes (Paris), T. de Graauw (ALMA), P. Diamond (SKA), A. Eckart (Uni Cologne), B. Fanaroff (SA SKA), R. Fender (Uni Southampton), L. Feretti (INAF), T. Fieseler (Juelich), D. Frail (NRAO), M. Garrett (ASTRON), R. Laing (ESO), K. Menten (MPIfR), L. V. Montenegro (IAA), M. Reid (CfA Harvard-Smithsonian), A. Zensus (MPIfR)

LOC: H.-R. Kloeckner (chair), G. Breuer, S. Bruschi, H. Falcke, M. Huynh, M. Kramer, J. Lazio, M. Zwaan

Important dates:

- Registration open: September 25th, 2012
- Registration deadline: April 1st, 2013
- Abstracts deadline: February 15th, 2013
- Conference dates: April 22nd - 26th , 2013

Conference email: mru2013 [at] lists.mpifr-bonn.mpg.de

c) 3GC3 Workshop & Interferometry School

10 - 22 Feb 2013
Port Alfred, South Africa

http://sites.google.com/a/ska.ac.za/3gc3/home
Sponsored by Rhodes University, SKA Africa and RadioNet

3GC3 is the third in a series of workshops on third-generation calibration (3GC) in radio astronomy. 3GC is catch-all term for new calibration and imaging techniques and algorithms that are needed to deal with the problems and increased capabilities of upgraded and upcoming telescopes, including the SKA itself. The themes of the previous two workshops were calibration of direction-dependent effects (Nancay, France, 2009) and beamshape-related problems (Albufeira, Portugal, 2011).

The theme of 3GC3 is "The Elephants In The Room". By "elephants", we refer to possible fundamental or practical limits on the scientific performance of upcoming telescopes. With orders-of-magnitude increases in the sensitivities and fields-of-view of our instruments, some of these "elephants" may now be taking shape -- can we afford to overlook them as we design and build the SKA?

Interferometry School

The first part of 3GC3 ("student week", Mon 11 Feb through Fri 15 Feb) will consist of an advanced interferometry school for postgraduate students and researchers looking to gain a deeper understanding of calibration and imaging problems. The aim of this is somewhat different than a regular synthesis imaging school -- rather than learning about routine data reduction, we will look at "difficult cases" that require new approaches, and lay the groundwork for 3GC.

Students looking to just get a taste of 3GC should come for the school only, while advanced students are encouraged to remain for the main workshop beginning Fri 15 Feb (numbers permitting).

The school will be very much hands-on, with students expected to bring their own laptops, while we will provide a big central compute server for running the practicals.

Main Workshop

The main workshop will start on Fri 15 Feb with a joint problem overview session, in which the students will also participate. After a one-day outing to Addo Elephant National Park, we then expect to spend an intensive six days (Sun 17 Feb to Fri 22 Feb) looking for our own "elephants", in particular:

- problems imposed by primary beams (sidelobes, beam stability, beam modelling, etc.)
- modelling and calibration of the ionosphere
- deconvolution, source extraction and source modelling

Participants are expected to bring their own laptops, while we provide a big central compute server for running the practicals -- which also facilitates easy data sharing. In our experience with previous workshops, it is the hands-on part that stimulates the real understanding and discussion. We will therefore be working with our invited speakers to put together a program structured around interesting issues and problems that have working software, data and/or simulations to back up the talks.

Pre-registration and further info

For pre-registration and further information, please refer to the 3GC3 website: https://sites.google.com/a/ska.ac.za/3gc3/home, or contact Oleg Smirnov .

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