



## Express Production Real-time e-VLBI Service

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# Monthly Report- Oct 2008

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### Document Log

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### Project Information

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## Table of Contents

1. Introduction
2. Network Activity Updates
  - \* NA1- Management
  - \* NA2- EVN-NREN
  - \* NA3- e-VLBI Science Forum
  - \* NA4- Public Outreach, Dissemination and Communications
3. Specific Service Activity Updates
  - \* SA1- Production e-VLBI Service
  - \* SA2- Telescope Network Connections
4. Joint Research Activity Updates
  - \* JRA1- FABRIC

### Section 1- Introduction

It has been a lopsided and busy month for the project with a vast majority of the work and activity focusing on current and future operational activities. SA1/Production Services makes up the vast majority of this month's report, with all other activities seeming to act in response/support of the SA1 items. Thinking about this situation, this means that the project is hitting a stage of maturity where the operational achievements are now at the fore, taking advantage of the infrastructure and R&D elements that have been built. There are obviously many elements that still need to be completed, but the fact that operations can commence and move forward is reassuring.

#### Section 2.1 – NA1 Management

The Project Office worked on two major items. The first (and easier) item was the receipt of the Period 2 distribution. The distribution has been received and will be processed over the next few days.

The more complicated item has been the revelation that one of our partners may need to change their status in the contract. CNIG-IGN was informed that it's organizational structure is viewed differently than they originally thought. The current belief is that the entity "CNIG-IGN" must be split into two separate groups and their participation in EXPReS reflect these changes. A telecon with the involved parties (CNIG-IGN, the Commission and EXPReS) was held at the beginning of the month. Paperwork to have CNIG listed as partner has been deemed the appropriate action and will be completed with cooperation between CNIG-IGN and the Project Office.

The Project Office and JIVE have presented a position paper on the infrastructure needs of e-VLBI into the future. This document identifies the opportunities and challenges made possible by EXPReS. The document will be made available by the Commission to several discussion groups who are looking to future activities.

#### Section 2.2 – NA2 EVN-NREN

No update at this time.



## Section 2.3 – NA3 eVSAG

Preparations for the end of project science and technology meeting have begun. The local organizing committee and science organizing committee have started email discussions that have provided enough input to post basic information to the web page.

## Section 2.4 – Public Outreach

On 1 October, a group of 35 science journalists from across Europe visited JIVE as part of a four-day excursion around the Netherlands. The focus of their tour is astronomy, space research, space travel and the international year of astronomy. The journalists were given a tour of the facility, overview of e-VLBI and EXPReS. While only a short visit, we hope that it was useful to give them a sense of what we do and better background for any news that might be upcoming.

EXPReS has begun preparation for the International Year of Astronomy. Several meetings have been held to determine how the event will highlight and showcase EXPReS activities. Demonstrations and educational materials for the general public are being developed. The IYA is seen as a very positive and large stage to showcase the achievements of e-VLBI.

Recently, some photographs and related materials have been posted to the wiki under a CC License. This licensing scheme supports the fair and wide use of materials through a more liberal framework than traditional copyrights. The first photos have been tagged (see <http://www.jive.nl/dokuwiki/doku.php/expres:outreach:photos:correlator>) and others should follow quickly.

In response to the ToO observation (see below in Production e-VLBI Correlation section), a press release and related announcements have been generated. The Astronomer's Telegram notification is listed in the "Papers and Results" section of the project web page.

The framework web pages for the end-of-project Science and Technology meeting have been posted online. They are available via <http://www.oan.es/expres09/>.

## Section 3.1 – Production e-VLBI Correlation

The next set of e-VLBI observation dates was announced to the community. The upcoming dates are:

13 November 2008  
19 November 2008  
4 December 2008  
22 January 2009  
10 February 2009  
24 March 2009  
21 April 2009  
19 May 2009

Further details on times and receivers are available via [http://www.evlbi.org/evlbi/e-avlbi\\_status.html](http://www.evlbi.org/evlbi/e-avlbi_status.html). The dates include both testing time and observational science time (as they always do). Time has been allocated for both the IYA 2009 opening demonstration as well as the related 100 Hours of Astronomy event.

It is also good to note that the announcement feels much more procedural than the first few announcements showing the maturation and acceptance of e-VLBI, at least within the project- we hope the same is true throughout the community.



The following was sent to the European VLBI Network mailing list announcing the completion of a Target of Opportunity observation. The ToO's highlight the capability of e-VLBI and the community's desire for rapid response science.

----- Original Message -----  
Subject: EVNtech: RT008 ToO yesterday  
Date: Fri, 7 Nov 2008 15:09:32 +0100 (CET)  
From: Zsolt Paragi <zparagi@jive.nl>  
To: EVNtech <EVNtech@jb.man.ac.uk>

Hi,

We observed an e-EVN ToO project yesterday, with Jb2, Mc, On, Tr and Cm participating. In the first 1.5 hours there were fringe-finders scheduled for data checking and clock-searching. For the first time, we did this in an automated fashion, without interrupting the correlation job. This makes the preparation time for e-VLBI observations shorter. Although we had initial problems with two Mark5As in JIVE (our fault), observations of the target source started as planned. The rest of the run went very smoothly, except for a few minutes "diagonal weight" in one of our Station Unit.

The PI is analyzing the data already. The first impression is that we will have a very nice result.

We thank to all stations who changed their observing and test plans on such a short notice to support this ToO. Special thanks to Bob Eldering and Bob Campbell for implementing the on the fly clock-searching mechanism.

With regards,  
Zsolt

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astronomer telegram:  
<http://www.astronomerstelegram.org/?read=1836>

The email announcement quickly summarizes the result at the expense of hiding the huge amount of effort put in to complete the observation.

### Section 3.2 – Telescope Network Connections

The project office received an update on connections to some of the telescope locations, specifically focusing on the steps needed to get to 1024 Mbps.

Jodrell Bank - have to configure bonding on 2 interfaces, connect one Mark5 to two lightpaths (1Gb/s each), which can only be a temporary solution. Might need to buy a second 1G card. They have already upgraded to SMP and Debian Sarge.

Medicina: currently do not have 10 Gbps connectivity. Once the 10 Gbps is in place we can move forward.

Torun: The Mark5 has a 10G card, but the lightpath to JIVE is only 1Gbps (limited by hardware at both ends of the link). The link still needs to be configured and tested.



Effelsberg: Network path is already fine and tested, they have a 10G switch in place close to the Mark5. They need to decide to buy a 10G card. This is already in discussion with Ef, alternatively they'll install a second 1G and do bonding from the Mark5 to the 10G switch.

Onsola: tested, works. They have Debian Etch with a 10G card installed and a 1.5Gb/s path to JIVE.

WSRT: tested, works. We use ethernet bonding over the installed CWDM. They need to replace a 1Gb/s card in their Mark5A to make bonding work without surprises, that's already in the works.

JIVE: we should receive 3 more 10G cards this week, bringing the total to 5. We have 6x copper-based 10G available on the switch, and enough CX4 cables. TODO: install new 10G cards in Mark5, install Debian Etch on those Mark5, run cables, configure switch: less than a day's work.

#### **Section 4.1 – FABRIC**

PSNC has made progress with the grid correlation and indicated that the software correlator was running on their cluster. At the moment, it works only using the ethernet transport between nodes; the infiniband network interface still needs debugging. PSNC and JIVE are exchanging email on this topic and expect to have a solution in the short term.

The email exchange in relation to PSNC's efforts with Infiniband lead to a more general teleconference that identified specific sub-items that needed to be addressed in order to get the grid system as a whole better integrated with the software correlation code.

Lastly, members of the JIVE EXPRoS team had an informal discussion with a hardware vendor who was interested in the future needs of the VLBI community. The conversation was quite general and ranged widely. From the EXPRoS point of view, there is a need to closely re-examine the relationship between processing capability and power utilization (heat). From the big cluster point of view, the relationship between FLOPS and power is critically important. At the moment, the can not talk about the change in power consumption given more or less aggressive software optimizations (approximations) as the code base is not cemented. However, there is was general agreement that general purpose CPUs would not be efficient as FPGAs. The development cost of each was not discussed in depth, but is understood to be another important topic.