NA3 -eVLBI Science Forum

EXPReS May 29th 2007

John Conway, Onsala, Chalmers Univ, Sweden

- eVLBI Science Conference (Month 31, Oct 2008)
- eVLBI Science Advisory Group (eVSAG)
- Give science advice to rest of project-advertise observing opportunities
- Online eVLBI science forum, news to users EVN newsletter etc

eVSAG-Members-1
EVN/Express members

- John Conway – Chairman
- Patrick Charlot – EVN PC Chairman
- Richard Porcas – EVN Scheduler
- Huib vanLangevelde - EXPReS coordinator
- Arpad Szomuru – SA1 leader
- Paco Colomer – SA2 leader
- Charles Yun– JRA1 leader
- Rudiger Haas - Geo VLBI rep
- Vacant – Space Navigation rep
- Bob Campbell – JIVE correlator rep

eVSAG-Members-2
Station members

- Z. Paragi – JIVE, Netherlands
- R.Vermuelen – ASTRON, Netherlands
- A Alcola – CNIG-IGNA, Spain
- C.Phillips – CSIRO, Australia
- J.Quick – Hart, SA
- T.Venturi – INAF, Italy
- A.Lobanov– MPI,Germany
- A.Lahteenmaki-MRO,Finland
- C.Salter – NAIC, Arecibo
- E.Pazderski- NCU, Poland
- M.Lindquist. OSO, Sweden
- H.Hase, TIGO, Chile/Germany
- D.Jiang, Shanghai, China
- T.Muxlow(?) Uni Manchester, UK
- I.Smeds, Latvia

Total of 25 members, 15 from observatory EXPReS participants

Face-to-Face Meetings

First F2F meeting Nov 29th 2006 at Radionet/CBD – delayed 4months wrt project plan

Discussion of science use of eVLBI document

Second meeting in project plan Month 16,

Now scheduled for June 29th in Gothenburg,

Day before PC. On time.

eVLBI End Use

- Adaptive Observing- adapt runs based on results
- ’Persishable’ observing- space nav, geo
- Automated observing – month long expts?
- Targets of Opportunity – no disk stockpile
- Connect to real time arrays (LOFAR, eMERLIN)

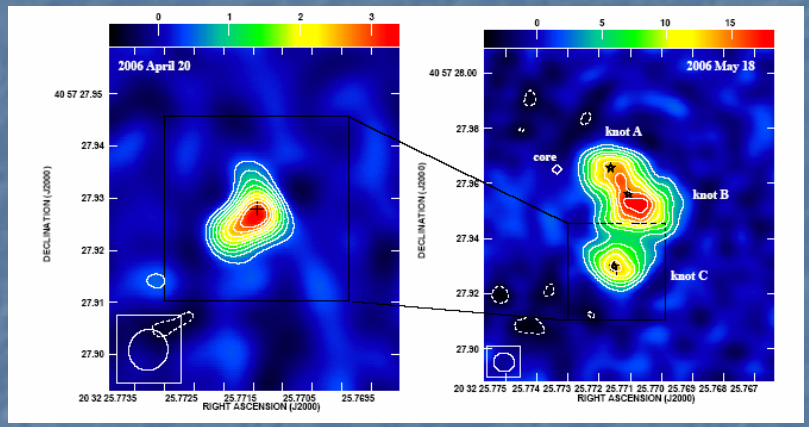
eVLBI astro runs in Year1

Date	Submissions / scheduled	Mbps/antennas	Comments
2006 Mar 16	3/1	128/5	Technical failures, no useful data
2006 Apr 20	3/2	256/6	Gave published observations (Tudose et al 2007 and Rushton et al 2007)
2006 May 20	0/1	256/6	Planned Technical only run, not advertised, but was used to observe a previously submitted proposal. Part of published observations of Tudose et al (2007)
2006 Jun 26	0/0	256/6	
2006 Oct 26	4/2	256/6	
2006 Dec 14	3/3	256/6	
2007 Jan 29/Feb 1	1/1	256/6	First adaptive, 'double header' observation. Technical success but no active sources.
2007 Feb 20	1/1	256/6	

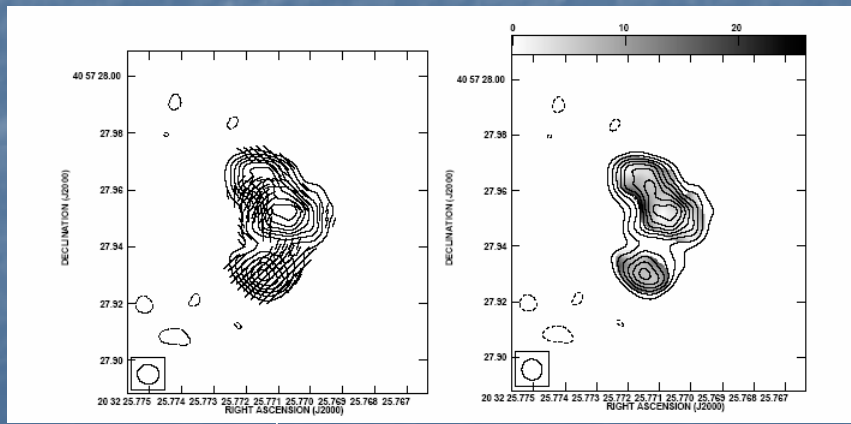
In every case proposal deadline 2 weeks before session as agreed in Nov 2005, CBD.

Cyg X-3

- Maps made from data at two epoch, first in very weak state second just after a major flare.
- Tudose et al (2006), MNRAS accepted, Polarisation map made for second expt



Epoch 2 →



Polarisation

Total Int

First Refereed Publications

First e-VLBI observations of GRS 1915+105

A. Rushton,[1*] R. E. Spencer,[1] M. Strong,[1] R. M. Campbell,[2] S. Casey,[1] R. P. Fender,[3,4] M. A. Garrett,[2] J. C. A. Miller-Jones,[4] G. G. Pooley,[5] C. Reynolds,[2] A. Szomoru,[2] V. Tudose[6,6] and Z. Paragi[2]

ABSTRACT

We present results from the first successful open call e-VLBI science run, observing the X-ray binary GRS 1915+105. e-VLBI science allows the rapid production of VLBI radio maps, within hours of an observation rather than weeks, facilitating a decision for follow-up observations. A total of 6 telescopes observing at 1 GHz across the European VLBI Network (EVN) were correlated in real time at the Joint Institute for VLBI in Europe (JIVE). Constant data rates of 128 Mbps were transferred from each telescope, giving 4 TB of raw sampled data over the 12 hours of the whole experiment. Throughout this, GRS 1915+105 was observed for a total of 3.3 hours, producing 2.8 GB of visibilities of correlated data. A weak flare occurred during our observations, and we detected a slightly resolved component of 2.7 ± 1.2 milliarcsecond with a position angle of 140° ± 2°. The peak brightness was 10.2 mJy per beam, with a total integrated radio flux of 11.1 mJy.

Key words: ISM: jets and outflows . X-ray binaries: individual (GRS 1915+105).

1 INTRODUCTION

First e-VLBI observations of Cygnus X-3

V. Tudose,[1,2*] R.P. Fender,[3,1] M.A. Garrett,[4] J.C.A. Miller-Jones,[1] Z. Paragi,[4] R.E. Spencer,[5] G.G. Pooley,[6] M. van der Klis[1] and A. Szomoru[4]

ABSTRACT

We report the results of the first two 5 GHz e-VLBI observations of the X-ray binary Cygnus X-3 using the European VLBI Network. Two successful observing sessions were held, on 2006 April 20, when the system was in a quasi-quiescent state several weeks after a major flare, and on 2006 May 18, a few days after another flare. At the first epoch we detected faint emission probably associated with a jacking jet, spatially separated from the X-ray binary. The second epoch in contrast reveals a bright, curved, relativistic jet more than 40 milliarcseconds in extent. In the first, and probably also second epochs, the X-ray binary core is not detected, which may indicate a temporary suppression of jet production as seen in some black hole X-ray binaries in certain X-ray states. Spatially resolved polarisation maps at the second epoch provide evidence of interaction between the ejecta and the surrounding medium. These results clearly demonstrate the importance of rapid analysis of long-baseline observations of transients, such as facilitated by e-VLBI.

Key words: accretion, accretion discs – stars: individual: Cygnus X-3 – ISM: jets and outflows – radiation mechanisms: non-thermal – techniques: interferometric.

1 INTRODUCTION

Figure NA3-1: First refereed journal publications from e-VLBI

Future runs

- May 20th technical test only. June 25th next, special deadline for June 12th.
- New proposal system for 1st June deadline for observations in Aug,Sept,Oct
- Three classes of proposal A) Standard B)Triggered C) Short observations
- Double header/adaptive run 2x24hrs end of Nov, Dec, Jan and Feb runs- Deadline Oct 1st From Jan 2008 some to include Bonn, Yebes, China and Metsahovi?

Technical aspects

- 256Mbps expected, 512Mbps target.
- Allow 18/21cm, 6cm, 5cm – consider 1.3cm after Bonn/Yebes joins
- Spectral line now allowed (not triggered), spread sessions allow monitoring.

Future Proposal Policy

- Discuss at June 29th, eVSAG
- For Oct 1st - limited 'generic' proposals – source classes with no positions at time of proposal. (but still fixed slots).
- Discuss feasibility (for March 2008 onward) of extensive ToOs in non fixed slots – report of Paragi working group- discuss needs of particular science goals

Session Distribution 2008/2009

- What to do after March 2008 for last year of EXPReS????
- Present 24hrs fixed slots or 48hrs maybe?
- AND/OR- significant time for 'generic ToO on unsheduled dates' ?
- AND/OR – Replace standard expts in sessions by eVLBI?
- AND/OR – Limited offer few stations long obs in conjuction with Software correlator in 2008?

Contract Goal

- Want EU to evaluate final project as success for future funding (!)
- What will satisfy them, vs SA1/NA3 goals?
- Proposal to ’move VLBI from disk to internet’ – implies must do ’significant part’ of Nov 2008 or Feb 2009 sessions with eVLBI?
- OR a few nice applications plus publications – plus demonstrating capabilty to replace disk enough??