

Targeting transient sources with e-VLBI

EXPreS Project

In electronic Very Long Baseline Interferometry (e-VLBI) an array of distant radio telescopes carry out VLBI observations and the data are streamed to a central data processor in real-time. The European VLBI Network (EVN) has been pioneering in the scientific applications of this new technique. The goal of the EXPreS project is to provide operational level e-VLBI service in the year of 2009. The greatest advantage of e-VLBI is the fast science turnaround time. Experiments targeting transient sources benefit the most of this capability. The trigger for e-VLBI may come from connected element interferometers (as the Westerbork Synthesis Radio Telescope, also part of the EVN), or from gamma or X-ray satellites and optical telescopes. For new transients it is essential to have accurate positions at the arcsecond level.



Currently the e-EVN consists of Cambridge, Jodrell Bank, Medicina, Metsahovi, Onsala, Torun and Westerbork telescopes. During 2007 we expect that Arecibo, Effelsberg, Shanghai and Yebes join as well. The e-VLBI data are directly coming to the EVN correlator at JIVE, through the GEANT network and other national research networks. There have been robust real-time science operations since 2006 at 128-256 Mbit/s in the 5 GHz and 1.6 GHz frequency bands. In 2008 we expect to increase the data rate to 512 Mbit/s, and extend the range of observing frequencies. The current sensitivity for 10 hours on-source integration time is 50 microJansky/beam, this will go down to 15 microJansky/beam during the next year.

For more information see:

<http://www.evlbi.org/>
<http://www.expres-eu.org/>
<http://www.jive.nl/>

Post-processing software at JIVE have been improved in the recent years significantly. The raw data from the correlator are being converted into FITS files in a largely automated manner. These are further pipelined by a completely automated process that produces images from the data within an hour. The results are stored at the EVN Data Archive (<http://archive.jive.nl/>). PIs are encouraged to come to JIVE to further analyse their data with professional help. This makes the e-EVN an easy access-easy to use instrument for the whole astronomical community. The science targets so far included a supernova, a stellar maser source, Algol, and X-ray binaries (microquasars). Follow up observations of faint transients is becoming a reality from early 2008.

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