

EUROPEAN VLBI NETWORK – TECHNICAL & OPERATIONS GROUP

4th December 2006 – Noto, Sicily, Italy

Report on VLBI Operations for Jodrell Bank Observatory

This report covers the period from April 2006 to October 2006 and includes the VLBI observing session carried out in June 2006.

1. June 2006 Session

This session comprised 5 experiments at L-band, 4 at 5cm and 8 at 6cm. At L-band, the Lovell telescope was scheduled for 39 hours and no data loss at the telescope was reported. At 5cm, the Cambridge telescope was originally scheduled for 44 hours but due to other commitments was not available. The Darnhall antenna, whose integration into the VLBI system is relatively easy, was used instead. The Mk2 telescope also observed the 44 hours of 5cm experiments. Only 1 hour (2.3%) was lost on the Mk2 (none on Cambridge) but this was the real-time fringe checking experiment which successfully identified a band-switch in the wrong position prior to the science observations beginning. At 6cm, 4 of the 8 experiments (39.6 hours) were joint MERLIN observations which involved both the Mk2 telescope and the Cambridge telescope (which had by that time returned to VLBI use). Cambridge also observed the fringe checking experiment, thus completing 40.5 hours of 6cm observations with a data loss of only 3 minutes (0.1%). The Mk2 observed a total of 80.5 hours at 6cm with a data loss of 2 hours 2 minutes (2.5%). Data loss was primarily due to loss of communication with the Mk5 recorders, but one instance involved an inordinately long slew of the telescopes. In conclusion, a total of 248 hours of observations were performed, with a data loss at the telescope of only 3hours 5 minutes (1.2%), i.e. a success rate of 98.8%.

2. Technical Developments

Both the VLBA and MkIV tape recorders have now been decommissioned. The Jodrell Bank home station (Lovell, Mk2 etc.) and Cambridge are now 'Mk5-only' VLBI stations. An additional four 3 TByte disk-packs have been constructed. Earlier this year, we installed RF mixers and synthesisers to support recording of two more MERLIN stations simultaneously on one disk-pack, and tested one unit (Cambridge and Darnhall) during the February 2006 session for Target-of-Opportunity observations of the nova RS Oph. These observations were processed successfully by Cormac Reynolds at JIVE. We can extend this to two-station recording on two terminals, thus supplying four antennas to the EVN. Substantial progress has been made with the real-time 'eVLBI' data recording system to the point where it has become a regular EVN science operation (since early this year) at 256 mbps. Fringes have been obtained at 512 mbps which is our current maximum, although a scheme exists aiming at 896 mbps by 'track dropping'. Consideration is underway for integrating our systems with the *e*-MERLIN correlator over the next 12 to 24 months. We are considering carefully how to avoid VLBI sessions being interrupted during this critical phase of the *e*-MERLIN upgrade. Earlier this year, JIVE expressed some concerns about the form of the Mk2 gain-elevation curve for EVN data. Some investigations have been made, initially implying that the measured curve is accurate. However, we wish to compare with an independent means of measuring the gain-elevation curve, but as yet, have not secured telescope time to proceed with this.

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