

EUROPEAN VLBI NETWORK – TECHNICAL & OPERATIONS GROUP

17th April 2009 – Torun, Poland

Report on VLBI Operations for Jodrell Bank Observatory

1. October 2008 Session

This session was shorter than usual due to various constraints across the EVN. For Jodrell Bank the session consisted of 8 experiments at 6cm, 6 at 18cm and 2 at 1.3cm. Only one experiment (eb037d) was a joint MERLIN observation. At 6cm, the Lovell telescope was scheduled for 30 hours of observations and the Mk2 telescope for 48.5 hours. 3.6% of Lovell time was lost due solely to high winds and 0.7% of Mk2 time due to a recorder problem. At 18cm, the Lovell was scheduled for 7.5 hours, the Mk2 for 60 hours and Cambridge for 16 hours. No Lovell time was lost, but Mk2 lost 5.8% of time due to problems with the 18cm receiver and the Field System computer (computer timing error). Cambridge lost 12.5% of time (2 hours) due to a failure of the Field System computer disk. At 1.3cm, both the Mk2 and Cambridge telescopes were scheduled for 16 hours of observations and neither reported any data loss at the telescope. In conclusion, a total of 194 hours of telescope time were scheduled, with a data loss of 6.9 hours (3.5%), i.e. a success rate of 96.5%.

2. February 2009 Session

The February 2009 VLBI session comprised 8 experiments at 6cm, 3 at 1.3cm, 5 at 18cm and 10 at 5cm. Six of the 6cm experiments and 4 of the 18cm experiments were joint MERLIN observations. Due to the appearance of a crack in the Lovell telescope azimuth track just prior to the session, all 18cm experiments which were scheduled to use the Lovell telescope used the Mk2 telescope instead. In all experiments where Cambridge was also scheduled and where there was sufficient unused bandwidth on our VLBA recorder, we recorded signals from the Knockin antenna also. This process, which is possible because the MERLIN L-band link is limited in bandwidth, enables data from an extra MERLIN antenna to be recorded on the same physical disk pack as the Cambridge data and thereby provides a complete set of EVN baselines for minimal extra workload. There were 13 experiments in total for which this was done, 7 at 6cm, 5 at 18cm and 1 at 5cm. At 6cm, the Mk2 telescope was scheduled for 80 hours of observations, and the Cambridge and Knockin telescopes were each scheduled for 66 hours of observations. 5% of time was lost for Mk2 mainly due to an LO system problem. 0.3% of time was lost for Cambridge and Knockin due to a minor antenna control problem. At 1.3cm, the Mk2 telescope was scheduled for 20 hours of observations and lost about 1.4% of time due to a recorder problem. At 18cm, all three telescopes were scheduled for 36.5 hours of observations. The Mk2 lost 5.7% of time and Knockin lost 25% of time mainly due to high winds during experiment ea039. Cambridge lost about 0.9% of time at 18cm due to recorder problems. Finally, at 5cm, the Mk2 and Cambridge telescopes were each scheduled for 73 hours of observations. Cambridge reported 3.1% data loss entirely due to recorder problems whereas Mk2 suffered no data loss at 5cm. Knockin was scheduled only to observe the Network Monitoring Experiment (n09m1) at 5cm and lost 16.7% of time due to a configuration problem. In conclusion, a total of 492.5 hours of telescope time was scheduled, with a data loss at the telescope of 19.3 hours (3.9%), i.e. a success rate of 96.1%. The majority of lost time was due to high winds but uncommonly high rates of recording failure on the VLBA DAR contributed.

3. Technical Developments

The most recent software updates have been to provide control of a secondary VLBI antenna using the same Field System interface on the VLBA DAR. This allows the FS to independently set the configuration and control of two MERLIN antennas. The system was used extensively during the February 2009 session to control Cambridge and Knockin simultaneously, without any problems. The software is mostly completed and necessary hardware changes have also been implemented. The Mk5 recorders have now both been upgraded to Debian Etch and SDK8 Conduant software. Tests are currently being performed to allow the Mk5-554 recorder to send the full 1024 Mbps from the Mk2 telescope. We recently purchased five SATA disk pack modules and constructed one 12 TB pack. The Hydrogen maser has a semi-temporary repair in place after a component failure but is operating within the range of VLBI accuracy. Monthly e-VLBI tests have also been going well. We have so far performed 4 e-VLBI observations in 2009, including an e-VLBI demonstration to coincide with the launch of IYA2009 in Paris.

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