EUROPEAN VLBI NETWORK - TECHNICAL & OPERATIONS GROUP

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Report on VLBI Operations for Jodrell Bank Observatory

1. February/March 2014 Session

The February/March 2014 EVN session for JBO comprised of 33 experiments: 9 at 18cm, 6 at 5cm, 13 at 6cm and 4 at 1.3cm and were scheduled to use Jodrell Bank's Lovell and Mk2 telescopes. Four of the experiments (2 at 18cm and 2 at 6cm, all except one using the Lovell telecope) were designated joint e-MERLIN/EVN observations although e-MERLIN observations were not always performed simultaneously with the EVN. One experiment was a joint RadioAstron observation. One experiment (ef025 at 18cm) was performed using eVLBI. At 18cm (Lovell telescope), 73h of observations were scheduled and 4h01m (5.5%) were lost due to either wind (2h37m) or antenna control issues (1h24m). At 6cm, the Lovell telescope was used for 12 experiments totalling 67h and the Mk2 telescope was employed for one experiment (eg080b) to enable fast phase referencing, for 8h. For 6cm, a total of 75h of telescope time was scheduled and 3h45m were lost. This loss was due to an antenna control problem (45m) in experiment eg062f and the complete failure of a azimuth bearing which prevented experiment ea053e (3h) being performed. No loss of data was reported for the Mk2 telescope at either 5cm (33h scheduled) or 1.3cm (20.5h scheduled). In conclusion, a total of 201.5h of telescope time was scheduled (140h on the Lovell telescope and 61.5h on the Mk2 telescope) with a total reported data loss at the telescope of 7h46m (3.9%), i.e. a success rate of 96.1%.

2. May/June 2014 Session

The May/June 2014 EVN session for JBO consisted of 36 experiments: 10 at 18cm, 6 at 6cm, 11 at 5cm, 6 at 90cm and 3 at 1.3cm and were scheduled to use both the Lovell and Mk2 telescopes. Five experiments (3 at 18cm and 2 at 6cm) were joint e-MERLIN/EVN observations although e-MERLIN observations were not always performed simultaneously with the EVN. One experiment was a joint RadioAstron observation. Shortly before the session, the Lovell telescope suffered a major azimuth boogie failure which resulted in all 18cm observations originally planned for the Lovell being performed with the Mk2 telescope. At 18cm, 94.5h of observations were scheduled on the Mk2 and 17h (18%) were lost at the telescope due to several antenna control failures. At 6cm, 35hr of observations were planned for the Mk2 telescope and a further 7hr using the Lovell telescope. No data loss was reported for 6cm observations. At 5cm, 65h of observations were performed with the Mk2 telescope and 1h (1.5%) was lost due to antenna communication problems. At 90cm, 14h of observations were performed on the Lovell telescope with a data loss of 2.5h or 17.8% (all of experiment gp052c). This was due to a critical failure of the antenna control software. At 1.3cm, 25h of observations were scheduled on the Mk2 telescope with no reported data loss. In conclusion, a total of 240.5h of telescope time was scheduled (219.5h on the Mk2 telescope) with a total reported data loss at the telescope of 20.5h (8.5%), i.e. a success rate of 91.5%.

3. Technical Developments

A great deal of time has been spent during the last year integrating the VLBI systems control software with the e-MERLIN control infrastructure. Some general improvements to timing have been done, including the development of a low-cost GPS timing/ntpd server to replace the TAC clocks. We have managed to reinstate the antabfs software locally and begun to investigate problems with Rx calibration with a view to improving reliability and effectiveness of local calibration measurements. Although we have made some progress in identifying problems which have led to a failure of e-MERLIN/VLBI fringes locally (using the software correlator vs the e-MERLIN correlator), the required software changes have not yet been implemented or tested. JBO is currently up-to-date with disk pack purchasing. Jodrell Bank took delivery of a DBBC during july and this has now been partially integrated into the observing system. Test observations will be performed in Session III 2014 and Session I 2015.

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