EUROPEAN VLBI NETWORK- CONSORTIUM BOARD OF DIRECTORS

29th November 2005

Report on VLBI Operations for Jodrell Bank Observatory

1. May 2005 Session

This session comprised 12 experiments at L-band and 6 at C-band. At L-band, the Lovell and Cambridge telescopes were scheduled for all 12 experiments for a total of 122 hours each. Nine of these experiments were joint MERLIN observations (113 hours per telescope). For the Lovell telescope, only 0.5 hours were lost due to human error but 4.5 hours were lost due to an unknown bug within the MERLIN control software that prevents source changes when commands are sent to the control computer at one second before midnight. This same problem affected the Cambridge telescope, which lost, in addition, a further 5.75 hours due to problems with the Mk5 recording unit. At C-band, one experiment (5 hours) was performed with the Mk2 telescope since it required fast phase referencing observations, which are restricted on the Lovell telescope. This experiment was also the only one recorded on MkIV tape, since it was to be correlated at the VLBA correlator in Socorro. The remaining C-band observations (totalling 54 hours) were performed with the Lovell telescope. Only 10 minutes were lost due to a minor problem with the Mk5 unit. The total number of scheduled hours on all telescopes was 303 (176 on the Lovell, 5 on the Mk2 and 122 on Cambridge). Total lost time amounted to 14.4 hours, giving an overall success rate (at the telescope) of 95.2%.

2. October 2005 Session

This session comprised 7 experiments at C-band, 2 at K-band, 15 at L-band and 2 at P-band. At C-band, the Lovell telescope was originally scheduled for 71 hours but it did not return from summer engineering (wheel girder repairs) before the start of the session. The Mk2 telescope was used instead. A total of 3^h22^m (4.7%) were lost at C-band due to technical problems (Mk5 communication loss and vacuum failures). At K-band, the Mk2 telescope was used for 15 hours of observations with 48^m (5.3%) lost time. At L-band, the Lovell was scheduled for all 15 experiments (125.5 hours), and Cambridge for 3 of these (31 hours), although the observations were not joint MERLIN programs. A power supply on the VLBA rack was beginning to fail as the K-band session began, resulting in a maximum of 27^h (90%) lost time, although fringes were obtained during the N05L5 experiment and data may be recoverable for much of the early part of the Cambridge observations. For the Lovell L-band observations, a total of 12^h36^m (10%) were lost. 14% of this time was due to high winds and the remainder due to two major failures of the Lovell azimuth drive system. At P-band, 14 hours were scheduled on the Lovell and no time was apparently lost at the telescope. The total scheduled observing time for all telescopes was 256.5 hours. The worst-case scenario, where all Cambridge data is considered lost due to the power supply failure, is 17% lost time. As noted, much of the Cambridge data may well be recoverable. Hence, excluding the Cambridge figures, the total lost time was 16^h43^m, giving an overall success rate (at the telescope) of 92.6%.

3. Technical Developments

A recent updating of records indicates that the Cambridge remote recording system is working highly predictably, with the occasional non-standard or broadband experiment not being observable. The two Mk5 recording systems continue to operate well and have undoubtedly contributed to recent good performance figures. We have continued to purchase Mk5 disks and constructed a further 10 x 3.2 TB packs for use in the October 2005 session. Obsolescence and failure of Mk4 IF racks remains a cause for serious concern, as no replacement is yet on offer. The VLBI-dedicated Gigabit fibre Internet link to JIVE, to be used expressly for e-VLBI applications, has been undergoing further tests this year. In addition, the Cambridge telescope was used during a ‘live’ demonstration of European e-VLBI on 7th July. During this event, the EU Commissioner for Research and the Dutch Minister for Science, Culture and Education witnessed real-time EVN fringes in the correlator room at JIVE. Overall, the e-VLBI tests have been very encouraging, although the JBO link seems to be subject to a 250 Mbps limit on the fibre connection to JIVE. The cause of this is unknown but is being investigated.

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