

23rd January 2014 – Geodetic Observatory, Wettzell, Germany

Report on VLBI Operations for Jodrell Bank Observatory

1. May/June 2013 Session

Thirty-six experiments were scheduled to be observed by JBO telescopes in the May/June 2013 EVN session. These comprised 11 at 6cm, 6 at 5cm, 13 at 18/21cm and 6 at 1.3cm. Two experiments were joint EVN/e-MERLIN observations and one (at 18cm) was performed using eVLBI. At 6cm, the Lovell telescope was used for a total of 67h with a reported data loss of 5h40m (8.5%), 4h of which was due to Mk5 recorder problems and the remainder due to high winds. At 5cm, the Mk2 telescope was scheduled for 38h of observations and there was no reported data loss at the telescope. At 18/21cm a total of 13 experiments (3 of which were at 21cm) were observed for a total of 88h. There was only 18m (0.3%) data loss reported due to problems with the Mk5 unit. At 1.3cm the Mk2 telescope was scheduled for 37h of observations and performed without any reported data loss. In conclusion, JBO telescopes were scheduled for 230h of observations this session with 5h58m (2.6%) reported data loss at the telescope, i.e. a success rate of 97.4%.

2. October/November 2013 Session

The October/November 2013 EVN session for JBO comprised of 28 experiments: 5 at 1.3cm, 7 at 6cm, 14 at 18/21cm and 2 at 90cm and were scheduled to use Jodrell Bank's Lovell and Mk2 telescopes. Four of the experiments (2 at 6cm and 2 at 18cm, all with the Lovell telescope) were designated joint e-MERLIN/EVN observation although e-MERLIN observations were not performed simultaneously with the EVN. Four experiments were joint RadioAstron observations. Two experiments at 18cm (eh027a,b) were performed using eVLBI. At 1.3cm (Mk2 telescope), 20h of observations were scheduled and 10h (50%) were lost due to incorrect pointing offsets. At 6cm, the Lovell telescope was used for 5 experiments totalling 27h and the Mk2 telescope was employed for the final two C-band experiments (totalling 10h) to facilitate a rapid receiver change to L-band on the Lovell telescope. A total of 37h of 6cm observations were scheduled with a loss of approximately 1h due to an LO multiplier failure. At 18/21cm a total of 14 experiments (two at 21cm) were observed for a total of 95h. Unfortunately, the L-band receiver warmed up soon after fringes were found during the fringe test experiment and since this occurred at the end of the week, a receiver replacement was not performed straight away. During this time, however, a serious backup power generator failure prevented observations completely for experiments eh027a/b (e-VLBI), eg075 (RadioAstron) and n1313 (NME). Some data was also lost due to the subsequent receiver change and a small amount of time due to recording problems. In total 13.5h (14.2%) were lost at 18/21cm, mainly due to the generator failure. At 90cm, two experiments were scheduled for a total of 16.5h. A total of 5h were lost due to high winds. In conclusion, a total of 168.5h of telescope time were scheduled (36h on Mk2 and 132.5h on Lovell) with a total reported data loss at the telescope of 24.5h (14.5%), i.e. a success rate of 85.5%.

3. Technical Developments

We have upgraded both Mark5 systems to SDK9, which allows 8x2=16TB disk packs. We built two 16 TB packs and will be building 3 more, using Hitachi drives, in the near future. At the start of the October/November session we transferred to the 'jive5ab' software for the Mark5's, which will now be default, as it allows seamless swapping between standard disk-recording and eVLBI. The 327MHz receiver was used this session and we were able to integrate it into the e-MERLIN RF system with no problems. The e-MERLIN/VLBI outstation recording is still problematic. Jimmy Cullen has recently spent 4 days at JIVE working on their real-time correlator software, which we now have running at JBO. We are still investigating why e-MERLIN data won't correlate with Mark5 VDIF data. We will be able to go to Mark5C recording when this problem is fixed.

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