

19<sup>th</sup> March 2018 – Shanghai, China

Report on VLBI Operations for Jodrell Bank Observatory

1. May/June 2017 Session

The May/June 2017 EVN session for JBO consisted of 29 experiments; 15 at 18/21cm, 2 at 5cm and 12 at 6cm. Three of these experiments were joint e-MERLIN/EVN observations. At 18/21cm, 119h of observations were scheduled on the Mk2 telescope (the Lovell telescope was unavailable due to ongoing engineering works) and the reported data loss was 5m (0.1%). At 5cm, 11h of time was scheduled on the Mk2 telescope with 7.5h of lost time due to the failure of the telescope azimuth encoder system. At 6cm, 63h of observations were performed with the Mk2 telescope with no reported data loss. In conclusion, a total of 193h of observations were performed on the Mk2 telescope with a total reported data loss of 7h35m (3.9%), i.e. a success rate of 96.1%.

2. October/November 2018 Session

The October/November 2017 EVN session for JBO consisted of 24 experiments; 6 at 6cm, 2 at 1.3cm and 16 at 18/21cm. Due to ongoing engineering work on the Lovell telescope all experiments were performed with the Mk2 telescope. Five of the experiments were joint EVN+e-MERLIN projects; data recorded locally from four e-MERLIN antennas was later e-shipped to JIVE for correlation. At 6cm, 43h of observations were completed with no reported data loss. At 1.3cm, 10h of observations were completed with no reported data loss. At 18/21cm, 146h of observations were completed with approximately 1h lost due to timing problems with the DBBC/Mark5 system. In conclusion, a total of 199h of observations were performed with a total reported data loss of 1h (0.5%), i.e. a success rate of 99.5%.

2. Technical Developments

The 2Gbps modifications for DBBC/Mark5 operations were completed prior to Session III 2017. During that session, 2Gbps data recording was successfully tested and produced good fringes at JIVE. Subsequently, from EVN Session I 2018 JBO is operating as a 2Gbps station for recording. The 10G switch for internal VLBI use was connected to a 100G Ciena router in December and this was then connected to the external network, although our current total throughput is still limited to 3Gbps maximum. 2Gbps eVLBI will hopefully be tested in the next eVLBI session (March) after which it is hoped that 2Gbps eVLBI will be routinely available for JBO. A future extension to 4Gbps should be relatively straight-forward.

We recently supplied a Flexbuff to JIVE to match our existing local Flexbuff. From EVN Session I 2018 we therefore aim to be a Flexbuff-only station, although some RadioAstron out-of-session observations will still be performed on disk-packs. Our investment in EVN disk-capacity will now be solely directed towards Flexbuff purchase.

In Session III 2017 several joint e-MERLIN/EVN experiments were run, recording four e-MERLIN antennas on our local Nexpress machines for e-transfer to JIVE. Further test observations were performed during EVN Session III 2018 with successful fringes obtained for all included e-MERLIN antennas. Although this is not yet a routinely available operational system we are confident most of the difficulties are now resolved, including some previous problems with sampler statistics.

Paul Burgess has now retired from JBO. Eskil Varenus has joined the National Facility support team and has been concentrating his VLBI activities, amongst other things, on the improvement of JBO calibration for the EVN.

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