

24th January 2023 – MPIfR Bonn

Report on VLBI Operations for Jodrell Bank Observatory

1. February/March 2022 Session

The February/March 2022 EVN session for JBO consisted of 34 experiments; 19 at 18/21cm and 15 at 6cm. Seventeen of these were joint EVN+e-MERLIN observations, 9 of which were at 18cm and 8 at 6cm. Prior to this session a potential problem with a wheel bogie on the Lovell telescope was discovered, so, to avoid problems should this fail during the EVN session, it was decided to run the entire session with the Mk2 telescope. The only significant problem occurring during this session was that the noise temperature diode was left disconnected at the start of the session meaning the continuous calibration measurements for the first 9 experiments were meaningless. Each of these experiments was supplied with a ‘dummy’ calibration file containing diode temperatures estimated in subsequent experiments. At 18/21cm, 175.5h of observations were scheduled on the Mk2 with 3.5h (2%) lost, due to high winds, mechanical failures and problems with the telescope control network. At 6cm, a further 105h were scheduled on the Mk2 with no data loss reported. In summary, 280h of observations were scheduled on the Mk2 telescope with 3.5h (1.2%) data lost, i.e. a success rate of 98.8%.

2. May/June 2022 Session

The May/June 2022 EVN session for JBO consisted of 38 experiments; 22 at 18/21cm and 16 at 6cm. Twenty-seven (71%) of these were joint EVN+e-MERLIN observations, 17 of which were at 18/21cm and the remaining 10 at 6cm. The Lovell telescope was not available during this session due to ongoing engineering works, so the Mk2 telescope was used for all observations. At 18/21cm, 191h of time were scheduled on the Mk2 with 3h (1.6%) of time lost due to telescope control network problems. At 6cm, 110h were observed with the Mk2 telescope 1h of time was lost due to a receiver carousel problem. Unfortunately, the lack of flexbuff space (and the slow buffering of data to JIVE) meant that a further 14h (two experiments) were lost. This make a total of 15h (13.6%) of time lost at 6cm. In summary, 301h of observations were scheduled on the Mk2 with 18h (6%) data lost, i.e. a success rate of 94%.

3. October/November 2022 Session

The October/November 2022 EVN session for JBO consisted of 38 experiments; 16 at 6cm, 17 at 18/21cm and 5 at 1.3cm. Twenty-nine of these were joint EVN+e-MERLIN observations, 12 of which were at 6cm, 14 at 18/21cm and 3 at 1.3cm. Repairs to the wheel girder of the Lovell telescope that ran into the start of the session meant that JBO supplied the Mk2 telescope at 6cm and the Lovell at 18/21cm. At 6cm, 106.5h of observations were scheduled on the Mk2 with no data loss reported. At 18/21cm, 125h of observations were scheduled on the Lovell telescope and 10h on the Mk2 telescope. A total data loss of 3h (2.2%) was suffered due to wind, antenna control problems and recording problems. At 1.3cm, 30.5h of observations were scheduled on the Mk2 with no reported data loss. In summary, 272h of observations were scheduled on JBO telescopes with 3h (1.1%) data lost, i.e. a success rate of 98.9%.

3. Technical Developments

Very little has changed in the VLBI equipment setup during the last reporting period. Flexbuff1 had three disks replaced as they had non-zero re-allocated sector counts which indicated that failure was imminent. Then, before session 3 of 2022 all 36 disks of flexbuff1 were replaced with 10TB units, since, during the previous 3 sessions the data to be recorded has exceeded the capacity of flexbuff1. A couple of parts remain outstanding for a new flexbuff which will be built as soon as possible. Funds have been secured for a petabuf VLBI storage system, to be located at JIVE, to facilitate network transfer of VLBI data from multiple e-MERLIN telescopes. Further funding will also be provided for two further flexbuff systems for local recording of VLBI data. Recently, the FS PC failed due to a graphics card failure but was eventually repaired prior to EVN Session III 2022. A replacement FS PC has been obtained and configured. However the interface to the e-MERLIN control system is being re-written, meaning that the FS interface will also need to be re-written. This will hopefully be done before the final EVN session of 2023. The DBBC3 system, which was ordered in February 2022, is expected to arrive this spring. It will be integrated into operations at the same time as the new FS machine, hopefully by the end of 2023.

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