

8<sup>th</sup> February 2022 – Online Meeting

Report on VLBI Operations for Jodrell Bank Observatory

### 1. May/June 2021 Session

The May/June 2021 EVN session for JBO consisted of 29 experiments; 14 at 18/21cm, 3 at 1.3cm and 12 at 6cm. Fifteen of these were joint EVN+e-MERLIN observations, 12 of which were at 18/21cm and the remaining 3 at 6cm. During this session the Lovell telescope suffered a bogie failure which resulted in the Mk2 telescope being substituted for 8 experiments in which the Lovell was scheduled to participate. This affected both L-band and C-band observations. At 18/21cm, 115h of Lovell time was scheduled with 2.5h (2.2%) lost time reported due to ongoing encoder problems with the Lovell telescope. 63h at 18/21cm were scheduled on the Mk2 telescope with no reported data loss. At 1.3cm, 43h of observations were scheduled on the Mk2 telescope and there was no data loss reported. Finally, at 6cm, 54h were scheduled on the Lovell telescope and 28h on the Mk2 telescope. There was 2.5h (4.6%) data loss reported on the Lovell telescope, again due to encoder problems. In summary, 303h of observations were scheduled on JBO telescopes (169h on Lovell and 134h on Mk2) with 5h (1.7%) data lost, i.e. a success rate of 98.3%.

### 2. October/November 2021 Session

The October/November 2022 EVN session for JBO consisted of 24 experiments; 5 at 6cm, 15 at 18/21cm, 3 at 5cm and 2 at 1.3cm. Eleven of these were joint EVN+e-MERLIN observations, 2 of which were at 6cm and the remaining 9 at 18/21cm. There were several major failures during this session. The Lovell telescope suffered a significant servo fault causing a swap of 18/21cm operations to the Mk2 telescope for several days. The Mk2 then suffered a failure of the OTX control computer resulting in more lost time. Finally, the K-band receiver on the Mk2 telescope failure shortly before observations began, but fortunately no user experiments were affected. At 6cm, 32h of time were scheduled on the Mk2 with no loss of time reported. At 18/21cm, due to the Lovell servo failure, 110h were observed with the Lovell telescope and 34h with the Mk2. Some time (4.5h) was lost due to high winds and the Mk2 OTX problem. In total 14h45m (13.4%) were lost on the Lovell and 14h05m (41.4%) on the Mk2 (28h50m or 20% lost out of a total of 144h at L-band). At 5cm, a total of 19h were scheduled on the Mk2 with no reported data loss. At 1.3cm, 19.5h were scheduled on the Mk2 but 3h (15.4%) were lost due to the receiver failure. In summary, 214.5h of observations were scheduled on JBO telescopes (110h on Lovell and 104.5h on Mk2) with 31h50m (14.8%) data lost, i.e. a success rate of 85.2%.

### 3. Technical Developments

The FiLa10G is now working as it should. A second VSI cable was added between the DBBC and FiLa10G allowing the use of ‘wastro’ mode at 4Gbps. This was successfully tested in the C-band NME in Session III 2021. Flexbuff2 (used for e-MERLIN VLBI data) has had the raid cards flashed with new firmware successfully. 30 new 10TB HDs were purchased and they have replaced the old 2TB drives which were beginning to fail. The storage is now configured as JBOD. Due to problems encountered flashing the firmware on flexbuff3 (used for e-MERLIN VLBI data), the cards were replaced with LSI-9207-8I (the same as flexbuff1) and the storage reconfigured as JBOD. Flexbuff1 (used for home station VLBI) had a problem in Session II 2021 which was believed at the time to be a faulty disk. However, it turned out to be a corruption of the XFS file system. This has now been repaired. We were awarded funding for another flexbuff and most of the required components have arrived but some outstanding items remain. The unexplained low-amplitude ripple on the Mk2 left polarisation remains. We are currently waiting for a full quote for a replacement FS-PC.

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