

24<sup>th</sup> November 2020 – Online Meeting

## Report on VLBI Operations for Jodrell Bank Observatory

## 1. February/March 2020 Session

The February/March 2020 session for JBO consisted of 28 experiments; 12 at 6cm, 6 at 1.3cm, 4 at 5cm and 6 at 18/21cm. Ten of these were joint EVN+e-MERLIN observations. At 6cm, 70.5h of observations were performed on the Mk2 telescope with 2.75h (3.9%) reported data loss due to either high winds or problems with the OTCX antenna control computer. At 1.3cm, 58.5h of observations were performed with the Mk2 telescope with 5.6h (9.5%) reported data loss due almost entirely to high winds. At 5cm, 33h of observations were scheduled on the Mk2 telescope with no reported data loss. Finally, 43h were scheduled on the Lovell telescope at 18/21cm with 8h (18.6%) reported data loss, again due to high winds. In summary, 205h of observations were scheduled on JBO telescopes (162h on Mk2 and 43h on Lovell) with 16.35h (8.0%) data lost, i.e. a success rate of 92%.

## 2. May/June 2020 Session

COVID-19 restrictions imposed by the University of Manchester meant that all JBO telescopes, including all e-MERLIN outstations as well as on-site antennas, were shut down prior to Session II 2020. However, the Mk2 telescope was returned to operations just before the start of EVN Session II. Hence, the session was much reduced compared to usual and involved no joint EVN+e-MERLIN projects. The May/June 2020 EVN session for JBO consisted of 20 experiments; 4 at 5cm, 5 at 1.3cm, 7 at 18/21cm and 4 at 6cm. At 5cm, 27h of observations were scheduled on the Mk2 telescope and the reported data loss was 3h (11%) due to FS computer problems. At 1.3cm, 29h of time was scheduled on the Mk2 telescope with no reported failures at the telescope. At 18/21cm, 49h of observations were performed with the Mk2 telescope (the Lovell telescope was unavailable due to ongoing pandemic restrictions) with 3h (6.1%) reported data loss due to a site-wide power failure. Finally, at 6cm a total of 23h were scheduled on the Mk2 telescope with no reported data loss. In conclusion, a total of 128h of observations were performed on the Mk2 telescope with a total reported data loss of 6h (4.7%), i.e. a success rate of 95.3%.

## 3. October/November 2020 Session

The October/November 2020 EVN session for JBO consisted of 29 experiments: 5 at 5cm, 9 at 1.3cm, 6 at 6cm and 9 at 18/21cm. Of the L-band experiments all but one were performed with the Lovell telescope; the rest of the session involving the Mk2 telescope. Fourteen (i.e. almost half) of the experiments were joint EVN+e-MERLIN projects. At 5cm, 35h of observations were scheduled and there was 0.5h (1.4%) reported data loss (due to operator error). At 1.3cm, 119h of observations were scheduled and 1h (0.8%) of data loss was reported (due to problems with the FS computer). At 6cm, 29h of observations were performed with no data loss reported. Finally, at 18/21cm, 101h of observations were scheduled (10h on the Mk2 telescope and 91h on the Lovell telescope) with 8.5h (9.3%) data loss reported for the Lovell (entirely due to high winds). In conclusion, a total of 284h of observations were performed with a total reported data loss of 10h (3.5%), i.e. a success rate of 96.5%.

## 4. Technical Developments

Our FiLa10G has had an intermittent fault for some time. The symptoms are that the data stops and the LEDs at the rear next to the XFP are out. This has been determined to involve the 3.3V power circuit. It was sent to Bonn for investigation in late 2019/early 2020. Two poorly crimped connectors were found in the 3.3V power circuit but their repair did not fix the problem. Further investigation revealed that the connections on the wires going from the 3.3V PSU to a terminal block were also badly crimped. Replacing these wires seems to have cured the problem. The FiLa10G has now been stable for several weeks. One of our Flexbuffs is not behaving correctly; it is slower than it should be. A suggested cure is to replace the raid cards. The current FS PC is old and is beginning to show signs of failure. A new rack mounted PC is proposed and will be specified, purchased and installed as soon as we are able. The Mk2 telescope fibre receiver has developed a low amplitude ripple approximately 0.2MHz in one polarisation. It needs to be confirmed as the problem and then the faulty unit can be replaced. Testing and replacement requires staff on-site which is currently not possible. We are considering purchase of a DBBC3 unit in the medium term.

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