

Performance and Reliability of the EVN

EVN Session 3/2010

The session consisted of five frequency blocks (5cm, 6cm, 1.3cm, 18cm, 13/3.6cm). In each block, ftp-fringe tests and NME experiments were performed before the user experiments. Ef did not participate in N10L3 due to a broken switch in the receiver (that was replaced during the NME and in time for participating in the user experiments). Tr had a problem in BBC 6 and fixed it during N10L3. Cm had no fringes in RCP in N10M3. Yebes had an incorrect tuning at the start of N10K1.

There were 22 user experiments (3 at 5cm, 1 at 6cm, 4 at 1.3cm, 11 at 18cm, and 3 at 13/3.6cm) in the session. There was one ToO experiment RL002 inserted in the 18cm part and performed in e-VLBI mode. There were four global VLBI experiments (GV020D, GC034B, GC034C, and GC034D). There were one experiment (EY010C) correlated at Bonn and three experiments (GC034B, C, and D) at Socorro.

Station and correlator feedback for individual stations:

Ef - Because of some oil leakage at the elevation gear, Ef had to stop observations for 6 hours in EL040C and again for three hours in EY012 to fix the problem. In ED030B, new schedule required for Jb1 -> Jb2 (Jb in all scans now). Ef downloaded the new schedule and tried to DRUDGE it automatically at midnight. This drudge failed because of the too-long comments. Thus, Ef missed the first 5 hours. The software bug has been fixed in the new release of NRAO SCHED 9.4. Ef stopped observing for 11.5 hours in GC034D because of high winds.

Wb - In the experiments with multiple modes, Wb missed a few scans because its backend needs 3 minutes to change frequency setup. Recently, it has been found and reported to Wb VLBI friends that there were significantly fewer calibration data points during the scans of weak sources (e.g. a half-mJy pulsar in EY011) in its calibration files as these calibration measurements are limited by its sensitivity.

On - In October/November, there were much more windy and rainy days. As a result of the bad weather, Onsala had to stow its antenna for 6.5 hours and in EB039H, 3.5 hours in EV018B, 3 hours in ED030A, 1 hour in GV020D, 2 hours in ED030B, 3 hours in EE006, 6 hours in EL040B. In the 18cm experiments, the new broad-band IF system was much more sensitive to RFIs than anticipated and high Tsys and varying correlation amplitude across subbands were seen in the pipeline results. Onsala had a problem with IF-level and missed 4 hours at end in EB039I.

Tr - No data in diskpacks was reported in ED030B. It had no fringes in BBC 8 and weak fringes in BBC 7 at 18cm in the 1Gbps experiments, which may be associated with RFI because both BBCs worked well in the other experiments, such as EY011 at 18cm in 512 Mbps mode (16x8 MHz/BBC) and EV018B at 6cm in 1 Gbps mode (16x16 MHz/BBC).

Nt - One of the antenna wheels was damaged before Session 2/2010. There were no observations scheduled for Nt in Sessions 2 and 3/2010.

Mc - Noisy and unstable auto-correlation bandpass shape was seen again in the line pass of EZ020B when high frequency resolution was available. Due to a problem with its cryogenic system, its S/X band receiver had to work at room temperature in GC034.

Ur and Sh - No observations in the session because the two Chinese stations had to contribute their observing time to their national task: VLBI tracking observations of Chang'E-2 lunar probe.

Ys - A cooled C-band receiver has been installed and used in the 5cm and 6cm experiments with a Tsys down to ~30 K. It lost 1 hour observations in EV018B due to a MK5B recording problem and started several hours late due to strong winds in GC034B.

Mh - Participated in all the 1.3cm experiments. BBC 1 was broken. BBC 2 was not locked in ER025. The other BBCs worked fine.

Jb - Jb2 suffered a receiver casualty after N10M3 and had no fringes in any 5cm user experiments. In the subsequent 6cm experiments (N10C3 and EV018B), they did not observe. A crack was found in Jb1 antenna just before the session, Jb2 was used in all the 18 cm experiments. In the K-band user experiments, Jb2 had no fringes in all RCP channels and unusual frequency-agile RFI in the LCP channels after 14:28 UT (change of disk packs) at end in N10K1. As Jb stowed antenna at 14:30 UT because of winds, the problem was missed in last ftp fringes test of N10K1.

Cm - Performed observations as the block schedule expected. Its 14 MHz signal was fed through two IFs instead of one in the user experiments although fringes were seen.

Kn - Participated in N10L1, ED030A, and ED030B.

Ro - Scheduled in two 1.3cm experiments: ER025A and B. An oscillating pattern was seen in the RCP auto-correlation bandpass plots. The 70m antenna had a much noisier phase in ER025A due to significant sensitivity loss. Its correlation amplitude in ER025A is 1/10 of amplitude in ER025B.

Ar - Participated in one EVN experiment: GV020D. No fringes most likely because of a problem with formatter.

Hh - The only EVN station in the Southern Hemisphere has returned to the EVN with 1Gbps optical fiber connection since the session. The first eVLBI fringes to Hh has been successfully detected in RL002. Moreover, it contributed good fringes to the other EVN experiment EE006.

Bd - Low correlation amplitude in the first RR and LL subbands in 18cm 1Gbps experiments probably caused by RFIs. At 6cm, LSB IFs have passbands that lose power away from DC, with an overshoot around the middle of the band.

Zc - No known problems in 18cm experiments. In EV018B, it had low correlation amplitude in LCP channels.

Sv - Provided MK5B data. For the first time in 2010, the EVN got Sv in the session. Due to a disk-distribution problem, Sv did not get disk packs for the last two 18cm experiments (EY012 and EL040F) in time.

It also had low correlation amplitude in the first RR and LL subbands in 18cm 1Gbps experiments. Note that no fringes in upper 4 subbands in EV018B is due to the limited frequency coverage of its C-band receiver.

Three Russian stations were in and Yebes has installed a cooled C-band receiver in the session. However, as the problems mentioned above, Nt, Sh, Ur, and Jb1 were out and some EVN experiments (GV020D, ER025A and B, EL040C, EY012, ED030B) suffered significant sensitivity loss.

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