

## Performance and Reliability of the EVN

EVN session 2/2013

The session consisted of five frequency blocks (6cm, 5cm, 18/21cm, 3.6cm, and 1.3cm).

On N13C2, Jb did not observe because of high winds, but came back to observations without problem during C-band user programs. Ur observed only the last 40 minutes of N13C2 because it was busy with other tasks the rest of the time.

Sh showed fringes on most of the projects of the L-band session, but not on N13L2 and EP075G. Nt and Hh showed fringes at L-band on project N13L2 from data from both analog and DBBC backends. On contrary, Tr only showed fringes from the analog backend.

During project N13X3, Sh used the new S/X dual-polarisation receiver, while only RCP lightpath was available during the experiment (LCP had no IF cable). On the same project, Ur showed fringes only in RCP. The same applies for user projects on the X-band observing block. No fringes were seen on LCP both at Sh and Ur. Both analog and digital BBC backends were used at Nt on N13X3, and had good fringes in RCP. The correlation amplitude on the baselines to Nt with DBBC was about a factor of 2 higher than that to Nt. Note that LCP hardware is not available at Noto.

No fringes to Mh on N13K2, most probably because of a problem found by the station regarding the format of the schedule for their DBBC. The three available stations of the KVN participated on N13K2. Fringes to/between the three of them were found.

Tr, Hh, and Nt observed both with analog and digital backends on most of the different frequency blocks. Fringes were found to the three of them in at least one frequency band (as given on the NME reports), but with strange bandpasses in K-band. Onsala observed only with DBBCs, and provided good fringes.

### Highlights

- (1) As one of the latest activities of the NEXPRES project (that successfully concluded on last year), five telescopes of the EVN, equipped with the next generation of European-built VLBI digital receiver systems (DBBC), successfully demonstrated 4Gbps e-VLBI on Sept 18th, 2013.
- (2) Onsala started to use DBBC as standard backend for user experiments. Nt, Tr, and Hh, successfully tested their DBBC backends and they shower fringes from them.
- (3) KVN participated in K-band Network Monitoring Experiment again showing good fringes. During the latest EVN CBD Meeting in fall 2013 at JIVE, the KVN officially requested to join the EVN.

There were 29 user experiments (8 at 6cm, 5 at 5cm, 11 at 18/21cm, 1 at 3.6cm, and 4 at 1.3cm) in session 2/2013. There were two ToO experiments (RY005 and RO004D) and one Global experiment GZ013. There were three experiments (EM097B, EM107A, EM107B) correlated at Bonn. There are two experiments RY005, EL043B and RO004D done in e-VLBI mode.

Station and correlator feedback for individual stations:

Ef - Missed all X-band observations due to a broken 3.6cm receiver. 2h stopped during ES072A because of strong wind. An elevation failure made impossible to observe F13L2. Did not observe F13L2 because of an elevation control failure. Thunderstop for ~+2h on EL043B.

Wb - had a problem with local correlated data storage due to a broken local disk during EM106A, EG062C. Part of the cal file is lost, but not the VLBI data. Missed 1h of observations on EP075F because of problems with the Mark5B recording system. Missed 1h of EG072A because of Mark5B recording problems.

On - Used the wrong procedure for caltsys (CALTSYS instead of CALTSYS\_MAN) in the session for the DBBC (all experiments expect for ER034). The problem was solved in the post correlation processing stage. Several problems with antenna network interfaces and then the Mark 5B+ during EP075F. Could not observe ES072D due to problems with the 220V to the antenna control. 1h lost because of Mark5B+ recording problems.

Tr - 40min lost at the start of EM106A because of problems with telescope control. 2h of EM097B lost due to problems with antenna control, and FS computer failure. BBC5 did not work properly in its upper sideband during N13L2.

Nt - Lost 3h on EM106 because of high wind. Fault of Right channel LNA at 5cm. Only Left polarization working.

Mc - Participated as a 1-bit sampling station to avoid their continuing Gb/s formatter problem.

Ys - Stormy weather at sometimes during EP075F.

Mh - Overall problem with format of the schedule for the astro2 DBBC during N13K2. The experiment .prc file was created from the "analog" type of schedule and edited manually. LCP was not recorded due to the dbbs mode, RCP is in question.

Jb - No standard feedback was provided by JB during (or shortly after) the session for every observed project.

Hh - Last two hours of EG072B lost because of a series of clock errors in the recording unit.

Ar - Participated in 5 independent observing projects. No problems found in the post correlation data review.

Ur - About the last hour of EG062C, and most of N13C2 did not observe, telescope doing other tasks. Frequency out of range for VC01 to VC04 during EM107A. No LCP data available from N13X3 and EP075H. Station feedback indicates that there was a problem on the cable connections.

Ir - Receiver LCP channel not working on F13C3.

Sh - No LCP data from Sh on EP075H for an unknown reason not specified by the station.

Because of problems with the Russian Custom not all EVN disk packs were received on time. Russian stations could not record data for some experiments (see below).

Sv - Had problems with delivery of disk packs to the stations. Some experiments were skipped on Sv: GZ013, EP075G, N13L2, F13L3, N13X3, EP075H, N13K2, R0004D, F13K1, ER034. Also, electric power failure - only 2 scans recorded on F13C3. Late start on EM106A due to electric power failure. Several minor data losses (~1.5h) because of Mark5 pack problems during N13C2.

Zc - Entire EP075F program missed due to antenna problems. Part of EM097B lost because of antenna problems. Several scans on EG072B lost because of LAN problems.

Bd - Had problems with delivery of disk packs to the stations. Some experiments were skipped on Bd: R0004D, F13K1, ER034. Several minor data losses because of Mark5 pack problems during EG062C. Missed scans for >1h of EM106B due to a faulty disk module.

As already taken into account on the block schedule, Sv, Zc, Bd were not available in most cases on UT 18:30, à 21:30 on any day of the session.

Ivan Agudo and Jun Yang, for the Science Operation and Support Group (JIVE)