Performance and Reliability of the EVN

EVN Session 1/2012 -- preliminary report

The session consisted of five frequency blocks (5cm, 3.6cm, 1.3cm, 18cm, 6cm). In each block, ftp-fringe tests and NME experiments were performed before the user experiments. Torun BBC 6 was OK now. Ur 22 GHz new receiver has started to pop out fringes since N11K1. Jb receiver was not properly cooled and the the correlation amplitude in RR was a factor of two lower than LL. There were no ftp fringes found to Hh and Mh at 1.3cm due to the limited sensitivity. Sv had signicantly low correlation amplitude in all RCP subbands (BBCs 9-12) in the ftp fringe test of N12C1. Jb had very weak ftp fringes in N12L1, while high-SNR fringes in the previous runs F12L1 and EP076A. Via rapid ftp fringe test in N12X1, wrong BBC-IF pathing was found and fixed at Urumqi.

There were 20 user experiments (1 at 5cm, 2 at 3.6cm, 2 at 1.3cm, 4 at 18cm, and 11 at 6cm). There were four experiments (EG060A, EG060B, EK032A, B and C) observed together with space VLBI station Radioastron and correlated at Astro Space Centre, Moscow. There was one experiment (EY013D) correlated at Bonn.

Highlights

(1) First EVN fringes to Irbene with their DBBC in FR012 on April 12, 2012.
(2) First EVN fringes to Zc, Sv, and Urumqi new receiver at 22 GHz in F12K1 on Feb 28, 2012. Totally, there will be three more sensitive EVN stations at 22 GHz.
(3) Noto had EVN fringes again in N12M1 after being out nearly two years.
(4) Fringes to news digital BBC backends at On, Hh, Bd, Sv, Zc, Sh. Fringes to Hh DDBC were clearly found. Fringes to On DBBC have been stablized now,

i.e. no phase jumps any more, according to the latest N12M1 correlation results. Bd, Sv, and Zc have started to use their R1002 digital backend and shown clearly fringes in all the ftp-fringe tests. There were also highquality fringes to Shanghai in the NME experiments.

Station and correlator feedback for individual stations:

Ef - DBBC was used. Lost IF power for 2 hours in EE008C. BBC 8 LSB had slightly different instrumental delay and its correlation amplitude was also lower. Due to clock rate limit (32MHz input), DBBC only can provide a bandwidth ~13 MHz in the obserations of 16 MHz filter requested. The bandwidth mismatch will cause over-high (~10%) correlation amplitude during the correlation.

Wb - Slightly low correlation amplitude in IF 5, LL on all the baselines to Wb. This problem were found in all the 1 Gbps (16 x 16 MHz) experiment, while not seen in all the 512 Mbps (16 x 8 MHz) experiments.

On - Lost totally 6 hours in EM071D, the first 8 hours (75% of total time) in EY018A because of bad weather.

Tr - BBC 4 was dead in EM071D.

Nt - Only in the NME experiment.

Mc - No fringes likely because of wrong frequency setup in EY018A. There was significant sensitivity loss after a report of computer problems in EM071D. The LCP auto-correlation plots at 5 GHz had a sinuisodal shape with five peaks in all subbands.

Ur - Due to problems with playing back disk module, it was out for the correlation of EG049D and the last hour of EP076B.

Sh - No known problems.

Ys - Out for 8 hours in EG061A and 8.5 hours in EY018A due to an antenna control problem. No IF power for 2.5 hour in EL042. Some scans (totally ~4 hours, most of them during 6.5 -- 9.0 UT) had no fringes due to bad recording quality in EP076B.

Mh - Recording failure at 1Gbps in EP061A. This 1Gbps recording failure problem has been solved before Session 2/2012.

Jb - All the experiments except for EB051 used Jb1. Fringes were quite weak in N12L1. It is not clear whether the later L-band experiment EY013D (sent to Bonn) and EG060B (sent to ASC) had the same problem. C-band RCP autocorrelation plots had an oscillation pattern with three peaks in all the user expriments. Correlation amplitude and phase varied significantly during some parts of EY018A.

Ro - Out.

Ar - Out.

Bd - There were earthquake during EL042. Wrong frequency setup in EL042.

Zc - Lost 1.5 hours in EE008C due to annutena problems. Wrong frequency setup in EL042.

Sv - LL correlation amplitude became quite low (0.1x) and phase were also noisy after a long gap (2 --4 UT) in EY018A. There were some clock jumps found in EY018A, ET024A, EP076A, while fringes did not go away. Wrong frequency setup in EL042.

Wz - Only in ET024A. There were good fringes to Wz in all subbands.

The experiments, suffered significantly loss, were EL042 (Sv, Bd, Zc) and EY018A (Mc, Ys, On, Sv) in Session 1/2012.

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