

EVN Performance and Reliability

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EVN TOG Meeting, MPIfR, 2013 April 10



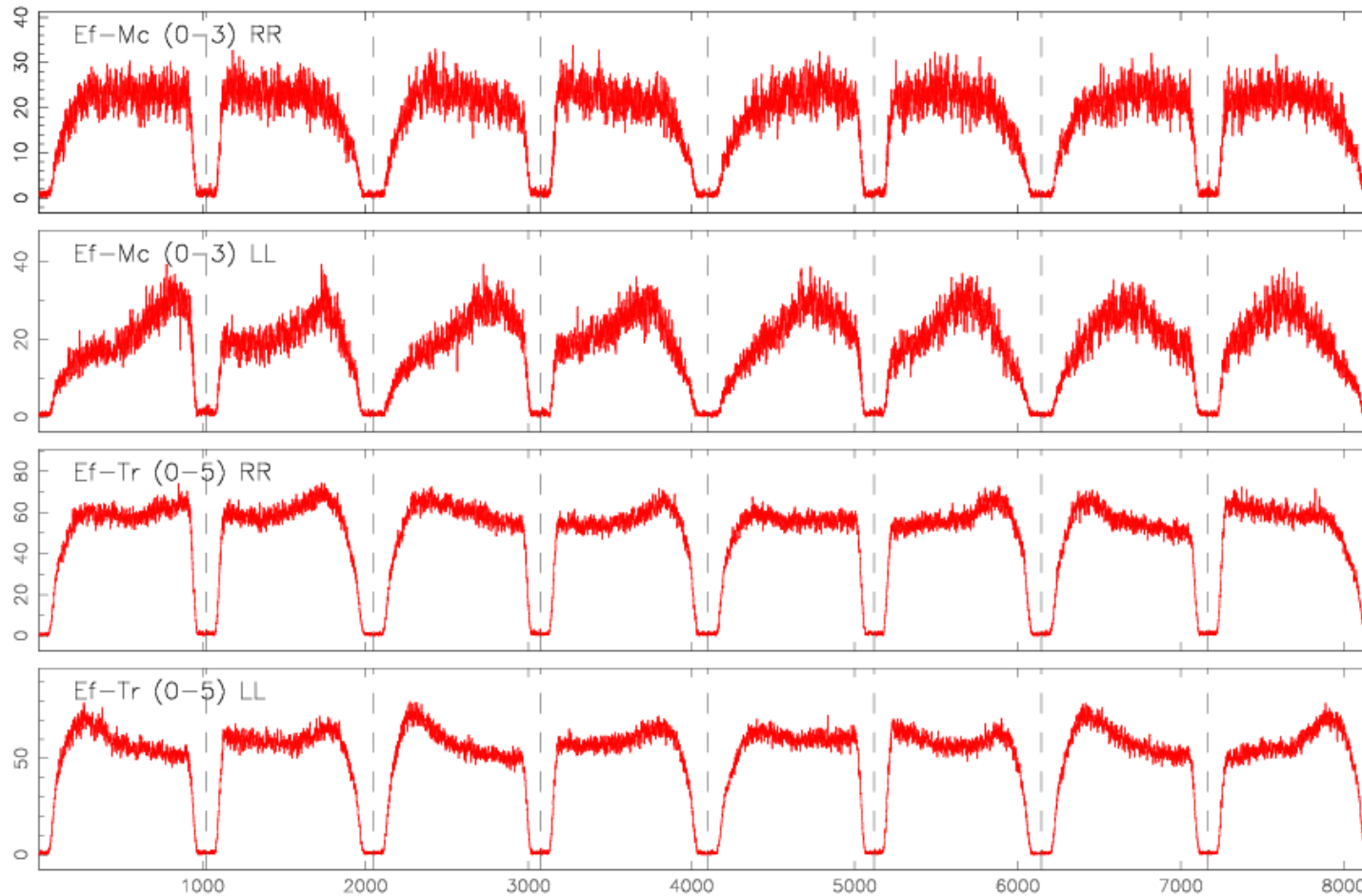
Outline

- ★ Recent EVN Highlights
 - ★ Early View of Session 1/2013
 - ★ Summary of Session 3/2012
 - ★ Summary of Session 2/2012
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Collection Highlights

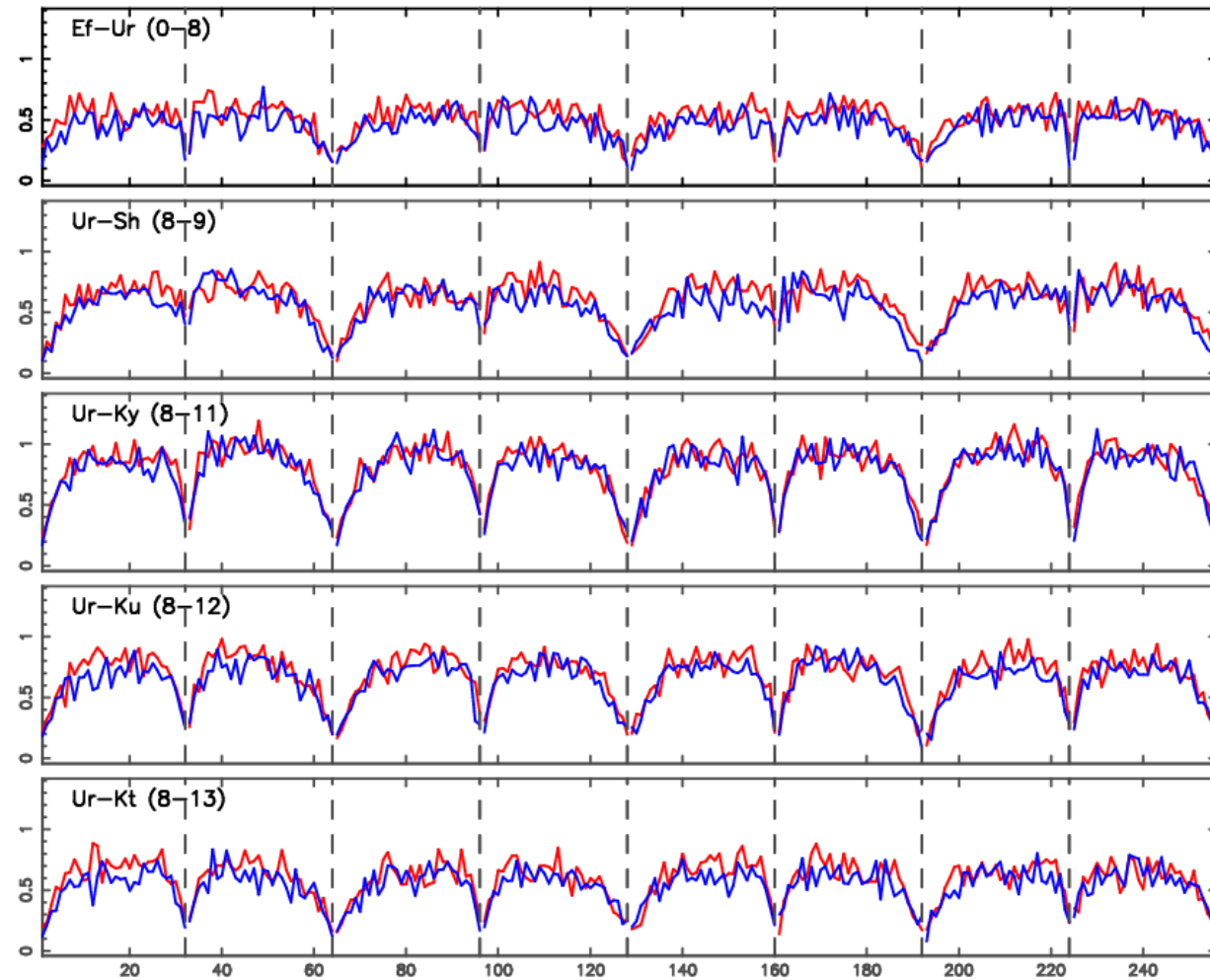
- ☺ Torun and Medicina are available at 22 GHz since Session 1/2013
 - ☺ Urumqi and Shanghai have installed new dual-polarisation S&X band receivers
 - ☺ All the eEVN experiments are also correlated by SFXC since 2013
 - eEVN sensitivity is also improved by a factor of 1.15 as no fringe-rotation loss
 - ☺ Ro70 provided additional sensitivity for six user experiments in Session 3/2012
 - ☺ There were 2Gbps fringes to all the participating stations in F13C1
 - ☺ 23 stations in GM070 -- the biggest VLBI experiment correlated at JIVE
 - ☺ There were first e-VLBI fringes to Irbene on 19 March 2013
 - ☺ There were beautiful fringes to the KVN in N12K4 and N13K1
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Beneficial to Mc and Tr new 22 GHz receivers, the EVN sensitivity has been significantly improved since 2013



Correlation amplitude vs frequency in the N13K1 ftp fringe test of scan 25.

Fringes to the KVN



Correlation amplitude vs frequency in scan 52 (source: 3C454.3), N12K4. Red: RR, Blue: LL.

FTP Fringe Tests in Feb/Mar 2013

F13C2: No fringes to Urumqi in the upper 14 bit streams. The switch in front of the formatter was somehow in the local instead of remote FS control mode. On the other hand, their last VLBI experiment was geodetic observations. So, the formatter was in the geodetic instead of astronomical mode.

-- All the C and K band 512/1024 Mbps observations were affected by the problem.

N13C1: Ef did not observe due to snow. Ur had the above problem.

N13K1: Sv was out due to instrumental problem. Zc was out due to no diskpacks. Ur again had the above problem.

N13M1: Success

N13X1: No fringes to Sh in LCP because of short of IF cables.

F13L1: No fringes to Sh due to a bad cable in the frequency-timing system. The problem was solved before the user experiment

N13L1: Both Ef and Jb1 were out because of bad weather

EVN Feedback in Feb/Mar 2013

Ef: No observations for most of the time due to snow in EK033B, ES068B, EG066H, EY019.

Mc: No observations in EG066H due to snow. The L-band receiver was not properly positioned at focus due to a malfunction in the positioning system.

Sv: Out for the K-band part because of antenna problems.

Out because disk packs were not delivered to stations on time.

Sv -- N13C1, EP087A, EK033C, N13K1, RO004C, EZ024, N13X1

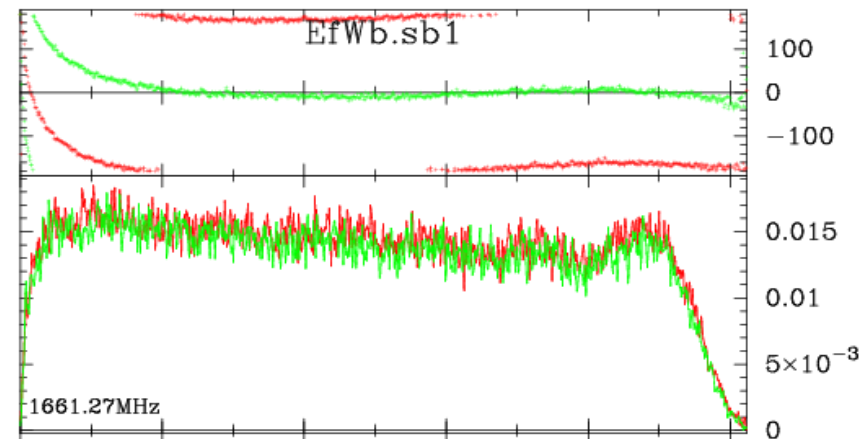
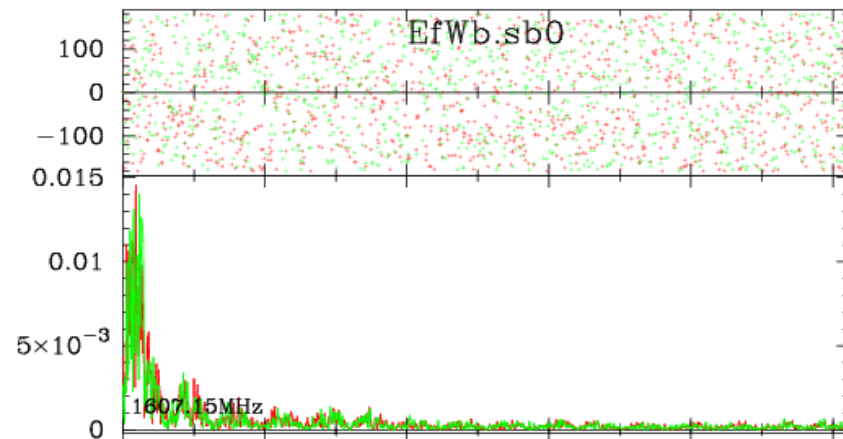
Zc -- EK033B, EY019, N13C1, EP087A, EK033C, N13K1, RO004C, EZ024, N13X1, ET026

Bd -- EM097A, EY019, N13C1, EP087A, EK033C, N13X1, ET026, EP087B, GK047A

Summary of 2012 Oct/Nov Session

Ef: DBBC 16 MHz filter is still not perfect. No observations in EG066F because of a failure of the secondary focus receiver cooling just after N12C4.

Wb: No fringes in half number of subbands in 4x8 MHz mode (EA051, E0009).



-- Additional test observations was done after N13C1. It is reported that the solution was found.

Ar: Because its log files were not available to update JIVE database, the disk pack for ED039, EG066E and EG066F was not properly labeled and erased accidentally before the correlation.

Mc: No useful data in the L-band 1Gbps experiments due to recording failure. Later, 1 bit sampling was used to avoid the problem.

Jb1: Replaced by Jb2 due to an azimuth-track wheel casualty.

Jb2: Stopped observations for 4.5 hours in GK045A due to high winds. Because of various instrumental problems, JB2 did not observe RM009A.

On: Out for EG066E because the fuse for the declination break failed. No observations in EG062A, parts of GK045A and the last 3.5 hours of EK033A due to bad weather.

Sv: A central bearing was reported before the session. Out for L and C-band experiments.

Ys: Lost 4 hours in ET016B due to a disk-recording failure.

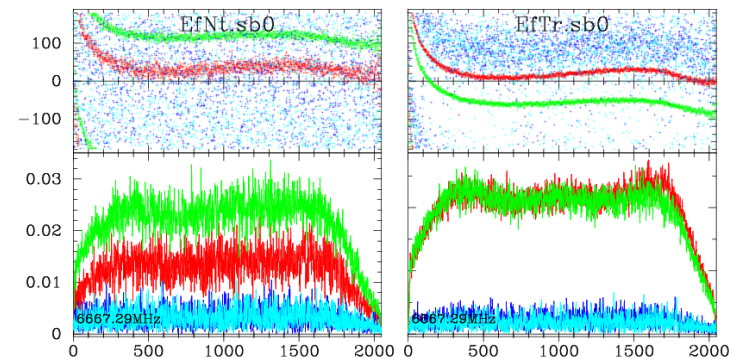
Ur: The disk packs for EY015D and EP076C were lost by shippers.

Sh: Fringes were quite weak in EA051, likely caused by an instrumental problem instead of source structure.

Bd and Zc: No fringes in RCP channels in the "swapped" patching mode of E0009.

Nt: Low correlation amplitude and high T_{sys} in RCP (red), ES069.

Problems with 6.7 GHz receiver?



Summary of 2012 May/June Session

Sh: Out for the whole session due to antenna maintenance

Jb1: Too many phase jumps on a time scale of seconds in all the 5 GHz experiments.

Ef: Loss time: 65% in EG061B and 25% in EE008D due to a broken oil pump.

Tr: Out for EG049E because of problems with antenna control system

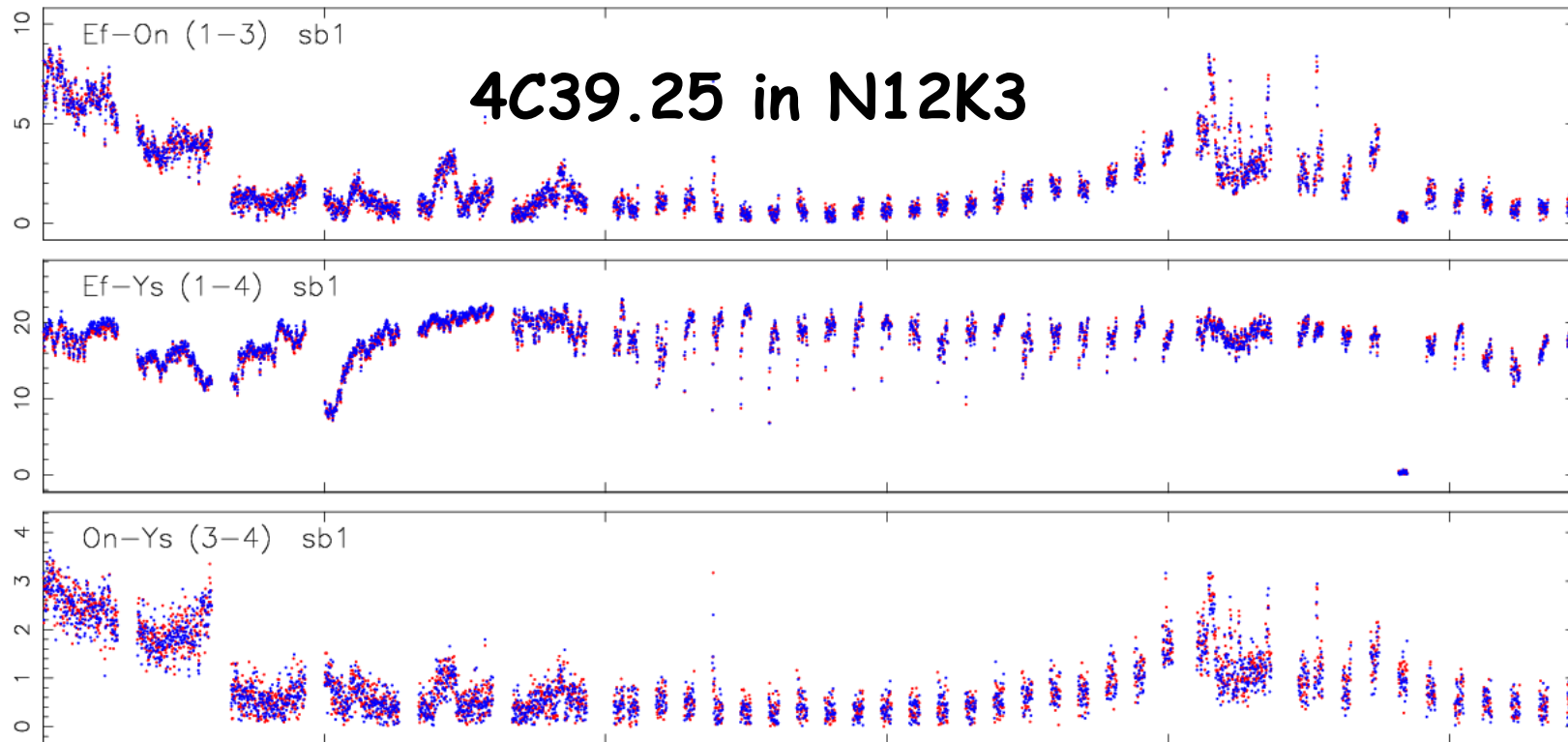
Mc: Lost 7 hours in GF018A due to MK5 problems.

Ys: Problem with IF-BBC patching in the first 17 hours of GB073

Mh: No fringes at 22 GHz because its receiver was broken.

Ro70: No fringes in EE008D because of problems with sub-reflector.

On: Correlation amplitude at 22 GHz varied significantly on a time scale of minutes on all the baselines.



Sampler statistics

- ☆ It has been monitored by the ftp fringe tests since session 1/2010.
- ☆ Wb TADUmax: A slightly high DC component ("--" is ~20%; "++" is ~16%) at 18cm and 6cm.
- ☆ Van Vleck correction is done by JIVE software correlator SFXC.
- ☆ Channels with poor sampler statistics were less seen.
- ☆ New digital backends

DBBC and R1002 — Bad sampler statistics was not seen at Ef, Bd, Sv, Zc.

CDAS — Sampler statistics was monitored and optimized by the internal program.
