

EVN Performance and Reliability

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EVN TOG Meeting, Granada 2018



JIVE

Joint Institute for VLBI
ERIC

EUROPEAN



NETWORK

DBBC Issues

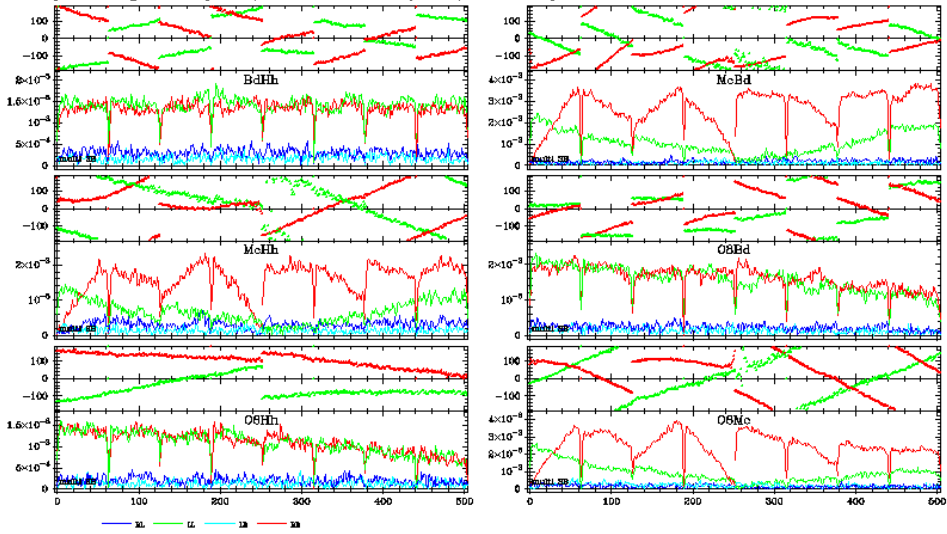
- Appeared to start session 3 2017.
 - First use of 106E, but seen in 105E also thereafter.
- Many Telescopes affected.
 - Ir: LCP always low, in addition large dip in centre of band for both pols.
 - Mc: Always LCP low in upper 4 sub-bands. Sometimes with a curve.
 - O6/8: LCP lower four sub-bands have a strong slope decreasing with increasing frequency. Less steep slope across whole band in both pols also.
 - Ur: Upper four always low in one pol. Usually LCP.
 - Ys: Slight slope across band, sometimes decreasing with increasing frequency (most often) and sometime increasing.
 - Ef: dip in center of total band, mostly in LCP.

105E

FR048E

amplitude+phase versus channel
unique: sess218.CM116e/08:39:30.00/0234+285
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[Vector avg'ed 07-May-2018/08:38:00.500->07-May-2018/08:40:59.500]

data: 16MHz_105E.ms [DATA]
jobs@<??> 2018-05-13T15:38:23
page: 1/1

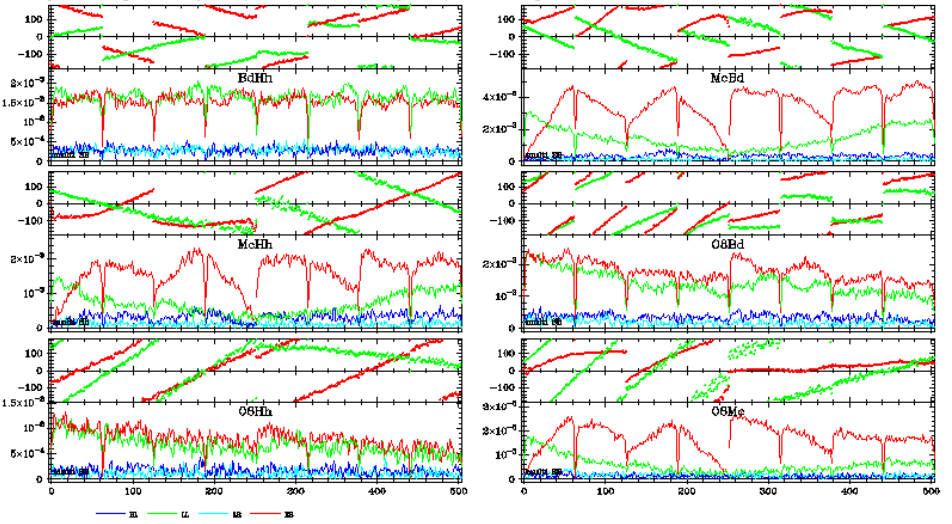


106E

FR048E

amplitude+phase versus channel
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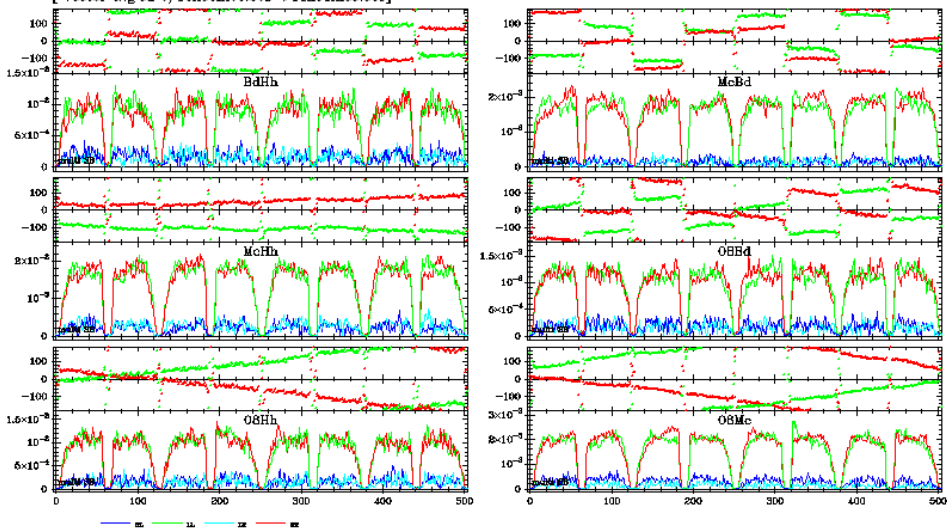
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jobs@<??> 2018-05-13T15:39:14
page: 1/1



FR048N
105

amplitude+phase versus channel
unique: sess218.CM116n/11:00:30.00/0528+134
Pol=RL,LL,LR,RR;Nsub=8;;
[Vector avg'ed 0/10h59m00.50s->11h01m58.50s]

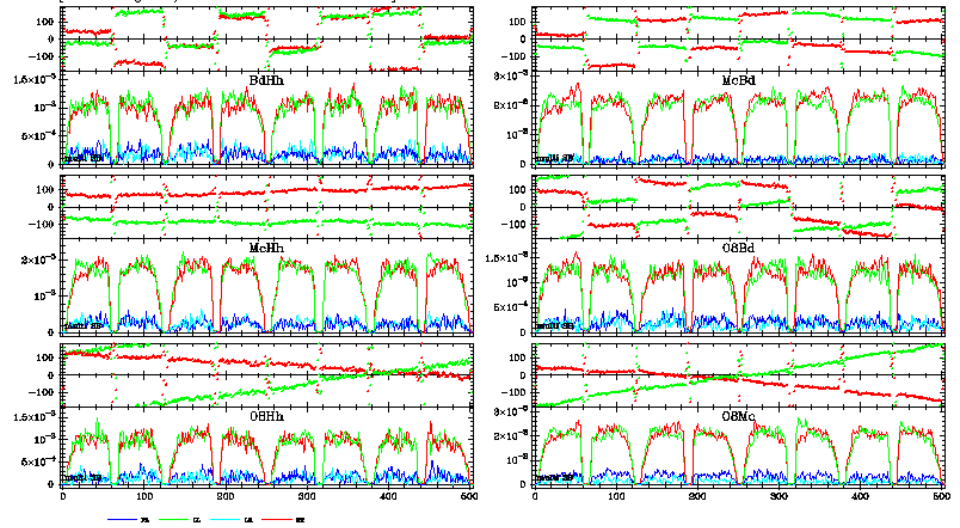
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jobs@<??> 2018-06-13T15:59:09
page: 1/1

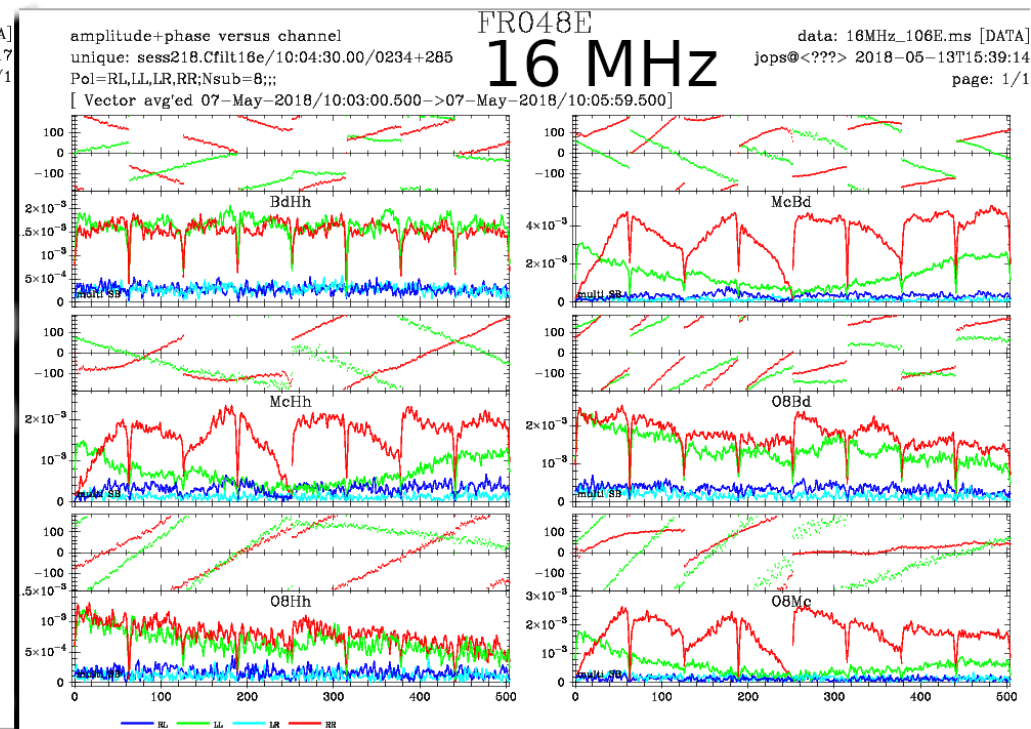
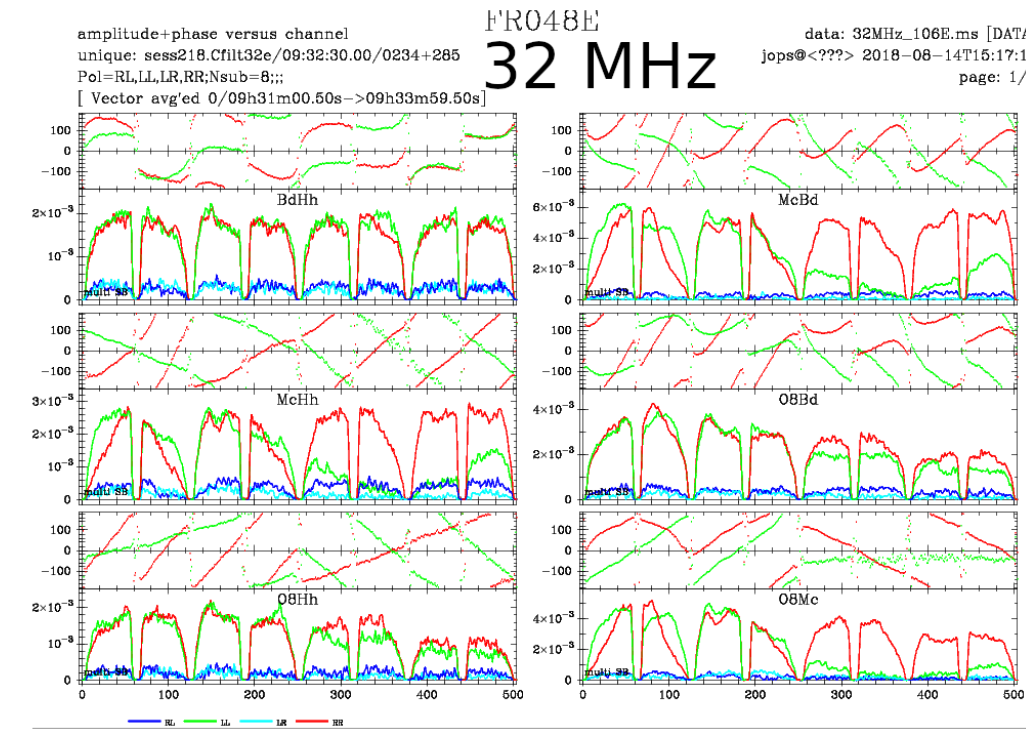
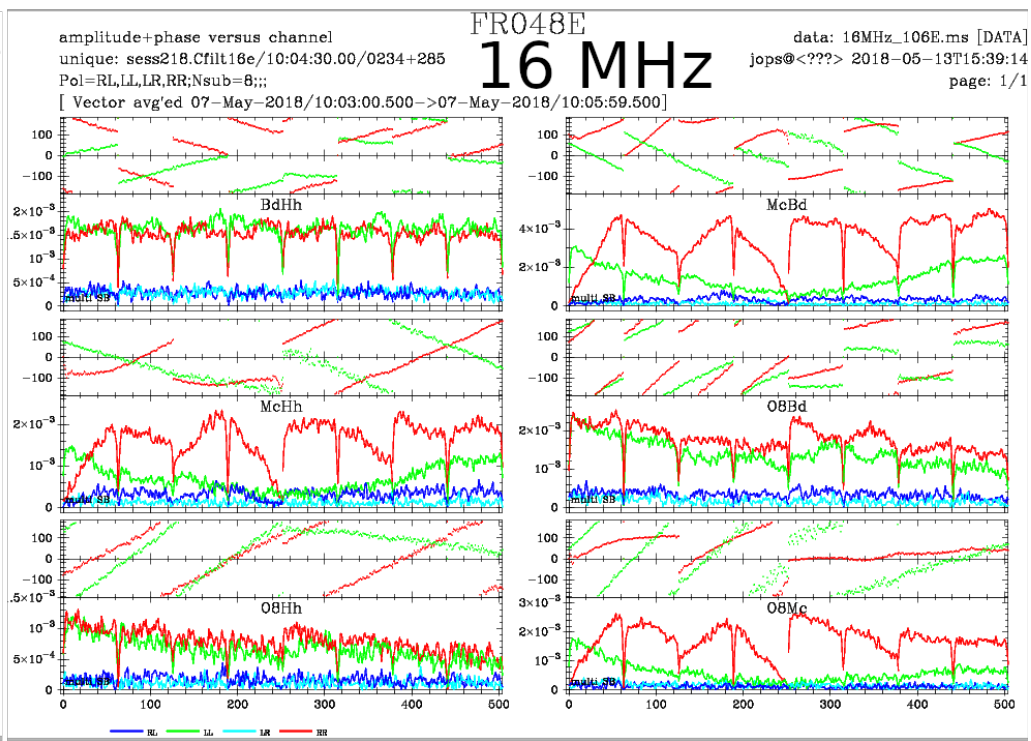
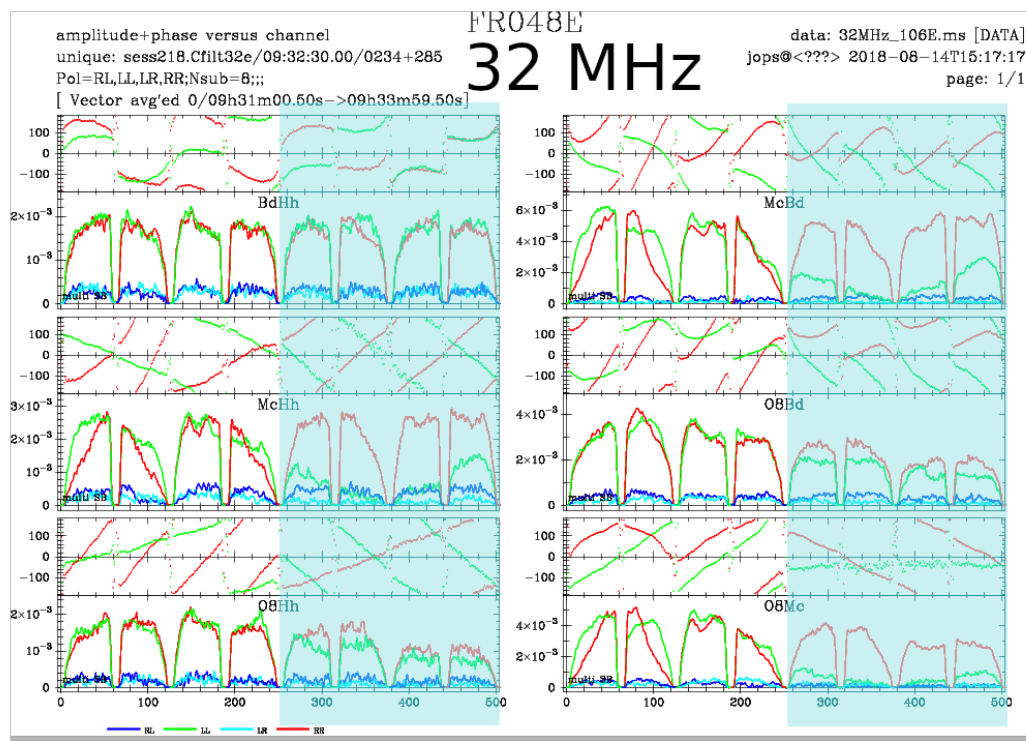


FR048N
106

amplitude+phase versus channel
unique: sess218.CM116n/11:58:30.00/0528+134
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[Vector avg'ed 0/11h57m00.50s->11h59m59.50s]

data: 16MHz_106.ms [DATA]
jobs@<??> 2018-05-13T16:00:49
page: 1/1





2017 Session 3 Oct NME Results

- **N17L3:**

- JB warm L-band receiver, LCP amplitude much higher than RCP. No fringes after scan 5.
- Mc subband 5-8 LCP amplitude much lower than RCP.
- T6 Only sent one linear polarisation.
- Tr LCP much higher than RCP in subband 8.
- Ir Weak fringes scan 01-02 then none.

- **N17SX1**

- Ef pol swapped but fixed by end of NME.
- O6 Warm receiver.
- Ur Receiver fault reported, bad sampler stats observed. No Fringes.
- Km Maser issues (fringes only briefly when resynched).

N17L3

amplitude+phase versus channel

unique: sess317.L512nme/12:21:30.00/J1751+0939

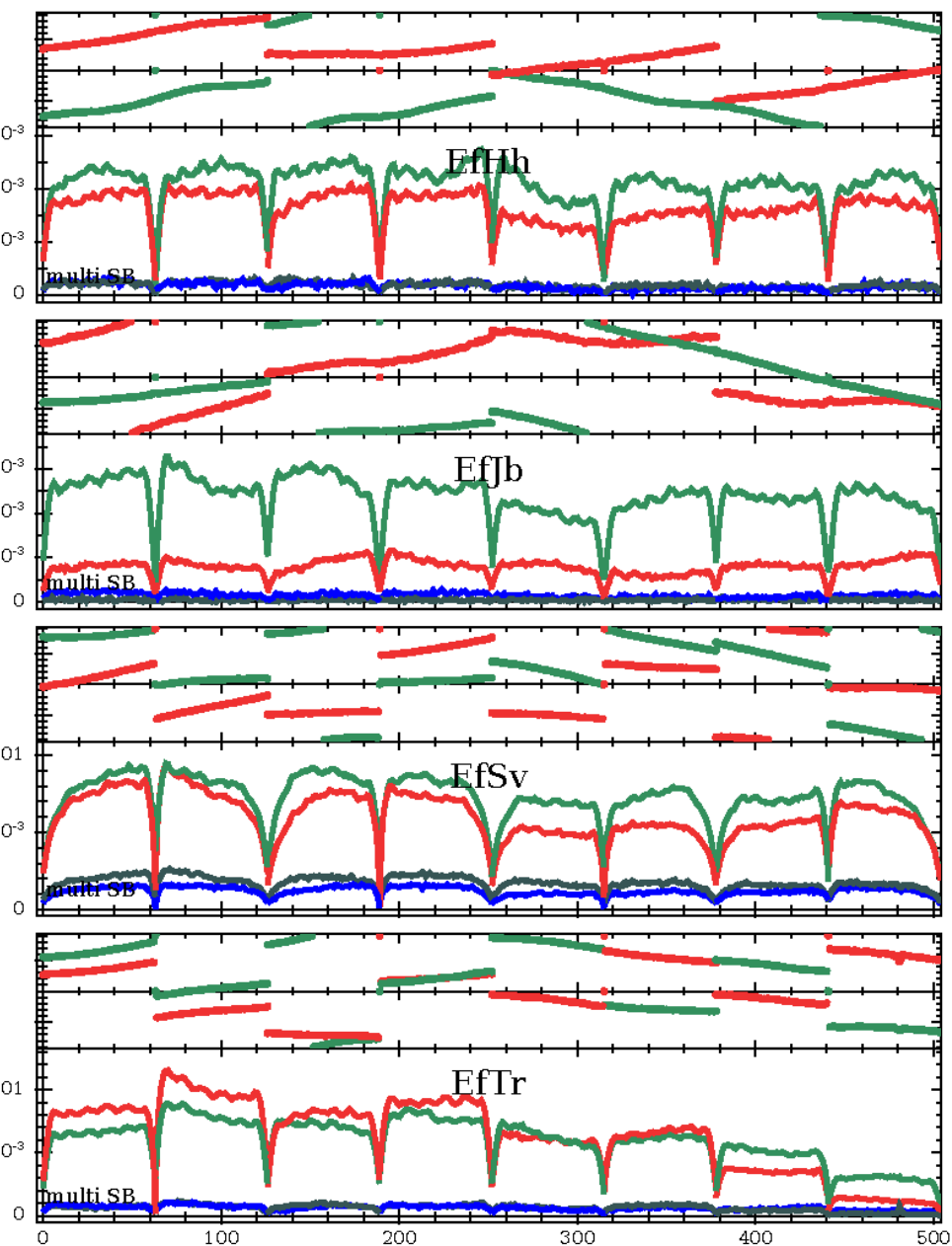
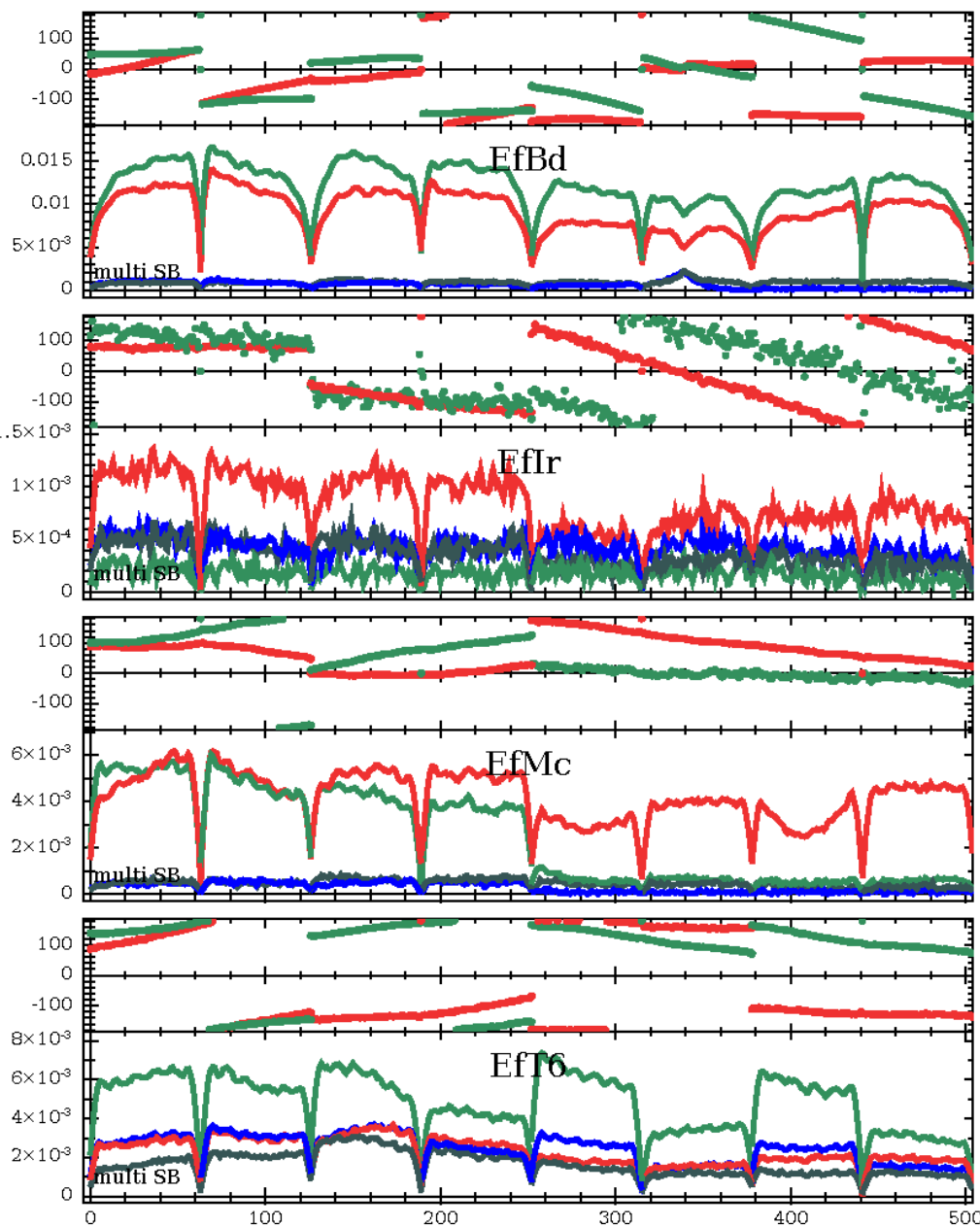
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data: n1713.ms [DATA]

jops@<??> 2018-10-02T12:10:10

page: 1/2



RL LL LR RR

2017 Session 3 Oct NME Results

- **N17L3:**

- JB warm L-band receiver, LCP amplitude much higher than RCP. No fringes after scan 5.
- Mc subband 5-8 LCP amplitude much lower than RCP.
- T6 Only sent one linear polarisation.
- Tr LCP much higher than RCP in subband 8.
- Ir Weak fringes scan 01-02 then none.

- **N17SX1**

- Ef pol swapped but fixed by end of NME.
- O6 Warm receiver.
- Ur Receiver fault reported, bad sampler stats observed. No Fringes.
- Km Maser issues (fringes only briefly when resynched).

2017 Session 3 Oct NME Results

- **N17C3:**

- Ir RCP fringes fainter, possibly larger rate.
- Cm/Da/Ka/Ta odd bandpass shapes.
- Nt invalid data in 2Gbps part.

- **N17K2:**

- No problems!

2017 Session 3 Oct Feedback

- **General:**
 - Zc tsys information bad (999s), broken diode?
 - DBBC issues.
- **18/21 cm:**
 - Pi/Kn/Da/Cm observed wrong subbands (1-4 instead of 5-8) and thus missed the line in ea058b.
 - Ur sent linears.
 - Tr no fringes in ea058b.
 - Ir low power in LCP. Missed one experiment due to miscommunication.
 - T6 recorded single pol only. Then linears.
 - JB warm receiver.

2017 Session 3 Oct Feedback

- 18/21 cm:
 - Ef lost data for part of eo107a as ip address for recorder was set incorrectly.
 - O8 missed some parts due to high wind. Broken chip in antenna control system.
 - Wb issues configuring dbbc due to incorrect mark5 mask.
 - Hh Poor tracking due to encoder fault.
 - Sv missed a few scans due to antenna control issues.
- 3.6/13 cm:
 - Ur formatter failure.
 - Km no fringes in S/X mode (only X-only RCP).
 - Ef missed some parts due to snow.
 - Several scopes used wrong version of schedule.

2017 Session 3 Oct Feedback

- 6 cm:

- O8 missed several experiments (all after ec062a) due to antenna control failure (broken chip).
- Jb2 pointing issues. Appear time/elevation dependent.
- Hh encoder issues remain.
- Ef frozen FS computer → lost part of ep103e.
- Ys missed some of ec062b due to FS problem.
- Mc reported fila10g loss of sync. Similar issue seen at Wb.

- 22 cm:

- Not much reported (single exp). Bad weather.
- O6 had to manually set LO as wrong LO scheduled.

2018 Session 1 Feb NME Results

- **N18L1:**

- Jb and outstations did not show fringes. No fringes ftp as extraction times off by several minutes. No fringes on disk as RAID issue prevented recording.
- Wb no fringes → problems with L-band receiver.
- Mc no LCP.
- T6 single linear pol only.
- Ur neither linears or circulars. Similar power in all stokes.
- Ir could not participate.

- **N18C1:**

- Wb sent linears.
- Sv no LCP.
- Km LCP only in central subbands.

2018 Session 1 Feb NME Results

- **N18M1:**

- Ef issues with sub-reflector control computer → no usable data.
- Nt RCP power much lower than LCP.
- Km maser issues? Fringe only in beginning and end of experiment.

2018 Session 1 Feb Feedback

- General:
 - Major issue with E-series dbbc firmware → amplitude issues across the band.
- 18 cm:
 - Due to amplitude issues none of this has been correlated.
 - Wb Fila10G sync issues (1s/half hour).
 - Tr control system failure.
 - T6 linears.
 - Ur not linears, not circulars.
- 6 cm:
 - Due to amplitude issues none of this has been correlated.
 - Wb broken power supply, linears, mark5c connection.

2018 Session 1 Feb Feedback

- General:

- Major issue with E-series dbbc firmware → amplitude issues across the band.

- 18 cm:

- Due to amplitude issues none of this has been correlated.
- Wb Fila10G sync issues (1s/half hour).
- Tr control system failure.
- T6 linears.
- Ur not linears, not circulars.

- 6 cm:

- Due to amplitude issues none of this has been correlated.
- Wb broken power supply, linears, mark5c connection.
- Hh subreflector controller failure.

2018 Session 1 Feb Feedback

- 5 cm:
 - Has been correlated (line data so not as badly affected by dbbc issue).
 - O8 polar motor power overload.
 - Wb slow because it was so cold the oil was too thick. Stuck in DEC.
 - Ir az/el motor failure.
 - Ef subreflector control failure.
- 1.3 cm:
 - Nt missed rp030b due to “technical issues”.
 - Ur missed em132a due to “technical issues”.
 - KVN Ky odd issue with weak fringes decaying with time. Possibly weather.
 - Tr RCP only, possibly bad form setting.
 - Hh (minor) DEC drive fault.
 - O6 Xserver crash antenna control computer.

2018 Session 2 Jun NME Results

- N18L2:
 - Not done.
- N18C2:
 - Sv LCP shows decreasing amplitude vs time, comparing to RCP which is stable.
 - Ir maser power failure.
- N18SX1:
 - Mc recorded Xband only due to incorrect mode selection.
 - Sv missed scans 05-14 due to antenna control issues.
- N18K2:
 - Sampler stats sub-optimal for all stations except KVAZARs (20,29,29,20).
 - Nt weak fringes at beginning – possibly pointing.
 - Ys no fringes until the last scan – possible equipment damage from lightning strike.
 - KVN did not send ftp data, disks had not arrived when correlated.
 - Kn/Pi – crossed pols.

General Problems

- Uvflg information
 - None for KVN, Mh, Ib, Ro, Km, Ur
- Phase jumps:
 - During data processing it was noticed that some stations exhibit sudden jumps in phase (vs time).
 - Began by looking at the data of Session I, 2017.
 - No progress (due to prioritising dbbc issue).
- Tsys
 - Work is undergoing comparing two ways to extract tsys information from continuous cal.

Possible Trends

- Less Mark5 problems reported since last TOG.
 - Stations moving to flexbuff.
- Relatively high number of hardware faults.
 - Maser failures.
 - Encoder faults.
 - Drive failures.
 - Receiver failures.
 - Subreflector failures.

Mattermost Usage

Last TOG:

72 Active Users, 23 channels, 4167 posts.

Current:

80 Active Users, 56 channels, 12885 posts.