

TOG web pages

EVN pages:

<http://www.evlbi.org/>

Radionet wiki:

[http://www.radionet-eu.org/radionet3wiki/doku.php?id=na:erat
ec:tog](http://www.radionet-eu.org/radionet3wiki/doku.php?id=na:erat
ec:tog)

MPIfR Deki:

https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG

Agenda

Action Items

- **All:** **Beam-maps** at L- and C-band and send them to Keimpema.

https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Beam_maps

- **All:** Upgrade to **SDK9.4** first at the correlators then at the stations.

- JIVE: Include Irbene in <http://mark5-info.jive.nl>

- **All:** 80 Hz **continuous calibration**. Update the table:

https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Continuous_calibration_%2880_Hz%29

- **JIVE:** set up a **wiki** page, summarizing problems per station.

- **All:** Provide frequency information of the stations to de Vicente

- **All:** measure discrepancy between actual tracking of source and log information.

- **All:** provide ANTAB and RXG files to correlator.

- **JIVE:** Send e-mail to stations with problems after results of Session II, 2016 have been published, as some/many of the problems were already reported and may have been fixed.

- **All:** If station's amplitude calibration deviation > 0.1 must do on/off measurement. Reference here:

<http://www.radionet-eu.org/radionet3...:evnampcal.pdf>

- **?:** Move calibration procedure to post-ob; discuss with Himwich to do this as post-ob is rarely included in the procedures.

Action Items

- **Campbell:** Cambell to provide list of stations that have not yet fully implemented data valid on/off.
- **All:** Update table https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/2Gbps on the wiki. In case of problems with the DBBC contact Gino Tuccari.
- **All:** If a station is not buying a FlexBuff, purchase disk packs
- **JIVE:** Include Ir into the e-EVN in 2017

Action Items

Tables with current status at stations:

[https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Continuous_calibration_\(80_Hz\)](https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Continuous_calibration_(80_Hz))

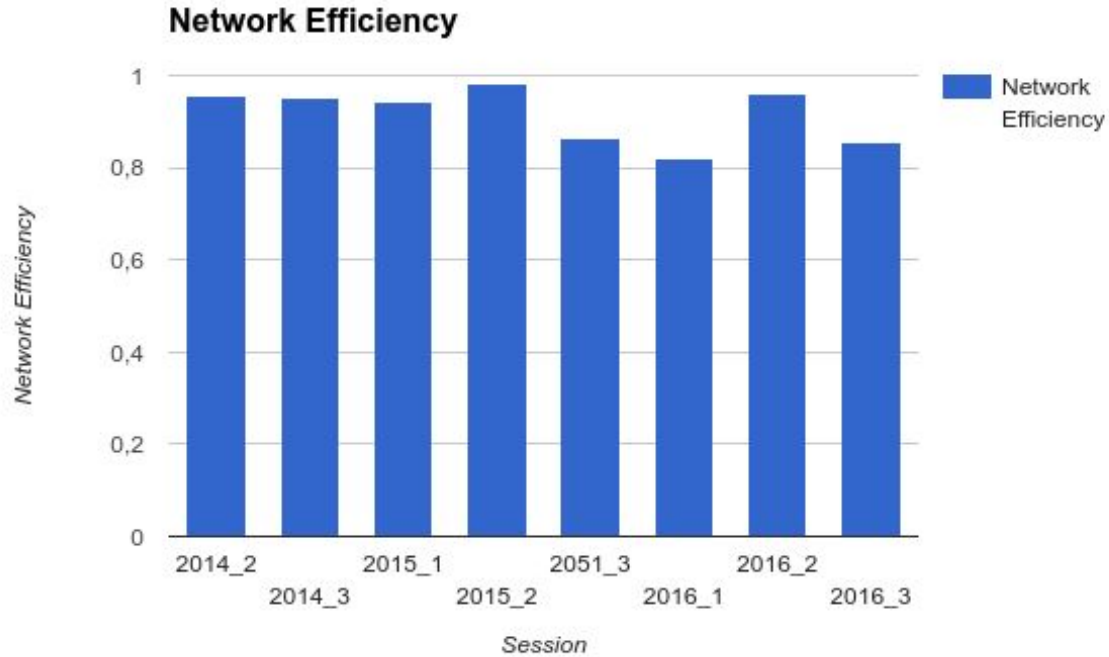
https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Beam_maps

Permanent Action Items

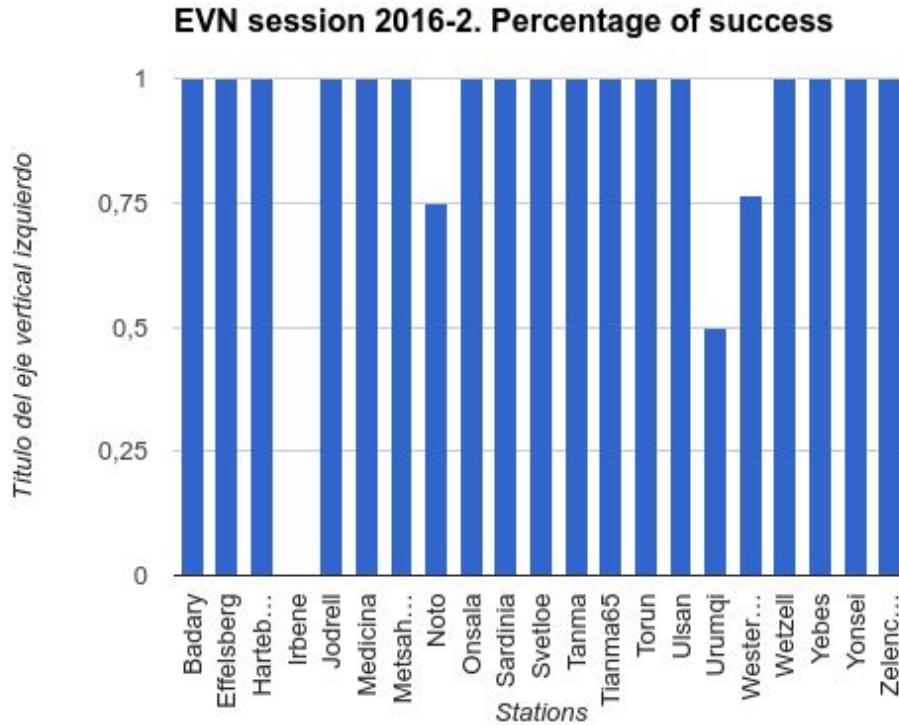
https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Permanent_Action_Items

- Contact information
- EVNtech e-mail exploder
- TOG-meetings
- The block schedule
- EVN disk-pack pool
- Disk-pack shipment
- GPS-Maser reading
- In advance of session
- Session preparation
- During sessions
- Post session feedback
- Post-processing
- e-VLBI
- EVN spare parts
- Receiver Frequency Information

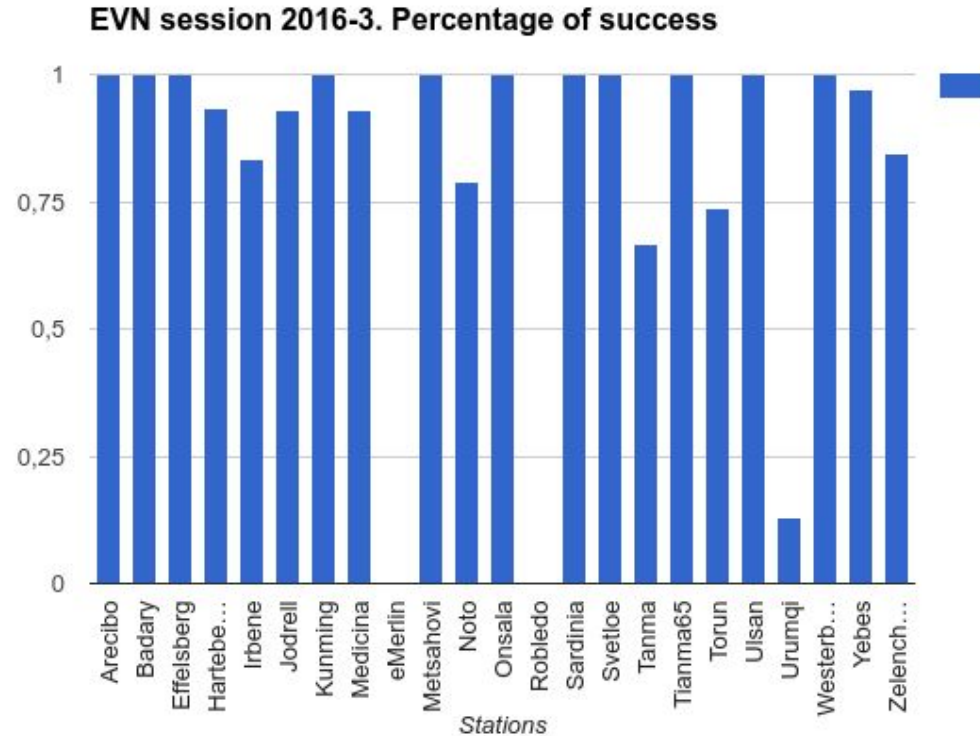
Network efficiency



Network efficiency



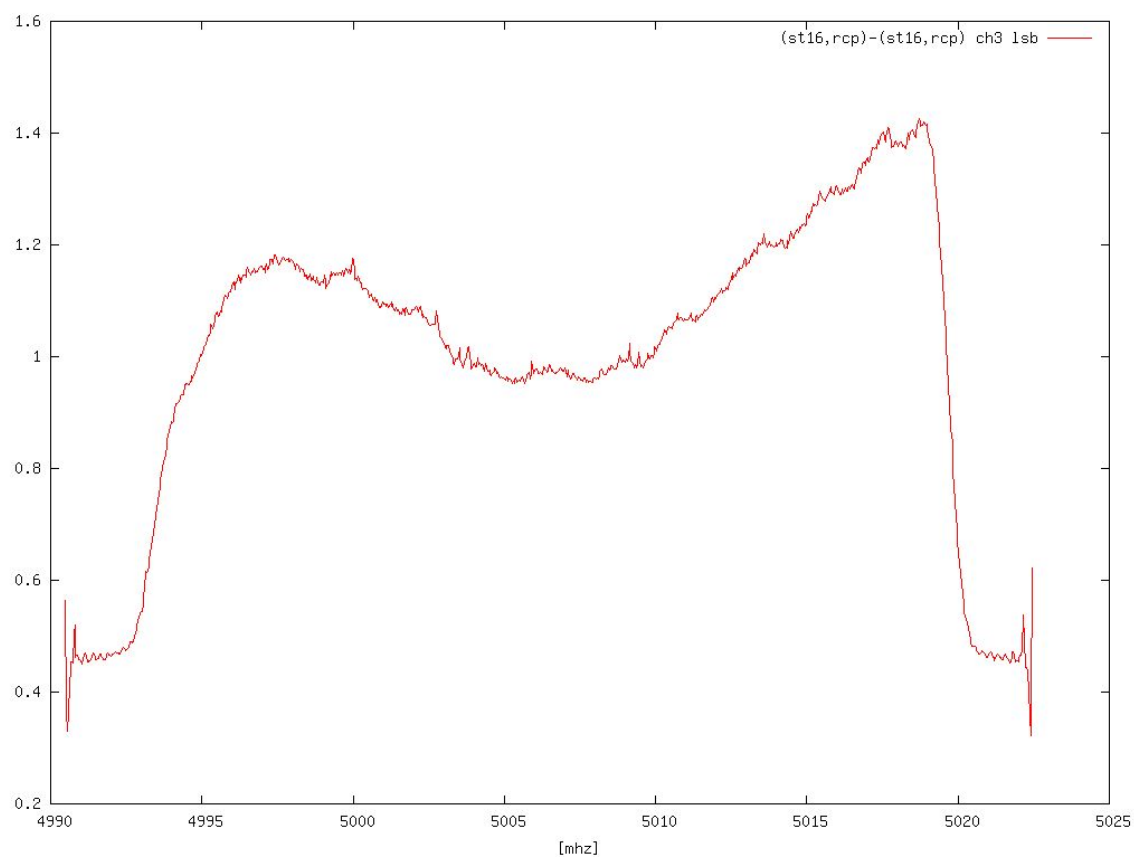
Network efficiency



Amplitude calibration

- Continuous calibration
 - Ef, Mc, Mh, On, Ro, Ys
 - ?
- What is required:
 - a switched controlled noise diode
 - a reference signal: 10 - 100 Hz
 - a backend that can detect synchronously the signal:
 - DBBC2, DPV
 - DAS R1002? CDAS? KDAS?

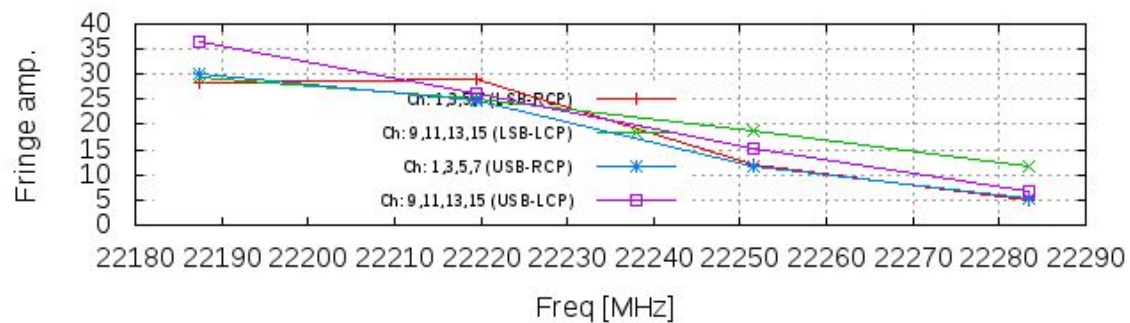
DBBC2 Issues



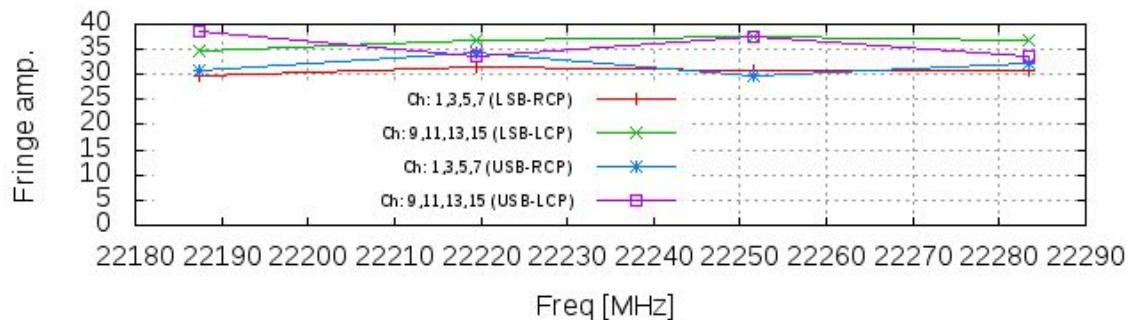
DBBC2 Issues

Tr-Ys amplitude correlation N17K1, scans 2 and 6

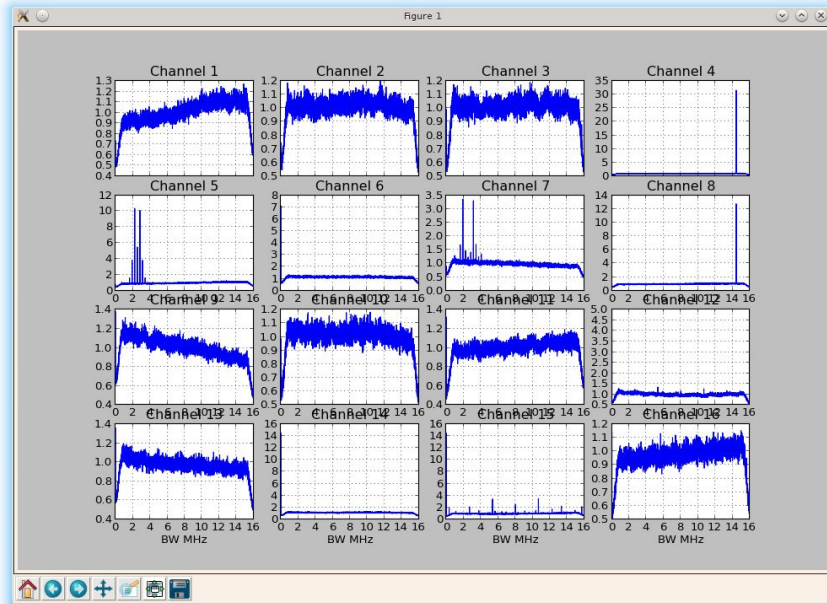
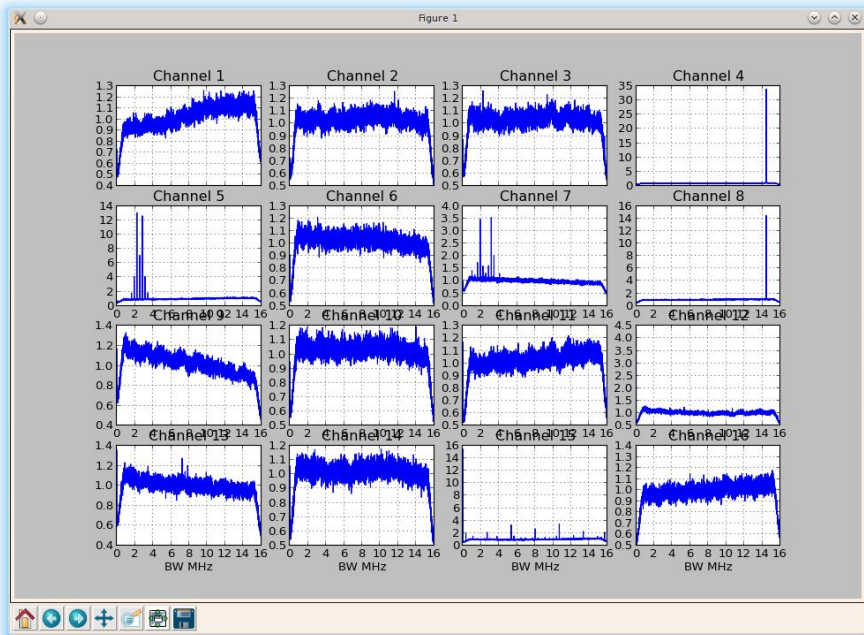
DBBC2#3 (scan 2)



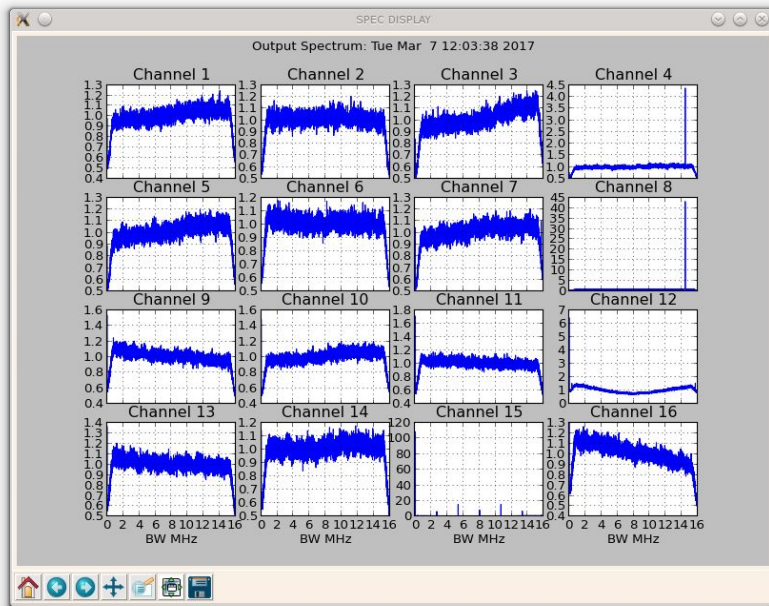
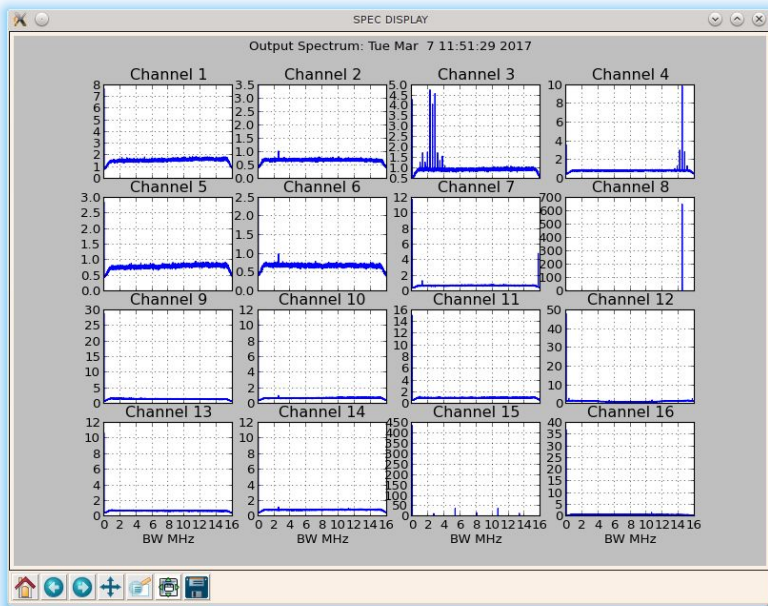
DBBC2#2 (scan 6)



DBBC2 Issues



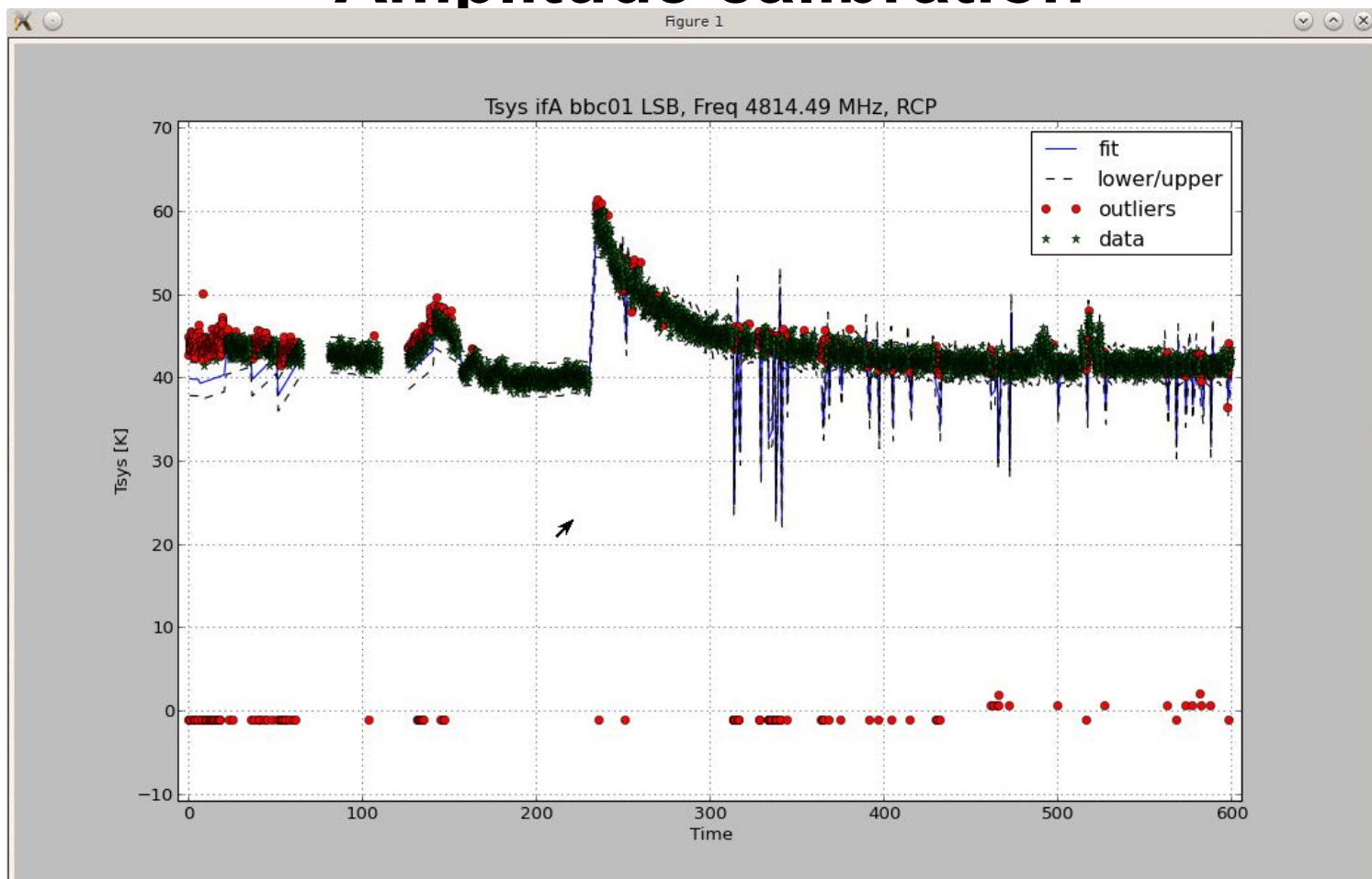
DBBC2 Issues



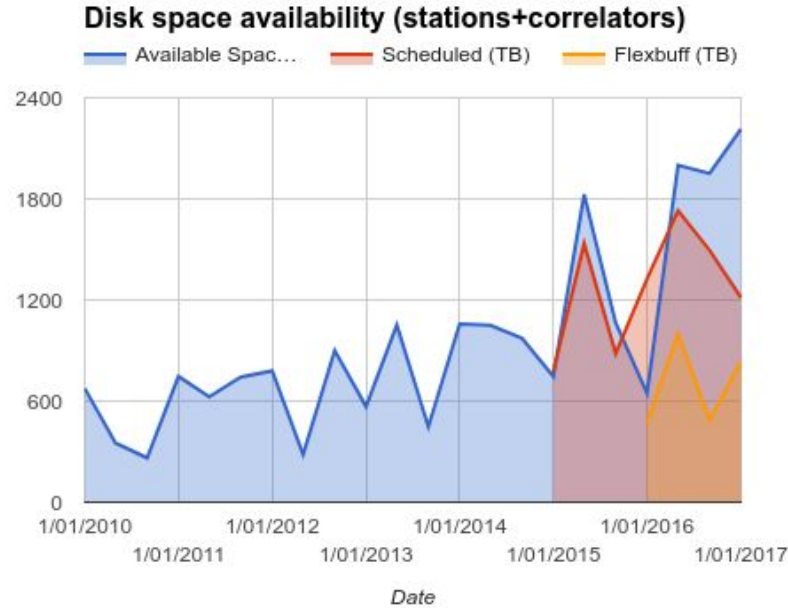
Amplitude calibration

- antabfs.py
 - Maintained by Yebeles (F. Beltrán)
 - Upload new versions to mpifr deki without announcing it
 - Supports:
 - PFB & DDC modes
 - Continuous cal and single shot cal
 - Multifrequency in the same log
 - Hot & and cold loads (Chopper Wheel)
 - Do we want a repository for useful scripts at stations? To be discussed later

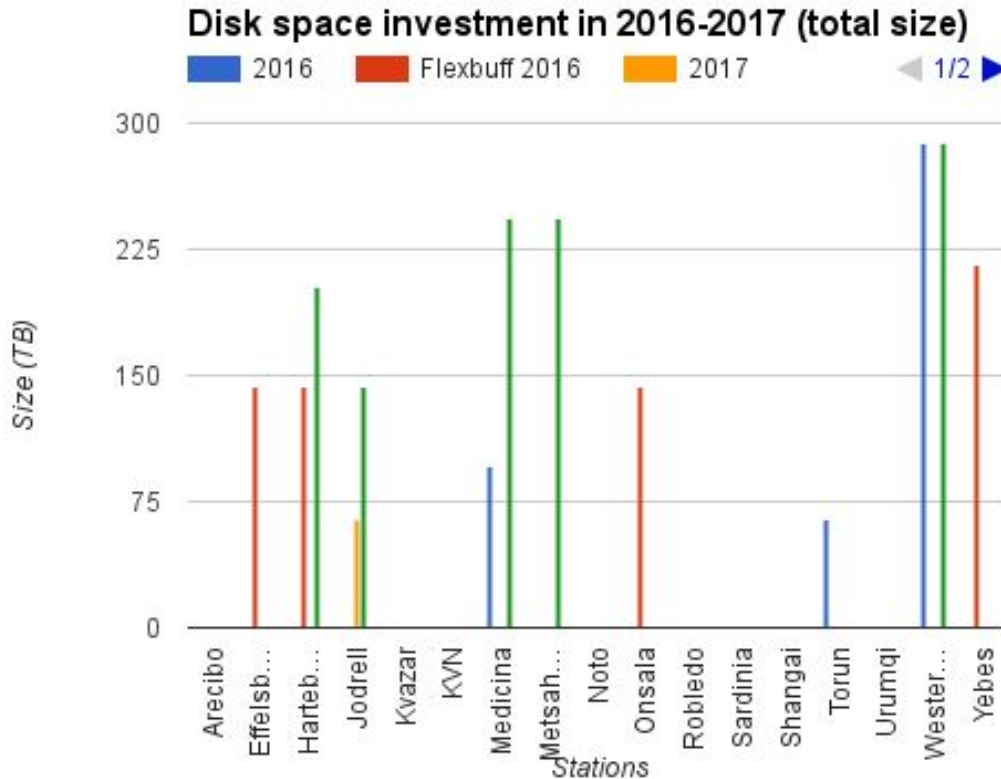
Amplitude calibration



Disk inventory & purchase status



Disk inventory & purchase status



Flexbuff adoption at stations

Station	Local capacity	Capacity at correlator
Effelsberg	128 TB	101 TB
Metsähovi	95 TB	-
Hartebeesthoek	110 TB	202 TB
Onsala	324 TB	101 TB
Yebes	216 TB	101 TB
Medicina	160 TB	168 TB
Noto	160 TB	Empty
Westerbork		288 TB
Jodrell	144 TB	

Disk exps.

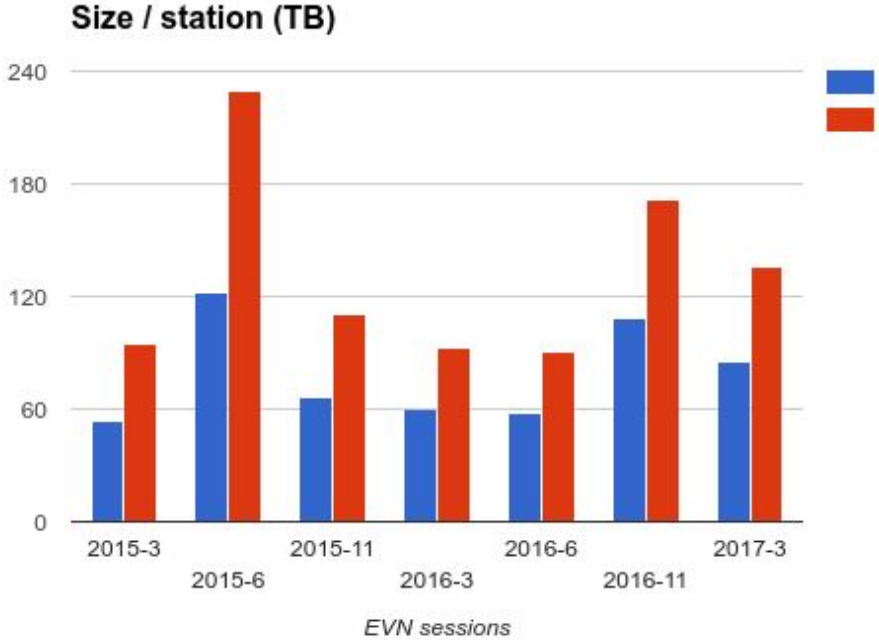
EVN session	average space per station	2 Gbps exps. versus total
2015-1	~ 55 TB / station	0
2015-2	~ 120 TB / station	0
2015-3	~ 68 TB / station	0
2016-1	~ 60 TB / station	0
2016-2	~ 77 TB / station	1/30
2016-3	~ 110 TB / station	6/29
2017-1	~ 70 TB / station	3/40

Disk investment & Flexbuff upgrades

- The budget is 7000 € / year for disk space.
- Ideally for 2 Gb/s there should be: 200 TB x 2 session / station => Upgrade the Flexbuff correlator
- Use 4 TB disks to populate disk packs.
- Please fill in **both** tables:

https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Disk_Inventory

Disk investment & Flexbuff upgrades



2 Gbps capabilities at EVN stations (10/4/2017)

Station	Recorded	Limitation	eVLBI	Limitation
Arecibo	512 Mbps	Backend	512 Mbps	Backend/Conn.
Badary	2 Gbps		512 Mbps	Backend/Conn.
Effelsberg	2 Gbps		2 Gbps	
HartRAO	2 Gbps		2 Gbps	
Irbene	2 Gbps		2 Gbps	
Jodrell	2 Gbps		2 Gbps	Proxy. Not tested
Kunming	2 Gbps		?	Backend/Conn
Medicina	2 Gbps		2 Gbps	
Metsähovi	2 Gbps		2 Gbps	More tests needed
Noto	2 Gbps		2 Gbps	
Onsala	2 Gbps		2 Gbps	
Robledo	2 Gbps		?	Connection
Sardinia	2 Gbps		?	Connection
Svetloe	2 Gbps		64 Mbps?	Never tested
T6 (Shanghai)	2 Gbps		1 Gbps	Backend
Tamna	1 Gbps	Backend	?	Backend
Torun	1 Gbps	Backend	1 Gbps	Backend
Ulsan	1 Gbps	Backend	?	Backend
Urumqi	2 Gbps	Not tested	1 Gbps?	Connection
Westerbork	1 Gbps	Backend	1 Gbps	Backend
Yebeo	2 Gbps		2 Gbps	
Yonsei	1 Gbps	Backend	?	Backend
Zelenchukskaya	2 Gbps		512 Mbps	Backend/Conn.

Towards 4 Gbps operations

- **Hardware requirements:**
 - 512 MHz x 2 pols
 - DBBC2 (2/4 COREs) + Fila10G (2 COREs > no cont. cal)
 - PFB firmware
 - Common LO at the stations (Please fill in the table at the TOG wiki)
- **Tests:**
 - **FR040** (4 Gbps) FS 9.11.19
 - Fringes in all cases: Hh, Mc, O8, Ys
 - Stable
- **Pending:**
 - Need to add FS support for continuous cal to PFB (but it requires 4 COREs)
 - Disk requirements increase by ~ 4
 - (Flexbuff, Mark6 or diskpack purchases)

Backends

- **EVN:**
 - DBBC2, DBBC3
 - VLBA
 - RDBE, R2DBE (VGOS)
 - DPV
 - KDAS
 - CDAS, CDAS2 (VGOS)
 - DAS R1002, BRAS (VGOS)
- **What we should advise for all backends:**
 - Same sampling rate
 - DDC mode BWs: 1, 2, 4, 8, 16, 32, 64 MHz /channel
 - PFB mode: 2 Gb/s and 4 Gb/s
 - VDIF
 - Continuous cal detection. Flexible: 10 - 100 MHz
 - Phase cal detection
 - Standard commands

Developments. Long term plan

Overall EVN goals need to be adapted to each individual station

- Possible goals for **2018**:
 - All EVN telescope capable of doing e-VLBI at least @ 1 Gb/s
 - Upgrades at the correlator. Using Uniboard
 - RFI studies at stations
 - Start first DBBC3 tests (high recording rates) at some telescopes

Developments. Long term plan

- Possible goals for **2019**:
 - All EVN telescopes capable of doing e-VLBI @ 2 Gb/s
 - VDIF implementation at all telescopes.
 - Non DBBC backends: RAS, CDAS & KDAS
 - Continuum cal at all EVN telescopes
 - Recorded VLBI at 4 Gb/s
 - Storage: 400 TB / station (2 sessions)
 - Tunable LOs to be able to use PFB mode

Developments. Long term plan

- Possible goals for **2020**:
 - 4 Gb/s eVLBI
 - 32 Gb/s recording rates at as many EVN telescopes as possible (DBBC3)
 - Optical fiber high bandwidth IF transmission at the telescopes
- Possible goals for **2021**:
 - Low frequency Broad band Receiver (prototype): 2-15 GHz
 - High frequency broad band receiver: 22/43 GHz