

EVN Technical and Operations Group Meeting

Hybrid meeting, hosted online and at INAF-OAC Cagliari/ Italy
04 Sep 2025, 09:02 CEST

Minutes

Participants:

According to the event registration page (via the meeting site¹) thirty-seven participants registered, of which five anonymously and one double registration, i.e. thirty-six unique registrations. Twenty-eight people attended in person and eight online. In total fifteen institutes in fourteen countries were represented.

Agenda:

The agenda is published online² on the JIVE TOG wiki.

1. Introduction

a) Welcome (Poppi (chair))

Poppi welcomes both online and local participants. After some technical hiccups - e.g. projector issues and the jivewiki disappearing from the internet (traced to network/firewall issues) - the meeting started.

b) Last-minute additions to Agenda (all)

Marcote: We need DBBC3 discussion (but already on the agenda)

Jang: Could we start Ku test observations? 15 GHz important for SKA-VLBI; 32 GHz important for space applications.

New Action: add column in the Deki for collecting Ku-band capability.

2. Acceptance of minutes from last meeting (all)

The minutes of the previous TOG (Göteborg, Jun 25th and Jun 26th 2024) were approved without comments.

¹ <https://indico.ict.inaf.it/event/3276/>

² <https://www.jive.eu/jivewiki/doku.php?id=tog:may-2025-sardinia>

3. Review of Action Items³ from last meeting (all)

Note: due to a lapse of attention from the TOG chair and vice-chair, the Action Items that were discussed in this TOG was the original list from Göteborg 2024 again, i.e. without applying the outcome(s) of the Göteborg 2024 meeting. The **Current Action Item** list on the wiki before the Manchester 2026 TOG will be updated to reflect to what they should be.

1. **All:** 80 Hz continuous calibration. Update the table on the wiki⁴
Nobody reported anything regarding this AI
Action remains
2. **Bach, Poppi:** Look at EHT station set-up document and see if it could be modified for use in the EVN. Create a master check list.
Bach: No progress
Action remains
3. **Bach, Himwich:** Investigate how to improve opacity and T_{sys} measurements at high frequencies in the Field System by incorporating the atm software
Bach: No progress
Action remains
4. **Bach:** compare gnpl t opacity estimation versus WVR measurement.
Bach: no progress
Action remains
5. **Poppi, Stagni:** sftp server set up on vlbeer (**Stagni**), set up discussion where to host server (**Poppi**)
Poppi: sftp server set up; **Stagni, Campbell, and Poppi** discussed certificate setup and how to upload daily GPS and other file types.
Action can be removed
6. **All:** set up basic monitoring information sent to the EVN Monitor at JIVE.
Discussed later in the agenda.
Action remains until more stations are added

³ https://xwiki.mpifr-bonn.mpg.de/xwiki/wiki/vlbiwiki/view/EVN%20TOG/Current_Action_Items/

⁴ <https://xwiki.mpifr-bonn.mpg.de/xwiki/wiki/vlbiwiki/view/EVN%20TOG/Continuous%20calibration/>

7. **Poppi, Verkouter:** questionnaire to stations and correlator to base document to CBD on to indicate needs of EVN to remain competitive.
Done.
Action can be removed

4. Update by the TOG Chair (Poppi)

Updates following the CBD meetings:

Since the last TOG there have been two CBD meetings. The following important TOG issues were identified:

- **Beam maps** still hampering wide-field observations, specifically at **L band**. According to the table on MPIfR's EVN TOG xwiki⁵:
Currently missing for L band: Hh,Ir,Nt,Jb,Da,De,Kn,Pi,Cm,Sh,T6,Ur,Wb
- **DBBC3 commissioning:** considered *highly* important, needs to be done on short time.
- **Disk space:** want to support more 4 Gbps observations, has everyone got and donated enough raw disk space?
- **Reorganise observing cadence:** Separate WG formed of EVN schedulers, including EVN TOG and EVN PC members.
Gunn: YT likely cause of this as 3-day e-VLBI discussed, never implemented as "not suitable". Not having a 'stable' network/scheduling multiple modes is very difficult.
Various people (Verkouter, Cambell, Gunn, Poppi): Dynamic scheduling discussed - that does have implications for the TOG - but that is likely future; first get away from the 3x per year fixed. - move to AOB

5. Performance of the EVN

*Performance of the EVN*⁶ presentation by **Oh**.

Topics: fringes to VERA; MeerKAT/GMRT joined NMEs;

Tr, Sr phasejumps; **T6** steps in amplitude/ANTAB issues;

Ur some ANTAB weirdness (one exp bad, others good)

⁵ <https://xwiki.mpifr-bonn.mpg.de/xwiki/wiki/vlbiwiki/view/EVN%20TOG/Beam%20maps/>

⁶ https://www.jive.eu/jivewiki/lib/exe/fetch.php?media=tog:evn_performance_tog_2024.pdf

Feiler: phasejumps not really fixed: installed new timing box which didn't work and old one still ok.

Surcis: C-band only, seems linked issue with 2nd downconverter (under investigation)

Yang: T6 lots of RFI

Stations missing their first scans?

Oh previous TOG asked for statistics to see if adding 30 minutes to each experiment at the beginning would help. Manually reviewed last 10 sessions: 87 late starts found, of which 35 (i.e. only 40%) were fixed *within 30 minutes*. Unlikely that expanding each experiment by half an hour will solve the real problem. There was insufficient feedback to identify cause of failures.

Campbell, Gunn, Surcis, Verkouter, Rottman, García-Míro: lengthy discussion ensues on how many calibrators per experiment (there is already a very strong suggestion to have at least two), complexity of setting up; no new insights except that the technical staff at stations that have problems are not attending TOG and/or keeping the Deki [now XWiki; red.] up-to-date.

+New Action Poppi, Verkouter CBD needs to be informed that technical staff should attend the TOG and keep (technical) data up-to-date.

Discussion item - station feedback?

Currently not enough feedback to diagnose several problems.

Campbell, Surcis, Gunn: discussion on options in the tool, or FS logs (which JIVE still parses) auto-inserted into feedback system? [May need filtering though].

Campbell: there used to be a comment for "Whole session"?

Marcote: could e- VLBI Mattermost comments into feedback?

All → get into contact with **Small** (JIVE) for "feedback" requests!

10:48 CEST coffee break, reconvene at 11:10 CEST

6. Beam maps missing

This is a recurring question from the CBD to the TOG!

Verkouter: are stations called out as not having submitted beam maps justified? Maybe someone submitted but Deki [*now XWiki, red.*] not updated?

Bach: Wb tried the FS-script but it failed.

Verkouter: that is why contacting JIVE can help. The list of failing stations will be shared with the CBD so the directors can appoint someone to make this happen.

Campbell: focus should be on L-band; there is now an approved EVN commensal project ("SWEEPS") that recorrelates all L-band data in wide-field mode.

+New Action Poppi, Verkouter share beammap missing stations with CBD

7. EVN Technical Roadmap Oct 2020

As derived from the EVN 2020-2030 Science Vision

It would be good if the EVN would have 6-7 stations ready with tri-band system before 2027. Wide C/X receivers installed at most stations.

Rottmann: there will be a Frequency-Phase-Transfer (FPT) session at tomorrow's GMVA Technical Group meeting.

Melis: an FPT meeting will be held in Bologna later this year, good moment?

DBBC3 commissioning remains a weak point.

Campbell, Himwich, Rottmann, Bach: very, very, long discussion ensues

Rottmann: Dornbusch working on manual, and more/in-depth lab tests, should wait with community tests until those have been done. Initial thought of offering all modes in same firmware has proven to be impossible b/c of FPGA resource limitations. A separate wiki area is being set up.

Himwich: Dornbusch sais that only reliable DBBC3 setup is via bootfiles; looking into 'keepsync' mode but seems to have issues (mode switching currently ~30 minutes triggered manually; outlook is that it would be possible to reduce it to ~minutes *and* trigger it remotely, booting from a different config file). FS10.3 will have a lot of DBBC3 modifications, could make 'keepsync' the default. DRUDG can handle VEX1.5 for DBBC3.

Yang: 32 MHz filter shape is not good for science but one of the most-requested bandwidths. Even if 64 MHz filter is better, it picks up more RFI.

Mode changes within experiment might not be necessary (requirement **deferred** to later); but lab tests need to wait for DBBC2 to arrive in Bonn.

Verkouter: Effelsberg GPU-based Direct Digitisation (EDD) backend an option? More flexible than FPGA?

Rottmann: not powerful enough, not dedicated to VLBI (but produces VDIF, successfully tested)

Verkouter: which reminds me, the EVN / TOG does not have a list of "standards" for new stations - e.g. regarding what data format the correlator can accept (correct answer: VDIF). Some aspiring EVN members just gave a binary file with samples only, no headers or metadata in the file.

Himwich: can we run a test with a number of DBBC3 stations to see if the whole workflow works (geo stations use DBBC3 but they don't use VEX) - who can do this and get feedback on how it goes.

Show of hands: **Ys, On, Mc, Ef, Tr, Mh**? (small question mark from **McKay**)

This concludes also **7c. Formation of a TOG DBBC taskforce**

Gunn: need to correct some spelling, it's **EVN-light** ("lite" is an Americanism)

7b. Reports from stations

Bach: **Ef** tri-band expected early (or "in") 2026. BRAND testing ongoing in Bonn. **Rottmann:** commissioning started last year, seeing some digi-board artefacts; telescope tests showed a shielding box is needed.

Surcis: **Sr** antenna upgraded (space agency funded), commissioning new receivers, tri-bands; one at a time, so far OK. DBBC3 had a problem, sent to Bonn for repair. L-band receiver longer time scale (not under our control, the hope is "next year"). C/M band receiver problem found! T_{sys} problem @K-band was due to DBBC2. [**Poppi:** funding was requested for X-band (X/Ku, actually)]

Orlati: **Nt** telescope not reliable, intervention ongoing: L/X focus position first, then refurbish subreflector, then electronics + fiber; refurbish mechanics (Spring '26), finally replace maser. Tri-band will be installed at end of first steps. M-band receiver being refurbished at MPIfR; C/X receiver for **Nt/Mc**. **Mc** installation of active surface finished, now commissioning: good increase in performance (surface RMS $\sim 20\mu\text{m}$). After that tri-band installation, but the receiver does not have a 2nd downconversion unit.

Yang: On funding for tri-band accepted! Next on the list is an automatic receiver changing system.

Feiler: Tr commissioning K- and C/X-receivers, new control system is work-in-progress but will take more time. Trouble with L-band receiver cooling. Deployed 2 PB CEPH distributed storage, streaming performance unknown.

García-Míro: Ys not operational since May 2025 because of broken subreflector spindle. A repair unit was ordered but a support structure is required before it can be used: not before end of year. Limited use at X-band possible, not participating in GMVA session, will try to participate in upcoming ToO in reduced mode. Focus seems ok for elevation 45°. [**Campbell:** if predictable for other elevations can still make a gain curve.]

Gunn: Jb1 into engineering, no changes in VLBI room; DBBC3: no progress. Problems/unresolved issues due to changing FS, e.g. "on/off" procedure #FAILED (fixed now). Announcement: I'm not the EVN Scheduler anymore. [**Campbell:** what about e-Merlin digitalisation?] Uncertain where process currently is.

Orbidans: Ir RT32 under upgrade to support commercial segment - now movable most of the time. RT16 helped us this year for EVN with C/X receiver. Plan to have a new receiver next year but will be small bandwidth (commercial segment) so not usable for EVN. Some K-band developments.

McKay: Mh director change (Savolainen from 1 Jan 2026); K/Q-band available, not S/X on the 14m. Tri-band expected early next year. Replaced platform to prepare for tri-band and made subreflector control into an active control system (tested in Session II): resulted in substantial improvement in gain. DBBC3 commissioning ongoing, hope to have it done before tri-band. FS upgraded and have three FlexBufs. Regarding masers: most are broken so looking to refurbishing but also purchasing a new one. Small-dish C-band interferometer working; 3rd dish in progress.

Quick: Hh C/X, tri-band receivers: no progress; only spend effort on latter if dish gets repaired. Installing high-resolution encoders anyway; investigating how high the system can go in frequency. VGOS system was qualified(!). Used DBBC3 but not controlled from the schedule. Tested FS to generate setup: if VEX detailed enough seems to work. DRUDG can handle eight IFs.

Baek: KVN is four-station network now. At Ky removed 4-channel receiver to replace with CTR (so antenna unavailable for a while). 115-230 GHz receiver installed at Kc (Pyeongchang).

13:15 CEST lunch break, reconvene at 14:30 CEST

7c. Recorder status - 4+ Gbps capable?

Bach: tried at > 4 Gbps (Mark6 moved to Debian12): 0.01% loss at 2 Gbps noticed by the PRECISE team: dedisperse algorithm assumes 0% data loss. Tried tuning different parameters but didn't see any progress.

Verkouter: at JIVE replacing certain network cards (Intel 710), more susceptible to packet loss. Replacing them with ConnectX4 (~40€ refurbished/second hand): must better.

Garcia-González: tuning of network/hardware remains important, but also in `net_protocol`.

Yang: 32 Gbps works fine.

8. Proposal to decommission "EVN Monitor" (Verkouter)

*All: a **very** long discussion ensues; one station representative is not convinced that "monitoring a complex system is a good idea"*

Decision: do NOT decommission; new stations *have* to set it up.

+Action Poppi, Verkouter: add to Permanent Action Items.

9. Ageing disk pool @ JIVE (Verkouter)

Presentation; 400 **EVN-owned** FlexBuff HDDs at JIVE (40%!) are 6+ years of age. Repair and preventive management plan will be presented to the CBD.

Discussion ensues around options (more e-VLBI? more frequent smaller sessions? Operational issues correlating from tape-robot, etc.)

Outcome - suggest more e-VLBI: *"Bring brave things to the CBD!"*

10. (Target-and-Observation Manager, Verkouter)

The meeting decided to skip the agenda item

11. Projects at JIVE (Verkouter)

Presentation Verkouter

García-Miró: progress on DOIs?

Verkouter: tested in sandbox environment, getting ready for deployment

12. Next TOG Meeting

Marcote/Bach: Online meeting before session; in-person at EVN Symposium?

Anonymous: (tongue-in-cheek: At "Station H" as punishment ...)

16:28 CEST meeting ends