

Metsähovi Radio Observatory

EVN station report I/2024

1) EVN sessions in 2024

Aalto University Metsähovi Radio Observatory's (MRO) participation in the EVN Sessions is as follows:

- **Session I/2024:**
 - o 1.3cm band (5 projects + NME)
- **Session II/2024**
 - o 1.3cm band (1 project + NME)
 - o 0.7cm band (1 project + NME)

MRO also participated in the GMVA session in April 2024 (86 GHz and 43 GHz).

2) VLBI personnel

MRO's personnel participating in VLBI activities consists of:

- **Derek McKay**, VLBI friend and EVN TOG representative, receiver changes
- **Tuomas Savolainen**, VLBI scientist, shares session management with McKay
- **Christian Malino**, RF engineer and receiver maintenance
- **Kjetil Holmberg**, receiver changes
- **Joni Tammi**, EVN CBD representative

For all VLBI-related topics, the address vlbi-metsahovi@aalto.fi should be used.

3) Receiver status

The following VLBI receivers are currently operational at MRO: 2/8, 22, 43 and 86 GHz. However, 2 GHz is not offered at the moment, since it requires change of the sub-reflector and that is not feasible currently. Remotely-adjustable sub-reflector steering system is under final phases of development, with installation and testing expected by mid-to-late 2024.

A new wide-band, multi-band receiver working at K-, Q- and W-bands is being built by the MPIfR electronics division; expected to be operational in 2026.

4) DBBC status

The dBBC2 has been working without major problems and it has been used successfully in all VLBI sessions. The dBBC3 commissioning has been delayed due to personnel resource challenges, and is currently expected to happen in latter half of 2024. We are collaborating with the Finnish Geospatial Research Institute (FGI), who is aiming to carry out IVS VLBI sessions with their VGOS antenna very close to the MRO, with the aim of utilizing synergies in having two dBBC3 and other VLBI equipment in the same area.

5) Flexbuff and Mark5B+

MRO has three Flexbuffs (watt, luckyluke and rintintin) with a total capacity of 1368 TB. All astronomical VLBI sessions use Flexbuff as a recorder. Because MRO does not participate in IVS

sessions anymore (the FGI aiming to use their own telescope for those), the Mark5B+ unit is kept mainly as a back-up recorder.

6) Software versions

We are using

- FS: 9.13.2 (upgrade scheduled for near future)
- SDK: 9.4
- jive5ab: 2.8.1
- FILA10G: v3.3.2_1

We have also been using DBBC firmware version DDC v107_301019 in past sessions.

7) Other issues

Our broken hydrogen maser remains unfixed, and the two older ones cannot be maintained/refilled, due to the Russian component and service unavailability. Our attempts to find company or service provider able to refill the Russian-made hydrogen units have not been successful. We are in the process of purchasing a new maser, but expect the long delivery times to cause problems to VLBI operations.