INAF- Institute for Radioastronomy - Italy

Medicina Grueff Telescope Report

Technical Working Group meeting
Cagliari, September 4th, 2025

G. Maccaferri, A. Atza on behalf of the station staff

Reference period June 24-August 2025

Antenna:

The telescope underwent a significant upgrade, transitioning from a static-surface antenna to a fully active-surface system. This major refurbishment, which took place from September 2024 to May 2025, involved the original primary and secondary mirrors and the integration of an active surface system. The upgrade was designed to enhance the telescope's operational frequency range and performance.
The new primary mirror panels were manufactured to achieve a surface RMS of less than 65 microns, the sub-reflector was also replaced with a new mirror having an RMS of 40 microns. The combination of these mirrors with an array of linear actuators, forming the active surface system, that dynamically adjust the mirror's shape in real time, compensating for structural deformations caused by gravity, allows the telescope to operate at frequencies up to 116 GHz.
Initial commissioning tests are underway following the completion of the installation. Preliminary data from observations at 22 GHz, conducted without the active surface system engaged, show highly encouraging performance gains. These results validate the improved surface accuracy of the new mirrors. Further details and performance metrics will be provided as the commissioning progresses. The next phases will involve activating and testing the active surface system and evaluating the telescope's performance at higher frequencies, specifically in the Q-band (33-50 GHz) and W-band (75-110 GHz).

Receivers:

Following the completion of the active surface system, all receivers were reinstalled. The new simultaneous K-Q-W band receiver has been mounted, but commissioning tests have yet to be conducted. A small helium leak was detected in the primary focus receiver(S-X-L bands). The receiver will be removed and taken to laboratory for repair next

week, with an expected return to service within 10 to 15 days.

VLBI terminal:

Our Flexbuff system is presently equipped with 360TB (310TB available at the moment)
We're running DBBC ddc_108
DBBC3 is ready for activity (we tried the DDC_E_v128 beta version, but cont_cal did not worked)
We are running FS-10.2.1.

VLBI sessions:

The last observation session (Session 2-2024) was highly successful, with only one hour of scheduled time lost.
The telescope was then inactive for the upgrade and commissioning phases. We resumed our regular operations in July 2025 and intend to participate in all upcoming EVN experiments across all frequency bands.