

Observatories Report To EVN TOG
 INAF-Institute of Radioastronomy

Medicina station Period June 2019 – May 2020

A. Orfei, G. Maccaferri, A. Orlati

1) Antenna.

New Active surface update from previous report.

The development has started. The upgrade will involve:

- a) new aluminum panels with enhanced surface accuracy
- b) electromechanical actuators to move panels in order to compensate for gravitational deformation
- c) completely new sub reflector with low RMS surface (one will be provided for Noto as well).

The timeline to complete the project is 3 years.

Two steel girders composing the reticular structure that supports the counterweights were found broken in December 2019. The same exact damage affected in the twin telescope of Noto. For safety reasons our institute decided an immediate stop of the telescope. A fatigue analysis (based of the Finite Element Model) of the structure was done by a mechanical engineering company. From their report we realised that the stress (during normal working cycles) on the two broken girders was higher than all the other elements of the structure.

In the mean time, we planned a complete inspection of the structure and the maintenance to replace the girders. This maintenance was planned in April, but, given the present situation related to the COVID-19 disease and the restrictions imposed by the Italian government, we were forced to postpone it. Timeline is still uncertain but end of May might be a guess.

2) Developments for higher bit rate.

As reported during last TOG meeting, INAF succeeded a call for fundings (PON) issued by the Ministry of Research. In the framework of the PON (Programma Operativo Nazionale), Medicina will be equipped with a simultaneous 3-bands receiver (18-26, 34-50, 80-116GHz). The receiver will output large bandwidth IFs (K-Band: 8GHz, Q-Band 16GHz and W-Band 16+16GHz) that will be down-converted to tuneable, 2GHz bands. The receiver will be built by KASI and is planned to be available in 2022.

Also the PON fundings will allow to buy a DBBC version 3. The call for tender is already been issued by INAF.

3) VLBI terminal

Our Flexbuff system is presently equipped with 360TB.
 We're running DBBC V107 (2019 January 29th)

4) Field System

We're running FS 9.13.20 on FSL9.

5) VLBI sessions

EVN 3-2019.

Bands: 1.3cm, 3.6cm, 13cm, 5cm, 6cm, 18cm, 21cm.

a) Projects failed: 0.

b) Scan lost: 2h,11m on ek046b , 3h on ek045b for wrong LO (6400 instead of 5800), 10m on E0016b for late start

c) Successful projects: 39 out of 35

d) 5 out of 5 NMEs experiments produced fringes

e) calibration runs were done at all frequencies as usual

f) some 18cm projects at 2Gbps (i.e. em131f) had 1 dbbc per pol out of our receiver band frequencies. Our L-band is limited with an IF filter(290-430MHz)

to reduce the huge RFI.

EVN 1-2020

Medicina did not participate due to the problem reported about the backup structure.