

Yebes Observatory Station Report

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VLBI Group

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1 VLBI Equipment

Details of the equipment used in EVN observations:

- DBBC2
 - 4 CoMo boards (Unica 4).
 - 4 ADB2.
 - 4 Core2.
 - Internal Fila10G.
 - Software available:
 - DDC:
 - v105_1 (June 10 2015). This firmware is used with channel bandwidth narrower than 4 MHz.
 - v107 (beta 4)(June 7 2019). This firmware is used with 4 MHz channel bandwidth or wider.
 - PFB (only used in some ad-hoc observations with the KVN):
 - v16_2 (October 13 2017).
 - Fila10G:
 - fila10g_v4_1 (reported as 2.8.0, October 20 2017).
- Flexbuffs
 - flexastro:
 - 36 disks of 10 TB capacity. Total capacity of 360 TB
 - Software version: jive5ab : 2.9.0 : 64bit : dev : flexastro

Other VLBI equipment:

- DBBC3-2L-2H. Ready to load firmware version v124.
- flexbuff:
 - 36 disks of 6 TB capacity. Total capacity of 216 TB
 - Software version: jive5ab : 2.9.0 : 64bit : dev : flexbuff
- 2 x Mark6 units
- 4 x RDBE-Gs
- We use a Harrobox running Debian Jessie (8.2) as a proxy between the FS and the DBBC to allow concurrent connections to DBBC2. JIVE correlator uses this feature

to control the flow of data from the Fila10G when doing eVLBI. This host is in the public LAN but allows connections from the private LAN.

At present time RT40m's spare DBBC2 is on lend to Santa María station in Azores.

We have set up a small DiFX cluster correlator with 3 nodes, two HP-Proliant server grade computers (octa-core both, 128GB and 16 GB RAM respectively) and one flexbuff type machine (hexa-core, dual socket, 32 GB RAM). The machines are interconnected with a 10 GbE network. Presently a geodetic post-processing pipeline has been deployed.

2 Field System

We presently run three FS computers:

- RT40m: FS version 9.13.2 on Debian Jessie 8.11, kernel-4.9.0
- RT13.2m: FS version 9.12.11 on Debian Jessie 8.10, kernel 3.16.0-4-686-pa.
- A test computer which can be connected to any of the non-used backends. Debian Jessie and FS 9.11.19

3 EVN observations

These are the statistics of Yebes participation in the EVN during 2020 so far:

EVN session 2020-1:

- S/X band: 6/6 successfully observed.
- Q band: 2/2 successfully observed.
- M band: 5/6 successfully observed. Incorrect Vex file was used for the NME.
- C band: 10/12 successful observations. Both loss observations were due to control software errors.
- K band: 4/6 successful. Two partial failed observations because no Tsys information available.

EVN session 2020-2:

- X band: 4/4 successful.
- M band: 3/3 successful.
- K band: 5/5 successful.
- C band: 1/5 successful. Broken cable wrapper affected the most part of the session.

EVN session 2020-3:

- M band: 5/5 successful.
- X band: 5/6 successful. One observation was canceled because of severe weather alerts.
- K band: 9/9 successful.
- C band: 6/6 successful.

EVN eVLBI: 3 out of 3 successful observations during 2020.

Yebes have missed the rm016a ToO due to a failure in the servo system.

Summary: 68 successful observations out of 78 scheduled.

4 Other VLBI observations

We regularly run several VLBI programs at Yebes: EVN, IVS (geodetic observations), GMVA (Global millimeter VLBI), and Radioastron observations. Since June 2011 the

telescope is managed by operators during 80% of the time. The rest of the time operations are done in an unattended and automatic way.

5 Continuous calibration

Continuous calibration mode (80 Hz applied to a noise diode) works in C, X and K bands.

6 Disk purchases

No disk purchases on 2020.

7 Spares

We also have some IO Mark5B+ boards and some main boards for the Mark5B+.

8 Gigabit connection

YebeS is performing the redesign to upgrade its connection to a 100 Gbps link with RedIRIS.

9 COVID19 impact on operations

After three months of relative normality, in October the public health situation worsened considerably as in other European countries. As of October 24th, the government declared a second State of Alarm, but this time the autonomous regions dictated their own rules under a common framework. Although some mobility restrictions apply, YebeS Observatory is running normally. Both engineering and operational tasks are fully accomplished, and observations are done locally.