

OAN - Yebes station report: 02/2016 → 09/2016

VLBI Equipment

Currently Ys is equipped with **2 Mark5B+** and **2 DBBC2** units with 4 IFs, 4 ADB2 and 4 CORE2s each. Both DBBCs are equipped with an internal Fila10G unit. The **Mark5C** on loan for some years was sent back to JIVE. We have purchased **3 Flexbuff** units with 36 disks; 2 units with a total of 144 TB (4 TB disks) each and one unit with 216 TB (6 TB disks) . One (144 TB) Flexbuff was sent to JIVE correlator.

The two Mark5B+ are not used since June and instead the 144 TB Flexbuff is used for all VLBI observations (geodetic, GMVA, Radioastron and EVN). We plan to use the 216 TB unit only for the EVN since next session. Experiments are e-transferred from the Flexbuff to Bonn, Washington and JIVE correlators using m5copy. For the moment we are not doing parallel transfers (more than one experiment at a time)

Flexbuffs are running Debian Jessie and jive5ab 2.7.1 version. We have a written report about our experience (<http://www1.oan.es/informes/archivos/IT-CDT-2016-12.pdf>)

The old **Harrobox** was upgraded to Debian Jessie (8.2) and it is used as a proxy between the FS and the DBBC allowing the JIVE correlator to control the flow of data from the Fila10G when doing eVLBI from the DBBC. This host is in the public LAN but allows connections from the private LAN.

There are **two Mark6s** at Yebes of which only one has been installed. The Mark6 runs dplane 1.21 and has been used through the last months for VGOS test observations at the 13.2m antenna. 12 packs 32 TB each are available, mostly for geodetic observations.

Field System

We are running two FS computers:

- The 40m one uses Field System version 9.11.15 on Debian Wheezy.
- The 13.2m one uses Field System version 9.12. on Debian Wheezy.

The connection method between the FS and the control computer of both the 40 m and the 13.2 m radiotelescopes is done via sockets and has been designed to allow the control of a twin telescope from a single Field System computer. The system works reliably since 9 months ago.

We have also modified our station code to be able to run a time counter for the cable measurement using an Ethernet to GPIB converter.

VLBI EVN 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.

EVN sessions 2016-1 and 2016-2:

38 EVN observations in CK and X band.

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

Out of session:

Taken part in FR033 (2 Gbps), FR034 (4 gbps), FR035 (2 Gbps), FR036 (4 Gbps) and FR037 (4 gbps).

Taken part in 3 OoS and 4 eVLBI observations.

Continuous calibration

We have written an antabfs script to manage continuous and non-continuous calibration observations. The script is available in the TOG wiki page.

Disk purchases

We have bought 1 Flexbuff (216 TB) since last meeting.

Spares

The VLBA terminal was dismantled by the end of 2014. We sent the old VSI formatter to Haystack. 14 BBCs are available. 3 of them are faulty.

Gigabit connection

Yebes is connected to Rediris, the spanish NREN using a 10 Gb/s dark fiber since May 2012.

40m radiotelescope

Two new 22 GHz and 45 GHz receivers were installed at the receiver cabin of the 40m radiotelescope. IF BW output for the 22 GHz is 1 GHz and 2 GHz for the 45 GHz one. The receiver temperature of the 22 GHz receiver is ~ 30 K and ~ 40 K for the 45 GHz is ~ 40 K. The best T_{sys} achieved at 45 GHz is ~ 85 K.

Both receivers can observe simultaneously. The installation was part of an agreement between the KVN and Yebes. The 22 and 45 GHz receivers have been developed at Yebes Observatory. The 45 GHz receiver is equipped with

amplifiers designed and built at Yebes. The receivers are mounted on a tilted table in a Nasmyth focus of the antenna. The table, a hot load and two reflecting mirrors plus a dichroic mirror were built and delivered by the KVN.

The air conditioning system at the backends room has been upgraded and now the temperature is kept stable within 0.3 degrees, improving the stability of the signal phase (specially relevant in geodetic observations).

13.2 m radiotelescope

The 13.2m radiotelescope has been taking part in VGOS test observations since April 2016. We use 2 DBBC2s to achieve 4 bands 2 polarizations and a Mark6 using dplane. FS is version 9.12.7.

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