OAN - Yebes station report – January 2014

VLBI Equipment

In December 2013 we received a new Mark5B+ with extra cards to convert it into a Mark5C. We also have a Mark5C on loan from JIVE.

SDK 9.2 is installed in both Mark5Bs. Most of the astronomy observations are done with jive5ab (2.4.4 version). DIMino is mainly used for geodetic observations.

A Fila10G standalone module was received from HAT-Lab by September 2013. The module had a limited functionality and it was replaced by a new fully functional one two months later.

The DBBC was sent for repair and check at MPIfR in Bonn after the last 4 Gb/s experiment. It was received in November and now the 4 COREs work correctly. We have done geodetic experiment R4616 in parallel with the VLBA5 and the DBBC. Fringes have been found with both equipment, but the quality of data from the DBBC is not as good. Some problems have been found with the phase cal signals. We are currently investigating this issue.

Field System

We are runing two computers with Field System version 9.11.4 on a Debian Lenny host and on a Debian Squeeze host. One of the computers controls the antenna, the VLBA5 and the first Mark5B+. The second one is used for the DBBC and the second Mark5B+.

VLBI observations

We 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.

There was a major modification in the 22 GHz receiver. The current receiver works between 18 and 26 GHz and has a bandwidth of 512 MHz or 2 GHz. The first bandwidth is the usual one for single dish and VLBI.

In May 2013 a new 45 GHz receiver was installed in the telescope. Fringes have been found with the Korean VLBI Network radiotelescopes. This results together with the characteristics of the receiver are described in the last EVN newsletter.

Yebes took part in the 4 Gb/s observation last september. The experiment was a success and fringes were found with other telescopes.

Gigabit connection

Yebes is connected to RedIris, the spanish NREN using a 10 Gb/s dark fiber since May 2012. The fiber has been working successfully since then.

VLBI data transfer

We regularly send geodetic experiments via the Gb line to MPIfR correlator and Washington correlator using fuseMk5 and tsunami. We also transfer VLBI data to Moscow using scp and a server where we store our Radioastron data.

We have also transferred some data to JIVE via Internet using jive5ab. Th whole process is controlled remotely by JIVE.

In order to avoid "blocking" our Mark5B we often use the Mark5C for data transfer. We have learnt that non real eVLBI requires a second terminal or an equivalent device that acts as buffer and does not prevent the usage of the main recorder for observations.

40m radiotelescope

The radiotelescope suffered a mechanical problem in August 2013: the spiral cable structure was partially broken and observations were stopped until a temporal solution was found.

Single dish observations at 43 GHz have started in the telescope. The aperture efficiency is ~ 40 % and the SEFD is approximately 200 Jy

13m radiotelescope

A 13m radiotelescope for geodetic VLBI has been built in Yebes. The telescope has not been equipped yet but it can be controlled and moved remotely from the control system. Works to install the receivers are under way. The telescope will be part of a geodetic network managed by the Observatory of Yebes.

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