Observatorio Astronómico Nacional – Yebes

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Abstract

This report updates the description and details of the OAN facilities as an IVS network station. The 14 meter radiotelescope at Yebes participates regularly in the geodetic VLBI campaigns (EUROPE and CORE), as well as astronomical VLBI experiments as part of the European VLBI Network (EVN). The new 40 meter radiotelescope will start operation in Yebes during 2004, being available as soon as possible for geodetic VLBI. The institute staff is involved in technical developments, and scientific research in geodesy, astrometry and astrophysics.

Figure 1. Status of construction of the new 40 meter radiotelescope of OAN at Yebes (Guadalajara, Spain), as of December 4^{th} 2003.

1. General Information: The OAN Facilities

The Observatorio Astronómico Nacional (OAN) of Spain, which is a department of the Instituto Geográfico Nacional (IGN, Ministerio de Fomento), operates a 14 meter radiotelescope at Yebes (Guadalajara, Spain). This facility is a network station of the IVS, and participates regularly in

the geodetic VLBI campaigns to study the tectonic plate motions in Europe (project EUROPE), Earth rotation, and pole motion (project CORE).

The 14 meter radio telescope, built in 1976, and nowadays used for VLBI, has been described in the 1999 IVS Annual Report. A photograph is included there, and a map of the Yebes site is in the report for year 2000.

The VLBI equipment has been constantly upgraded. A Mark 5A unit was purchased from Conduant, and is now installed and operational. Due to the old control system, there is no direct interface between the Field System computer and the telescope. This fact has forced the development of several tools which, to date, allow automatic operation.

On the other hand, studies are being conducted to connect the Yebes site to GEANT (the high speed transeuropean data network). Finally, we succeeded in obtaining protection against radio interference at Yebes in and out of the radioastronomy bands. The full text of this law is available at:

`http://www.oan.es/instalaciones/cay/A21789-21790.pdf`

The institute is currently involved in the construction of a new 40 meter radiotelescope (see Fig. 1) which is expected to be available for geodetic VLBI observations in mid 2005. Progress can be followed at the web address:

`http://www.oan.es/instalaciones/telescopios/40m/40m.shtml`

2. OAN Staff Working in VLBI projects

Table 1 lists the OAN staff which are involved in VLBI studies, some of which can be found at the telescope (CAY) address. The associated members of IVS are indicated with an asterisk. Contact information is provided at the URL:

`http://www.oan.es/investigacion/astronomia/vlbi.shtml`

The VLBI activities are also supported by other staff like receiver engineers, computer managers, secretaries and students.

Table 1. Staff in the OAN VLBI group (Email: **vlbi@oan.es**).

Name	Background	Role	Dedication	Address
Francisco Colomer*	Astronomer	VLBI Project coordinator	30%	OAN
Pablo de Vicente*	Astronomer	VLBI Technical coordinator	30%	CAY
Isaac López–Fernández	Engineer	Technical support	20%	CAY
Maria Rioja*	Astronomer	Scientist	20%	OAN
Alberto Barcia	Engineer	Chief engineer	10%	CAY
Rebeca Soria	PhD student	Support	10%	OAN
Jean-Francois Desmurs	Astronomer	Associated scientist	10%	OAN
Jesús Gómez–González*	Astronomer	IGN General Subdirector for Geodesy and Geophysics	10%	IGN
Rafael Bachiller	Astronomer	Director of OAN	10%	OAN

3. Status of the Geodetic VLBI Activities at OAN

The main contribution of OAN to IVS is the realization of geodetic VLBI observations in the EUROPE and CORE projects: the OAN radio telescope at Yebes has participated in two EUROPE and three CORE experiments in 2003, failing to participate in two other EUROPE and one CORE due to technical problems with the old antenna control system and receiver. The institute also participates in the European VLBI Network (EVN) for astronomy (two sessions at X band in 2003), taking part in its logistics and carrying out technical developments.

4. Future Plans

The OAN 14-m radio telescope at Yebes goes on participating regularly in the campaigns for the EUROPE and CORE projects.

The construction of the new 40 meter radiotelescope at Yebes is progressing well. The erection is expected to finish in May 2004. This telescope is expected to be operational at S/X bands in mid 2005. Other frequencies of operation will be 4-7 GHz, 10-15 GHz, 21-24 GHz (first light receiver), 30-32 GHz, 40-50 GHz, and 72-116 GHz.

Finally, studies are being conducted to connect the Yebes site to GEANT (the high speed transeuropean data network).

References

[1] R. Bolaño, P. de Vicente, C. Albo, C. Almendros: "Monitorizacin de los errores de posicionamiento de la antena de 14M para su uso sincronizado con el terminal VLBI", Informe Técnico OAN 2003-6