

Noto Station: Status Report on the Geodetic Activity

G. Tuccari, C. Stanghellini, F. Mantovani

Abstract

Noto station report is presented with an introduction of the new systems: active antenna surface and antenna control unit and driving system. Moreover a general overview will be shown on the geodetic activity at the station.

1. Update Program at the Noto VLBI Station

1.1. Efficiency Optimisation

The active surface developed by the Medicina team for the Noto antenna, has been installed starting in August 2001. The antenna will be unusable until the end of January 2002. Surface errors are now about 150 microns at 45 degrees and such a value or better is expected in the entire elevation range. Calibration phase is under way and will be completed in February. Surface measurements have been done for elevation greater than 45 degrees using a theodolite, while for lower elevation values the holographic method with phase reference, developed in Noto, will be adopted. A new driving system has been ordered and will be delivered in the second half of 2002. Such system includes the entire chain of Antenna Control Unit, driving electronics, brush-less motors, and encoders. It is based on digital technology, and a great improvement in reliability is expected, with respect to the present one.

1.2. SXL Receiver and Microwave Technology

The L and S/X band feeds have been delivered and tested, and the dewar construction has been completed in November. Both feeds will be cooled, together with the front-end LNAs. This new receiver for geodesy observations should be operational in the summer 2002. The construction of L band amplifiers is in a completion phase; it is the first example of a bonded amplifier built in Noto. A study to develop and realise LNAs in S band is on course and the first sample is expected in a few months.

1.3. Acquisition Terminal

A two-head VLBA4 recorder is now operational and tested and the MK4 decoder inserted in the acquisition environment. A MK5A recorder has been ordered and is expected to be operational in the station in spring 2002. Noto is willing to be included in the evaluation network for the use of such a recorder, because a great improvement and simplification in the station operations is expected by using such disk based equipment.

1.4. Digital Technology

High frequency FIR and digital BBC chips are in development, and their performance will be evaluated for the activity of the ALMA BEE team. A possible first use will be considered with the MKIV terminal for reducing the effects of the worst interference in S band. Moreover development of a fully digital baseband converter using such techniques and achievements is under evaluation.

1.5. Operations

Considering the numerous improvements the station is going to introduce, a great deal will be given to achieve unattended observations, giving particular importance to preventive maintenance and pre-observation checks.

2. Geodetic Experiments in Noto during 2001

During 2001 the Noto radiotelescope participated only in 3 geodetic experiments, due to the upgrade activity: 21 May CORE-C101, 18 June EUROPE-60, 20 June CORE-C102.

For the year 2002, Noto is expected to participate in 13 geodetic experiments.