Noto Station Report

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1. Antenna, Receivers and Microwave Technology

At present the main issue for the antenna functionality is still the azimuth rail, but it's actually uncertain whether INAF will support the repair expenses.

A new antenna driving software has been realised able to support all the functionalities available with the TIW ACU and is able to control with better precision. The new software has also a web interface.

The 43 GHz receiver was working with only one polarization and the replacement of a front-end amplifier has been done in the NRAO laboratories. The amplifiers has been mounted in September and EVN observations were successful.

The 86 GHz is still an issue. Functionality measurements in laboratory showed pretty high system temperature so the receiver has been moved to MPI in Bonn and repaired. The front-end mixer has been replaced and a thermal control added to the local oscillator. A new testing campaign is expected during the 2009.

The SXL receiver (X wide band and double polarization) built some years ago and never adopted in antenna will be modified to take into consideration the extra weight that made not easy and safe the operations in antenna. The receiver will be greatly simplified and the ADC+FILA10G of the DBBC system inserted in primary focus in order to transfer the signals through optical fibres to the control room.

2. Acquisition Terminal

A complete DBBC system is under construction for Noto. This process has been accelerated because of the numerous problems met with the analog base-band converters. These caused several failures in previous VLBI geo experiments.
A MK5C/B+ unit is going has been ordered to operate with the DBBC system. Initially both systems will operate in parallel, then after a complete debugging of the new terminal the old one will be dismissed.

3. DBBC Status Report

The hardware and firmware of the new Core2 board is ready and has been tested. Further observative tests are still needed, which started in January 2009. The Core2 uses Virtex 5 LX220 FPGAS, but can also be populated with the bigger 330 model. The DBBCs have up to 32 MHz BW. DBBCs with larger BW are available for the Core1 and could be adapted to the Core2 modules. The firmware in its present version can provide 4 DBBCs (U+L) on one FPGA, so only four Core2 boards are able to produce the functionality of 16 bbcs. The filter shapes have been improved. A fixed filter-bank firmware with real output is available, and will be tested at Haystack in the beginning of May.

The control software has to be upgraded from the Core1 to the Core2. Wettzell is working on the integration in the FS. The operating system will be converted from Windows XP to Linux, as soon as all the software will be completely rewritten for such new environment.

The first two DBBC.2 systems have been sent installed in Wettzell in November. A third system in Wettzell will be upgraded from ver.1 to ver.2. Additional prototype backends DBBC.2 are ready to be tested and delivered to Effelsberg, Yebes, New Zealand. Two more systems already delivered in Arcetri and Irbene need to be upgraded to the ver.2. to be operative with the standard observing requirements, as they behave only few Core1 boards.

FILA10G the interface between the DBBC (or any VSI device) to 10G network is completed in the hardware side. A team composed by IRA/MPI/SHAO/Metsahovi is jointly developing the firmware. The board will be interface for the MK5C or as direct connection to the network at 1–2–4–10–20 Gbps. It can be used as standalone element between VSI and network. VDIF protocol will be adopted as data format.

The creation of the spin-off company named HAT-Lab which will take care of the DBBC production is still in pending, as numerous bureaucratic procedures have been necessary that took much longer than expected. At present we are waiting for the completion of INAF procedures.

A new building in Noto has been completed. New laboratories are available and so a part of it will host the spin-off company in charge for the construction of the DBBC systems.