Effelsberg Station Report

The integration of the new digital VLBI backends at Effelsberg is progressing. Following the parallel use of the analogue Mark IV and the digital DBBC backends in the Feb/Mar 2011 EVN Session, the DBBC was used as primary backend during the recent May/June EVN session and for eVLBI runs.

The NRAO RDBE VLBI backend and a Mark5C recorder have been installed and used for a test observation together with VLBA antennas in which the RDBE was configured in a dual-polarisation polyphase filter mode at 2Gbps. The existing VLBA terminal was also used, observing at 512Mbps. On July 4/5 Effelsberg participated in the geodetic observation EUR112 using both analogue Mark IV and digital DBBC VLBI-backends. The clock phase of the DBBC was carefully aligned before the experiment, a process referred to as "calibration" which ensures that data bits and clock are coincident. Care was also taken to compensate cable losses to present flat passbands to the DBBC. This was the first time that all four IF channels and all FPGA boards have been used to yield 14 BBC channels at Effelsberg. A very high correlation was found between the S/X band data from the DBBC and MkIV terminals.

Just after EUR112 Onsala and Effelsberg performed a successful fringe test observation using the polyphase filter bank mode of the DBBC. In this mode a 512 MHz wide IF at a single circular polarization is split into 16 x 32 MHz channels and recorded at 2 Gbps on a Mark5B+. The actual observations were performed at X-band (RCP) over a frequency range of 8640-9120 MHz. Strong fringes were found for all the common frequency channels. The highest frequencies above 9 GHz had lower amplitudes, due to the present frequency limits of the Onsala 3.6cm receiver. Following the successful outcome of all these test, we plan to remove the MkIV terminal this autumn and use the DBBC in future.

During the EVN session JIVE staff were very successful in providing PIs with sched setup files adapted to the requirements of the DBBC.

A minimum set of DBBC commands is implemented in station code of the Effelsberg FS. Scripts reformat drudg procedures for the DBBC, and interpret logging of the 80Hz switching cal data to make standard 'antabfs' files. This solution allows adaptation to changes in DBBC command and log syntax as the system develops and as we migrate from the present 5B+ to Mark5C recording.