Using the DBBC as a spectrometer

The DBBC is the new digital VLBI backend. With its flexibility in tuning and filter size and the possibility to use software correlators to analyse the data it can be used to perform very high resolution spectroscopy.

The general features of the VLBI equipment

- 2 RF/IF Input either 0 to 500 MHz or 500 to 1000 MHz.
- Two polarizations or bands available for a single group of 32 output data channels
- 1024 MHz sampling clock frequency
- Channel bandwidth ranging between 500 kHz and 16 MHz, U&L
- Tuning step less than 1 Hz
- Multiple architecture using fully re-configurable FPGA CoreBoard
- Modular realization for cascaded stack processing

More details can be found at Hat-Lab

The data from the DBBC is send out in VSI format. A VSI cable connects the DBBC with a Mark5B recorder, which records the data on disk modules (diskpacks of 8 PATA or SATA hard disks) in Mark5B format. The Mark5B formatted data consists of two parts a header and the payload. The header is composed of 4 32 bit words and the body of the frame is composed of 2500 32 bit words. More details can be found in the Mark5B manual on page 15 and 16 Mark5B Manual

Software to access Mark5B data

Jan Wagner has written some tools to access Mark5B data from python. They all use the pylibMk5B.py module. mark5b_tools.tar

There is also a collection of different script that use the pylibMk5B.py, e.g.

- **time_check.py** read a m5b file and print the start and stop time
- **xcorr5b.py** Reads data from two files and cross correlates them
- **plot5b.py** plots cross correlation
- **extract_second5Bbytes.py** Extract some bytes from the beginning of a given second
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Another, maybe the proper, way to access the data are the tools from the mark5access library mark5access-1.4.5.tar.gz. They are part of the DifX software correlator package, see DifX docu