

# Bonn DiFX correlator report January 2014

## *DiFX Correlator status and operations*

In Bonn all VLBI observations are processed using the **DiFX software correlator**.

The DiFX release being used presently for production correlation is the recent stable version 2.2 to be changed to 2.3 in the very near future. Correlation of Radioastron observations is done with a special branch which will be merged back to the main correlator development version “trunk” hopefully before the end of January.

Work is going on in the framework of the ALMA Phasing Project to bring the correlation of different sub-band widths into a production environment. Correlations with correcting side-band mismatches is done for 1mm observations.

Quick summary:

- 14 (+1) Mark 5s can be used for playback from disk modules. In addition data can be played back from presently 7 big RAID systems (~400 TB). This setup allows correlation of significantly more than 20 stations in parallel. Soon correlation of a Radioastron observation with ~30 antennas is expected.
- All Mark 5s can playback all flavours of Mark 5 data (A/B/C).
- All Mark 5 systems have been upgraded to SDK 9.1 which allows the usage of bigger disks.
- An Infiniband 20 Gb/s connection between the Mark 5s and the cluster has been installed. Maximum data rates of about 1.5 Mb/s have been observed (This is a limit of the Streamstor RAID card into the host computer).
- Data is archived on the new MPIfR archive server in raw format, FITS, and MK IV (if desired). FITS (default) or MK IV formatted data is made available to the PIs. (HOPS software for handling MK IV format can now be installed “at home”.)
- The new database for storing experiment and module information is operational.
- GMVA data is transferred to the VLBA archive for public access. Old MK4 correlated data is translated to FITS for this.

## *Correlator Cluster upgrade*

The HPC cluster which runs the correlator is now 6 to 7 years old. A proposal for replacement in 2014 is being prepared as. We expect the costs to be less than about 300 k€ for a cluster which can handle 16 Gbit/s to 64 Gbit/s. 2 Mark 6 recorders capable of recording at 16 Gbit/s have arrived and a first test has been done in the lab.

## *Capabilities*

The capabilities of the DiFX software correlator can be found at <http://www.mpifr-bonn.mpg.de/771785/DiFX-CORRELATOR>

## *Operations*

1/3 of a position is available for correlation supervision. Another scientist started in October to support Radioastron and GMVA correlations. No student shifts on weekends and in the night are needed any more. Disk turnaround is typically between two sessions, but presently due to the load from 1mm and Radioastron correlation somewhat delayed..

## *Disks*

MPIfR bought disk modules for the EVN pool for 7000 € in 2012 (64 TB) and 2013 (80 TB) as agreed by the CBD in 2011. To compensate for delays at the correlator an additional 128 TB have been added to the pool.