

Bonn DiFX correlator report January 2016

DiFX Correlator status and operations

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

The DiFX release being used presently is the latest release 2.4. W. Brisken has been implementing native Mark 6 playback into the correlator, H. Rottmann the handling of Mark 6 modules. W. Brisken has also implemented VDIF modes for the DBBC3 (similar to fan-out; all development trunk version).

Quick summary:

- 15 Mark 5s and 6 Mark 6s can be used for playback from disk modules. In addition data can be played back from presently 8 big RAID systems (~740 TB). This setup allows correlation of significantly more than 20 stations in parallel.
- All Mark 5s can playback all flavours of Mark 5 data (A/B/C).
- Native playback from Mark 6 into the correlator is now possible. JIVE5ab 2.6 is installed for auxiliary tasks like copying of modules etc.; also works for Mark 6.
- All Mark 5 systems have been upgraded to SDK 9.4.
- RAID storage for correlated data is 57 TB.
- Data is archived on the MPIfR archive server in raw DIFX format, FITS, and MK IV (if desired). FITS (default) or MK IV formatted data is made available to the PIs.
- Transfer of GMVA data to the VLBA archive for public access is finished. Old MK4 correlated data was translated to FITS for this. Calibration data is being collected in a next step.
- Calibration transfer for GMVA data is being worked on.

Correlator Cluster upgrade

The HPC cluster was upgraded in December. The system has 3 head nodes, of which 2 are for correlation, 68 nodes with 20 compute cores each (=1360), and Infiniband 56 Gbps interconnect. In addition the data RAIDS work as data-stream nodes.

Capabilities

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

Operations

No backlog exists for geodesy. The latest 0.8 and 1 mm observations are being correlated. The RadioAstron backlog is 7 experiments from AO-1/2. Two extra experiments: CenA and SgrA*, which should have been correlated at Curtin University. The processing of the correlation queue is carried out in agreement with PIs from the different KSPs, following the progresses on reduction/analysis of the previously correlated slots

A successful test of the DBBC3 at Onsala was correlated (only 1 polarisation with 16 Gpbs against a DBBC2 at both Onsala and Effelsberg (512 Mbps)). In this test the DBBC3 at Effelsberg did not work.

The ALMA – VLBA – Effelsberg test was correlated. ALMA had recorded 16 Gbps on Mark 6. In addition to the 4x 128 MHz mode the 512 MHz DDC mode (no sub-bands) was used at Effelsberg for the first time in a field test. Unfortunately there was no time overlap between ALMA and Effelsberg, and the 2nd LO of Effelsberg was not stable. Fringes were found to all stations.

Disks

The Mark 6 at Effelsberg has been equipped with 4 big disks modules (128 TB) to work as a Flexbuff (thanks to software of Verkouter of JIVE!). We bought an “Effelsberg” RAID for the correlator at JIVE which will be used for the next session. So no additional disks for modules will be procured at this time.