Major User-Facing Developments in DiFX since 2.0 Release

Synopsis

Phase cal tone extraction (max. number, flexible selection, minimum spacing)
Antenna parameters in FITS files.
Multiple bandwidths per pass to mark4
Mark6 support
Multiple datastreams per station
difxcalc11
VDIF support
PolConvert
datasim
autozoom
Complex sampled data
Run without IPP
Mixed 1 and 2-bit correlation
Allow much bigger LO offsets
non-power of 2 FFTs
Switched Power Detection
Fake data for performance testing
Maintained compatibility with all new IPP versions
VLITE buffer
List of new adopters (VLITE, ASKAP, EHT, CVN, KVN)
CODIF
Output bands
GPU experimentation
Running on shared supercomputers (Pawsey, OzStar)

The associated ChangeLog entries are included below.

DiFX 2.7.1 (Release in development)

- HOPS updated to v 3.23
- m6support updated to v 0.36
- …

DiFX 2.6.3 (Release pending)

- HOPS updated to v 3.23
- …

DiFX 2.6.2 (Released Sep 11, 2020)

- parseDiFX package added
- HOPS updated to v 3.21
- PolConvert updated to v 1.7.8

DiFX 2.6.1 (Released Aug 28, 2019)

- mpifxcorr can extract pulse cals with tone spacing smaller than 1 MHz
- difx2fits: populate antenna diameters and mount types for antennas known to the difxio antenna database
- difx2mark4: support multiple bandwidths in one pass

DiFX 2.5.4 (Released Aug 27, 2021)

- Mark6 native mode for non-VLBA recordings, Mark6 host auto-detection
- VGOS-related improvements to difx2mark4
- Bundled with new HOPS 3.22
- Support for 'exhaustiveAutocorrs' as in 2.6 series

DiFX 2.5.3 (released March 28, 2019)

DiFX 2.5.2 (released Mar 6, 2018)

DiFX 2.5.1 (released Sep 25, 2017)

- Initial support for correlating Mark6. This is still much a work in progress.
- Multiple datastreams per antenna supported via vex2difx
- New delay model program: difxcalc11. No longer requires calcserver.
- Support for more than 6 days of EOP values.
- "Union mode" in difx2fits allows merging of correlation output that uses different setups. Some restrictions apply. Designed for GMVA and RadioAstron use.
- Improved VDIF support: wider range of bits/threads, support for multi-channel, multi-thread VDIF, support for complex multi-thread VDIF
- Support for new VDIF Extended Data Version 4 which is useful for multiplexed VDIF data. See: http://vlbi.org/vdif/docs/edv4description.pdf
- New package: polconvert. Used to post-correlation convert from linear to circular polariations
- New package: autozoom. Helps a user develop .v2d file content when setting up complicated zoom band configurations.
- New package: datasim: generate baseband data suitable for simulated correlation

DiFX 2.4 (released Mar 31, 2015)

- Add network support (TCP, UDP and Raw Ethernet) for multi-threaded VDIF.
- Support for X/Y polarization correlation. Many fundamental issues with linear polarization remain though:
    1. This does not support in a meaningful way Linear*Circular correlations
    2. There is a terminology gap in many bits of software and file formats that confuses X/Y with H/V polarization bases
    3. The intent of this support is for short baselines (VLITE)
- Support for "d2k" mode in Mark5B format (swapped sign and mag bits).
- m5bstate: support complex sampled data

DiFX 2.3 (released Jan 18, 2014)

- mpifxcorr: LO offsets are now corrected in the time domain when fringe rotation is also done in the time domain (the usual mode), allowing considerably larger LO offsets without decorrelation
- mpifxcorr: Working polarization dependent delay and phase offsets
- mpifxcorr: Complex Double sideband (RDBE/Xcube) sampling support

DiFX 2.2 (released Jun 12, 2013)

- Fix bug preventing subintegrations longer than 1 second. Now 2 seconds is allowed (this limit comes from signed integer number of nanoseconds).
- Faster VDIF corner turning through customized bit shifting functions
- mpifxcorr can now be built without Intel Integrated Performance Primitives, though resulting in a slower correlator.
- vdifio: several new VDIF manipulation and processing utilities added: vmux, vsum, vdifd, vdifspec, vdiffold, vdifbstate. Also bug fixes in multi2singlethreadVDIF to cope with large amounts of packet loss.
- difx2fits allows more phase cal tones

DiFX 2.1.1 (released Jun 07, 2012)

- mpifxcorr: fix a scaling issue with autocorrelations of LBA-format data in mpifxcorr. Does not affect Mark4, VLBA, Mark5B or any other format.
- mpifxcorr: Mixed 1 and 2 bit data are handled more cleanly
- mpifxcorr: Correctly scale cross-correlation amplitudes for pulsar binning when using Tsys>2 (accounts for varying # samples per bin c.f. nominal)
- mpifxcorr: Support for non power-of-2 FFT lengths
- mpifxcorr: Multithread VDIF support enabled for the data sources FILE and MODULE, including stripping of non-VDIF packets
- mpifxcorr/vex2difx: new FAKE datastream type for performance testing
- mk5daemon: VSIS interface added
- difx2fits: write new RAOBS, DECOBS columns in source table
- Espresso, a lightweight system for managing disk-based correlation, has been added to the DiFX repository.

- vex2difx: Option to correlate only one polarization has been added.

DiFX 2.0.1 (released Jun 24, 2011)

- mpifxcorr: Switched power detection
- mpifxcorr: Early multi-thread VDIF format support
- mpifxcorr: Initial complex sampling support

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