DiFX for Geodesy

An overview of using DiFX for Geodesy. This includes verification against the Mark4 correlator, difx2mark4, integrations with HOPS (fourfit), unit testing to ensure continuing accuracy and consistency, and preparation for 2010.

difx2mark4

Todo List

- ~~Test for antennas in scan by checking if they have a model~~
- **~~Crashes?~~** ~~investigate behaviour when antenna should have correlated but no visibilities are found~~
- proper calculation of fourfit reference time consistent with mark4 code
- Get EOPs from difx input rather than vex file
- Write $SOURCE block from difx input rather than vex file (in case .v2d file changes the source name)
- Handle n-order clock polynomials properly
- allow different order delay polynomials (or give an appropriate error if fourfit can only handle 6 terms)
- ~~update -h documentation~~
- ~~explicitly disallow specifying a single scan to extract for now~~
- Handle data outside individual antenna slew times. At the visibilities are discarded but root file doesn't reflect this.

Wishlist

- Support multiple phase centres/different pulsar bins
- Allow a single scan from a job to be extracted
- Spectral averaging on conversion
- Time averaging on conversion

HOPS

HOPS is still tied to some extent to the Mark4 correlator. Separating the post-processing tools (including but not limited to fourfit) and making them installable and testable with autotools is a work in progress.

Todo List

- Get into a vendor branch
- Installation guide on DiFX wiki
- Expand multitone mode in fourfit to allow flexible averaging over time, and application of

resultant phases to data.
- Add ionospheric estimation in fourfit.
- Add fourfit code to allow coherent combination of multiple polarization products.

Full Audit of differences between DiFX and Mark4

handling filler-pattern data

start of the recording

defining accumulation periods

multiple-tone phase cal (configurable in fourfit)

VLBI2010

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Last update: **2015/10/21 10:08**