

Extracting phase-cal tones in DiFX2.0

Phase cal tone extraction is soon to be added to DiFX2.0. All of the hooks are already in place in the control file formats. The following assumptions are explicitly made:

- The phase cal tones fall on integer MHz boundaries.
- There is a tone every N MHz, where N is specified as the extraction interval to the correlator.

DiFX2.0 will write out the phase cal values in a format very similar to that written by the hardware correlator. This allows the computed phase cal values to be picked up by [difax2fits](#).

Various efficient implementations for phase cal extraction have been proposed, particularly for multiple tones - all more efficient than the straightforward modulation/accumulation scheme. Wagner et al. (in prep) has a good description of these methods. However, none of them match well to the “unpack, FFT, XMAC” cycle used in DiFX, since the repetition period of the phase cal tones is typically larger than an FFT length in DiFX and is never a power of 2, as the FFT must be. This means that there must be some adjustment of the phase cal accumulation from FFT to FFT to make sure the samples are modulated by the right value and sent to the right place.

A phase cal record will be produced for every integration period. For short integration periods this will result in a lot of phase cal data, but still much less than the visibility data. Phase cal records will be averaged to a desired interval in [difax2fits](#).

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