

Vector Phase Cal extraction

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Presentation at

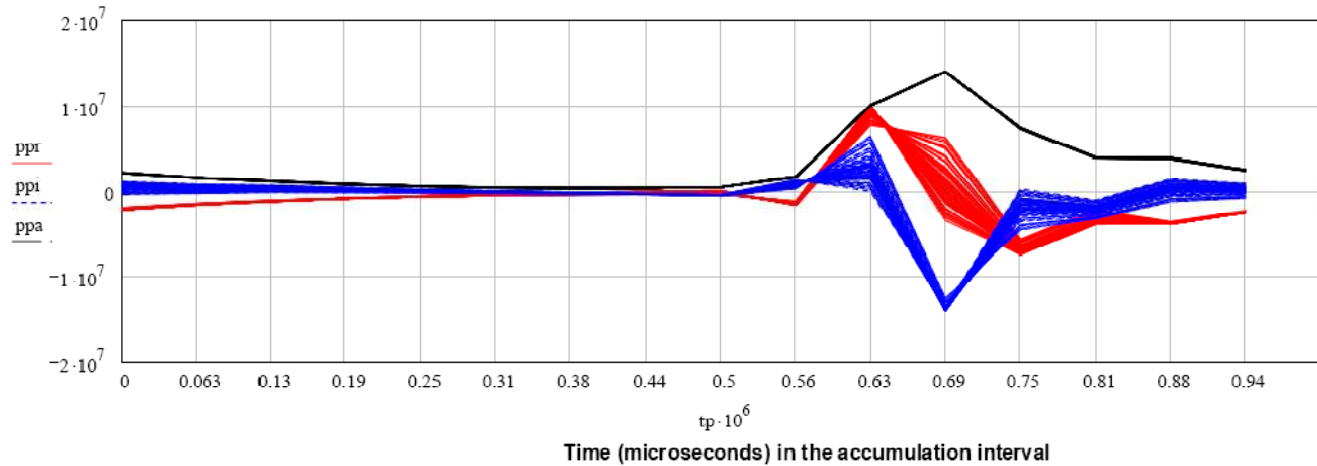
IVS VLBI2010 Workshop on

Future Radio Frequencies and Feeds (FRFF)

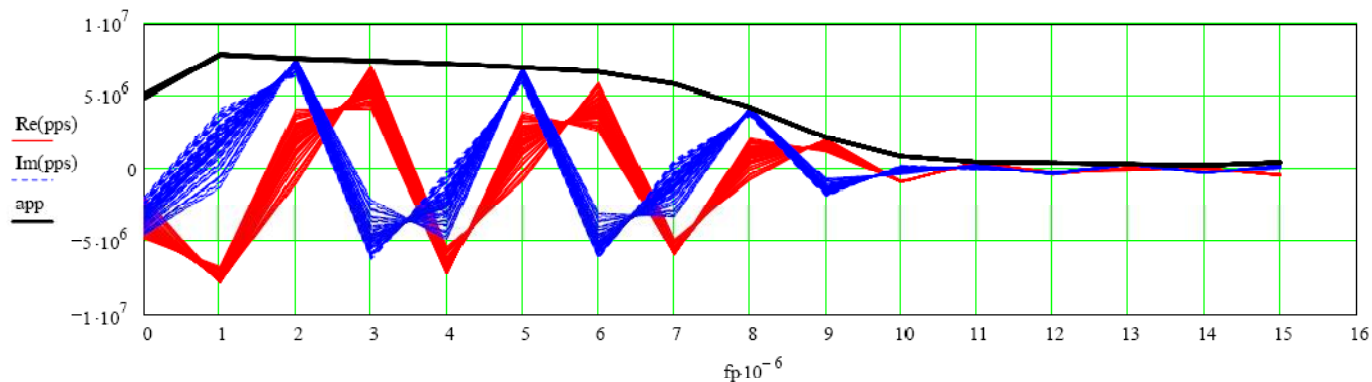
Wetzell/Höllenstein, Germany, March 18 – 20, 2009

Stop the pulse in video band, by rotating it with complex exponent of offset frequency.
 Fold it (like a pulsar), but in voltage domain, as a vector of certain length.
 Now you a complex pulse, like here in 16 bins for 8 MHz video band.

Plot the amplitude, Re and Im of the accumulated pulses for each accumulation interval



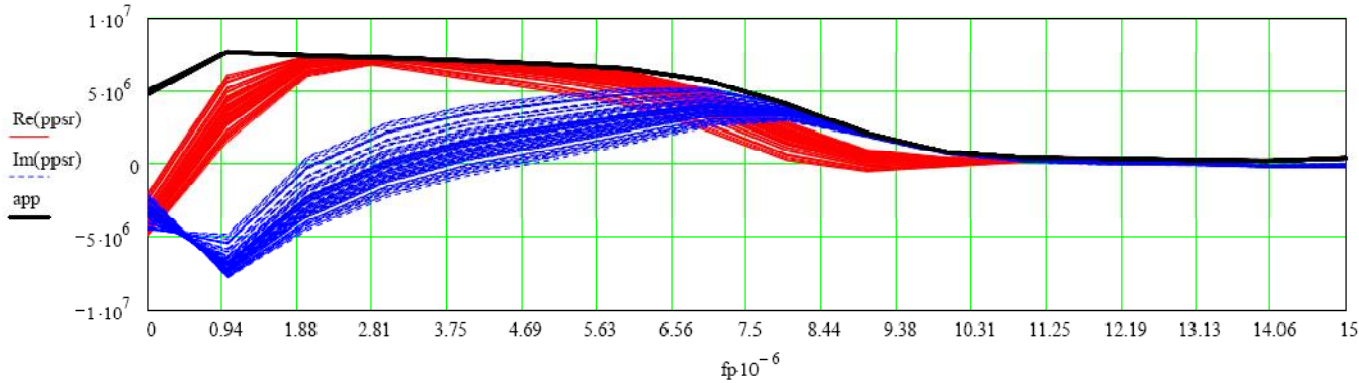
Plot the Re, Im, and Amp of the spectra of the pulses (in overlay)



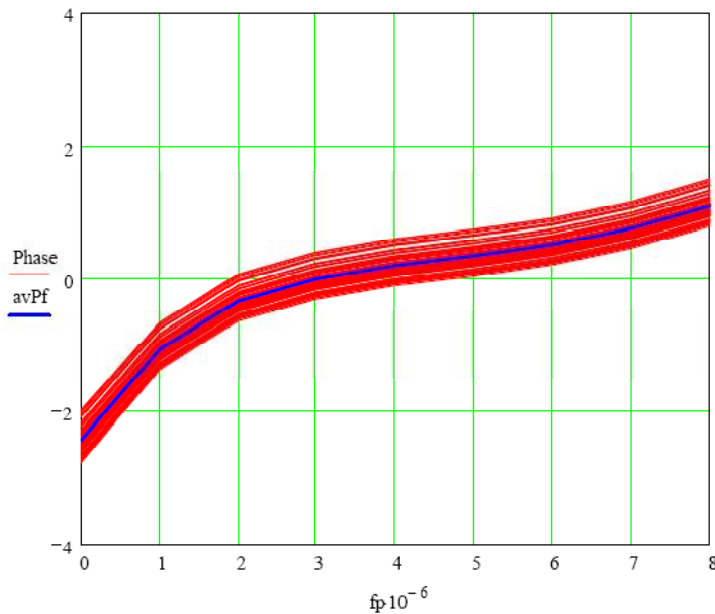
Fourier transform of the pulse gives us a (complex) spectrum of the bandpass,
 With amplitudes and phases of all the tones in the band in one go.

The same, but after compensation for pulse time offset (integer bins)

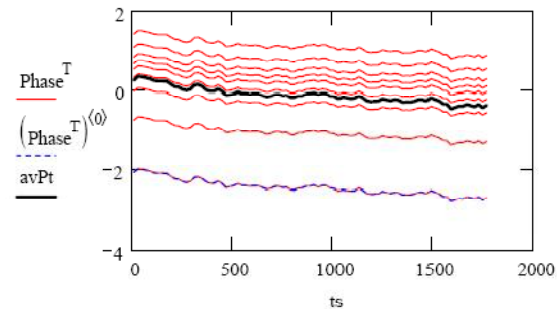
Plot the bulk delay corrected spectra



Plot the phase for each time slot as a function of frequency



Plot the phases of each tone as a function of time



Phases of all the tones over the time,
Major linear trend – 0.5 rad in 0.5 hour,
Stochastic phase noise – few ps on
Time scale 1 minute.

Phase slope over the band – fractional bin group delay of the pulse.

Thanks !

Questions?