Simple Lag and Frequency Result Plotter

$N := 512$ **No. of lags**

$M := N$ $\quad m := 0, 1 .. \frac{M}{2} - 1$ $\quad m1 := 1, 2 .. \frac{M}{2} - 1$

$q := 0, 1 .. M - 1$ $\quad w := 0, 1 .. 2 \cdot M - 1$

$Wn(n, N) := 0.5 \cdot \left[1 - \cos\left[\frac{2 \cdot \pi \cdot (n)}{N}\right]\right] + 1 \cdot 10^{-18}$ $\quad winswitch := 1$ Set 1 if want windowing

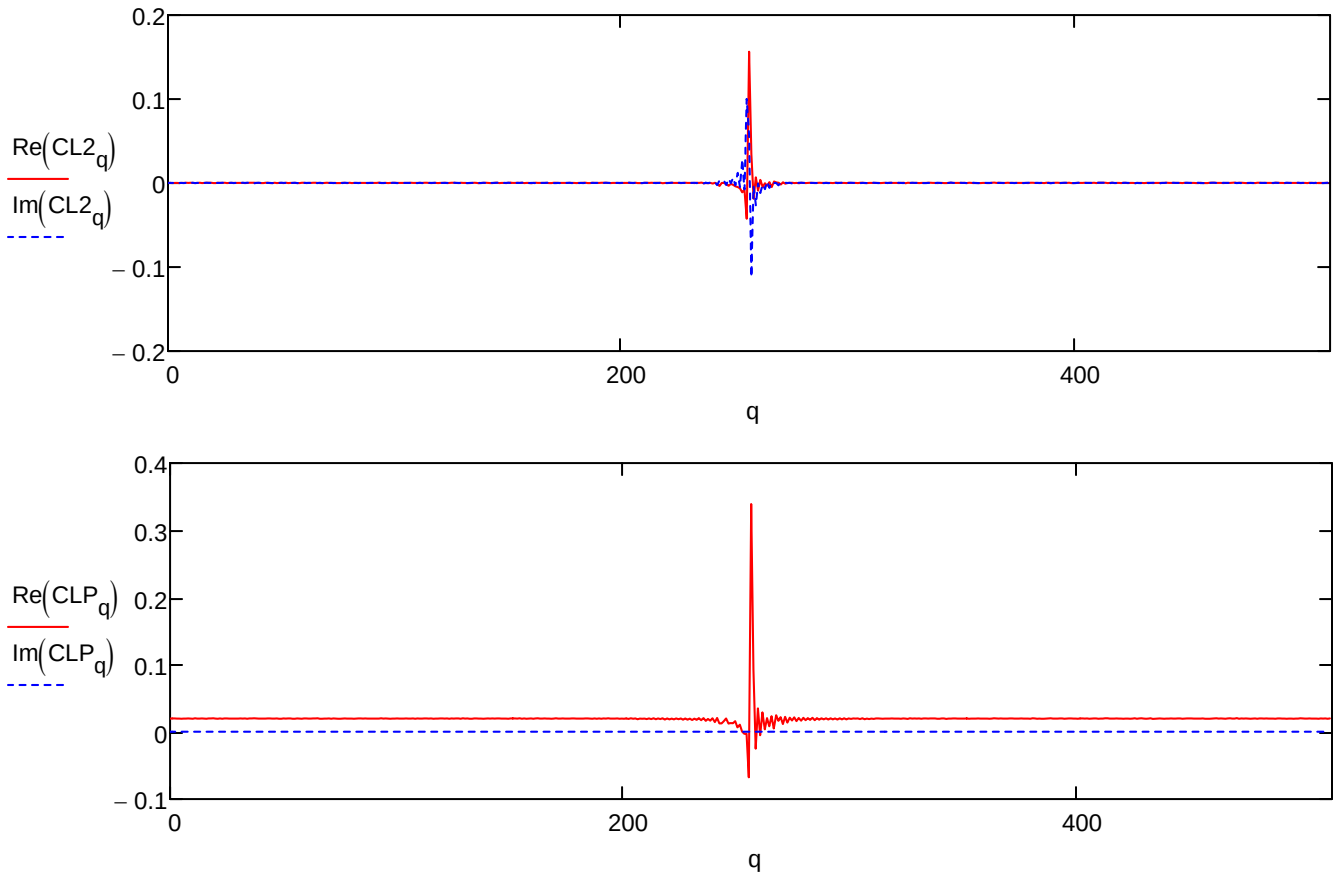
$FL2 := READPRN("./normal\_cc\_cont128.dat")$

$FLP := READPRN("./phased\_cc\_cont128.dat")$

$CL2_q := FL2_{q,0} + i \cdot FL2_{q,1}$ Convert to complex array

$CLP_q := FLP_{q,0} + i \cdot FLP_{q,1}$

Real and Imaginary Lag Plots



$CL2_q := if(winswitch = 1, CL2_q \cdot Wn(q, M), CL2_q)$ Window the lag data if enabled.

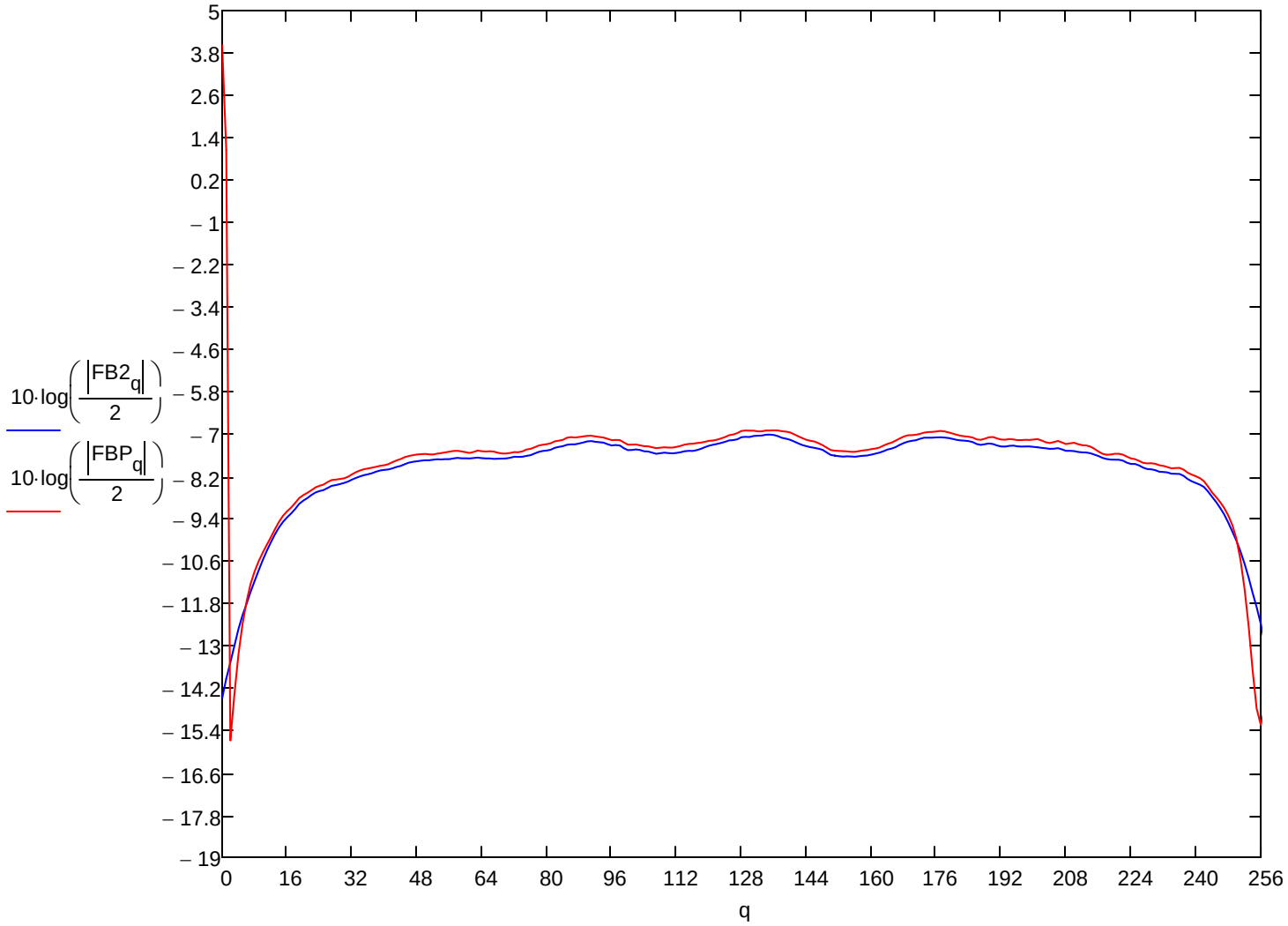
$CLP_q := if(winswitch = 1, CLP_q \cdot Wn(q, M), CLP_q)$ Window the lag data if enabled.

$RL2_m := CL2_{m+\frac{M}{2}}$ $RL2_{M-m1} := CL2_{\frac{M}{2}-m1}$ Rotate lag data before FFT $FB2 := cfft(RL2)\cdot\sqrt{M}$

$RLP_m := CLP_{m+\frac{M}{2}}$ $RLP_{M-m1} := CLP_{\frac{M}{2}-m1}$ Rotate lag data before FFT $FBP := cfft(RLP)\cdot\sqrt{M}$

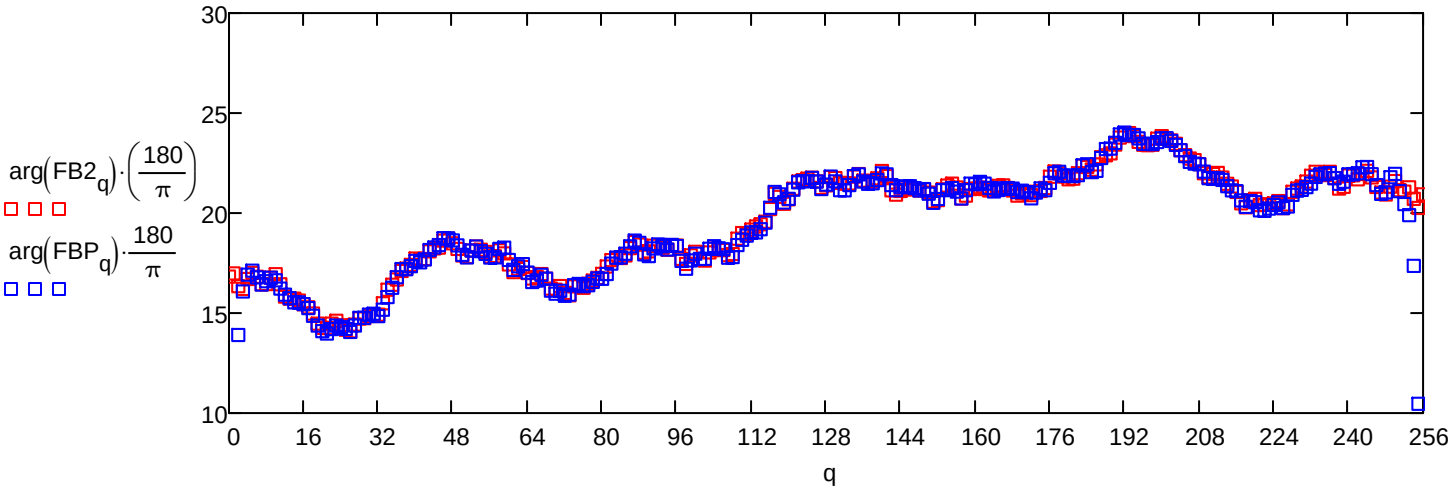
$C_q := 10\cdot\log\left(\frac{|FB2_q|}{2}\right)$ $P_q := 10\cdot\log\left(\frac{|FBP_q|}{2}\right)$

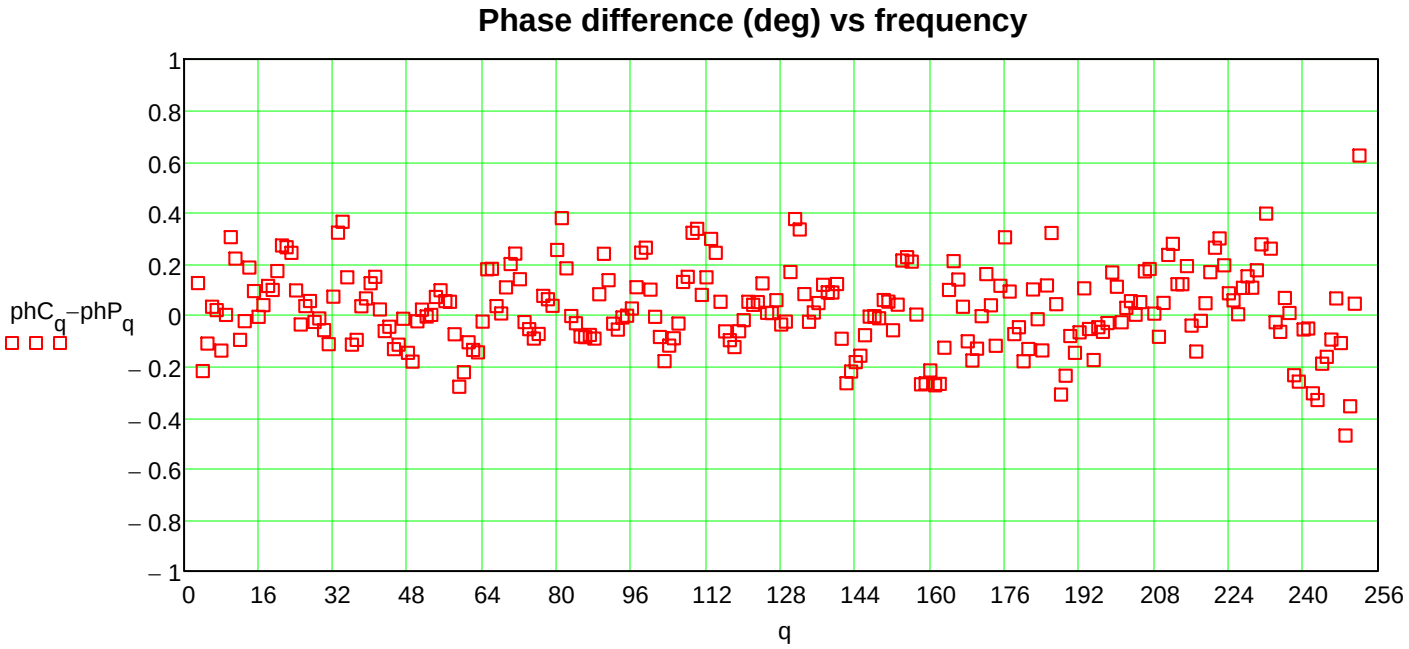
Amplitude vs Frequency



$phC_q := \arg(FB2_q)\cdot\left(\frac{180}{\pi}\right)$ $phP_q := \arg(FBP_q)\cdot\left(\frac{180}{\pi}\right)$

Phase (deg) vs Frequency





$r := 16, 17 .. 240$ $\quad phS_r := phC_r - phP_r$

$$phaserr := \left(\frac{1}{240 - 16}\right) \cdot \sum phS \qquad phaserr = 0.03140101 \quad \text{degrees}$$

$$\left(\frac{phaserr}{360}\right) \cdot \left(\frac{1}{27 \cdot 20 \cdot 10^3}\right) \cdot 128 \cdot 10^6 = 0.02067556$$

This is how many 128 MHz clock cyles difference between normal cross-correlation and phased cross-correlation, as to when phase is applied.