IP BPM position dependence on upstream phase

T. Bromwich

Outline

Data taken on 160614. With 40 dB attenuation on Y dipole cavities:

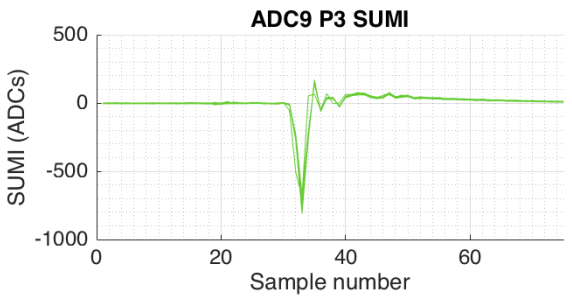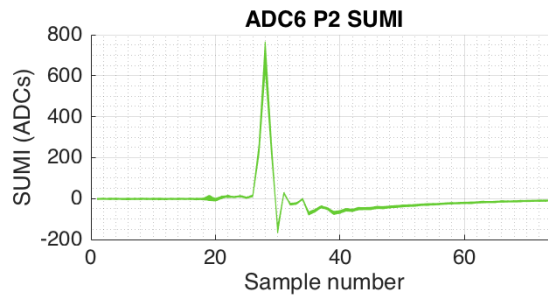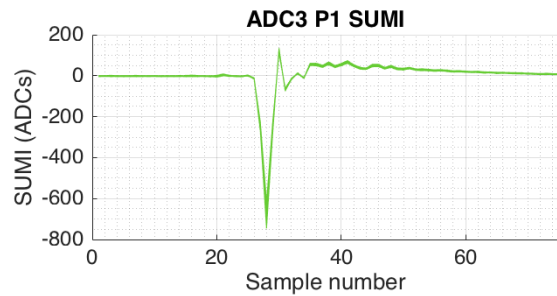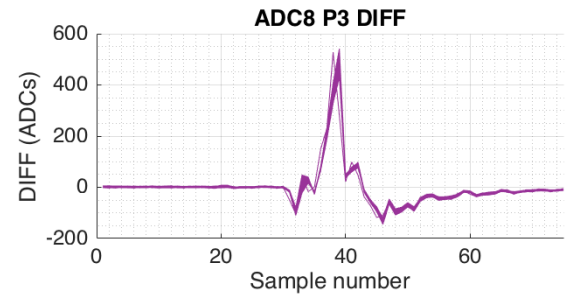upstream3bpm2bunch3_Board1_140616 (P1, P2, P3)
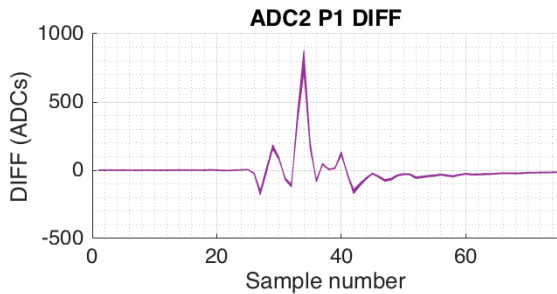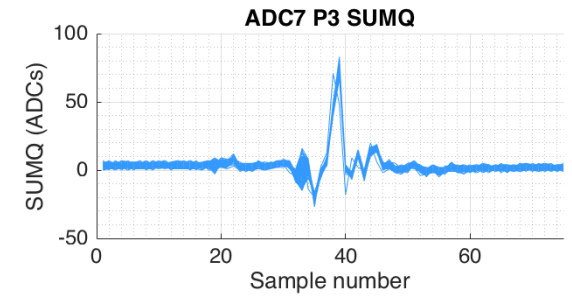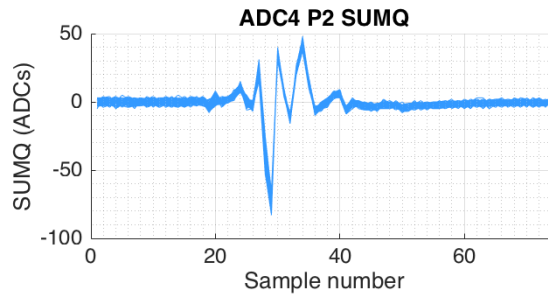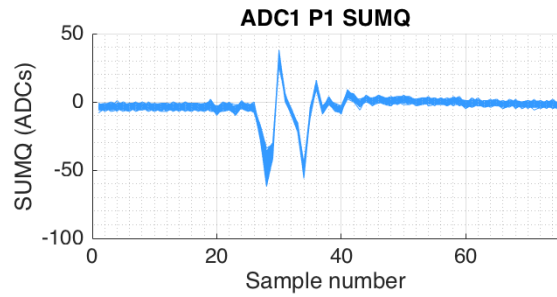upstream3bpm2bunch3_Board2_140616 (IPA, IPB, IPC)

515 triggers after cuts

– Waveforms
– Positions at IP and upstream phase $arctan(\Sigma Q/\Sigma I)$
– Correlation of position with phase at one location
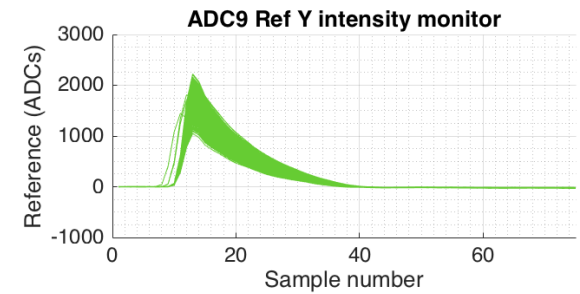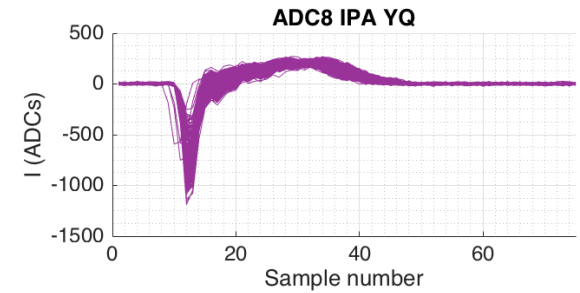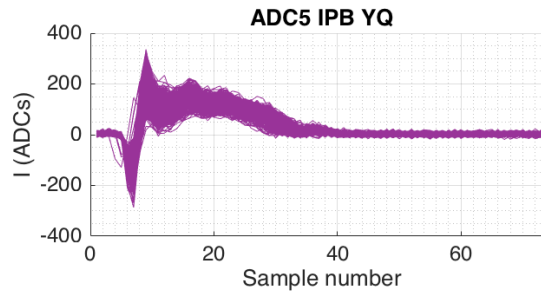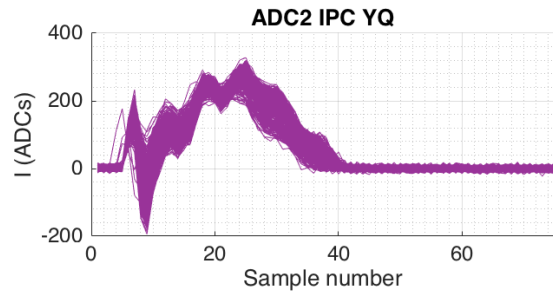– Correlation of position with phase as a function of sample number
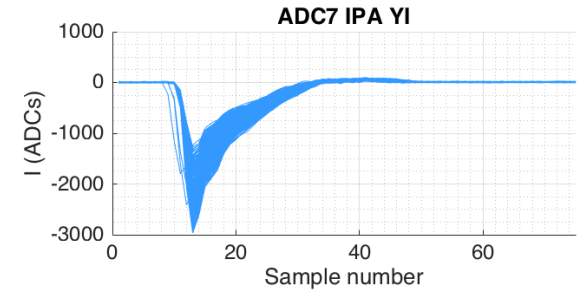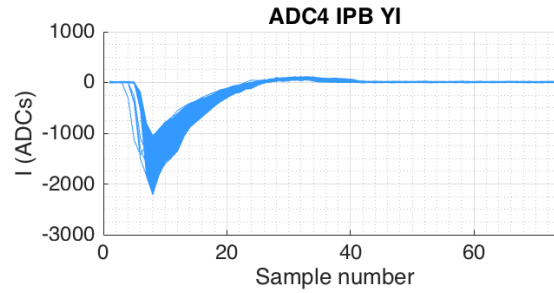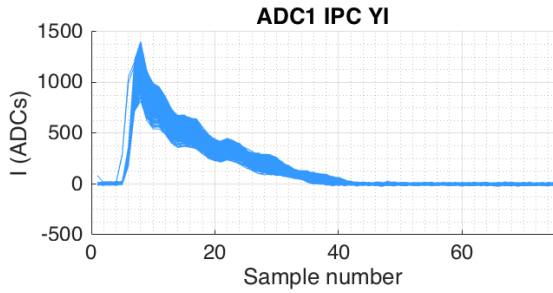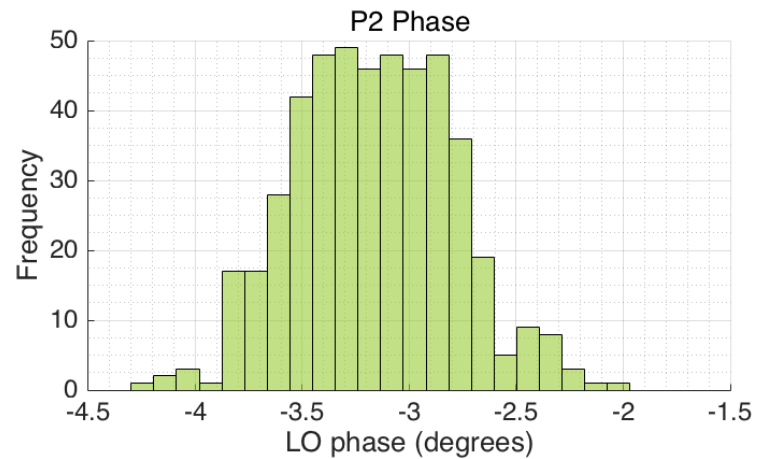
Upstream waveforms
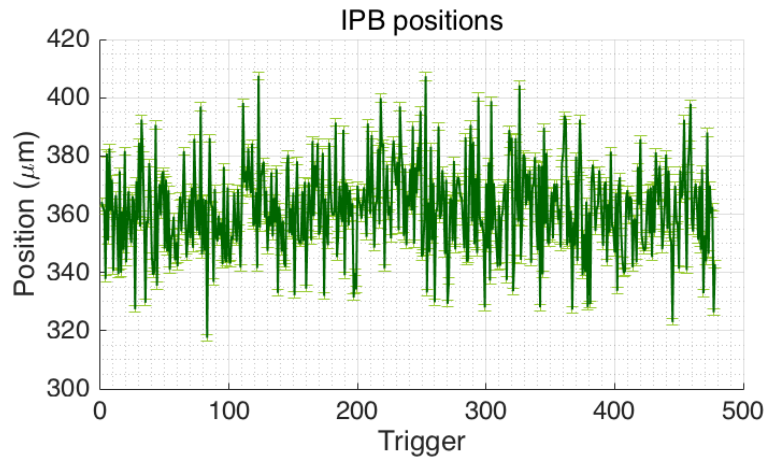

upstream3bpm2bunch3_Board1_140616 - UPSTREAM - FONT5A board #4
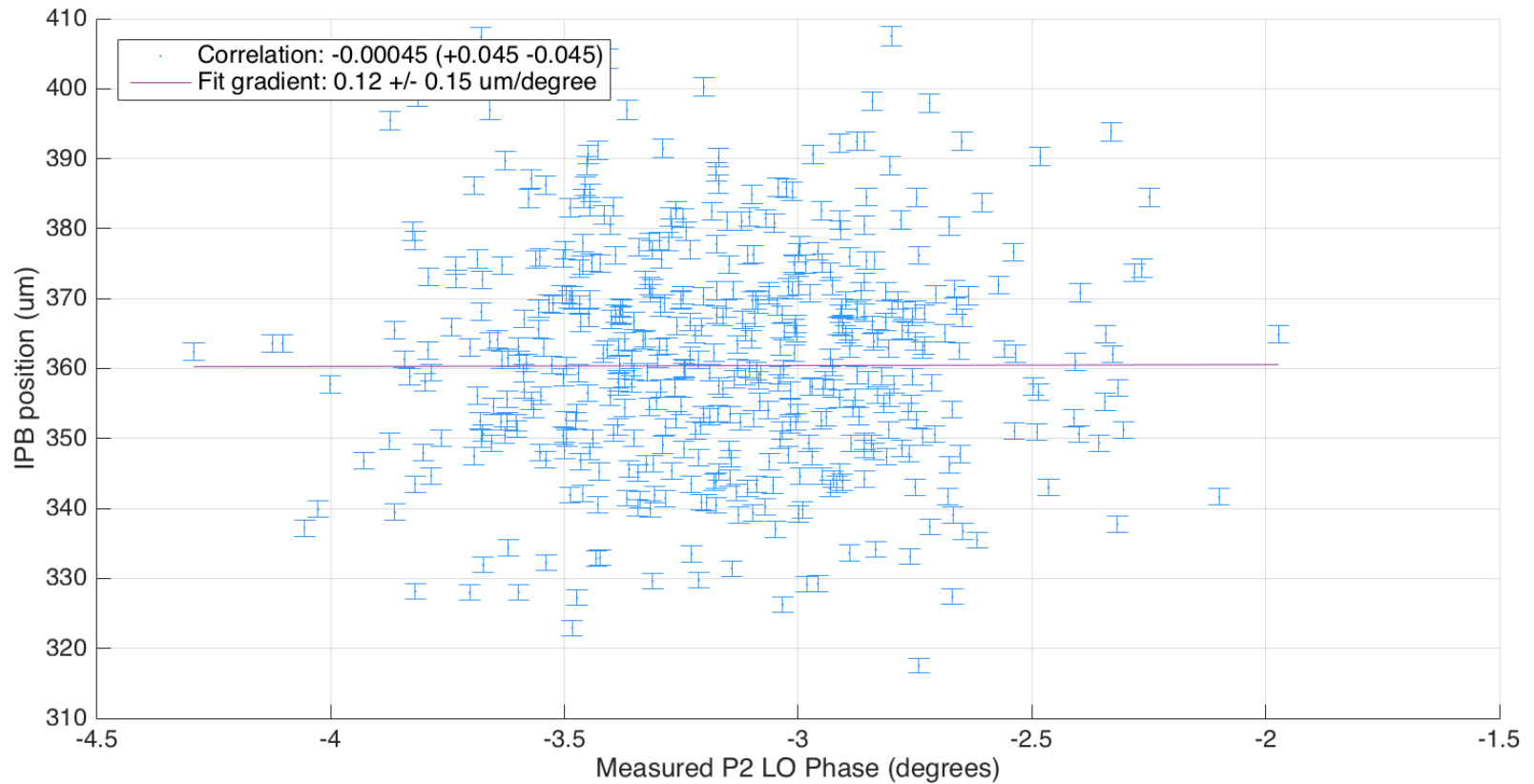
IP waveforms

IPC positions and LO phases

Using bunch 1, IPC positions calculated using sample 14.
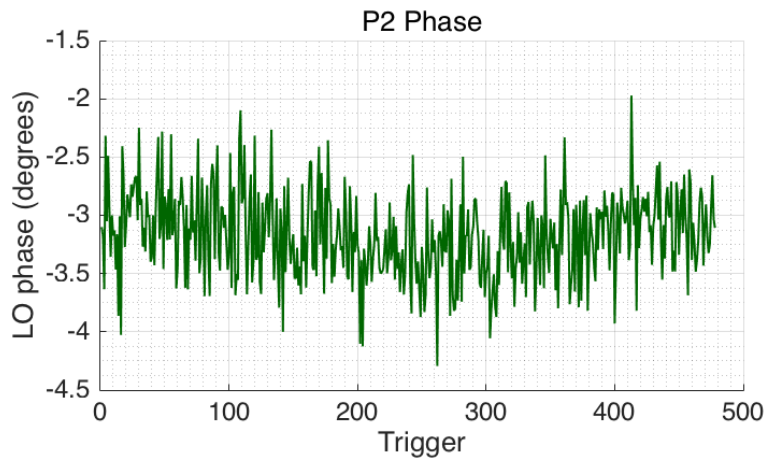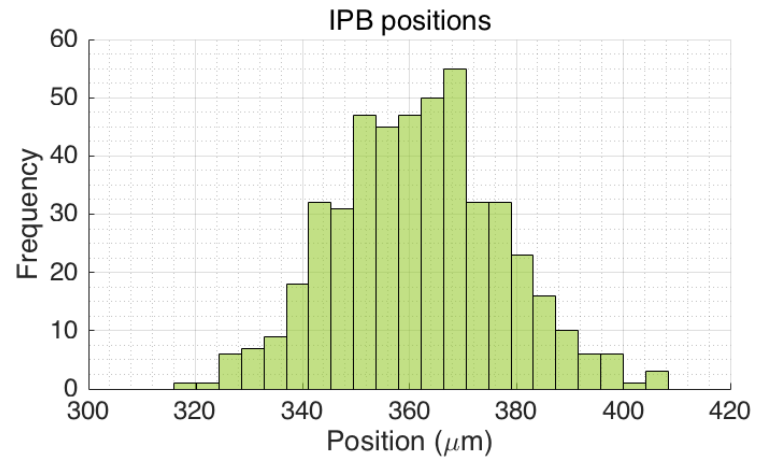
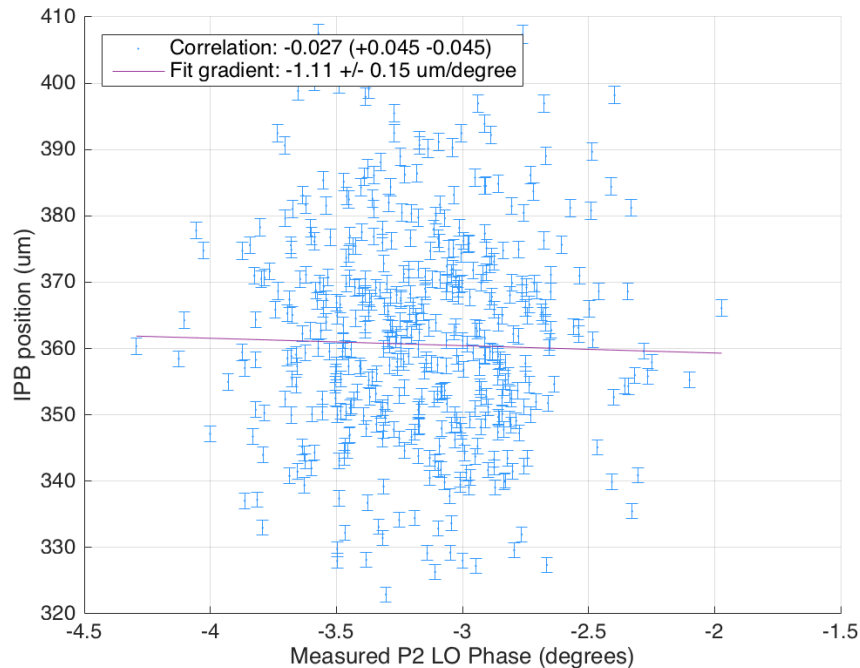# IPC position vs LO phase upstream

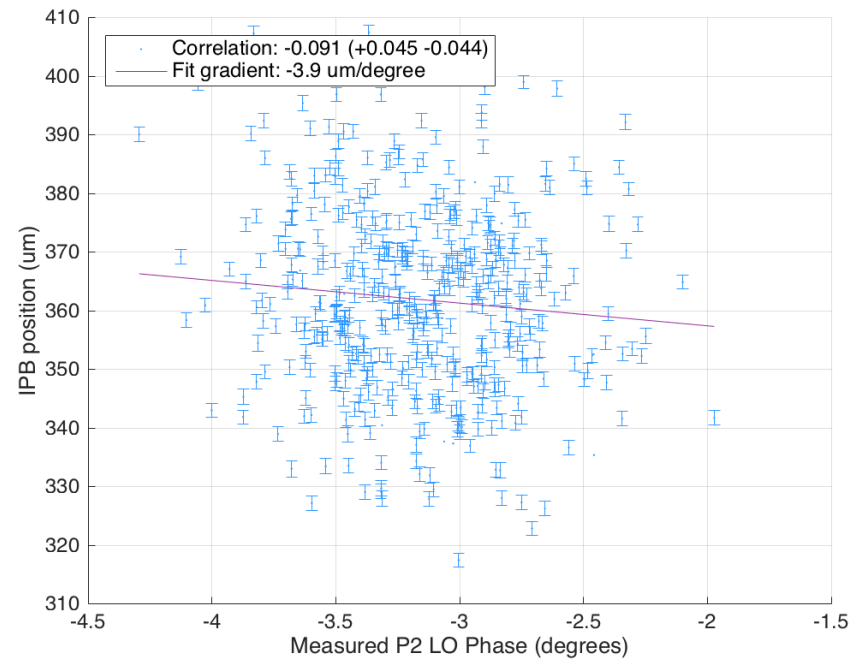Using bunch 1, IPC positions calculated using sample 14.

Shift triggers relative to each other

Check synchronisation by shifting upstream data by 1 trigger relative to the IP data.

Shift 1 trigger one way
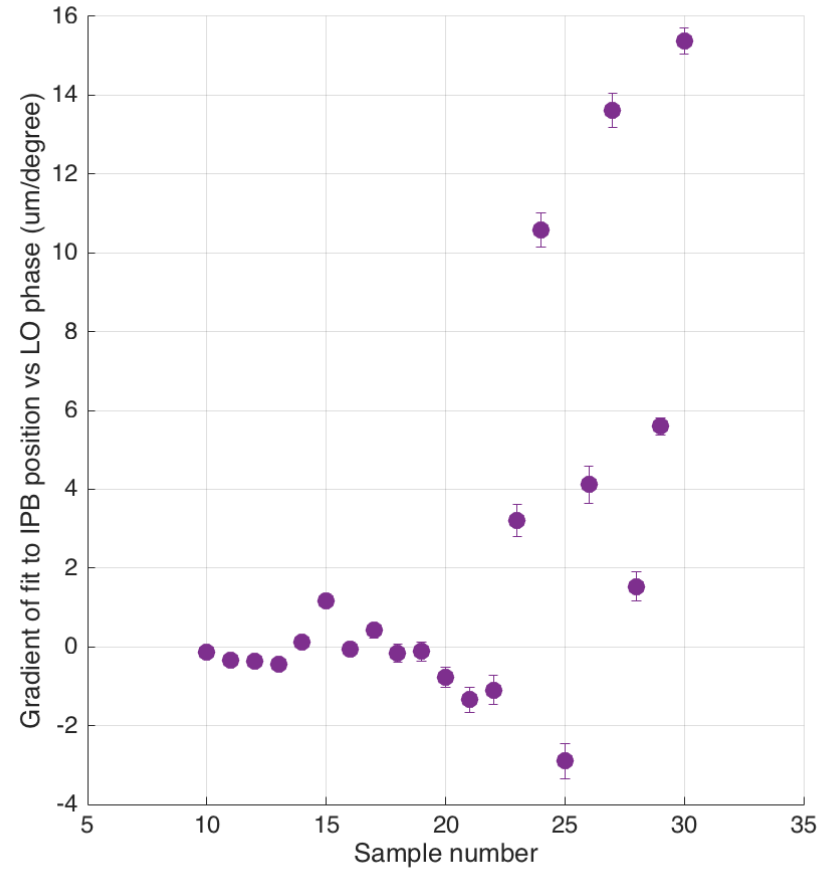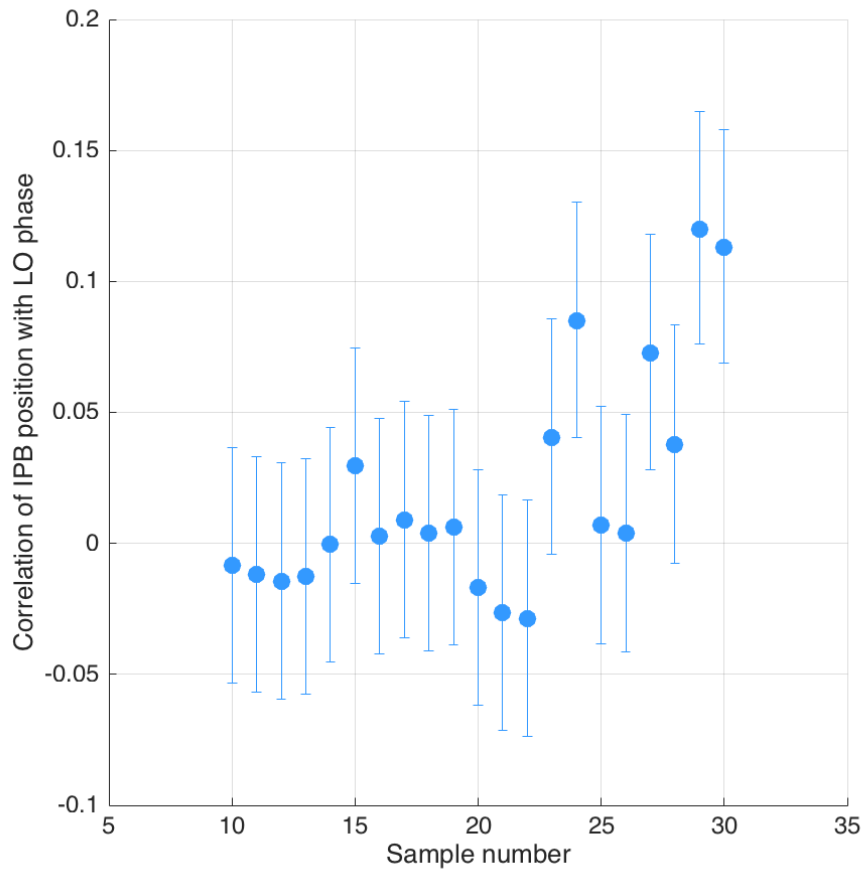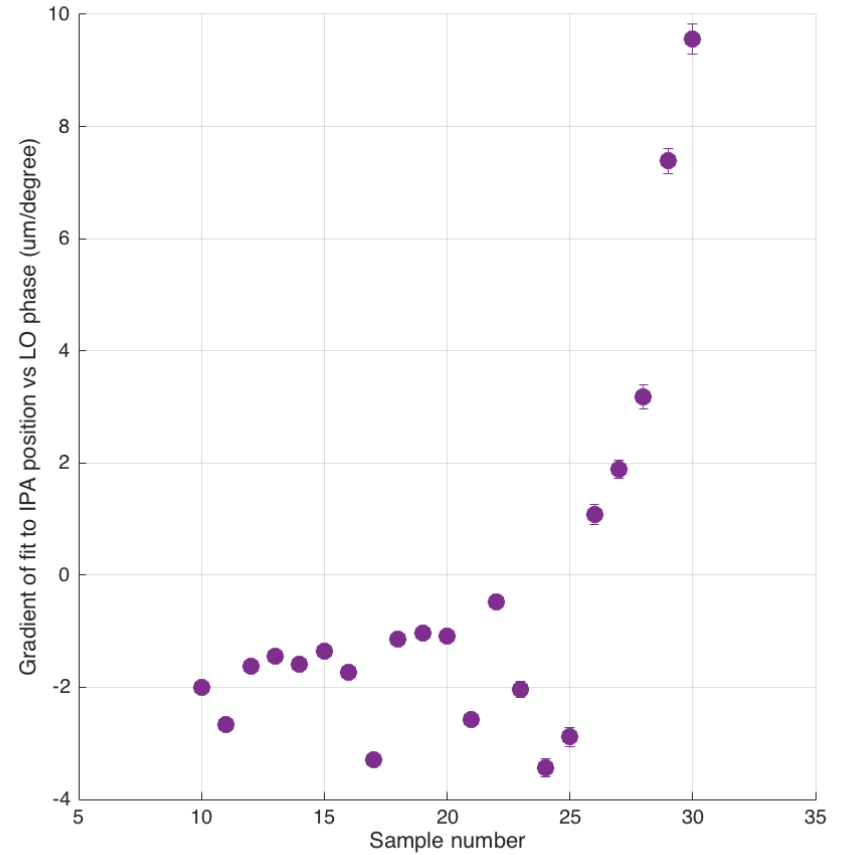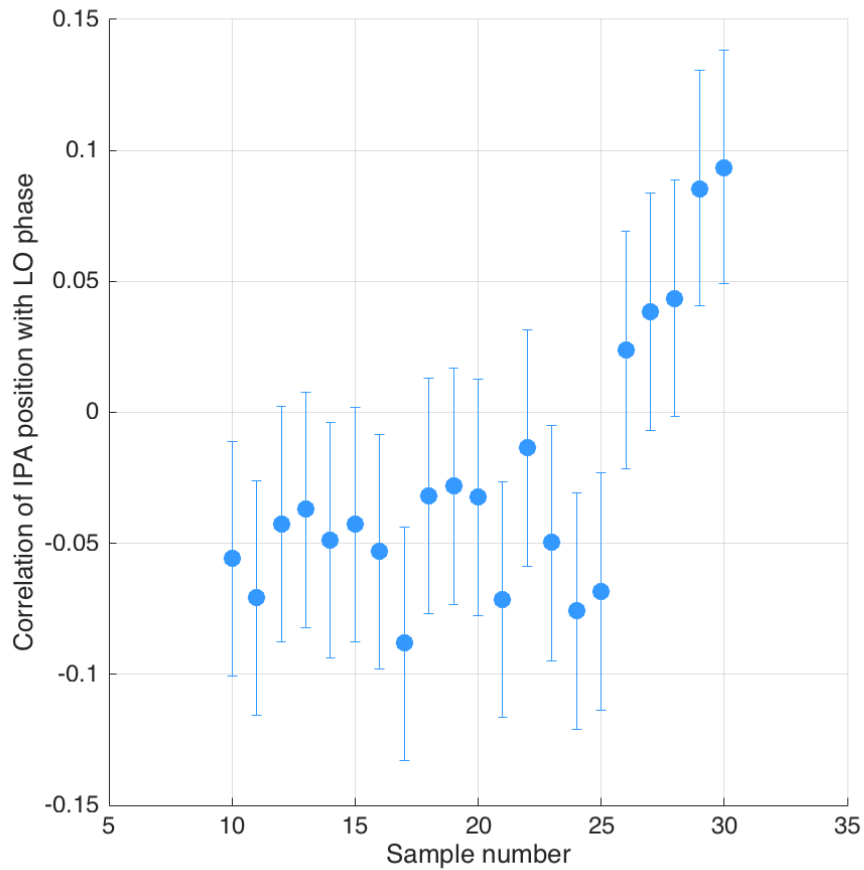
Shift one trigger the other way

Correlation vs sample number

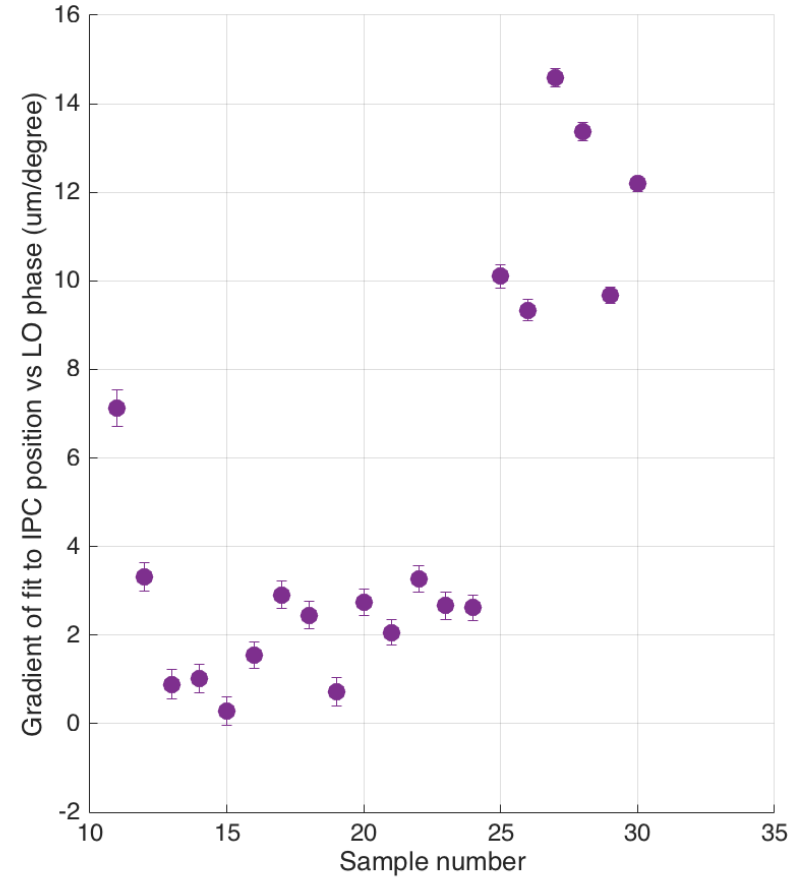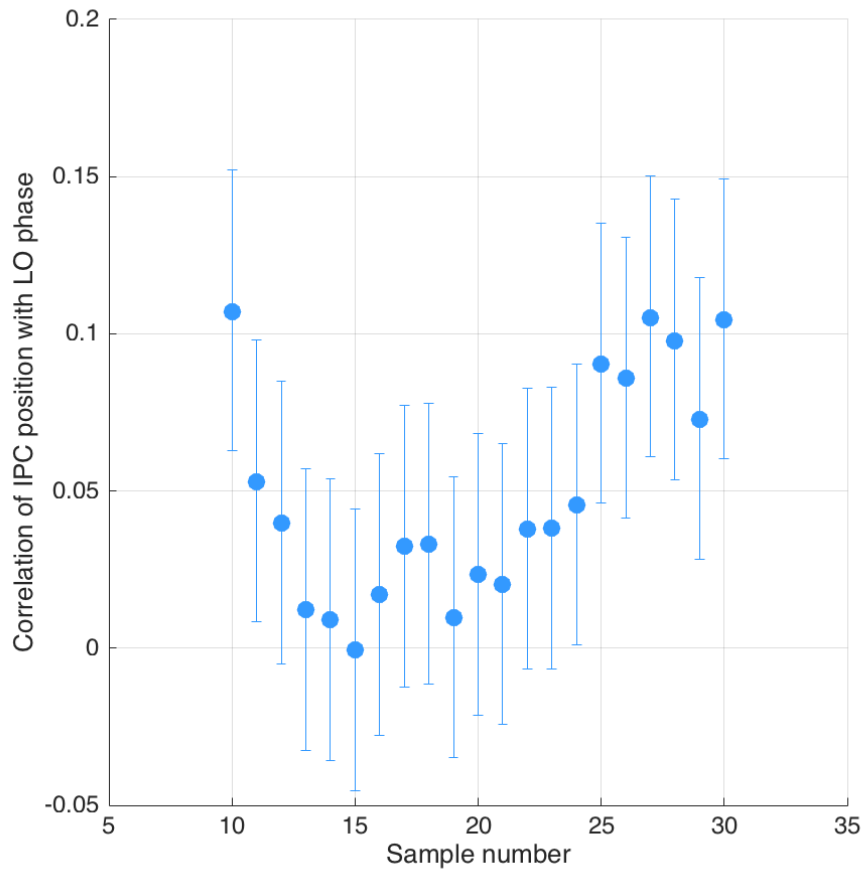Correlation, and gradient of fit, along the IPB waveform.

Correlation vs sample number

Repeat for IPA

Correlation vs sample number

Repeat for IPC

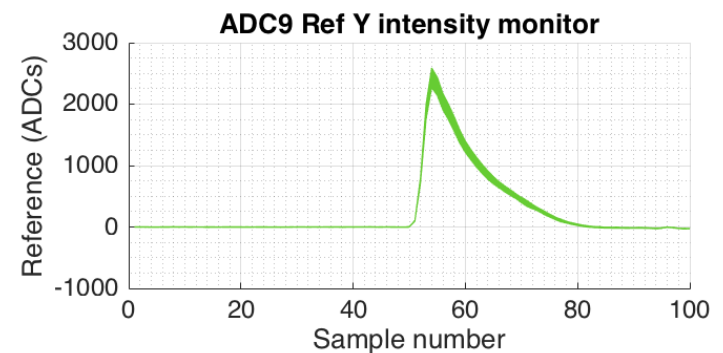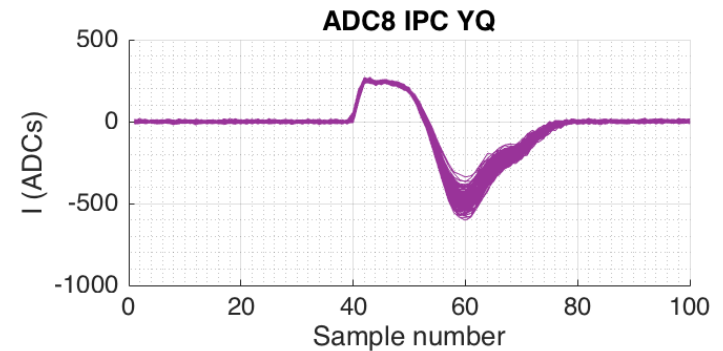# Appendix:
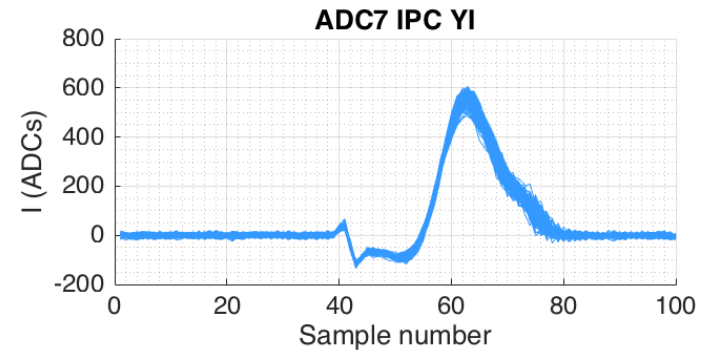# Repeat analysis for data from February

Outline

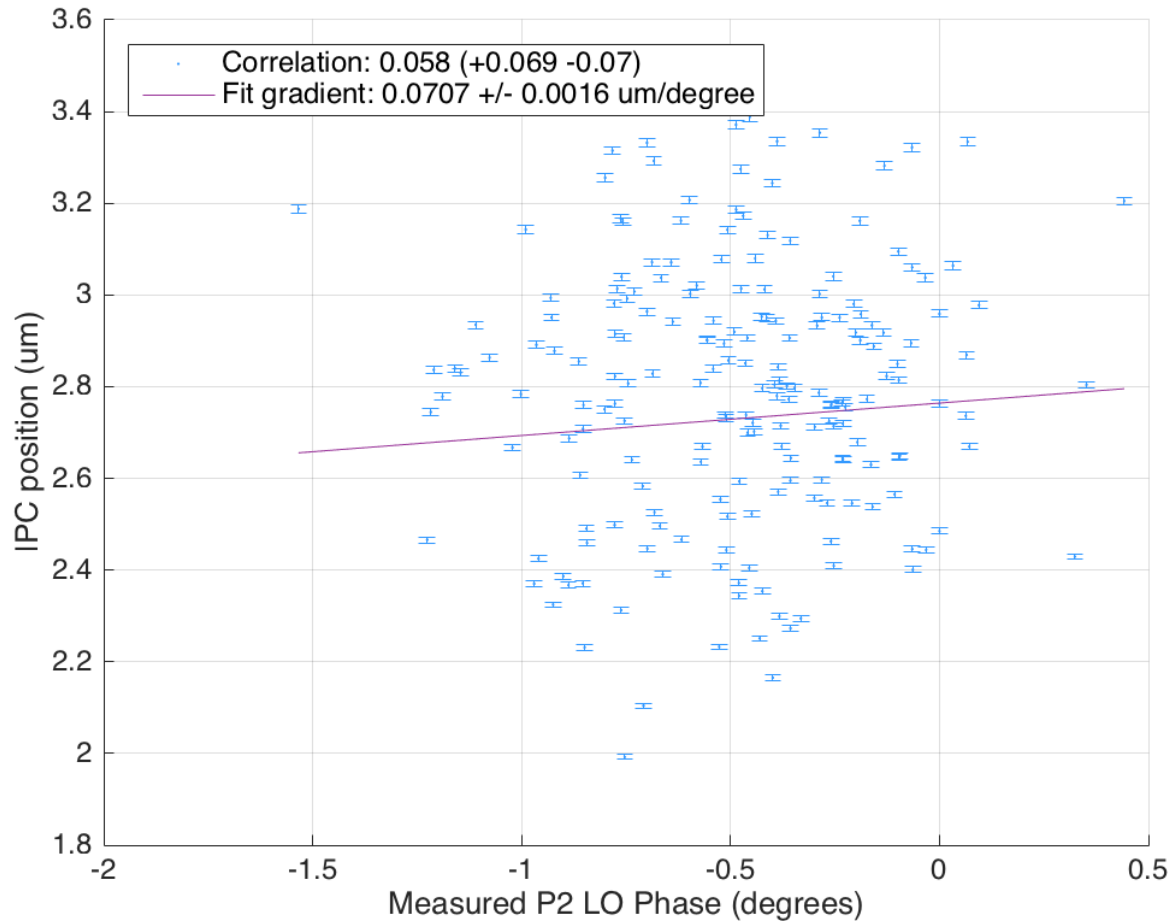Data taken on 240217 at 10 dB:

fbRun1_Board1_240217 (P2, P3)
fbRun1_Board2_240217 (IPC)

Timing was not optimised on this shift and it is possible we had both C-band and 714 MHz BPFs.
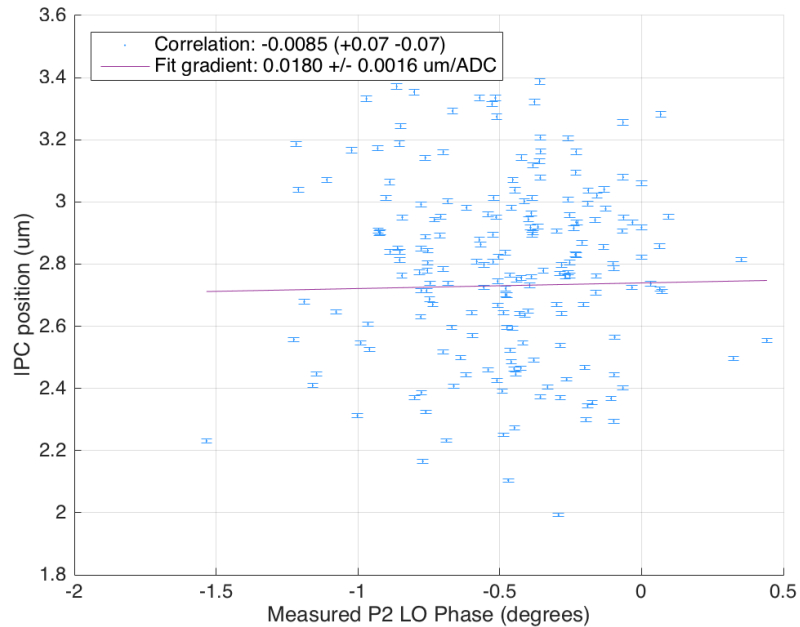
IPC position vs LO phase upstream

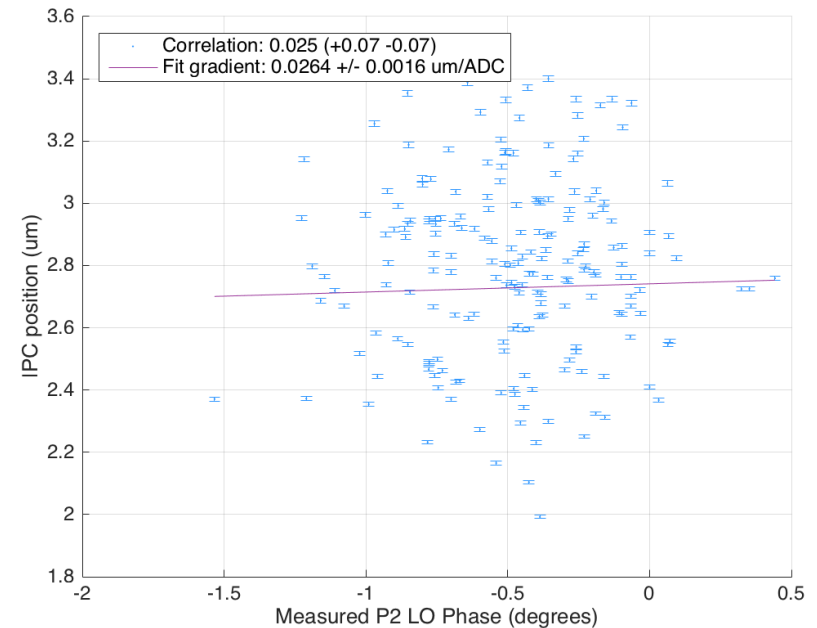Example plot with positions at IPC calculated using sample 60 (reference 55)

Shift triggers relative to each other

Check synchronisation by shifting upstream data by 1 trigger relative to the IP data.
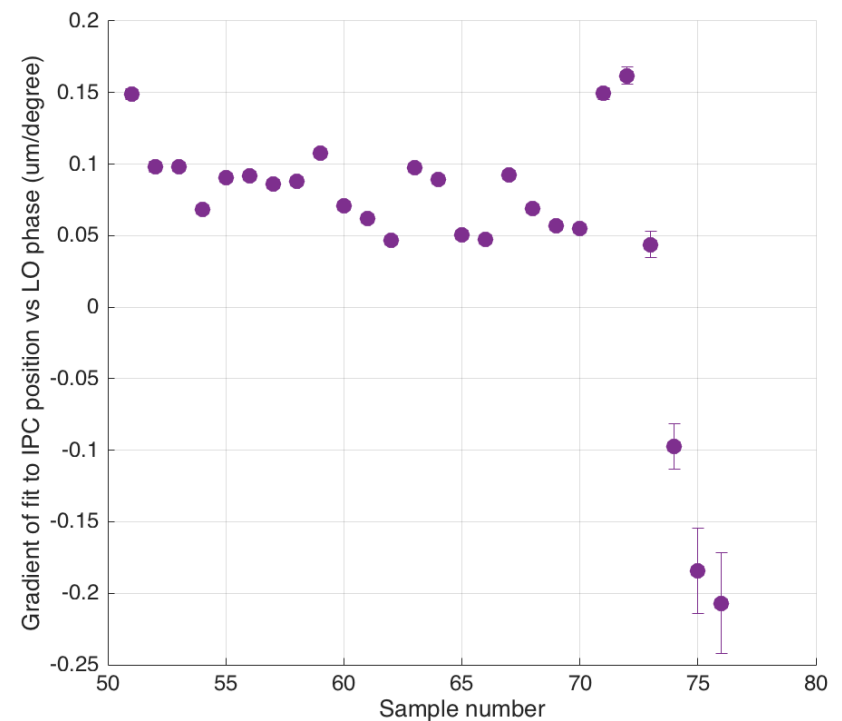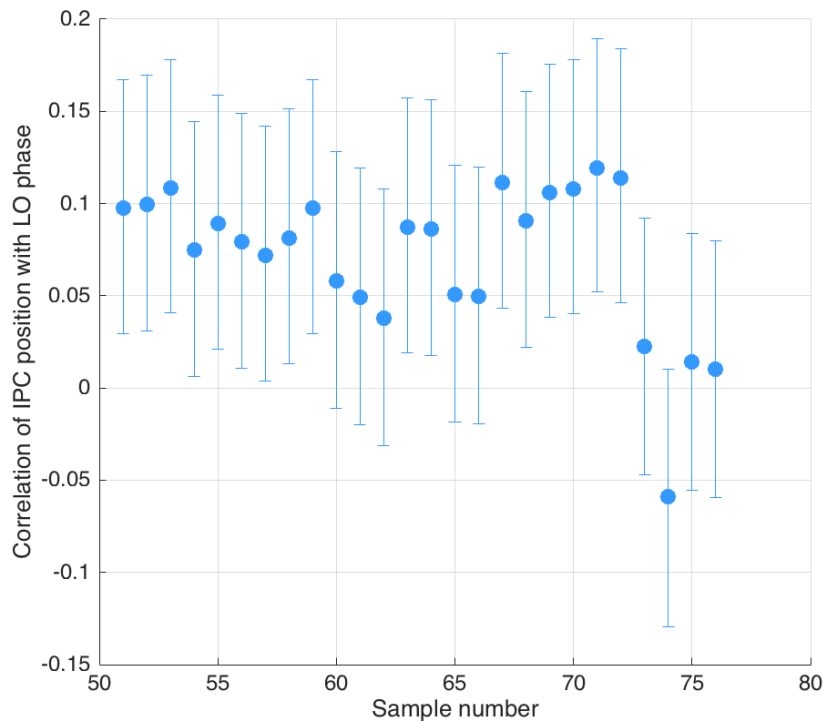
Shift 1 trigger one way
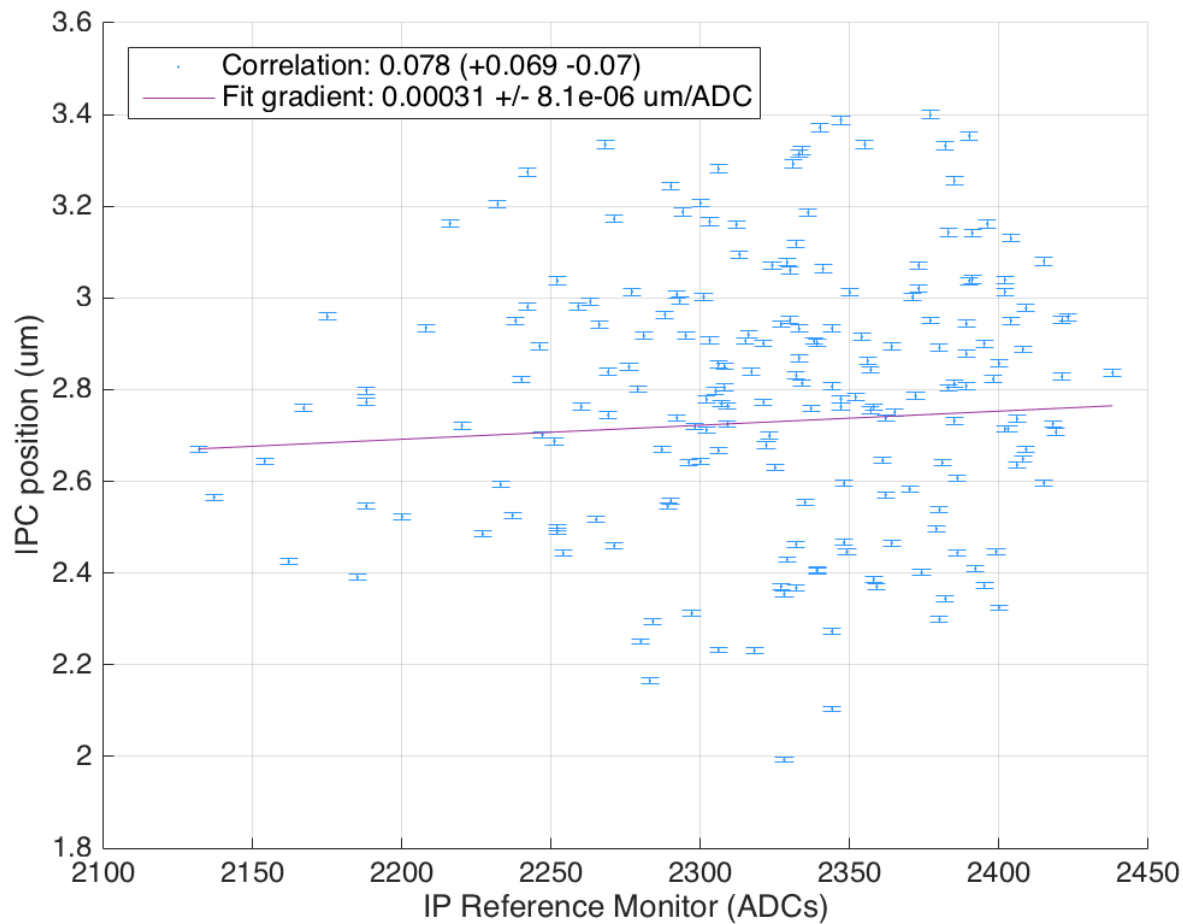

Shift one trigger the other way

Correlation vs IPC sample

Correlation, and gradient of fit, along the IPC waveform.

IPC position vs charge

Use IP reference monitor as a measure of charge and see how position changes as a function.

Correlation vs IPC sample

Correlation, and gradient of fit, along the IPC waveform.