

# Resolution Study cont.

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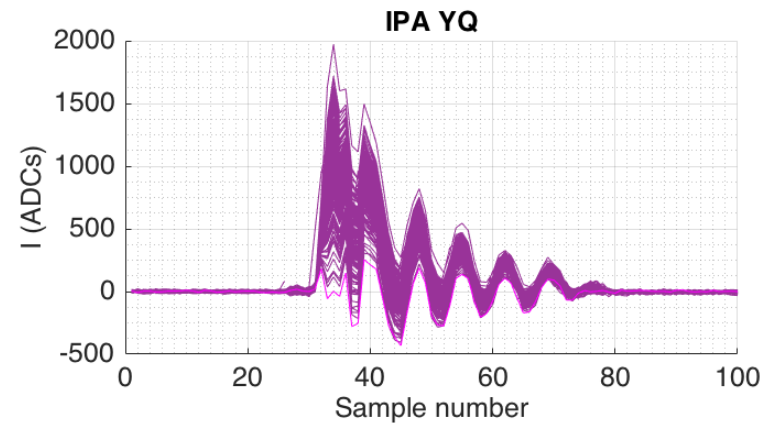
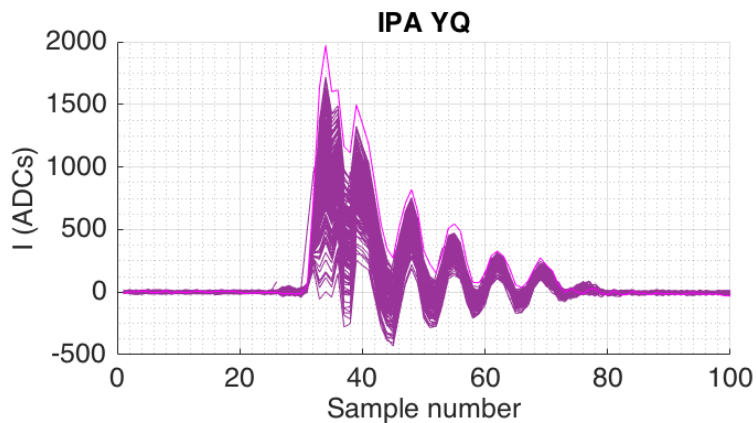
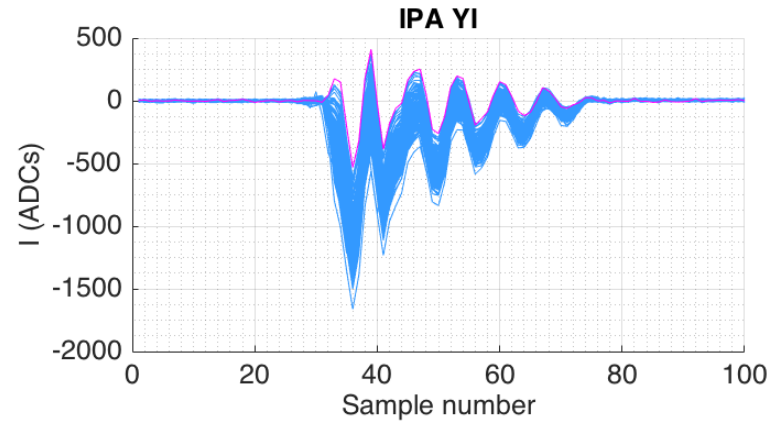
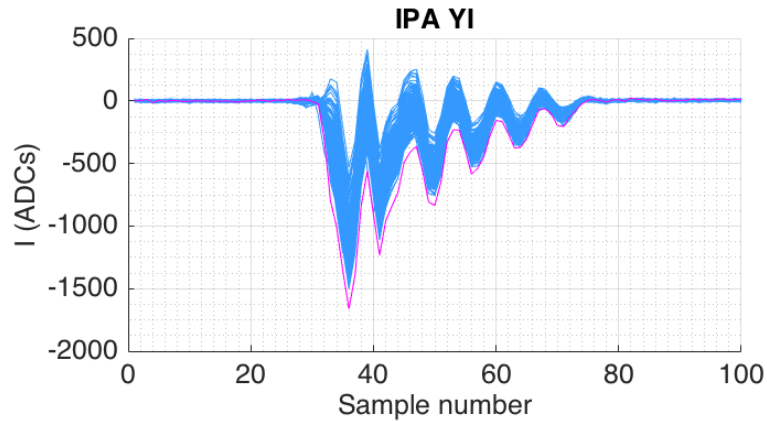
# Outline

Look at different files from the May/June run and attempt to identify common conditions for achieving good resolution results.

- Study 1: Look at stray waveforms
  - Check timing of data sets.
  - Plot how position changes with time.
  - Plot position residual changing with time.
  - How theta changes with jitRuns.
- Study 2: Try removing outliers from Q/I plot.
  - How theta changes within jitRuns + differences from calibration file.

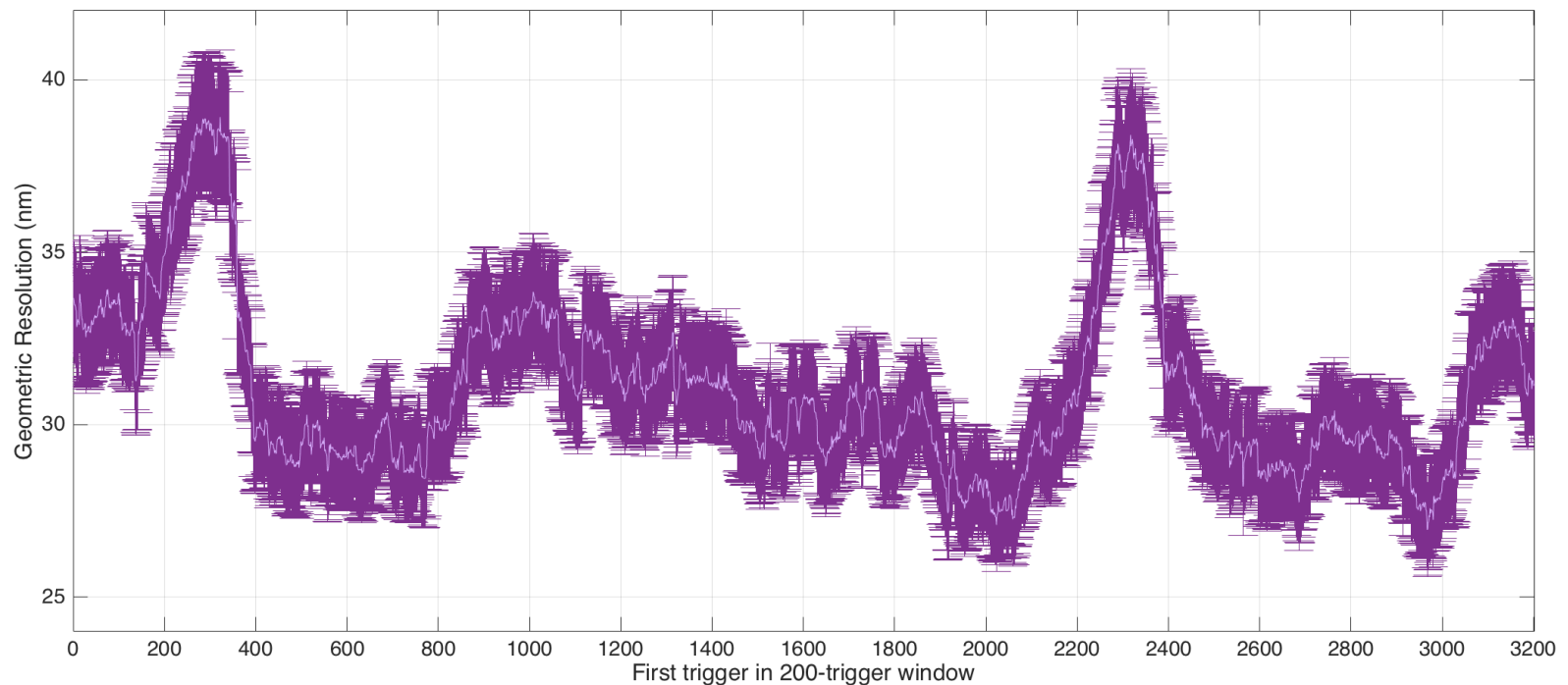
# Check stray waveforms

jitRun14(601:800) → 33nm



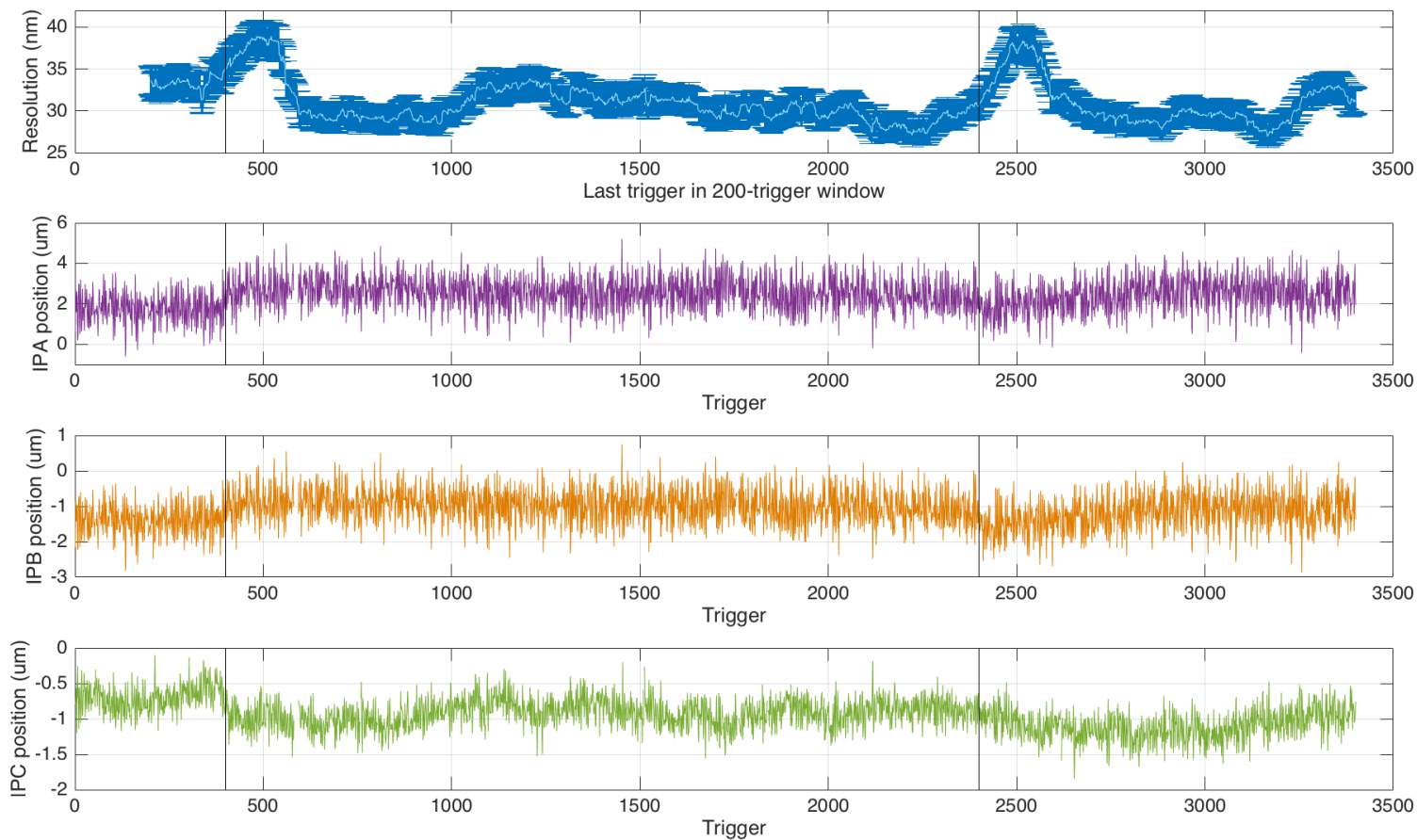
# Study 1: Rolling resolution

- jitRun13: triggers 1:400 ← *Time gap: 67 seconds*
- jitRun14: triggers 401 to 2400 ← *Time gap: 8 minutes and 7 seconds*
- jitRun15: triggers 2401 to 3400



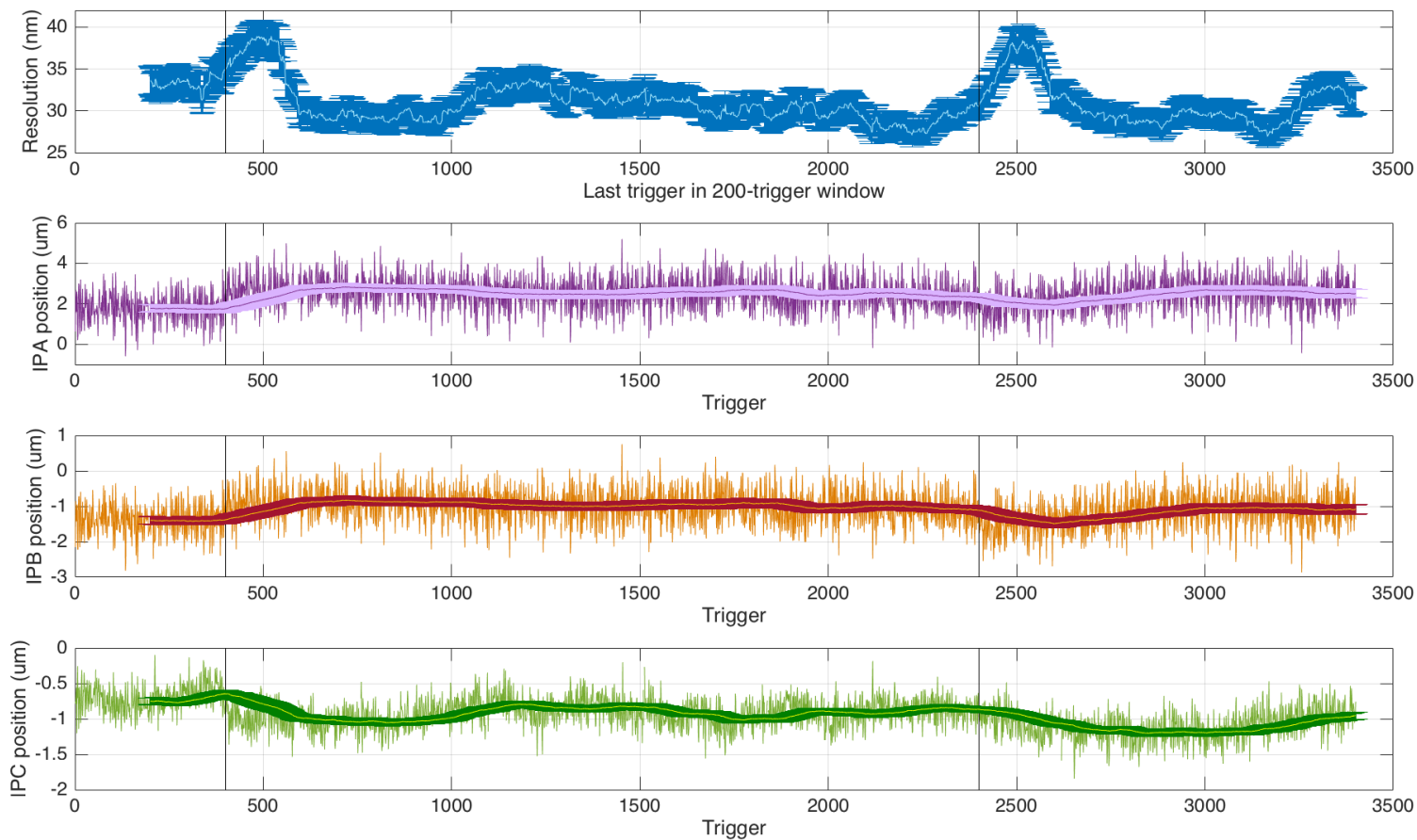
# Study 1: Res & position

200-trigger resolution against same axes as the position trigger by trigger at IPA,B, C.



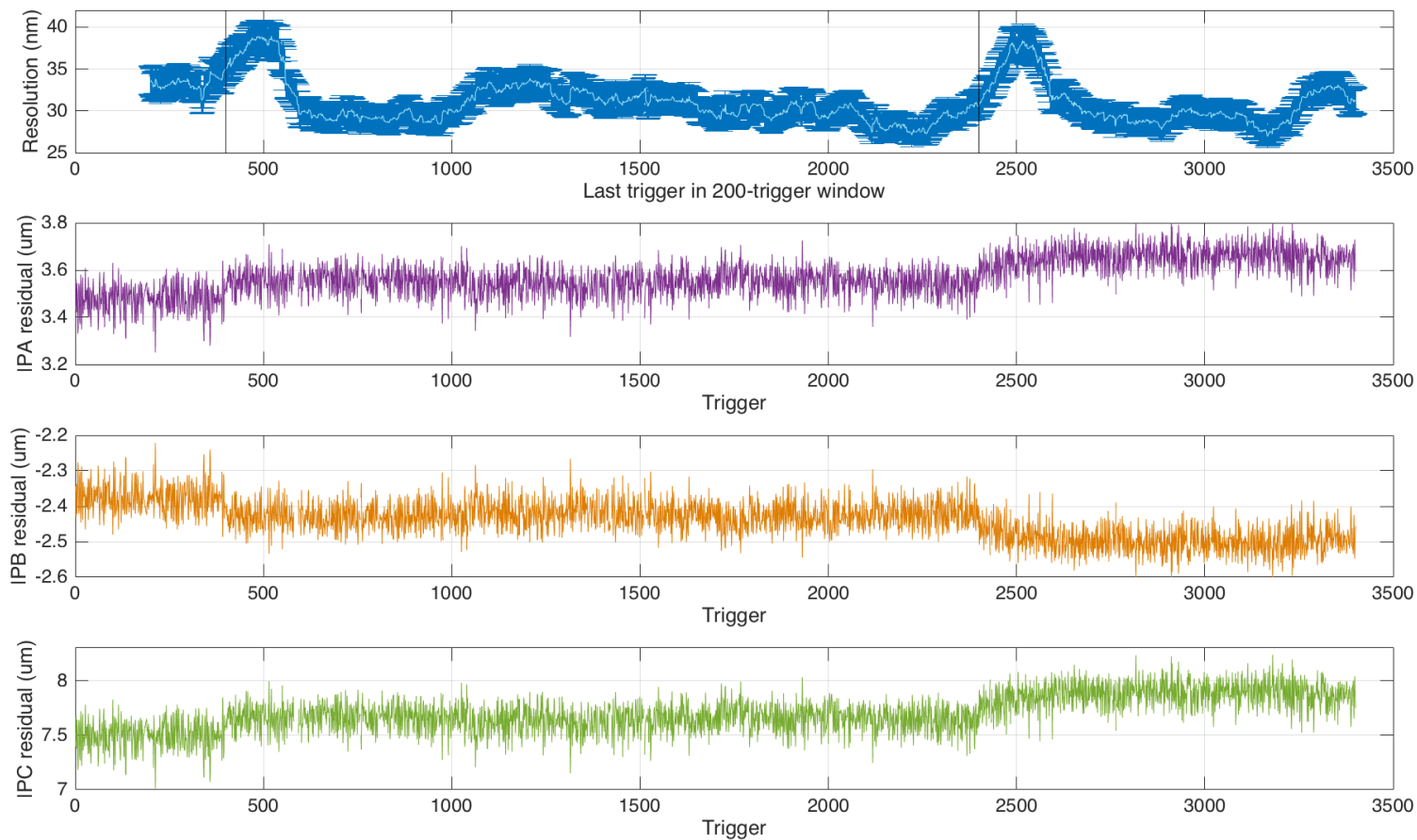
# Study 1: Res & position

Superimposed mean position for each 200-window block.



# Study 1: Res & residual

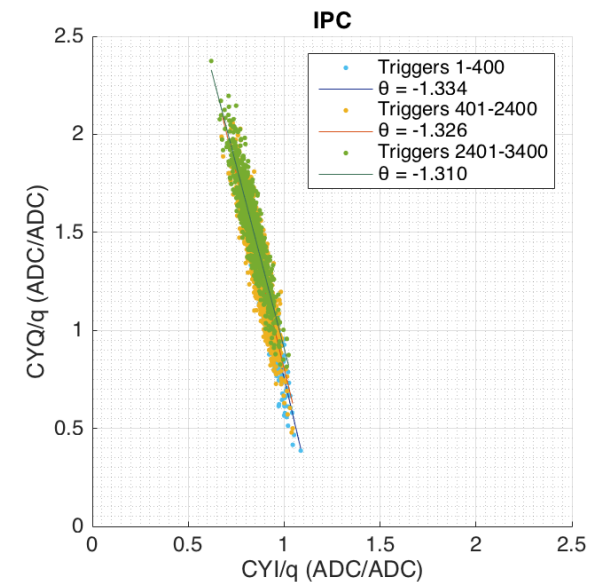
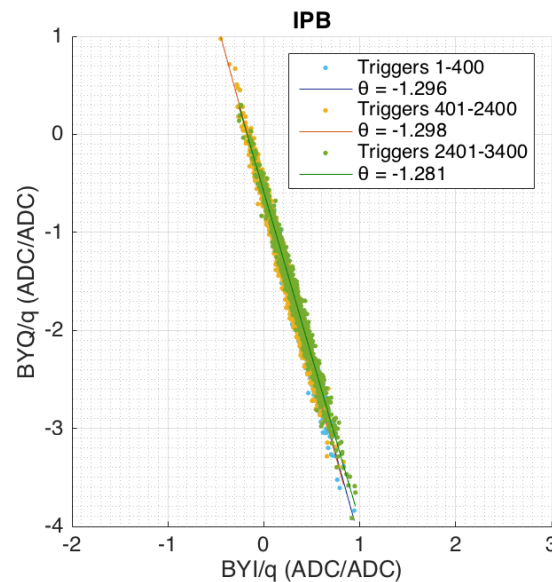
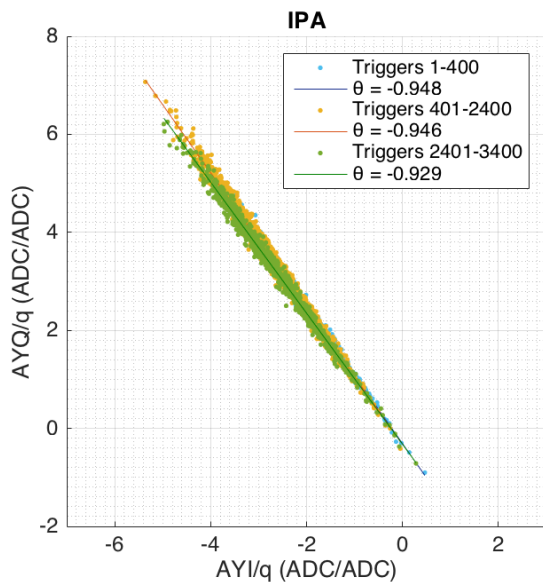
How the position residual varies with time as compared to the 200-trigger resolution window.



# Study 1: Theta for different files

Fit to the I and Q values from the separate jitter runs to see how theta changes with time at the three BPMs.

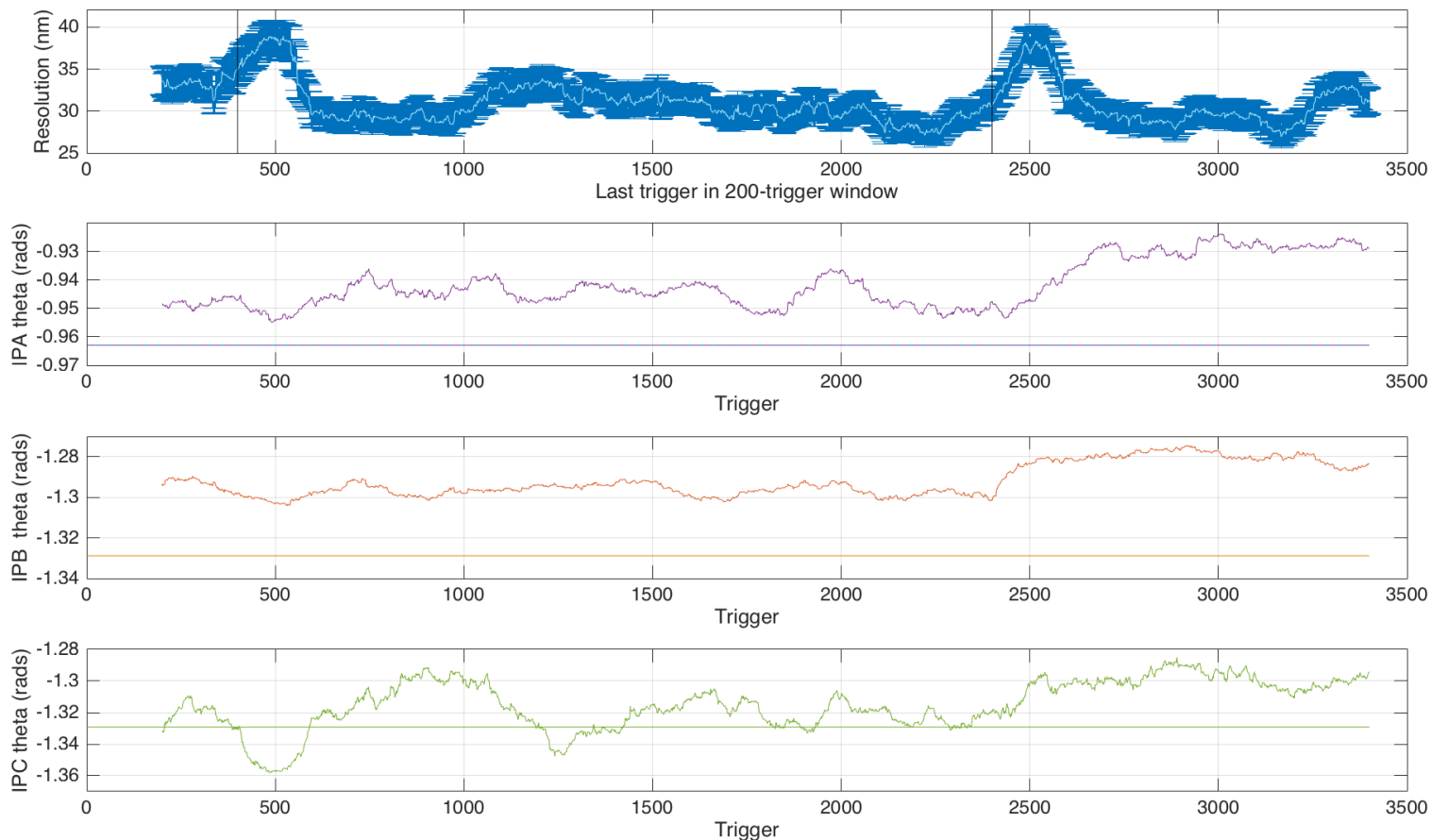
- jitRun13: triggers 1:400 ← *Time gap: 67 seconds*
- jitRun14: triggers 401 to 2400 ← *Time gap: 8 minutes and 7 seconds*
- jitRun15: triggers 2401 to 3400





# Study 1: theta with time

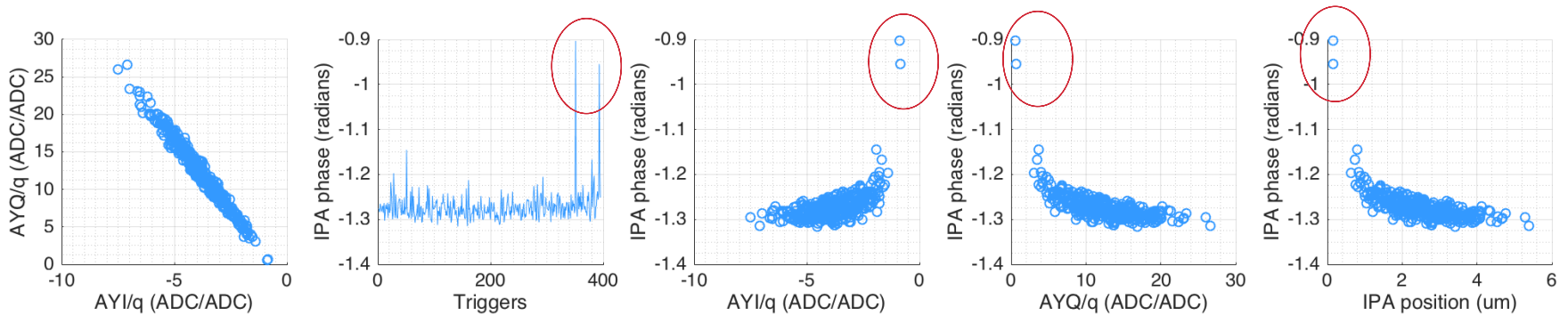
How theta for 200 triggers varies with time as compared to the 200-trigger resolution window. Also plotted as solid straight line is the theta value from the corresponding calibration file.



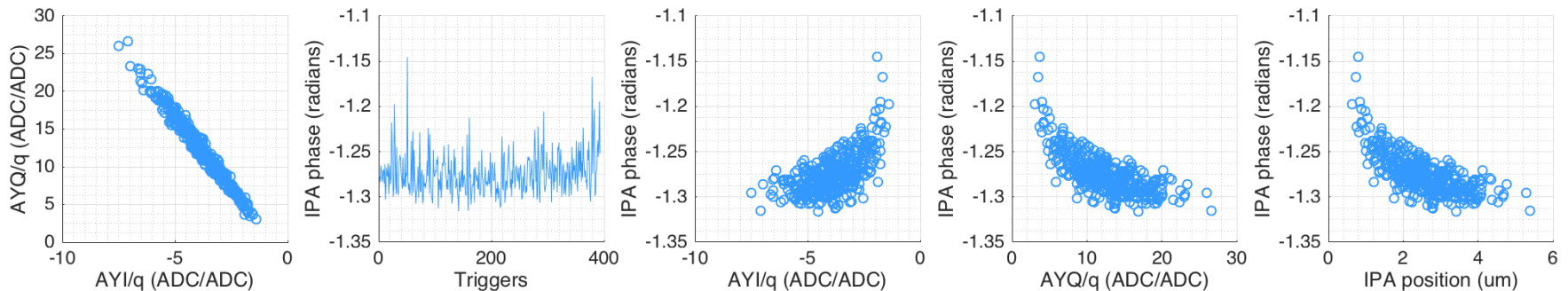
# Study 2: jitRun9 (~40nm)

Study of the phase trigger by trigger shows a few clear outliers.

Try removing these from jitRun9 and see the impact on the resultant resolution.



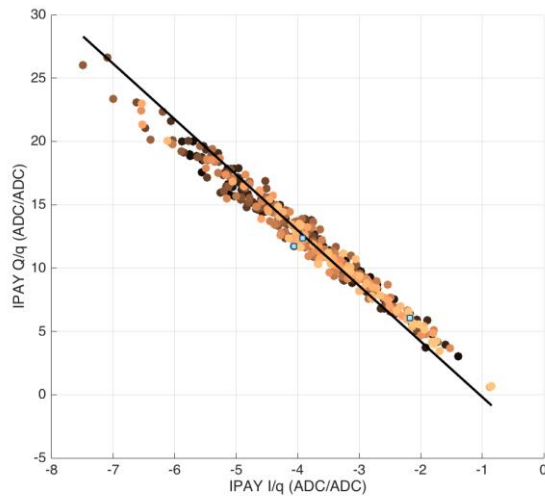
Resolution only changes from 40.8 to 40.5 nm.



# Study 2: jitRun9 (~40nm)

Try looking at the spread of Q/I with time. Colour coded with triggers 1:400.

Compare to the calibration for calculating theta – fit to calibration plotted in black.

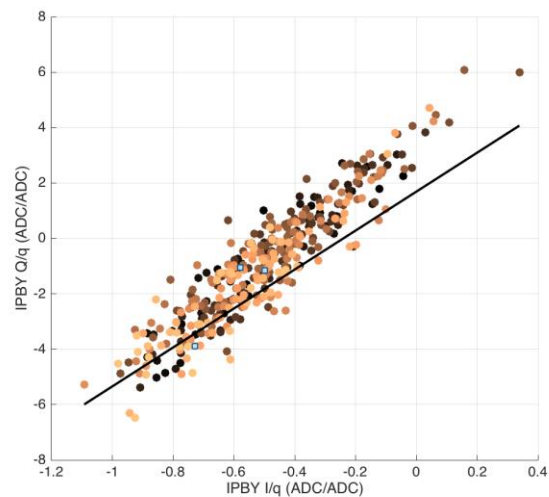


**IPA**

Calibration theta: -1.347 rads

JitRun theta: -1.312 rads

Delta theta: 0.035 rads

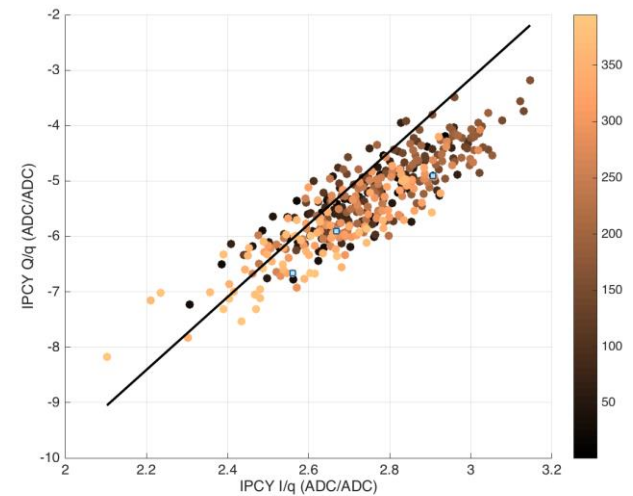


**IPB**

Calibration theta: 1.430 rads

JitRun theta: 1.456 rads

Delta theta: 0.026 rads



**IPC**

Calibration theta: 1.420 rads

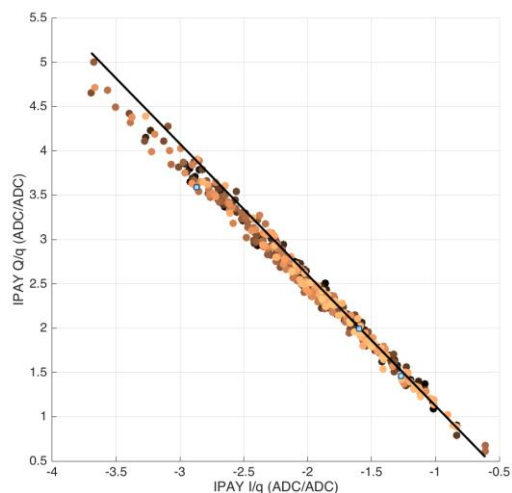
JitRun theta: 1.335 rads

Delta theta: **0.085 rads**

# Study 2: jitRun8 (~20nm)

Try looking at the spread of Q/I with time. Colour coded with triggers 1:400.

Compare to the calibration for calculating theta – fit to calibration plotted in black.

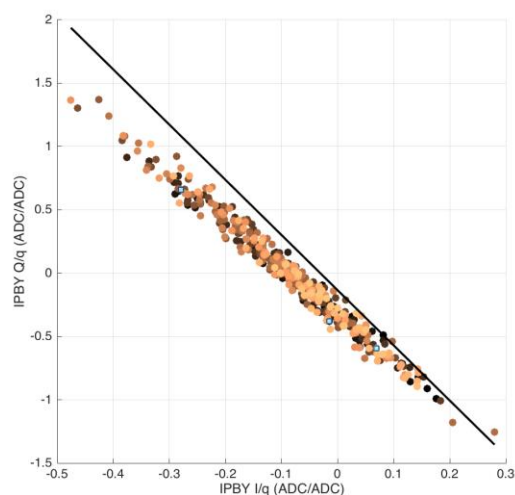


## IPA

Calibration theta: -0.976 rads

JitRun theta: -0.943 rads

Delta theta: 0.033 rads

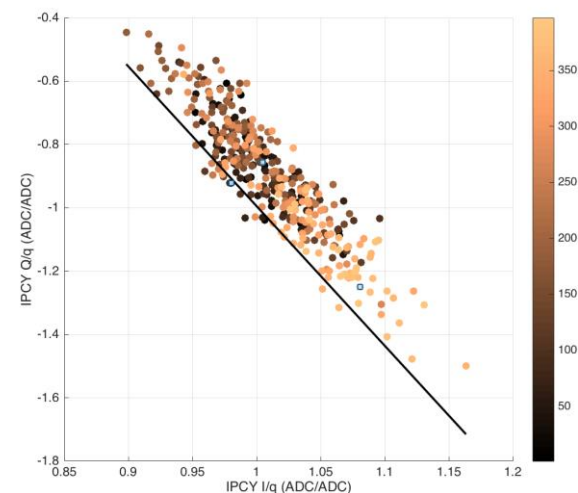


## IPB

Calibration theta: -1.345 rads

JitRun theta: -1.306 rads

Delta theta: 0.039 rads



## IPC

Calibration theta: -1.348 rads

JitRun theta: -1.3296 rads

Delta theta: 0.018 rads