



ATF2 June Shifts 2

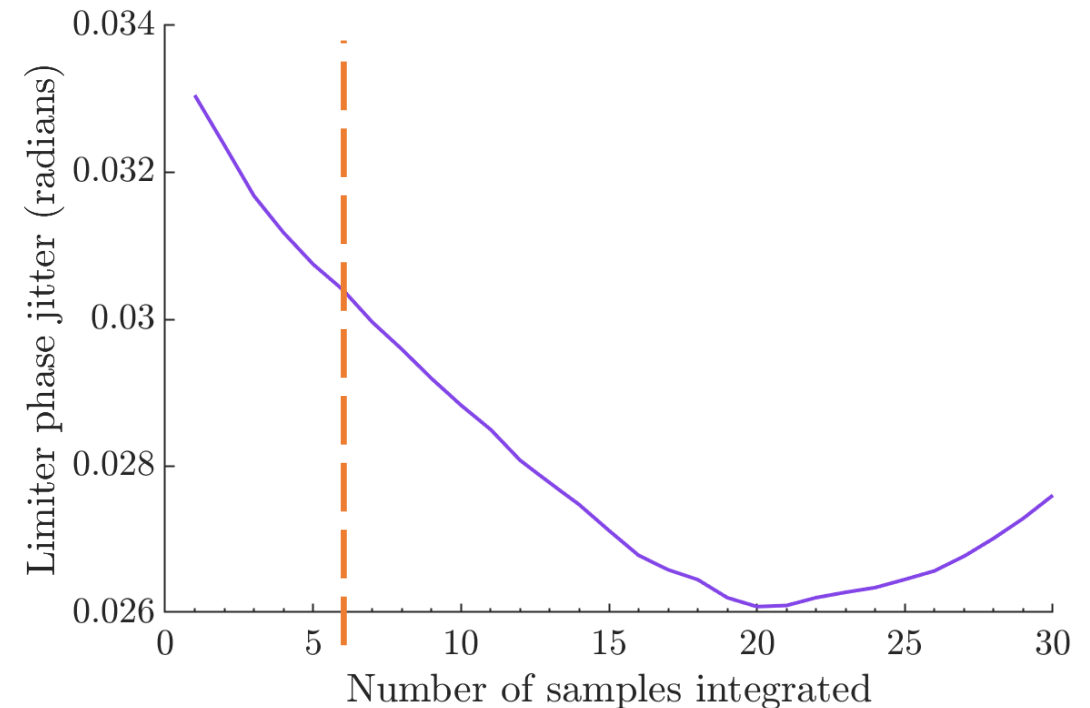
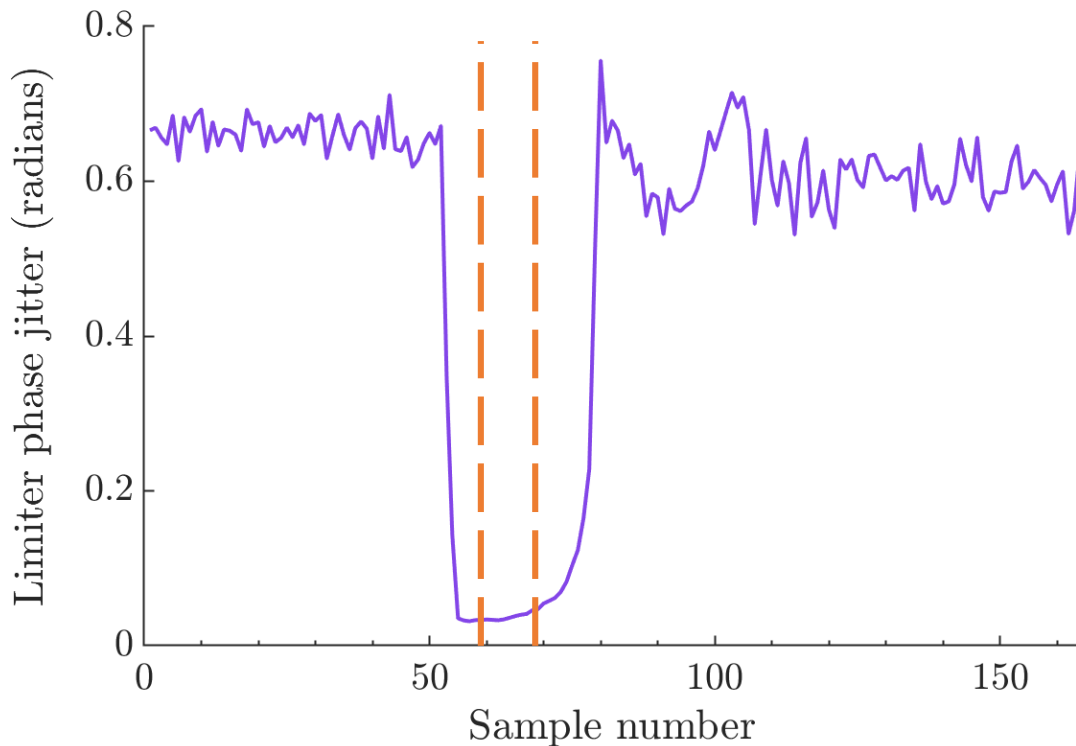
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Friday, 6th July 2018

Limiter Phase as a Function of Sample Number

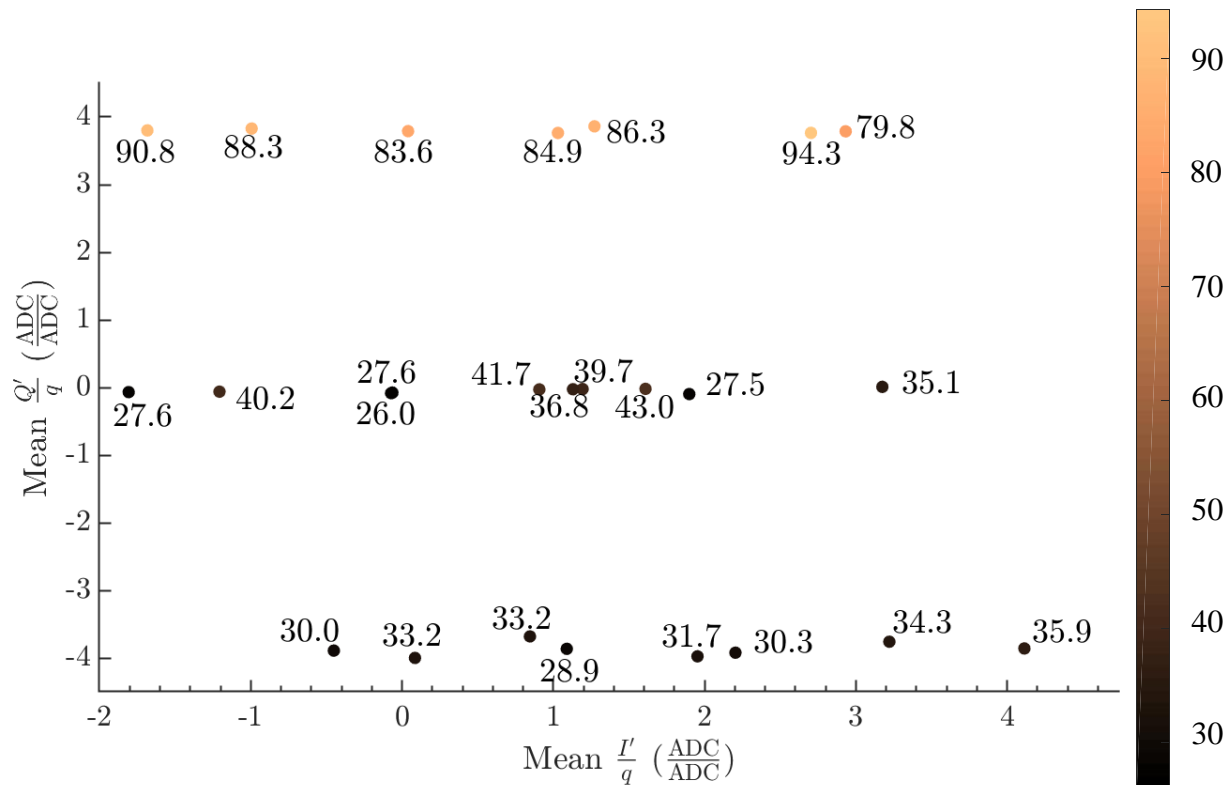
Limiter phase jitter as a function of sample number and of number of samples integrated (starting at the first sample we would use in an integration window – sample 59).

For best resolution samples 59:64 used – shown in dashed orange lines.

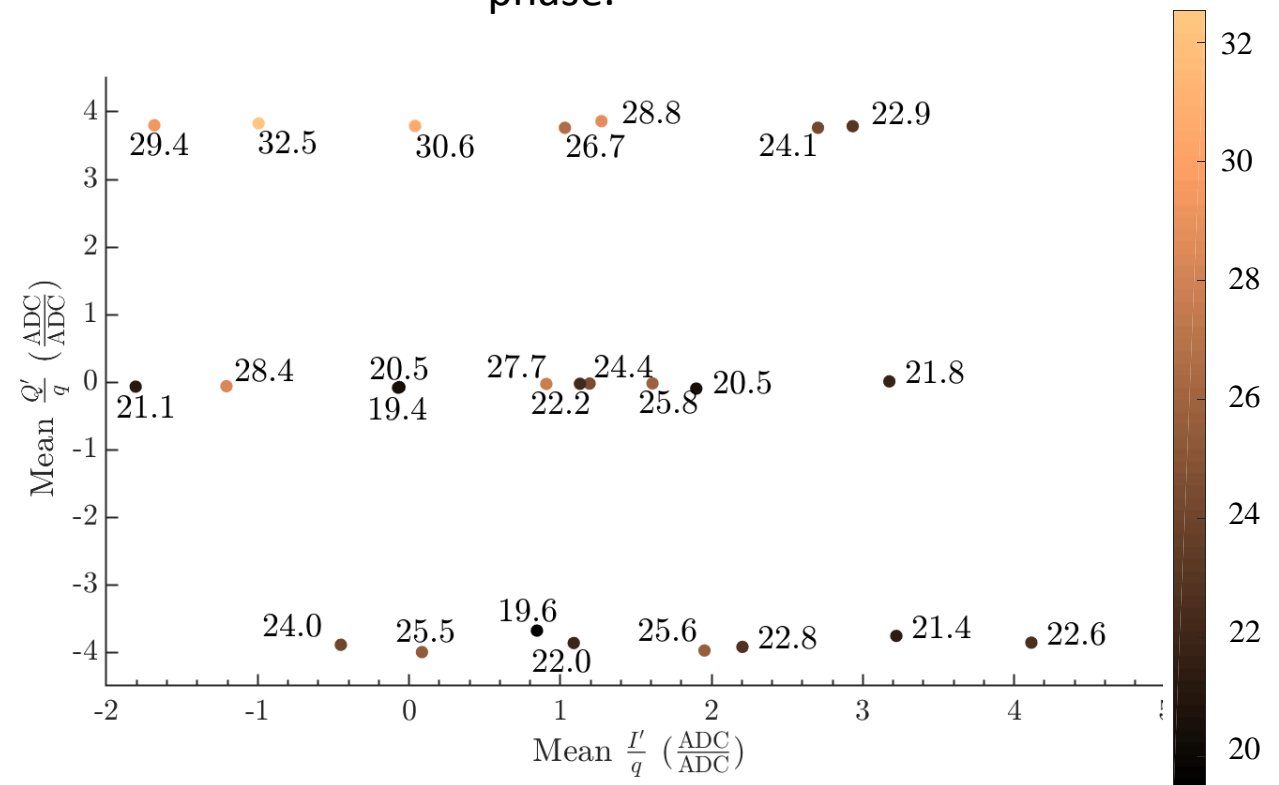


Resolution as a function of position and angle

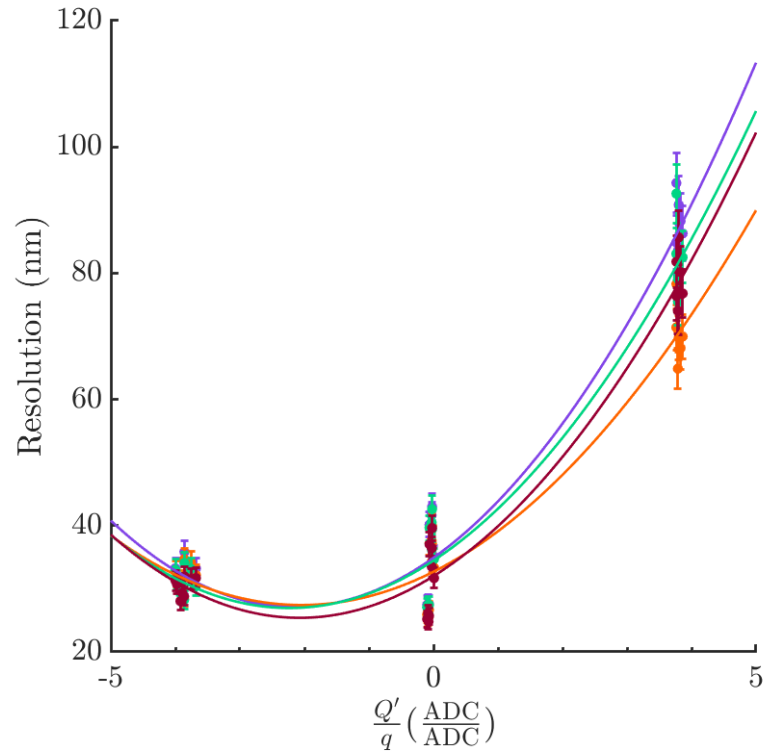
Geometric resolution (nm) as a function of position (x axis) and angle (y axis)



Fitted resolution (nm) as a function of position (x axis) and angle (y axis), fitting to position, angle and charge in x and y as well as limiter phase.



Resolution vs. Q'/q

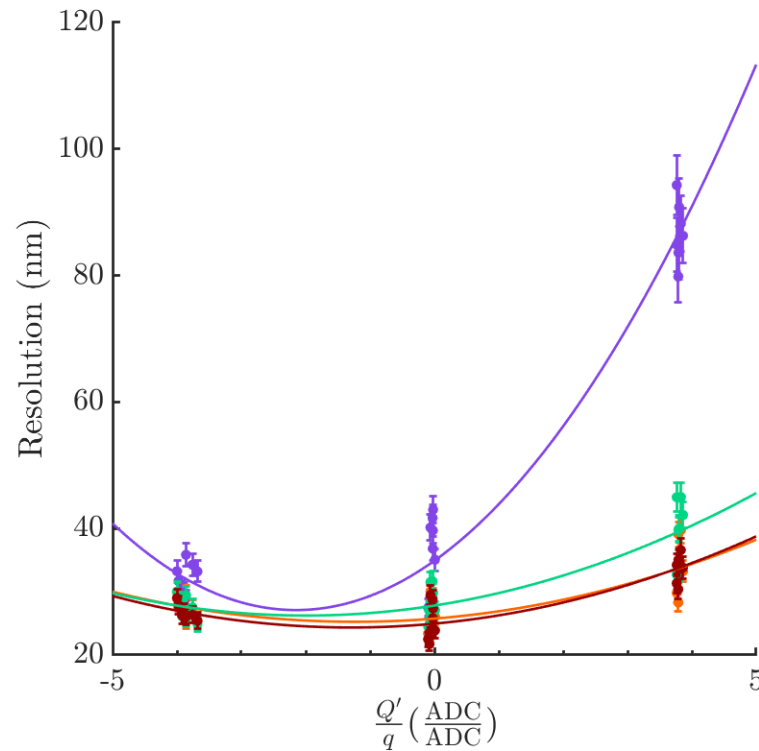


Geometric resolution

IPA Fit to position

IPB Fit to position

IPC Fit to position



Geometric resolution

IPA Fit to position and angle

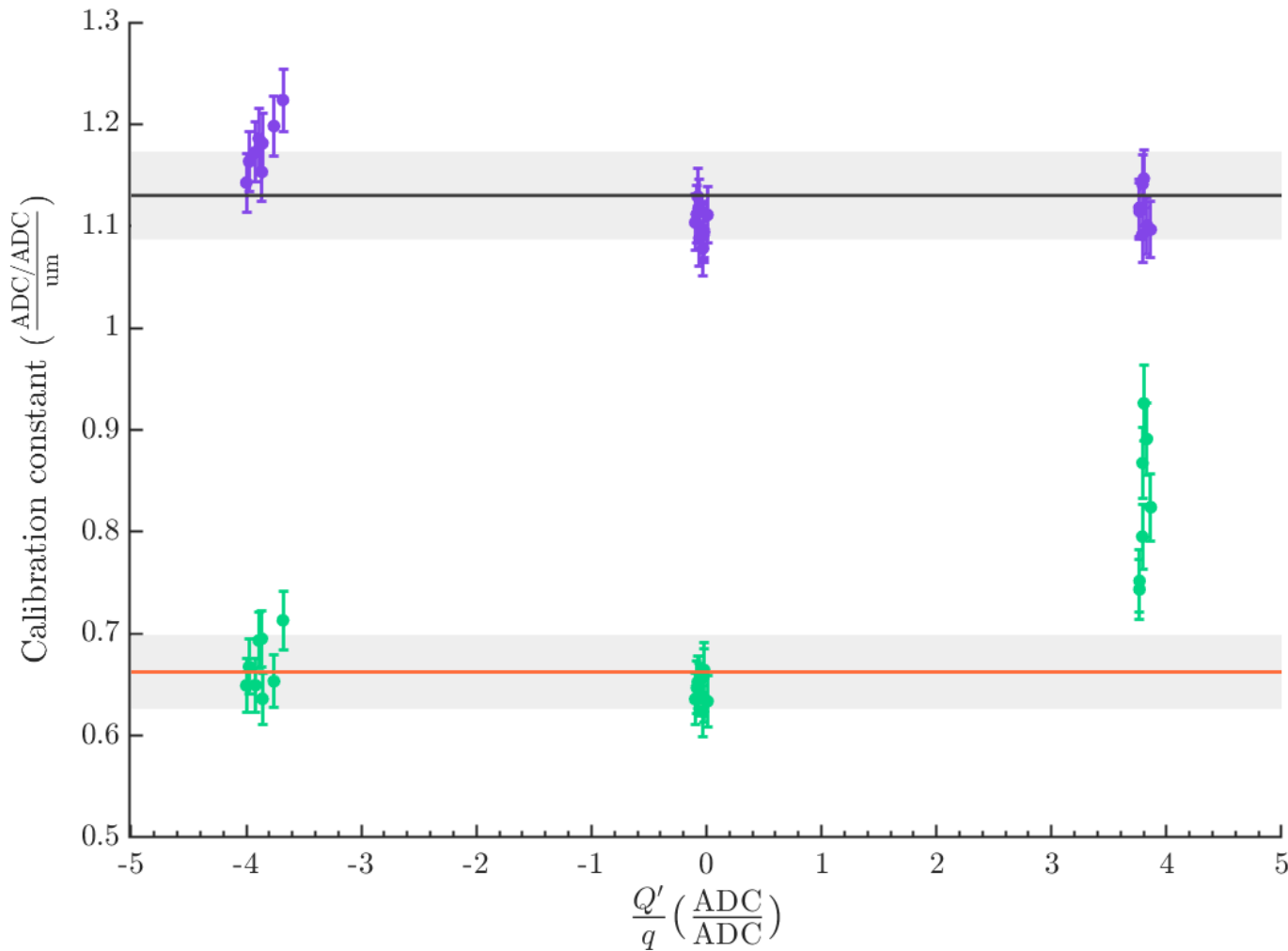
IPB Fit to position and angle

IPC Fit to position and angle

It is possible to reduce the impact to the resolution by fitting to Q'/q but not possible to fully eliminate the effect.

Fitting to l'/q offers some improvement as the fitted calibration constant is different for the extreme Q'/q settings.

Fitted calibration constant during scan

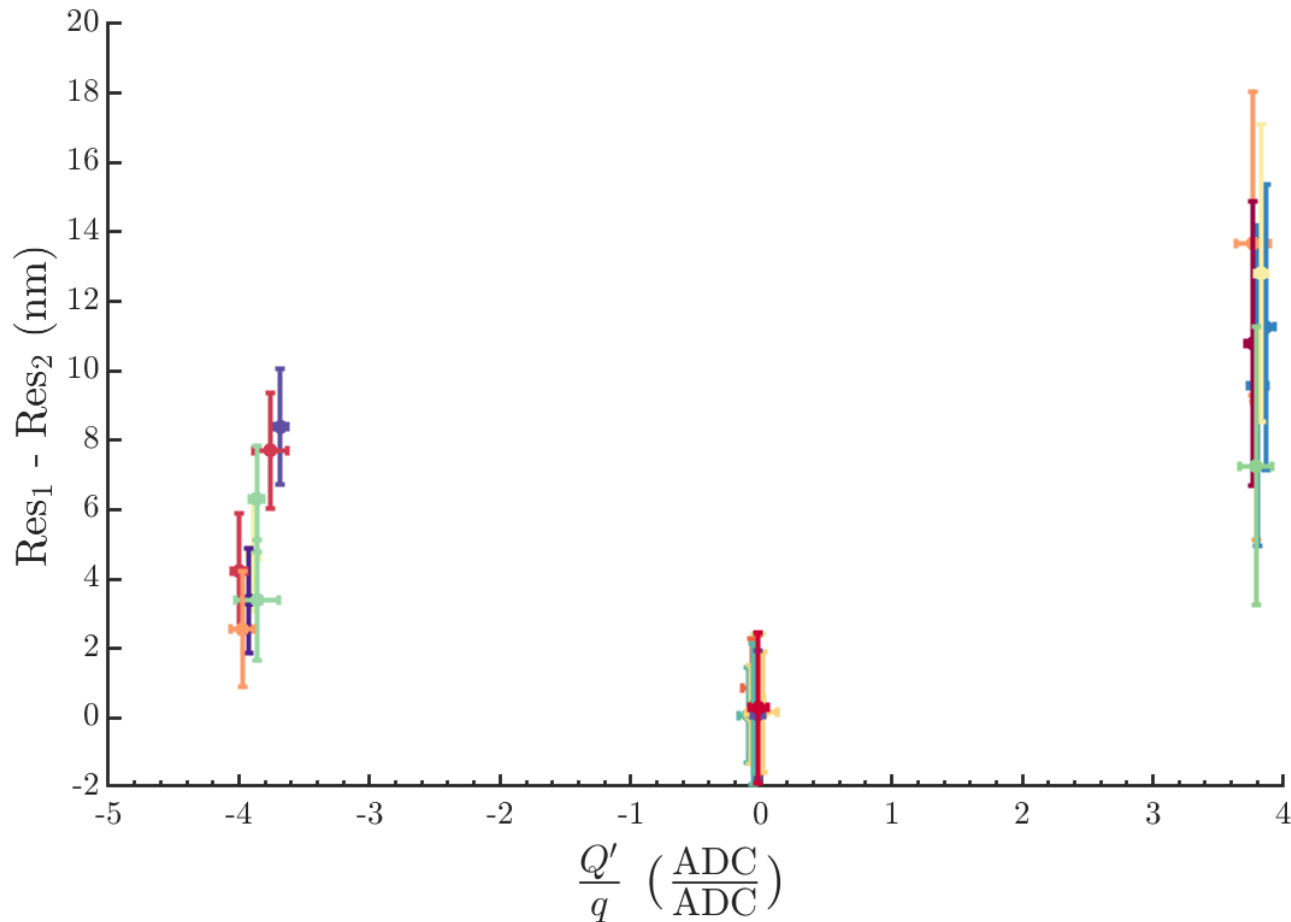


Comparing calibration constants with the calibration constants obtained by fitting to the bunch position.

IPA and IPC fitted calibration constants from fitting for IPB.

Black and orange lines show calibration constants determined by usual calibration and the grey bands are the errors from this fit.

Improvement to resolution from fitting limiter phase



- Fitting to position compared with fitting to position and limiter phase. Res1=fitting to position.
- Res2=fitting to position and limiter phase.
- As expected from:

$$y = \frac{I'}{q} + \frac{Q'}{q} \times \delta\theta_{IQ}$$

Error on the
resolution

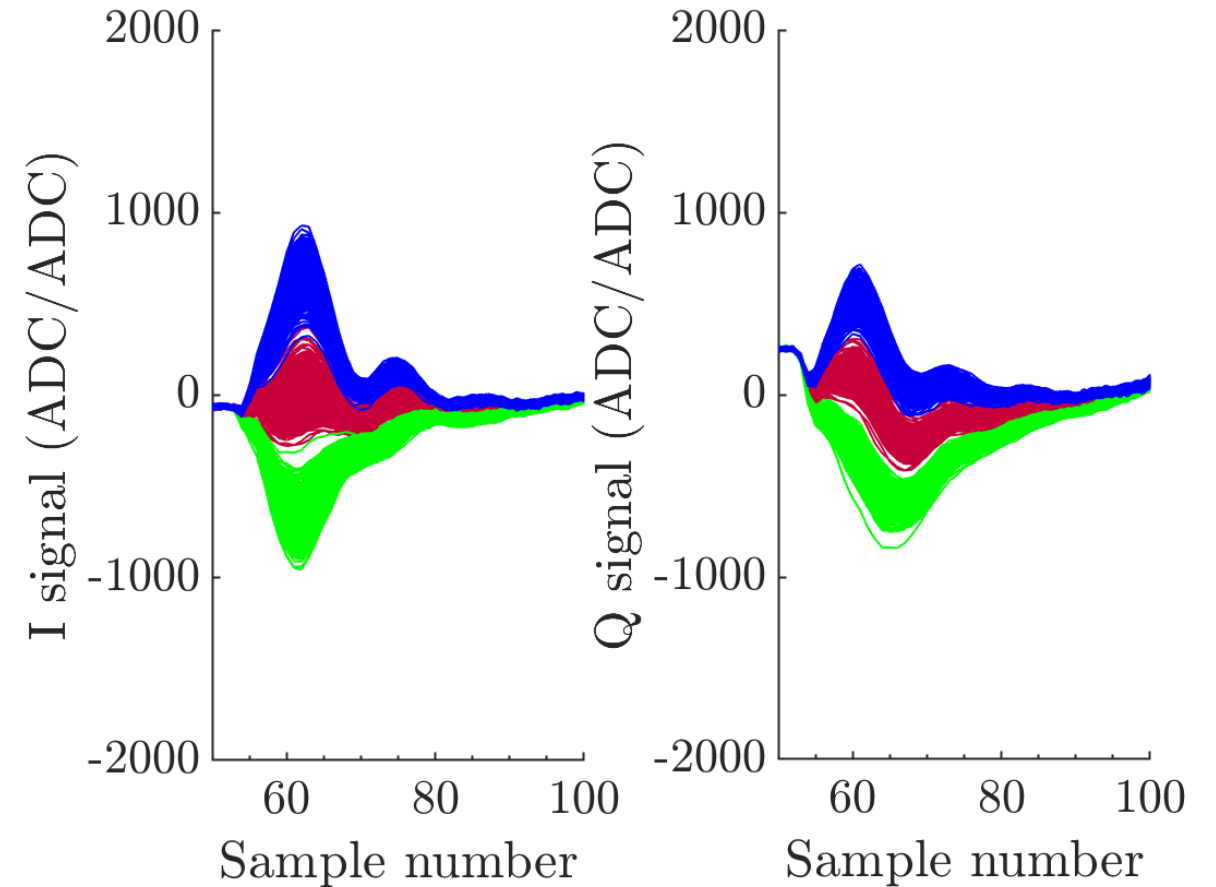
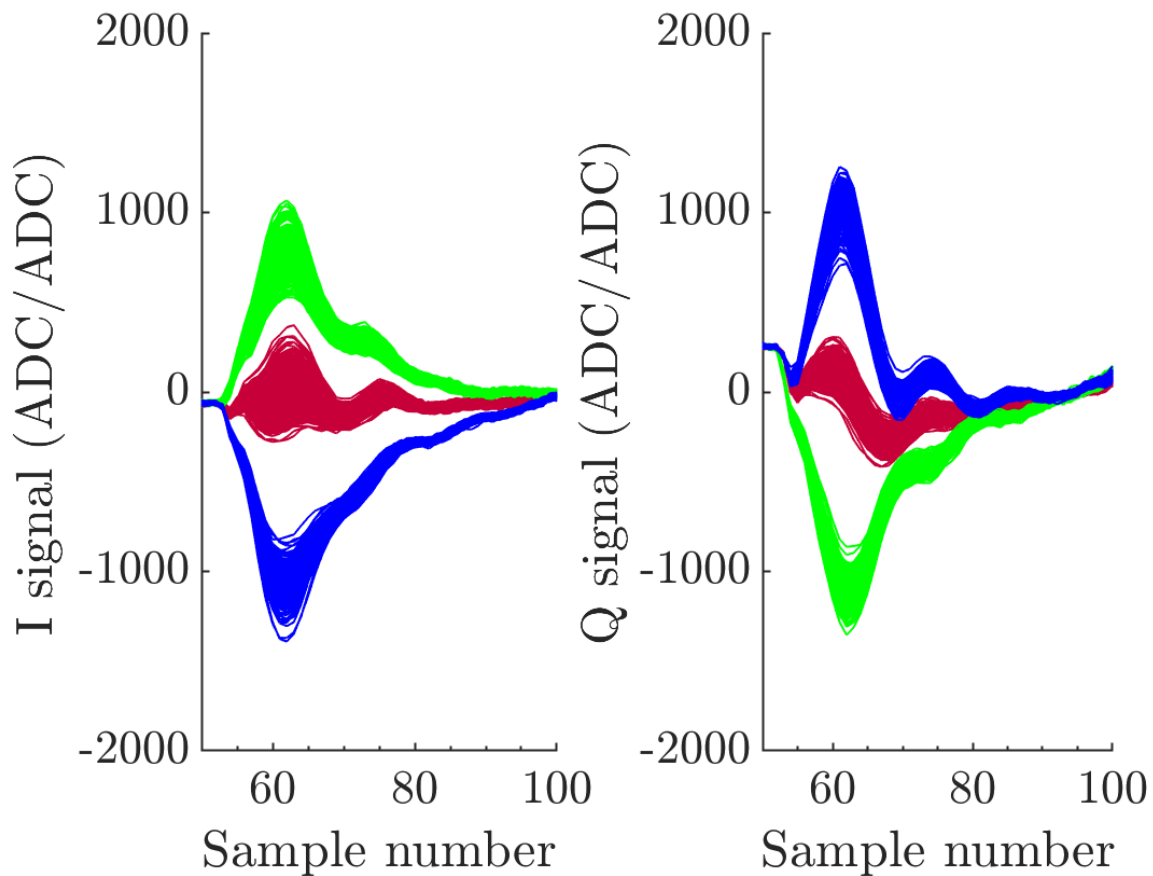
Covariance of
the two vectors
of residuals

$$\sigma_f \approx |f| \sqrt{\left(\frac{\sigma_A}{A}\right)^2 + \left(\frac{\sigma_B}{B}\right)^2 - 2\frac{\sigma_{AB}}{AB}}$$

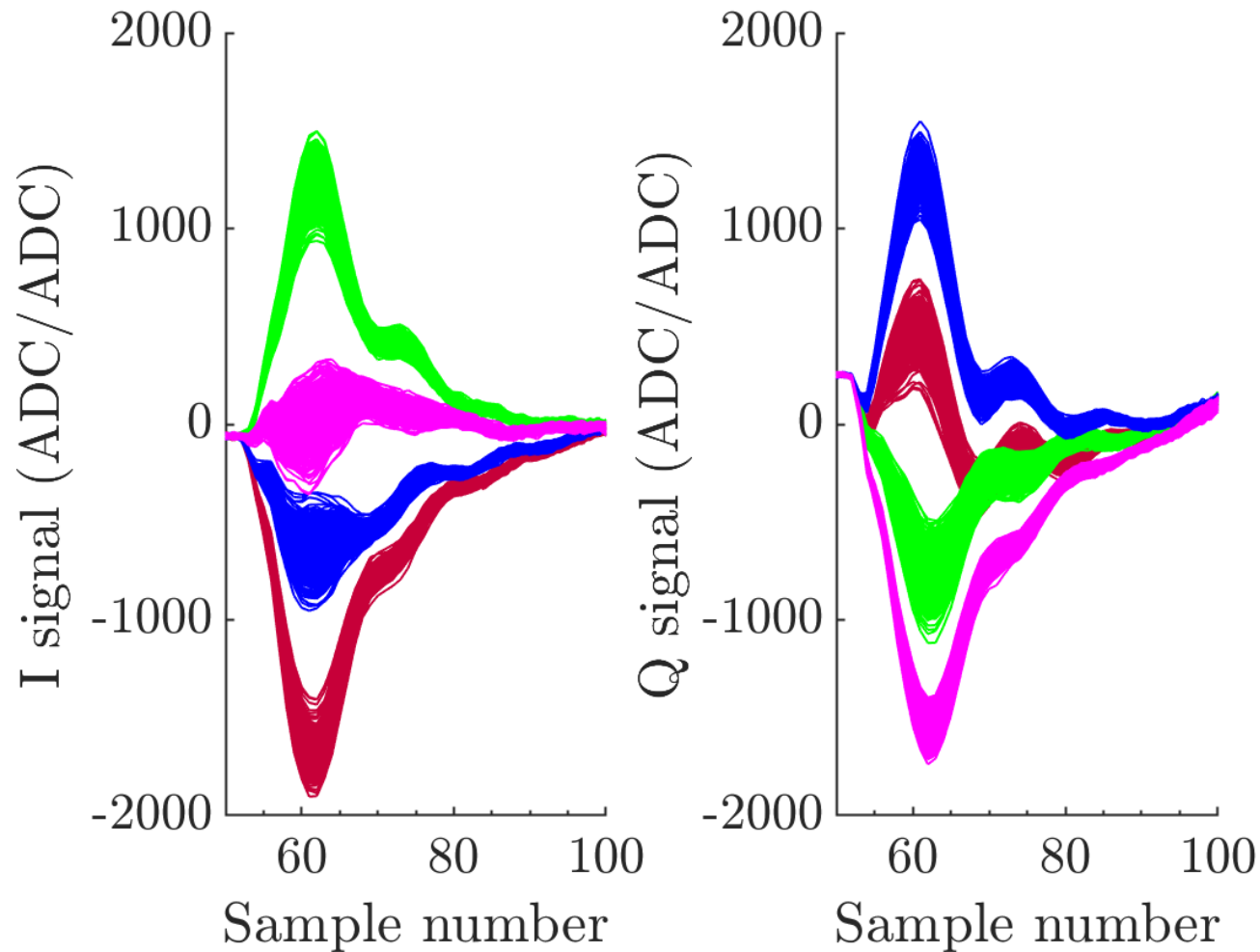
Scan of positions and tilts

- Min pos
- Nom pos
- Max pos

- Min tilt
- Nom tilt
- Max tilt



Scan of positions and tilts



Position and tilt scan

- Min pos, min tilt
- Min pos, max tilt
- Max pos, min tilt
- Max pos, max tilt

Bowtie shape as a function of number of samples integrated
Plotted: I/q and Q/q divided by number of samples integrated.

