EICROC 0 update

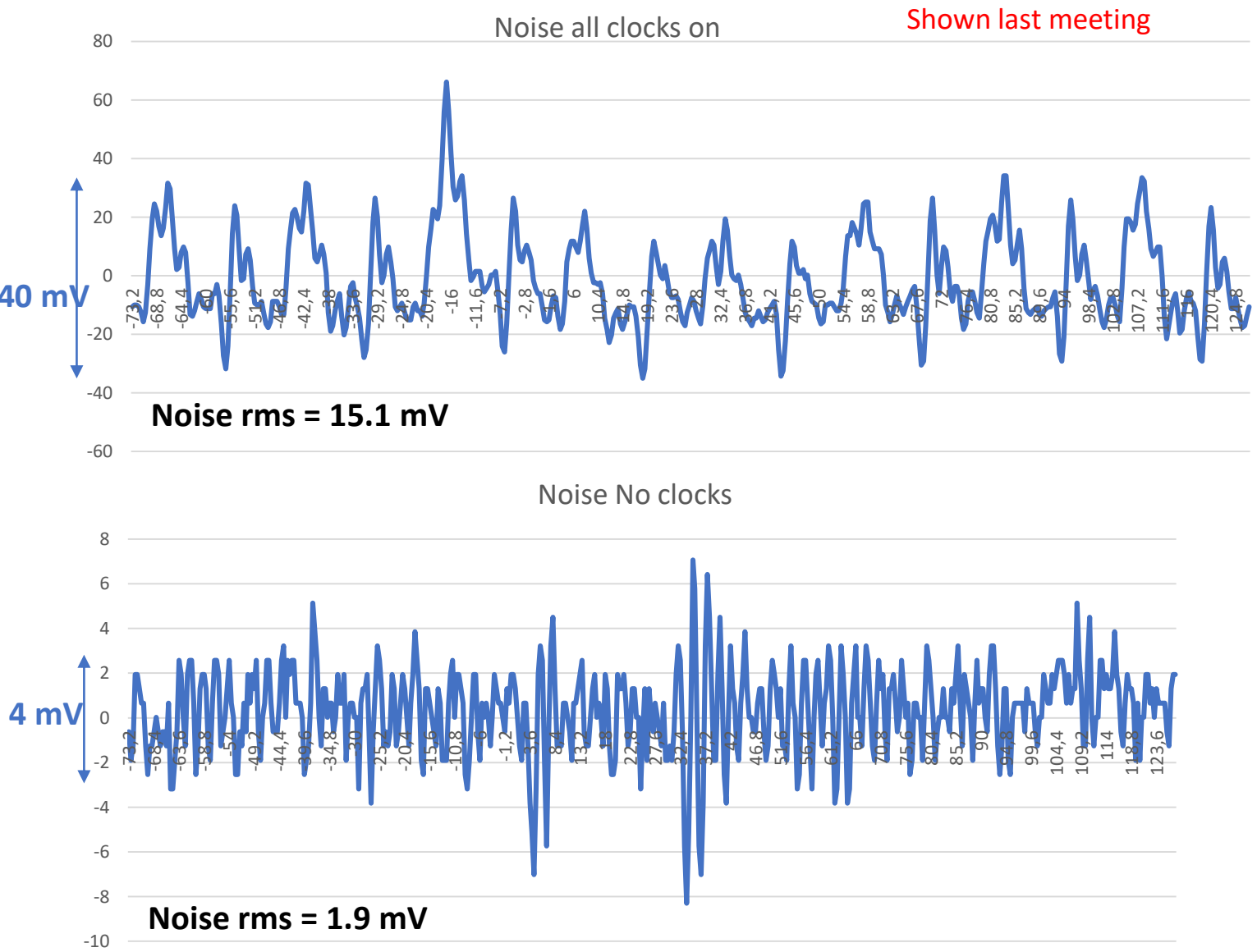
Measurements since last meeting :

- Noise on probe preamp

- A bit more on TDC jitter/performance

- Start to look at ADC data.

Probe output noise



Large noise on probe PA output

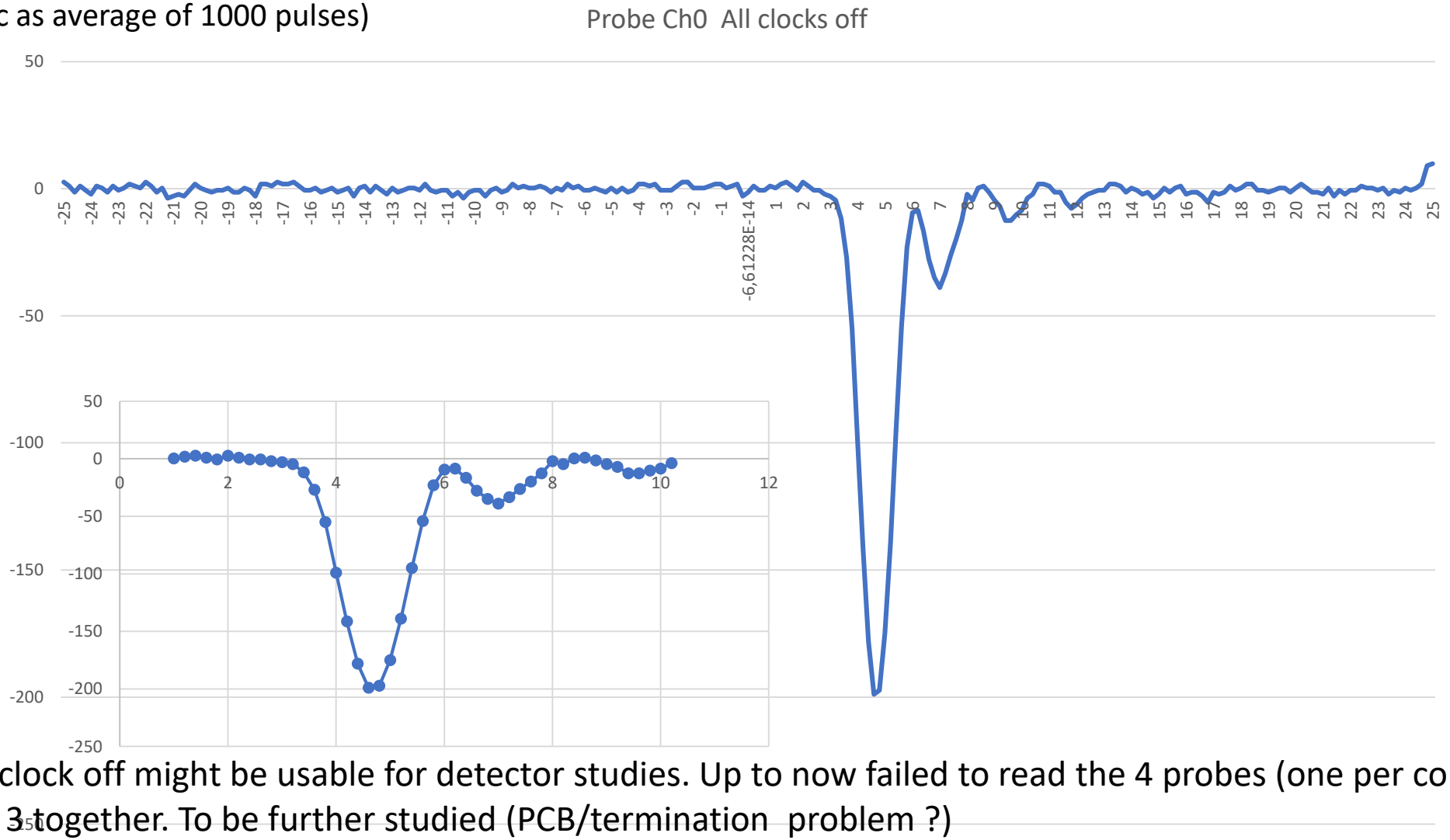
Dominate by digital activity and 160 MHz clock

With clock off, noise at expected level (2 mV)

Couplings not yet understood from layout/simulation.

Probe PA output with clocks off

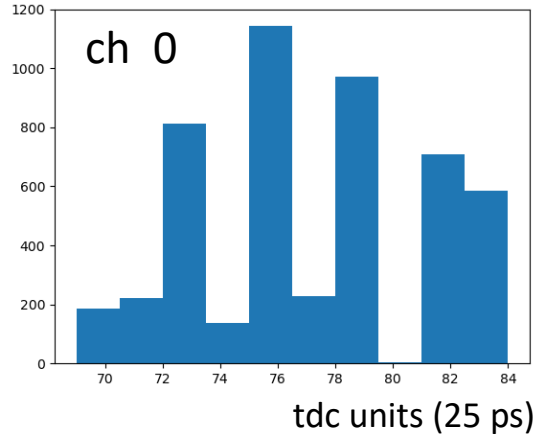
Clean pulse, a bit of ringing : amplitude = 199 mV Noise = 1,6 mV
With 0.8 ns rise time, I would expect a of 0.8 / (199/1.6) = 6 ps !!!!
(A bit optimistic as average of 1000 pulses)



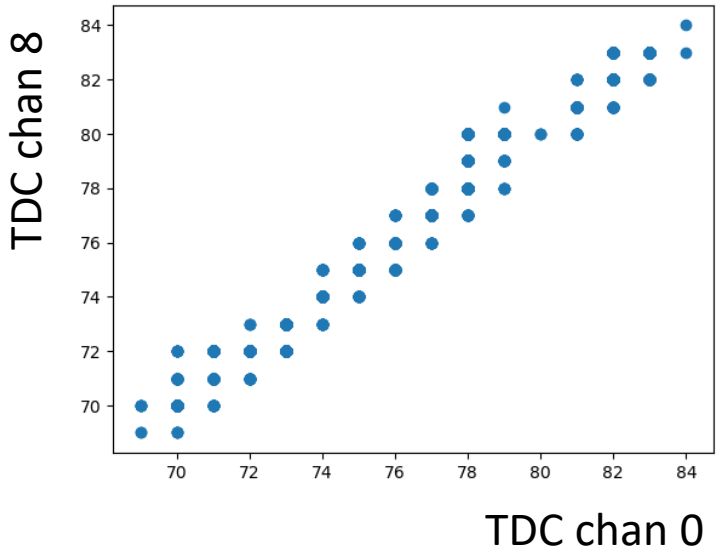
Probe PA with clock off might be usable for detector studies. Up to now failed to read the 4 probes (one per column) together., only 3 together. To be further studied (PCB/termination problem ?)

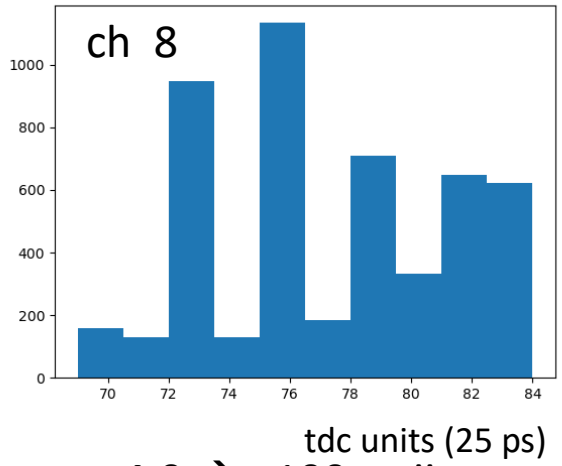
TDC resolution

Pulsed simultaneously a few channels

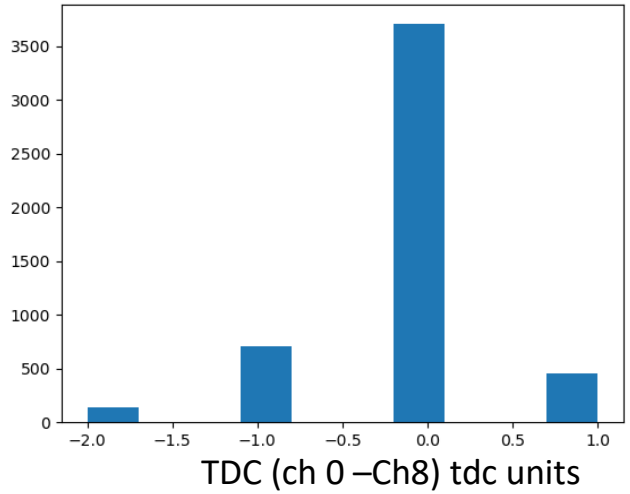


rms = 3.9 → 98 ps jitter





rms = 4.0 → 100 ps jitter



Individual channel jitter large due to digital noise but strongly correlated between channels.

TDC channel difference rms :

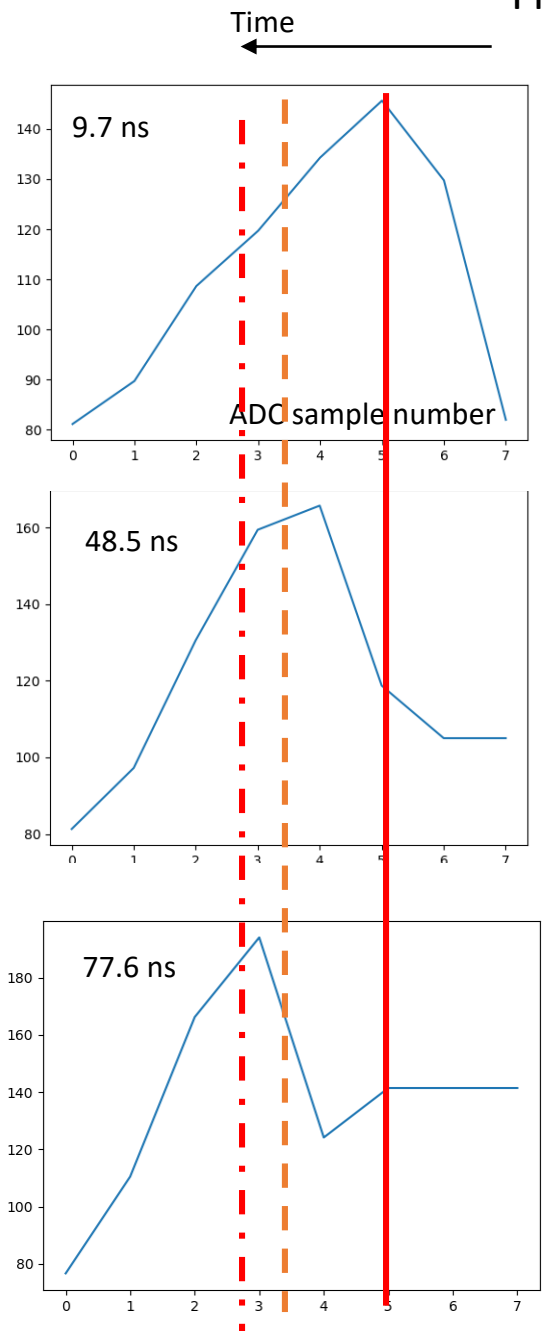
0.5 tdc → 12.5 ps

For individual channel, 12.5/sqrt(2) = 9 ps

→ Demonstrate that TDC are working as expected

→ Will redo using the external discri instead of the charge injection

First look at ADC : see some signals…..

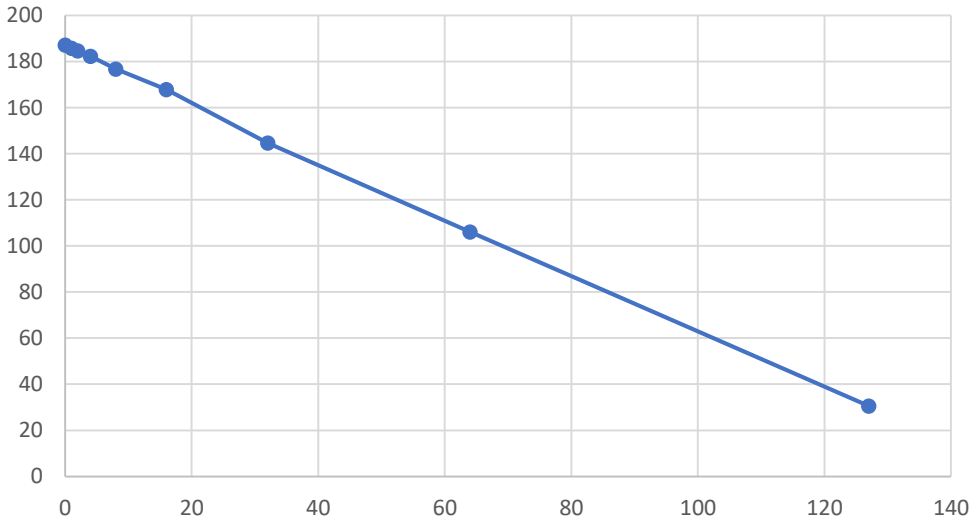


Largest charge input, averaged sample amplitude for different calib CMD pulse delay

Pulse maximum moves with delay

Pulse width larger than expected but average pulse mixed different population/noise (next slide)

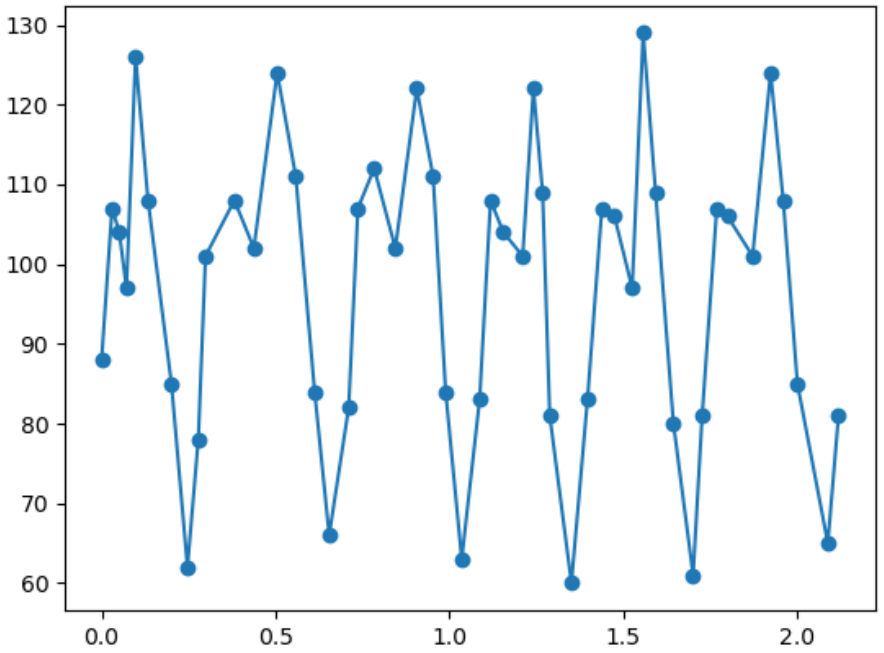
ADC pedestal (dc level) can be tuned

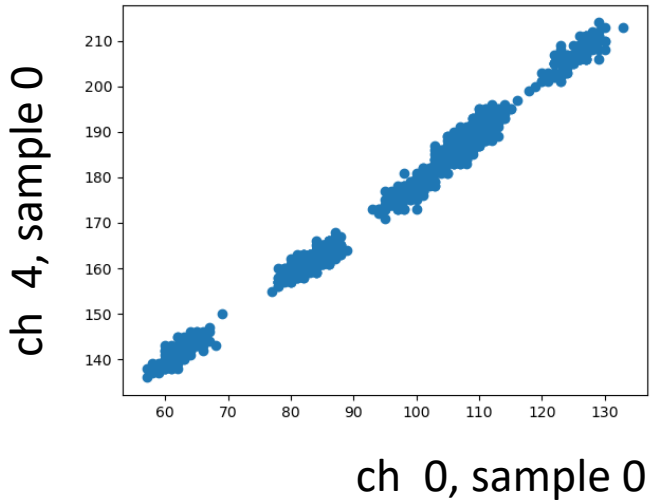


First look at ADC : and quite some noise
Sample 0 amplitude vs event time in s

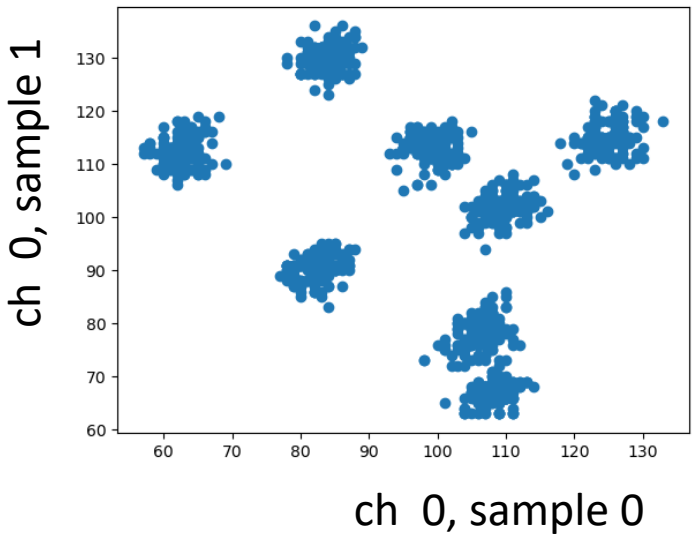
First look at ADC : and quite some noise…..

Very low frequency noise/baseline drift





Noise coherent between channels

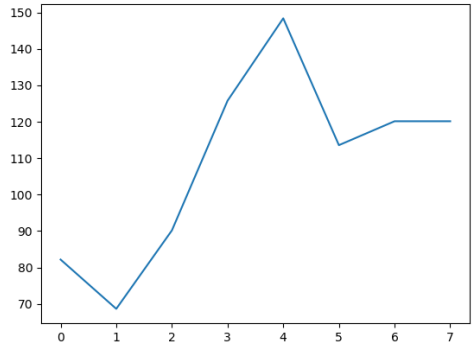


Not coherent between samples
→ 8 populations

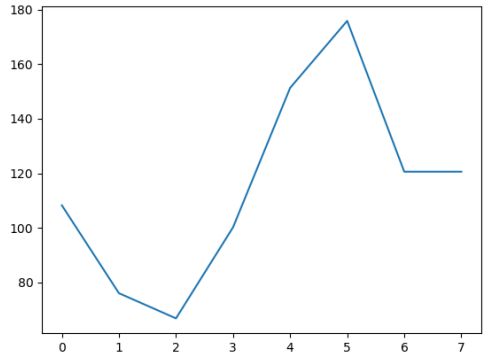
→ Switching off the 160 MHz in the TDC does not change the picture….

Average amplitude versus sample number for the 8 populations

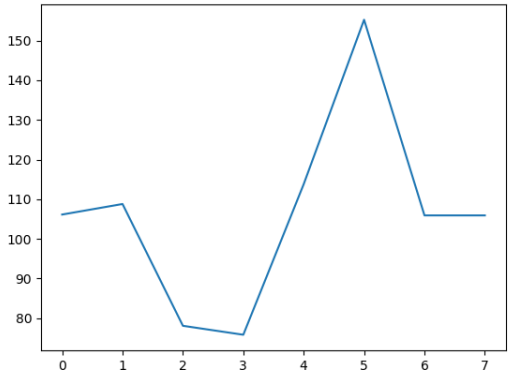
evt%0 = 0



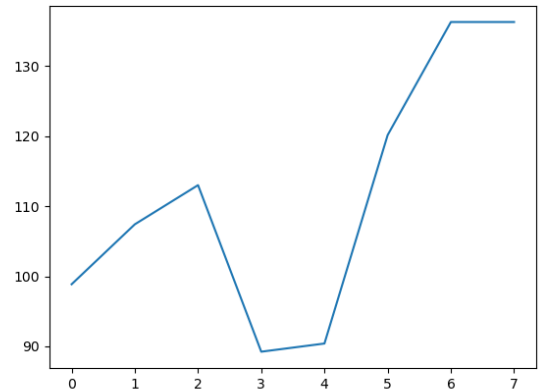
evt%0 = 1



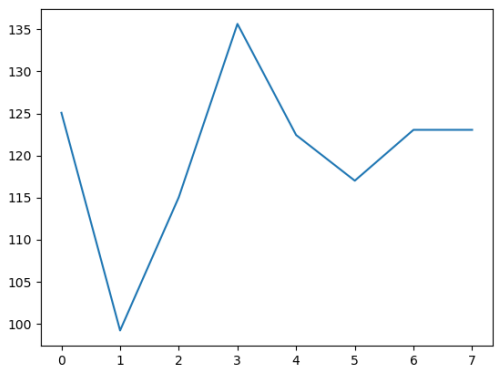
evt%0 = 2



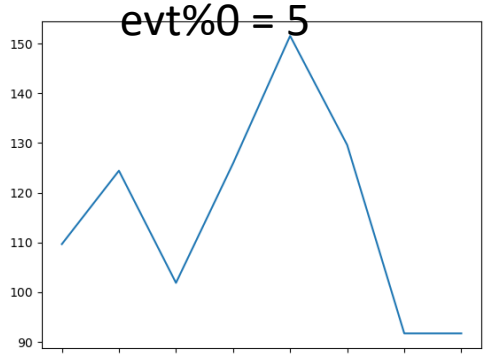
evt%0 = 3



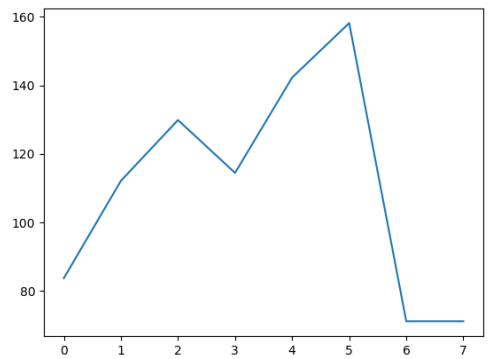
evt%0 = 4



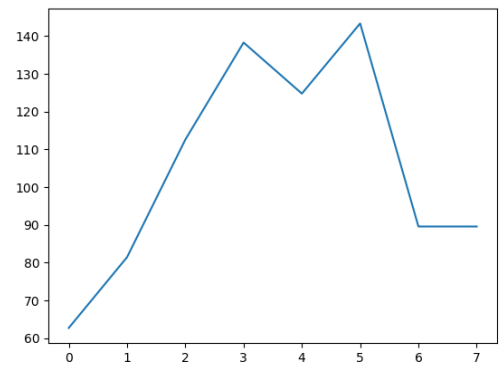
evt%0 = 5



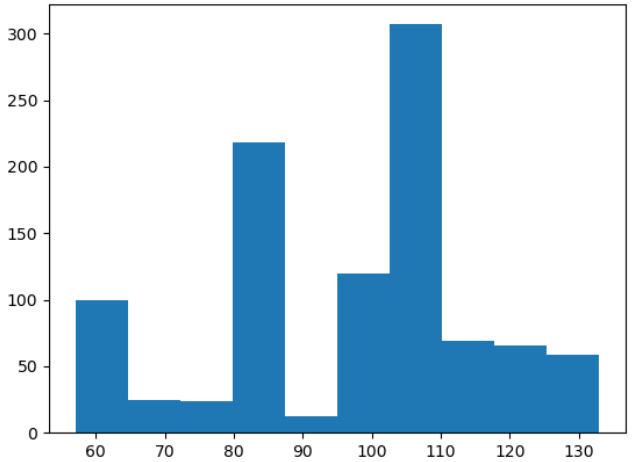
evt%0 = 6



evt%0 = 7

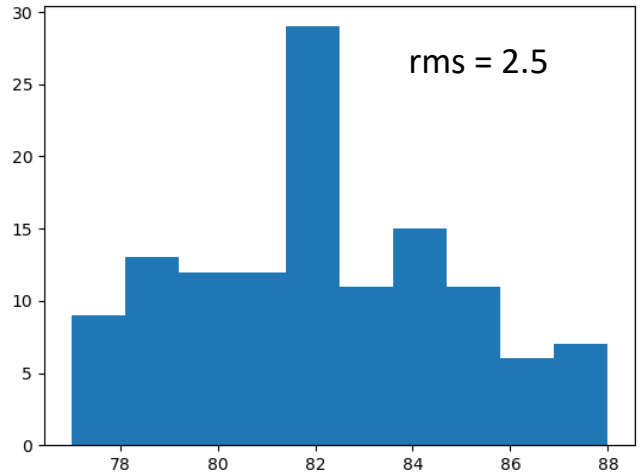


All events



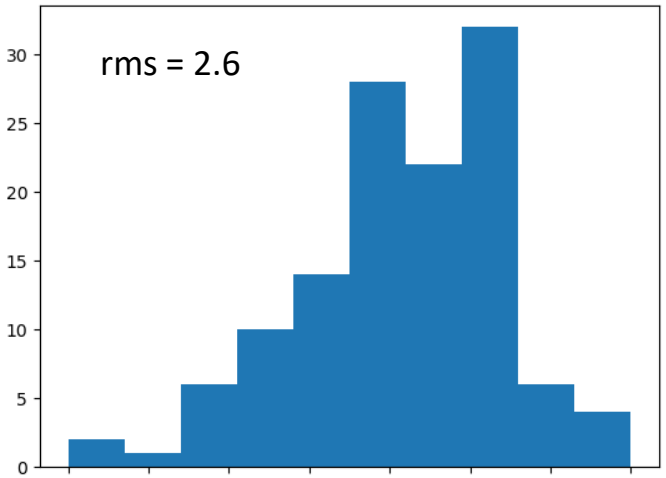
ADC sample 0

evt % 0



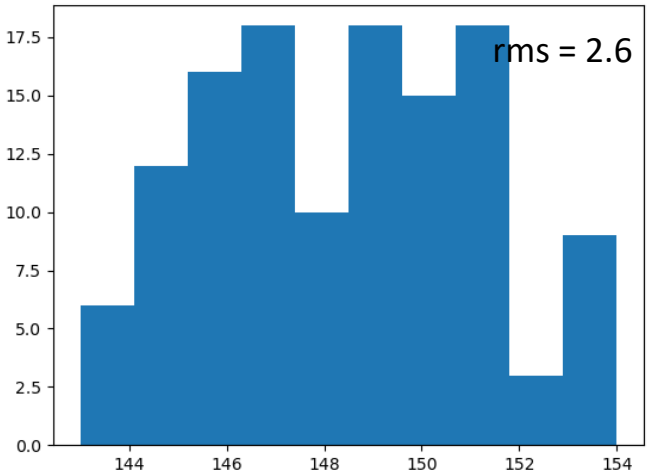
ADC sample 0

evt % 2

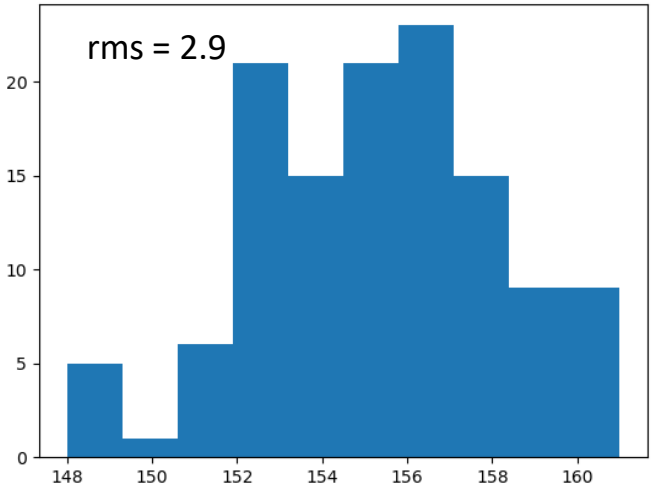


ADC sample 0

For each population noise is about 2.5 – 3 adc



ADC sample 4



ADC sample 5