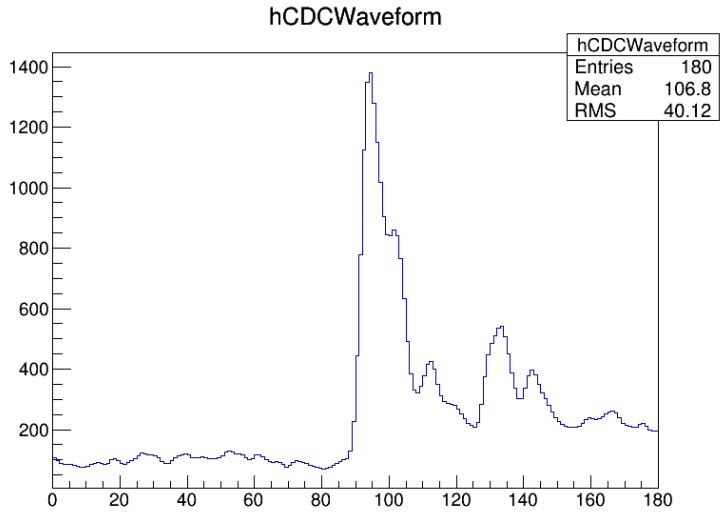
CDC Update

Run Coordination Meeting

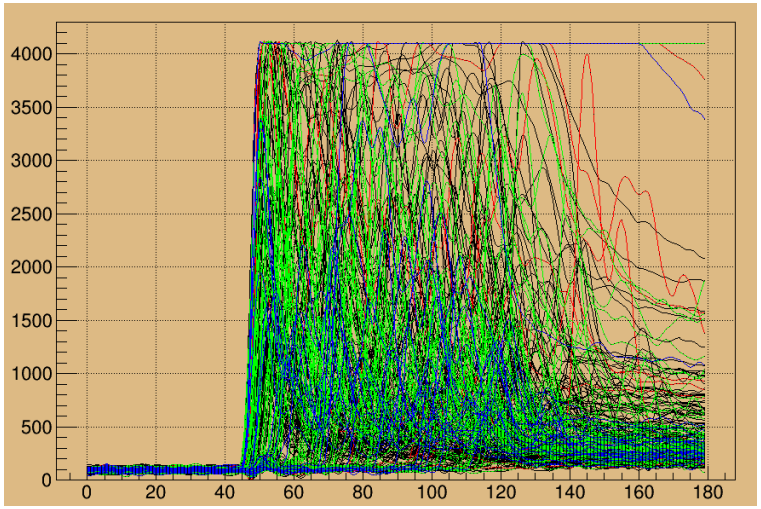
December 12, 2014

fADC125 Signals

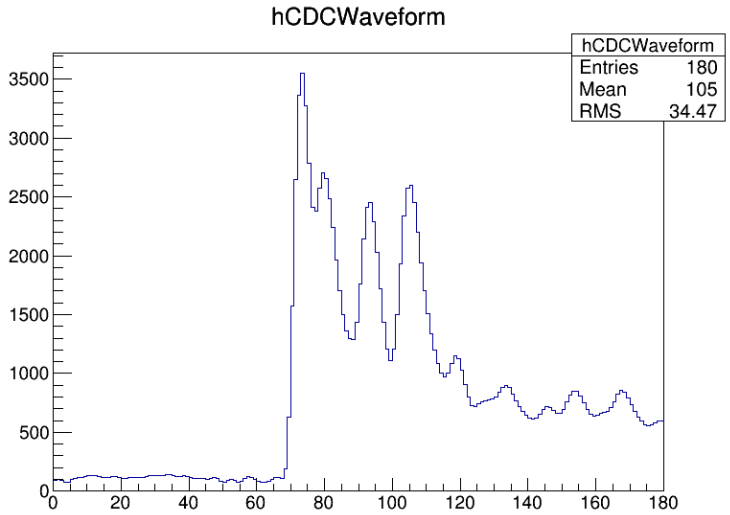
“Tagged” pion from dE/dx



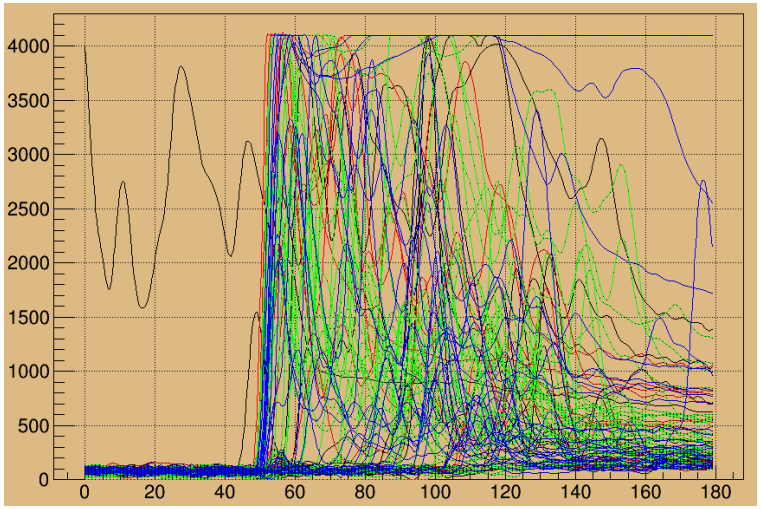
50nA 10^{-5} radiator (Run 1505)



“Tagged” proton from dE/dx

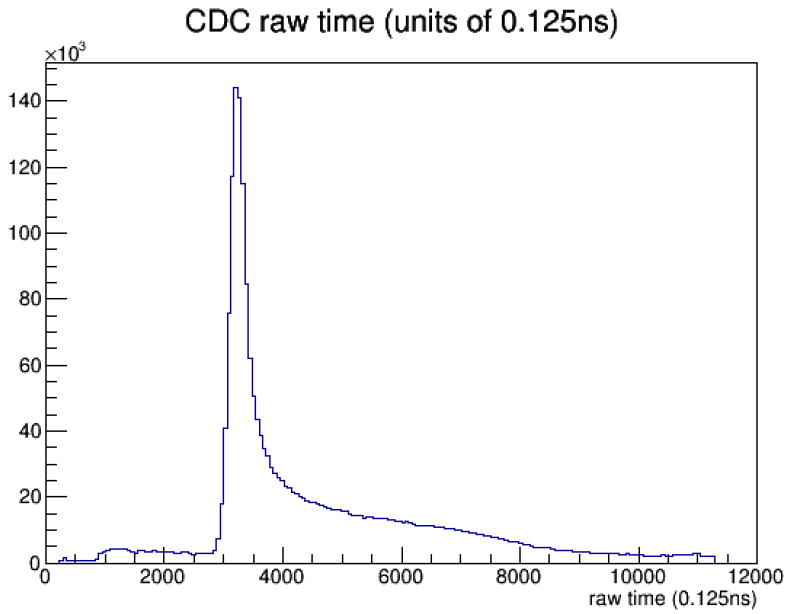


100nA 10^{-4} radiator (Run 1561)

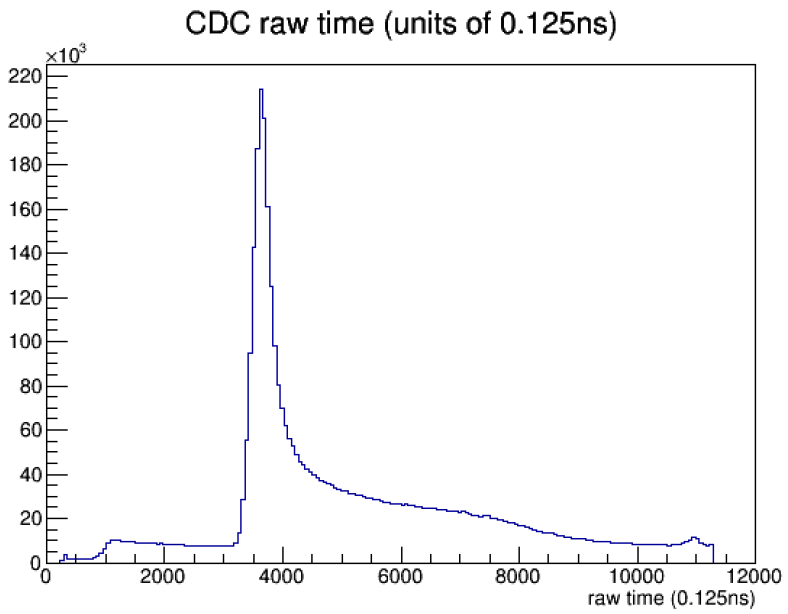


fADC125 Timing

50nA 10^{-5} radiator (Run 1505)



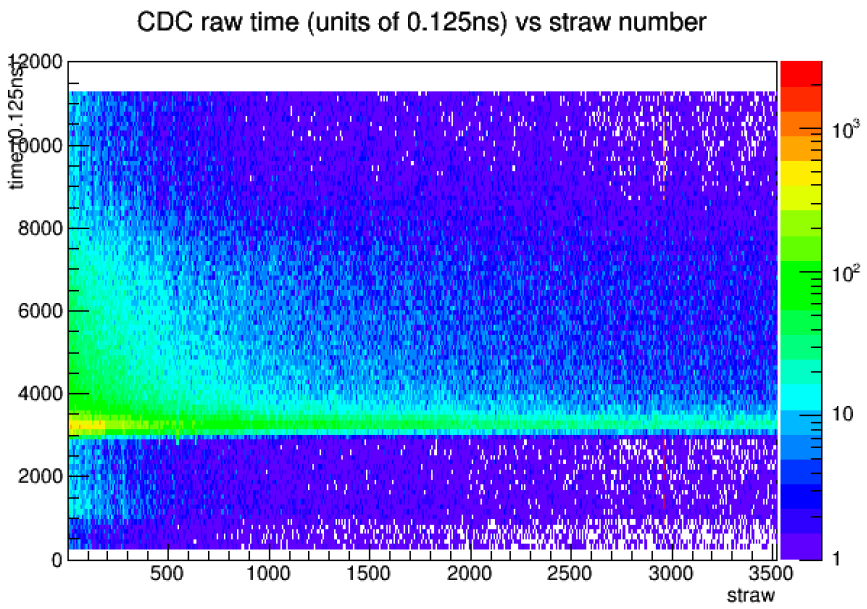
100nA 10^{-4} radiator (Run 1561)



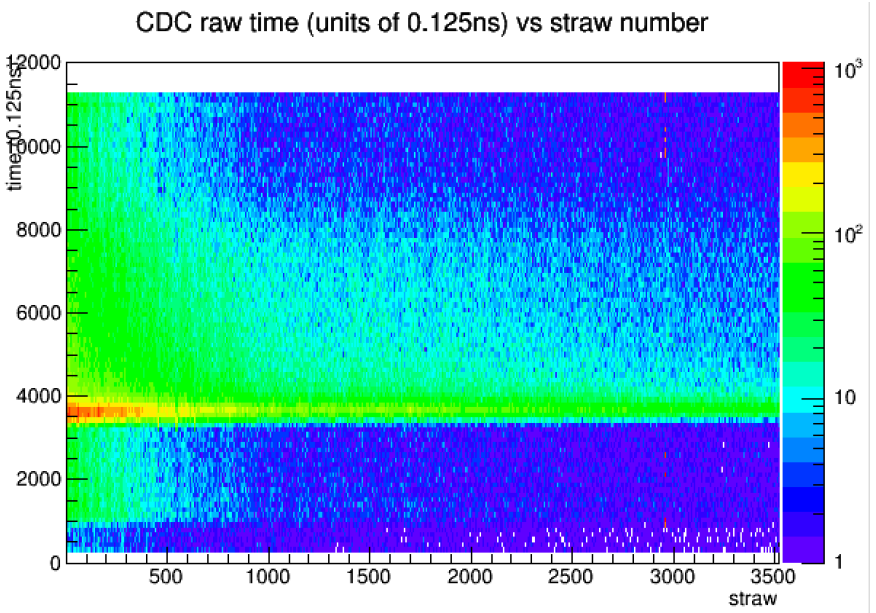
- The signals are within the window. We are capturing up to the maximum drift time.

fADC125 Timing

50nA 10^{-5} radiator (Run 1505)



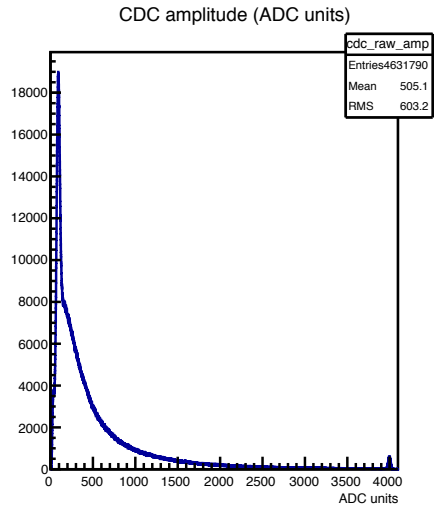
100nA 10^{-4} radiator (Run 1561)

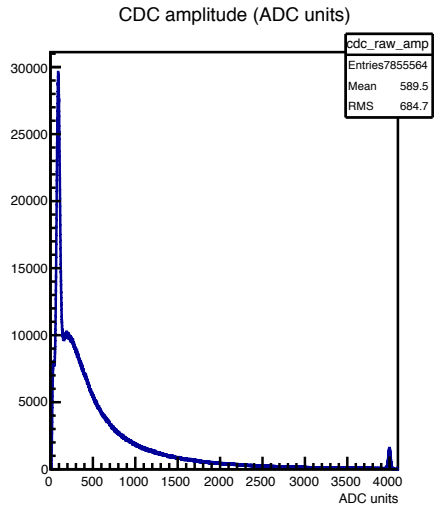


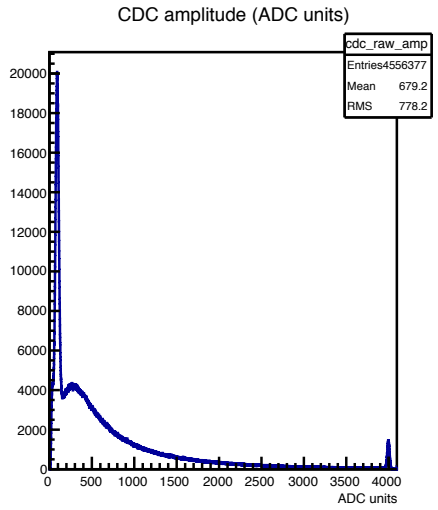
- Lots of noise in this measurement on the inner straws.

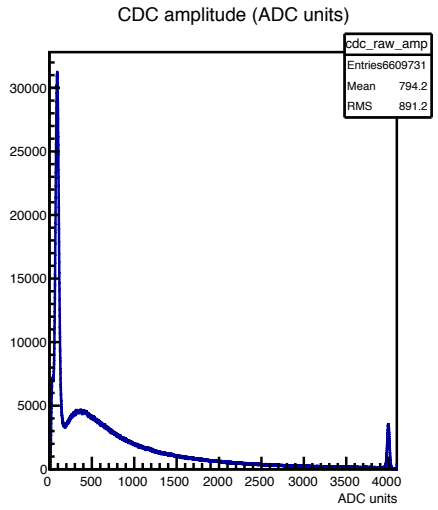
fADC125 Pulse Height

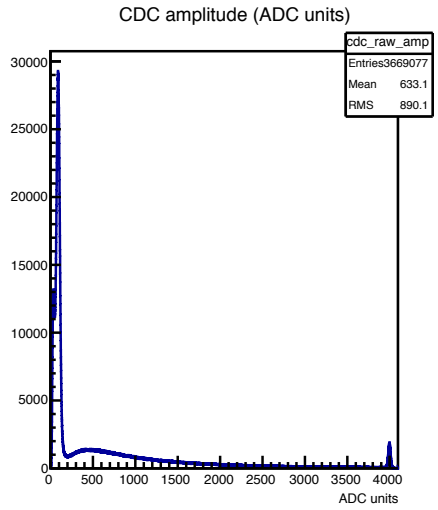
High voltage scan from 1975 to 2125 V in 25V steps

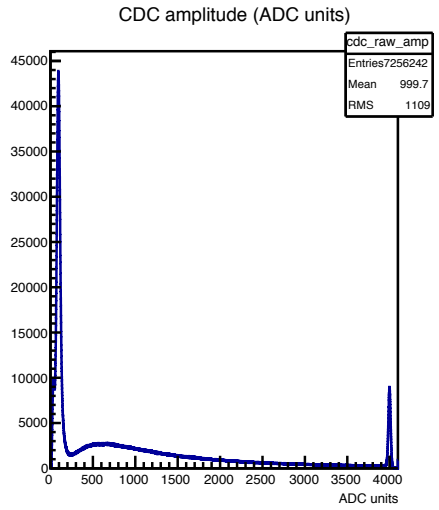


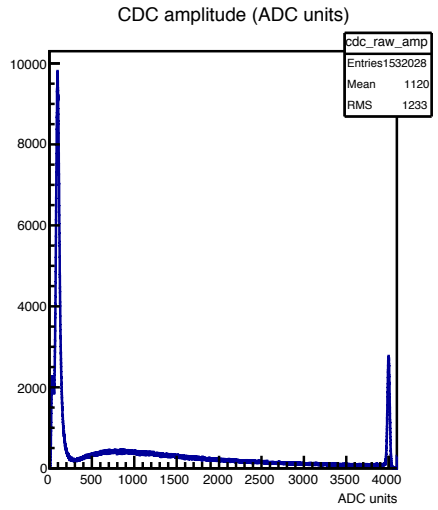








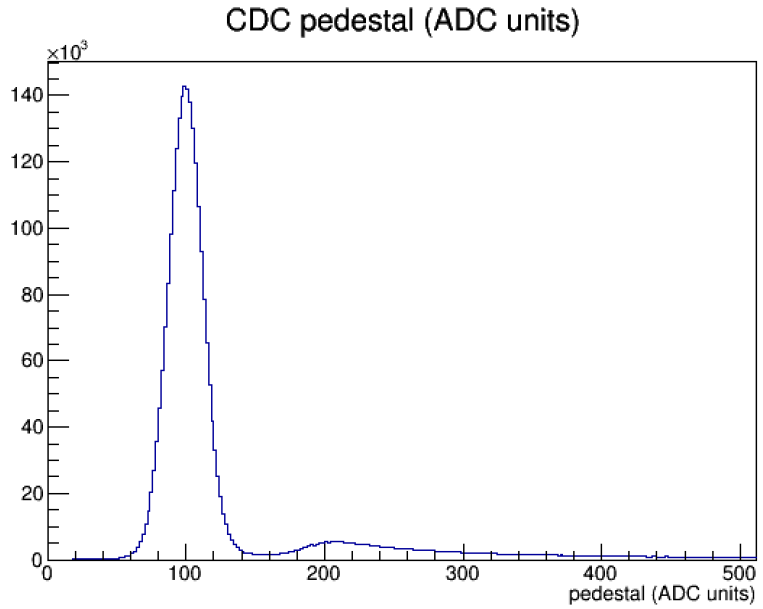




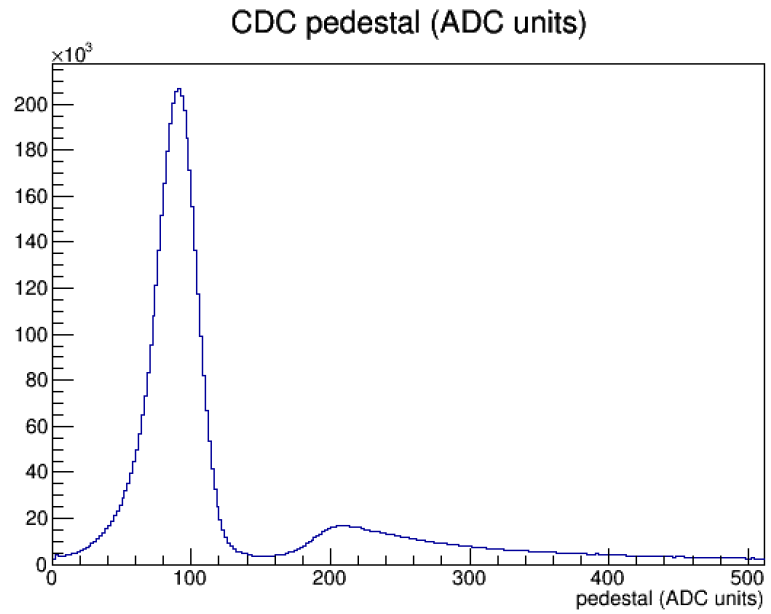
These values are higher than expected from earlier running with cosmics…

fADC125 Pedestals

50nA 10^{-5} radiator (Run 1505)



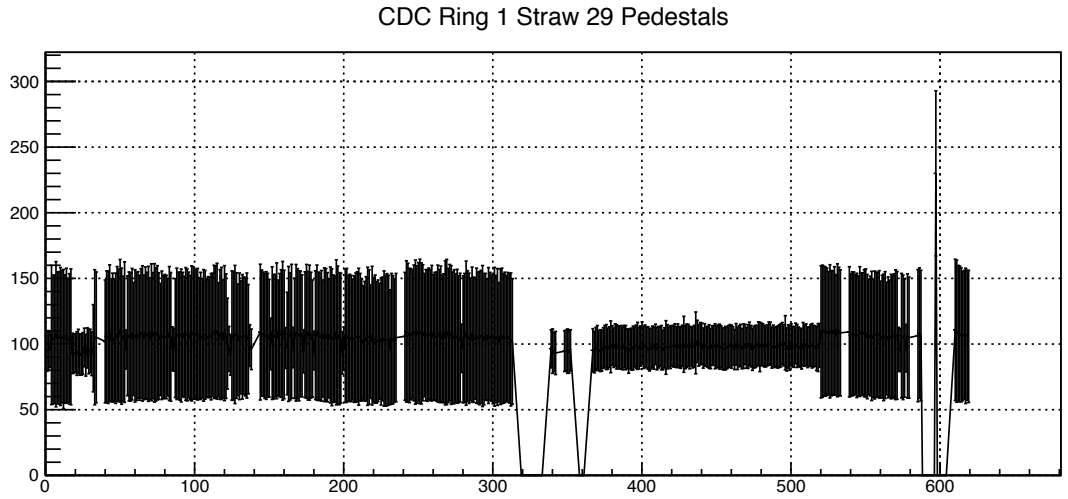
100nA 10^{-4} radiator (Run 1561)



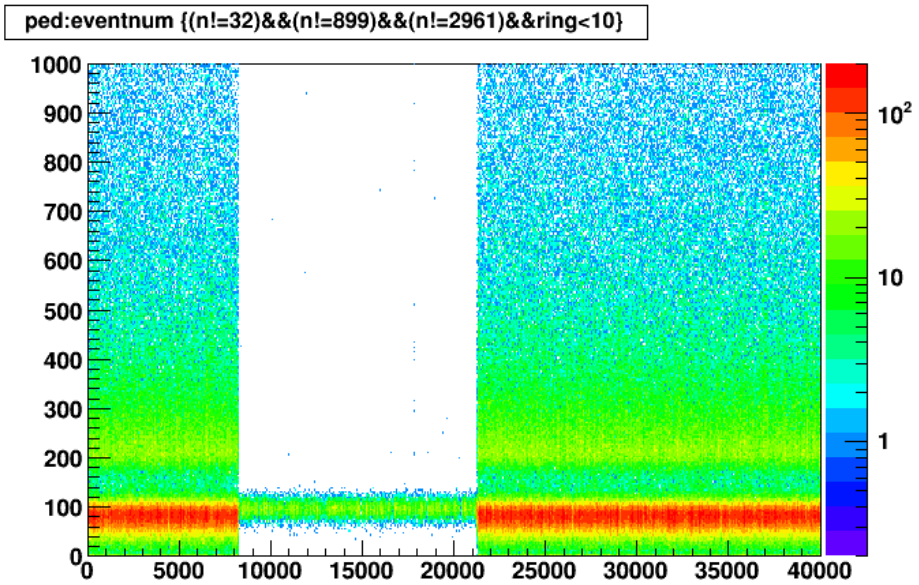
- Since our noise is so high, we are not as sensitive to small changes in the pedestal value as some other detectors. Pedestals were last set before Thanksgiving, have not drifted substantially. Weekly calibrations should be adequate, but pedestals should be monitored for outliers.

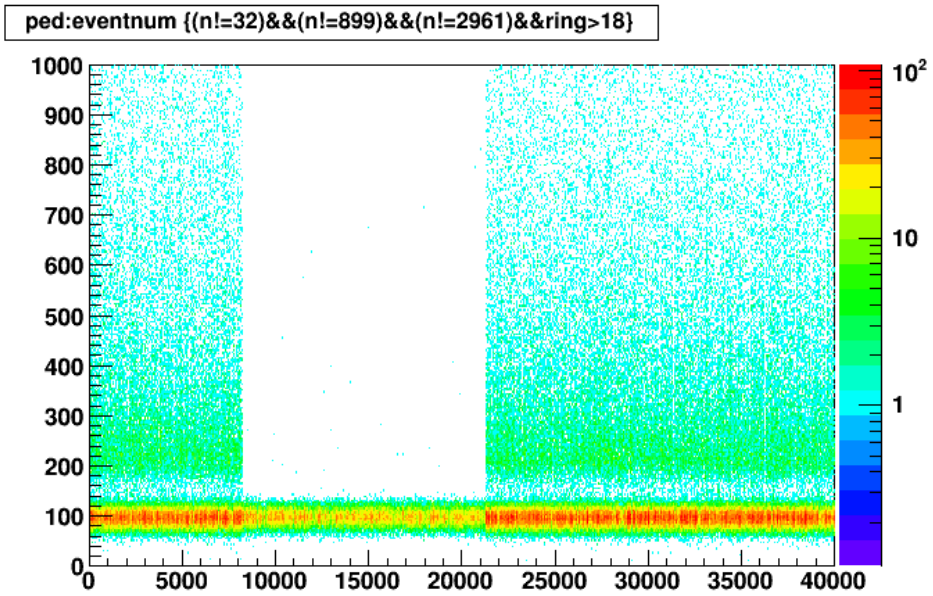
- The sparsification threshold is currently set to 7x the baseline RMS per individual channel.

fADC125 Pedestals Run 1802-1843



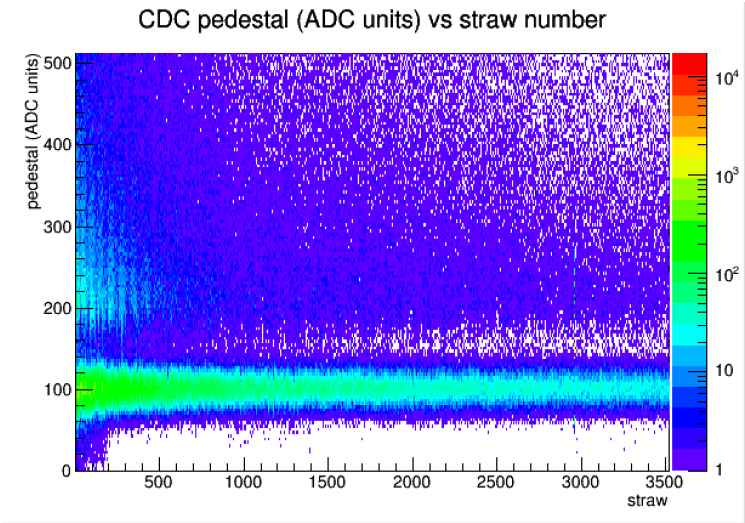
fADC125 Pedestals Run 1602



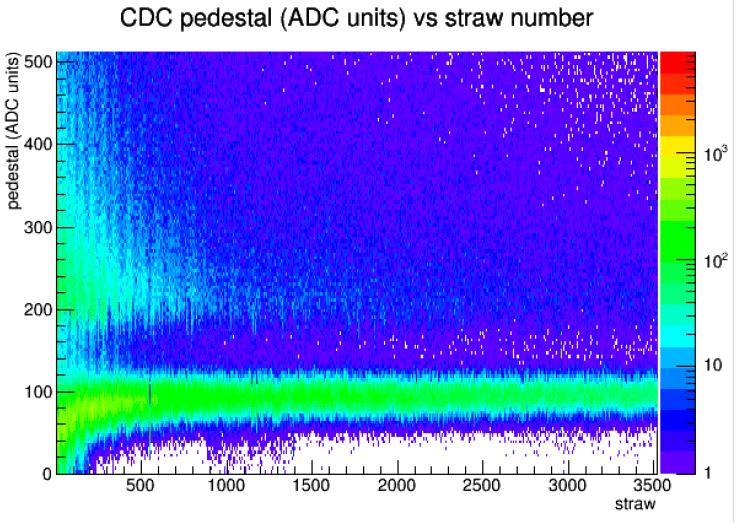


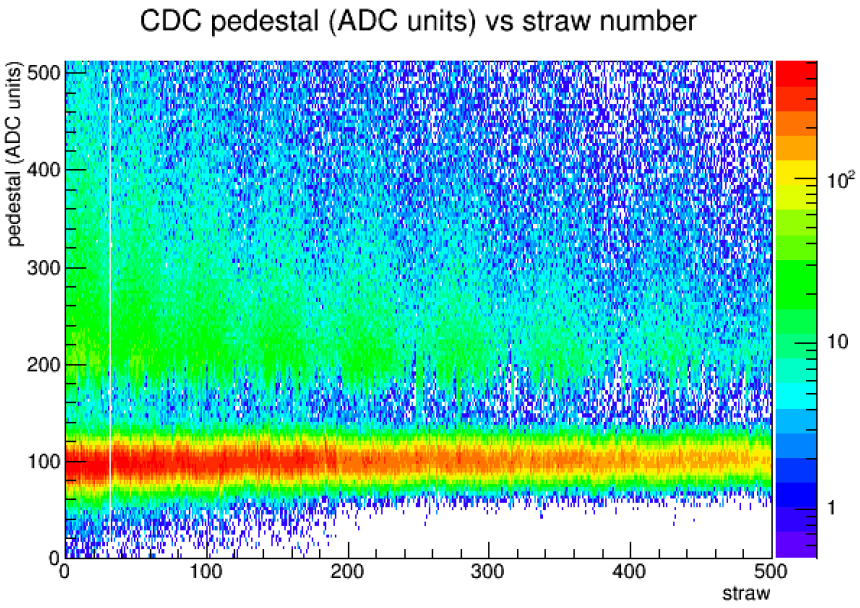
fADC125 Pedestals

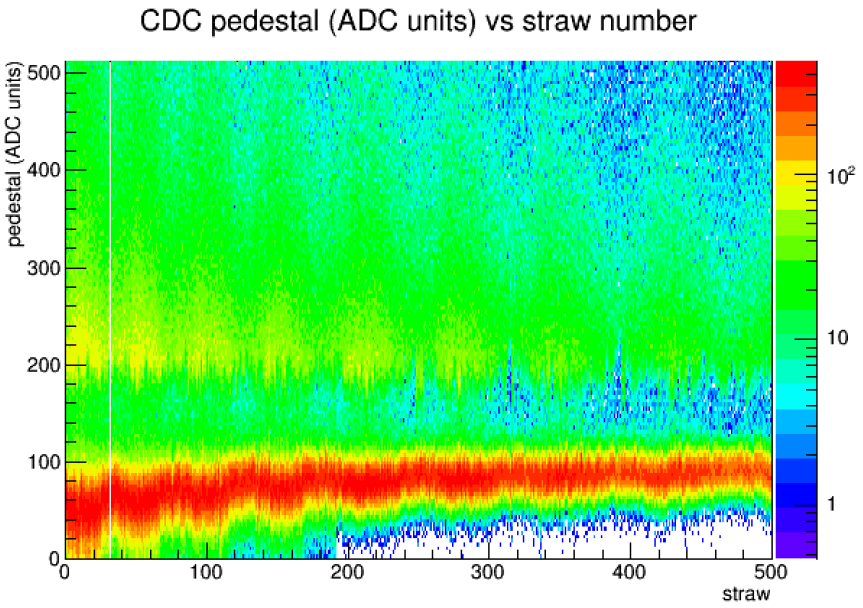
50nA 10^{-5} radiator (Run 1505)

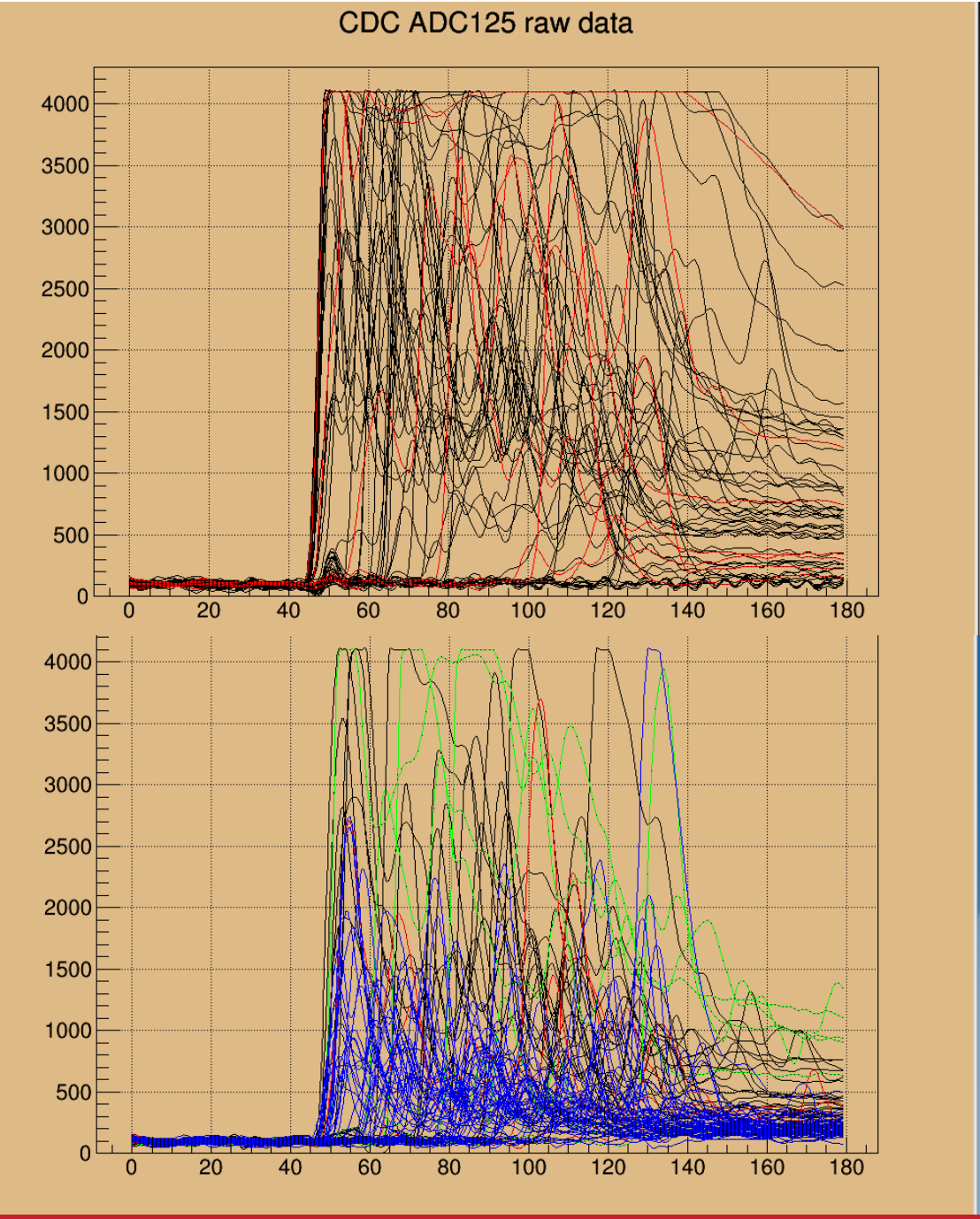


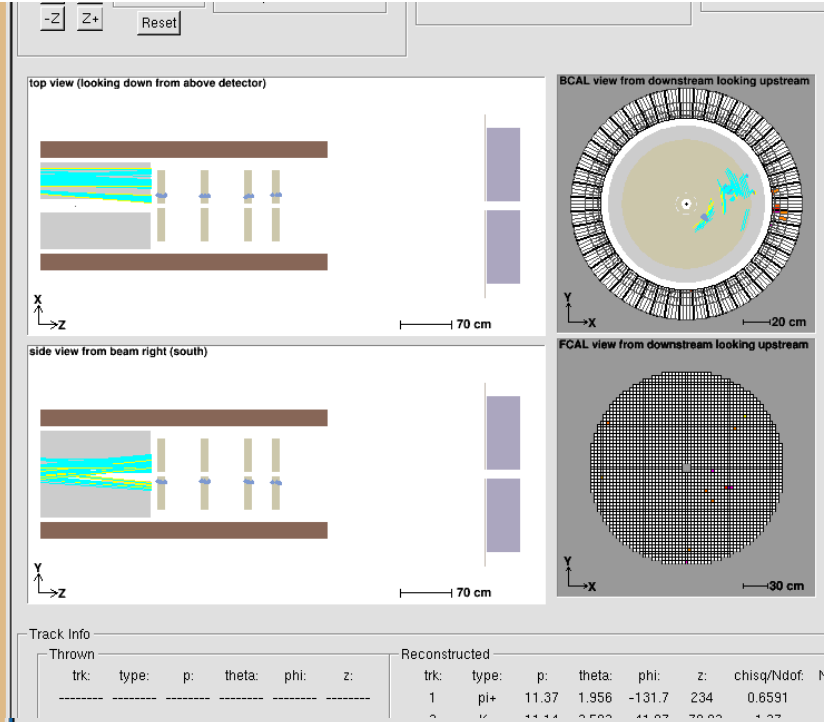
100nA 10^{-4} radiator (Run 1561)

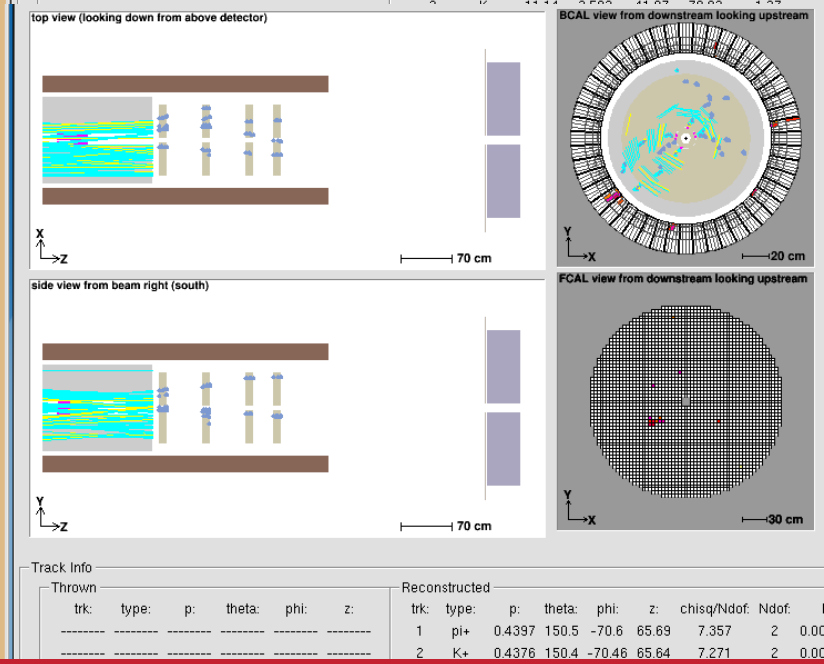







CDC ADC125 raw data
4000
3500
3000
2500
2000
1500
1000
500
0
0 20 40 60 80 100 120 140 160 180


-Z
Z+
Reset
top view (looking down from above detector)
70 cm
BCAL view from downstream looking upstream
20 cm
side view from beam right (south)
70 cm
FCAL view from downstream looking upstream
30 cm
Track Info
Thrown
trk: type: p: theta: phi: z:
Reconstructed
trk: type: p: theta: phi: z: chisq/Ndof:
1 pi+ 11.37 1.956 -131.7 234 0.6591


top view (looking down from above detector)
70 cm
BCAL view from downstream looking upstream
20 cm
side view from beam right (south)
70 cm
FCAL view from downstream looking upstream
30 cm
Track Info
Thrown
trk: type: p: theta: phi: z:
Reconstructed
trk: type: p: theta: phi: z: chisq/Ndof: Ndof:
1 pi+ 0.4397 150.5 -70.6 65.69 7.357 2
2 K+ 0.4376 150.4 -70.46 65.64 7.271 2

GlueX-doc-2616

Preamp close to saturation

Input charge = 1.3pC

Voutput = -390mV

Offset = 0mV

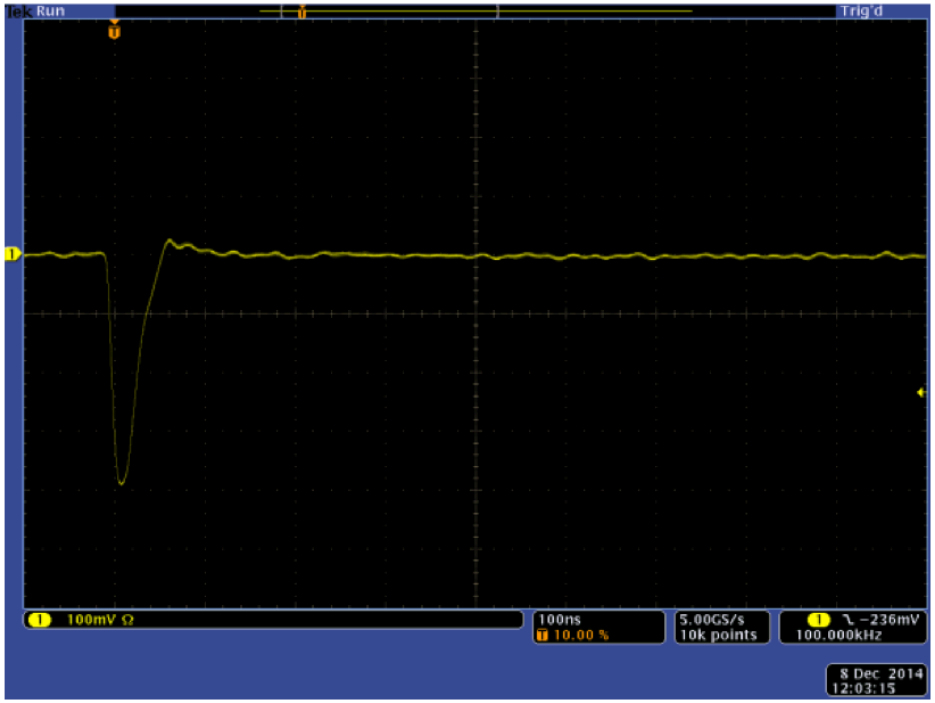


Fig.4 – Preamp output at about saturation

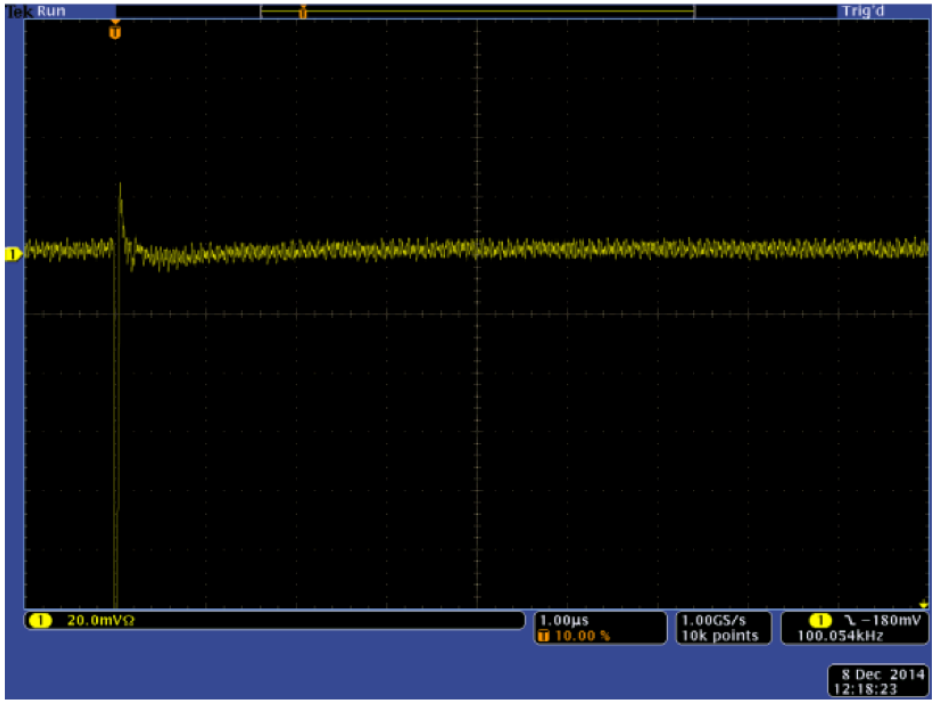


Fig.5 – and offset at 0mV

GlueX-doc-2616

Preamp in saturation

Input charge = 4.1pC

Voutput = -400mV

Offset = +4mV

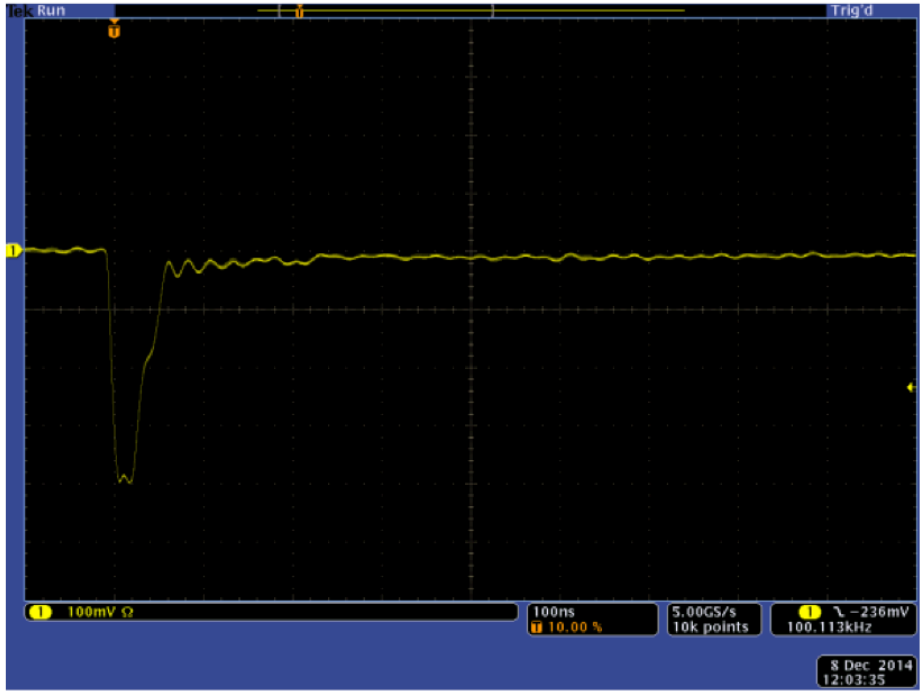


Fig.6 – Preamp output in saturation

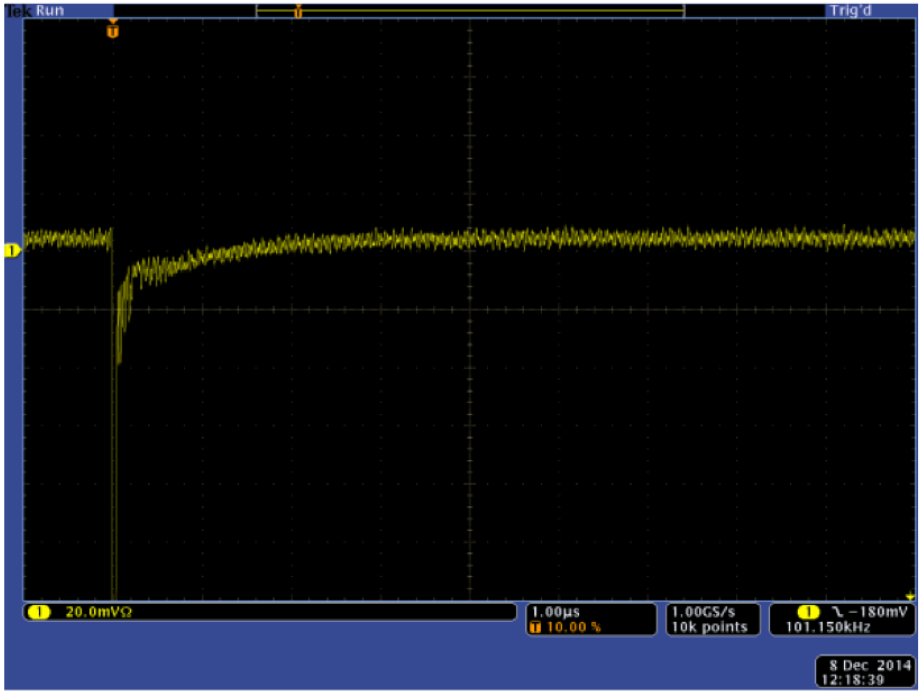


Fig.7 – and offset at +4mV

GlueX-doc-2616

Preamp in extreme saturation

Input charge = 13pC

Voutput = -400mV

Offset = +8mV

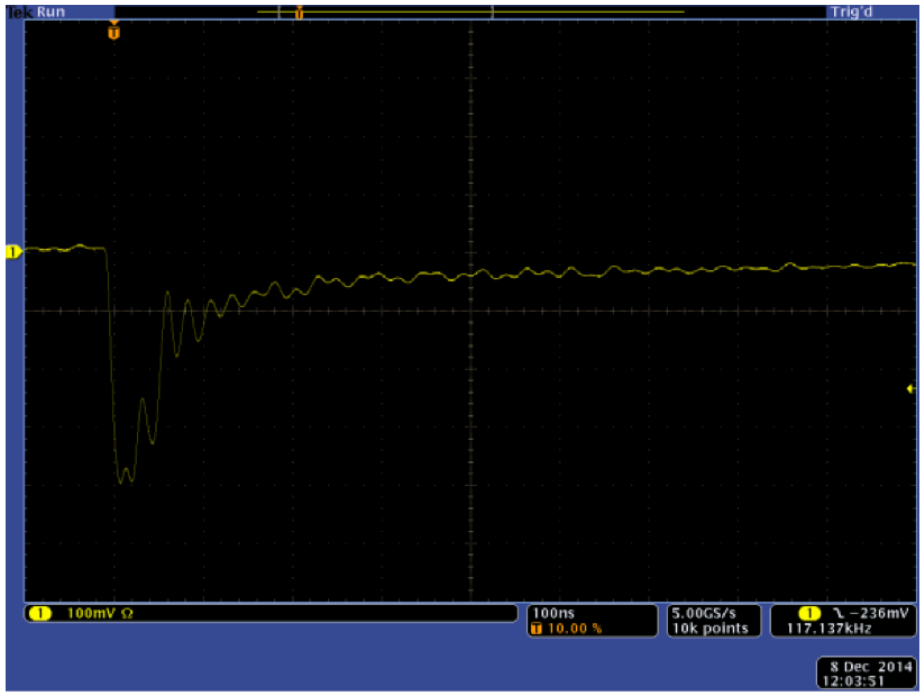


Fig.8 – Preamp output in extreme saturation

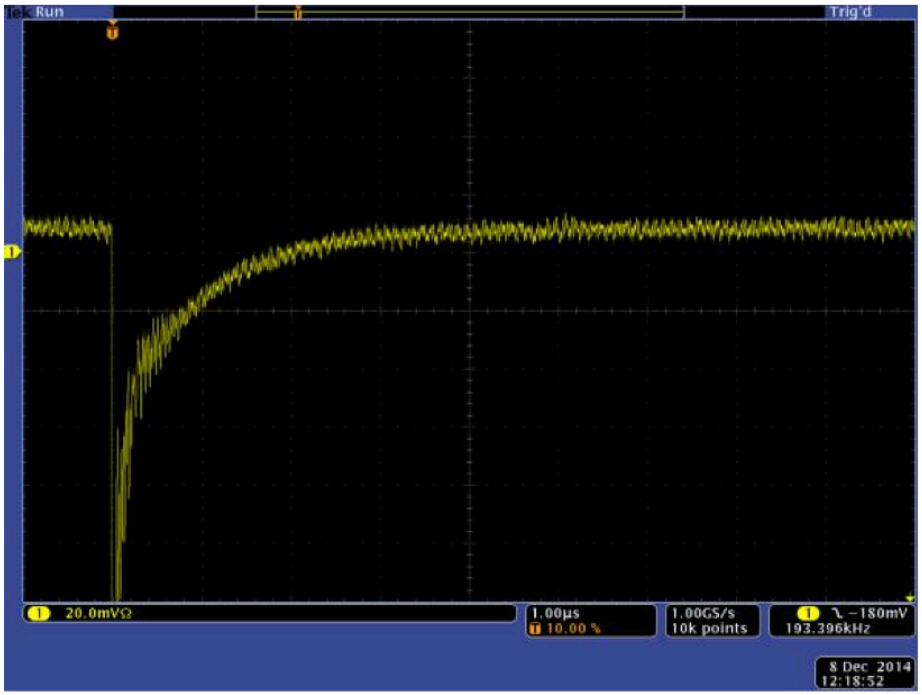


Fig.9 – and offset at +8mV

Things to take away from this talk…

- CDC has been functioning well in beam thus far, timing distributions are reasonable, tracking finding and fitting is working, trips are low (but the current limit is high).
- 11 channels with no data due to readout issues which can be likely be fixed after this run period.
- Noise in the chamber must be improved, and we need to minimize low angle particles reaching the CDC from upstream to avoid unwanted performance issues.
- Pedestal calibrations are stable.
- Energy scales need to be investigated.

Questions?