Update on field response check

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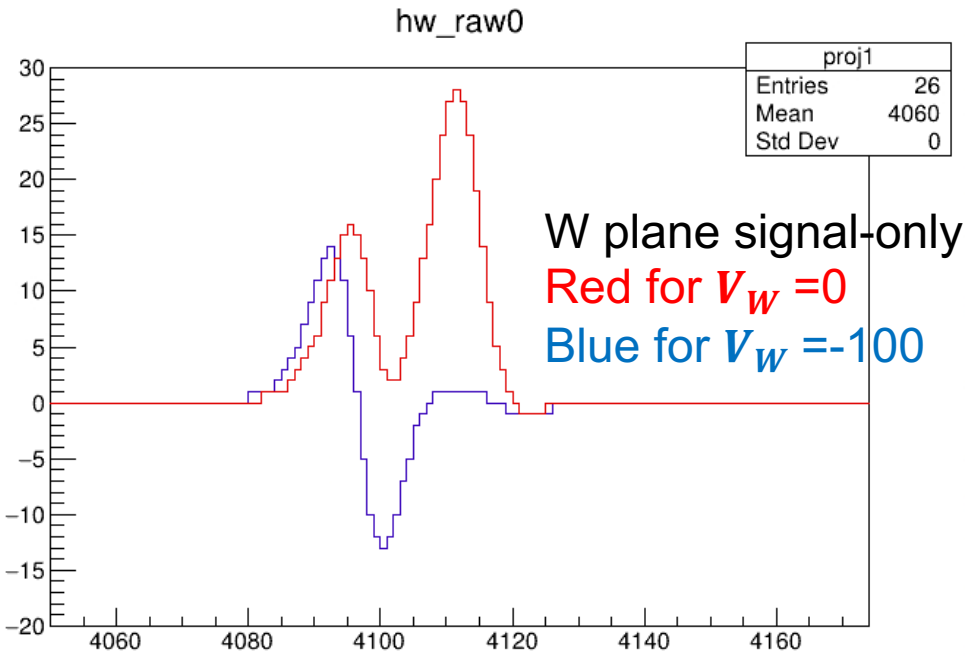
11/04/2024

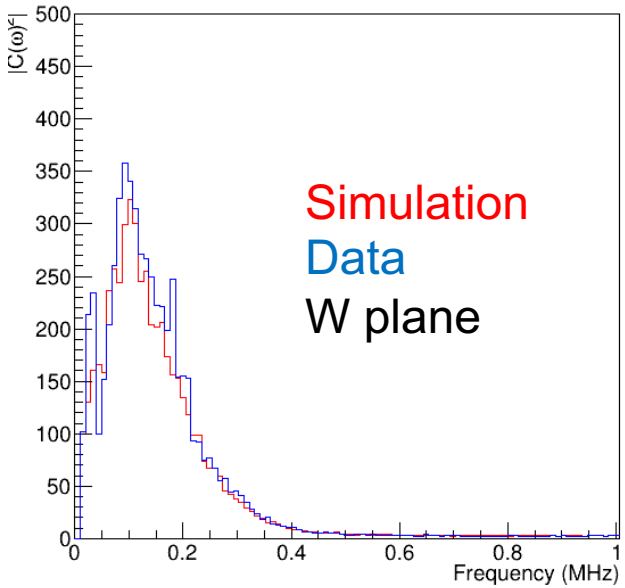
Brookhaven National Laboratory

Set V_W =-100V

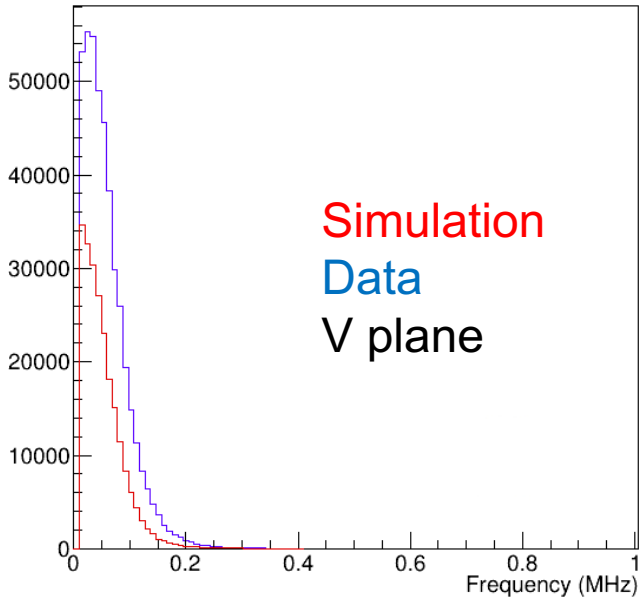


W plane signal-only simulation
Red for V_W =0
Blue for V_W =-100

power spectra in beam direction

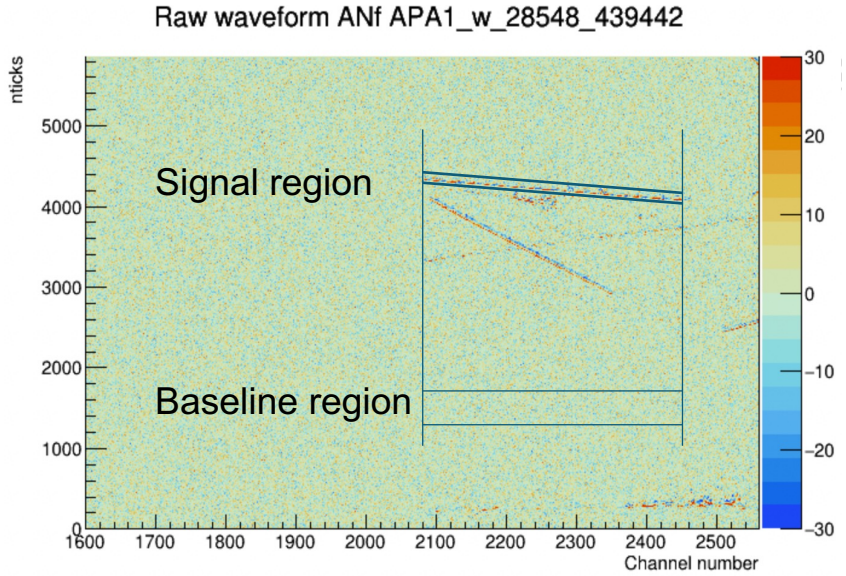


Simulation
Data
W plane



Simulation
Data
V plane

Align signal from Data

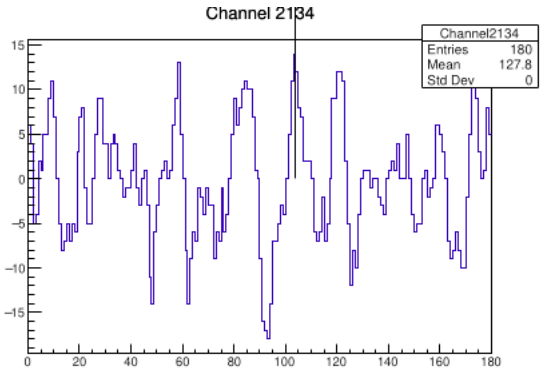


Align signal:

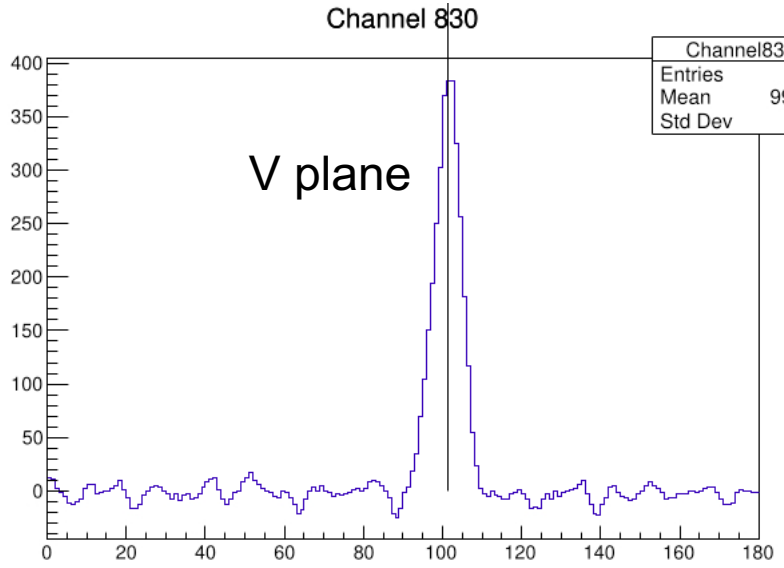
- Cut a small region with pure signal
- Find the maximum bin, regard it as the peak of the signal (sometimes fail for w plane but not much)
- Align all the peaks.

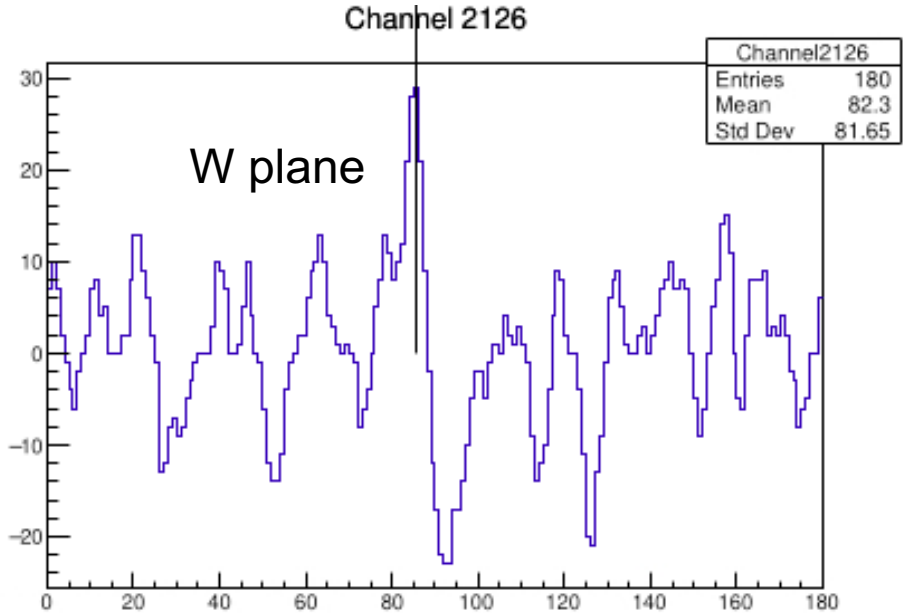
Baseline:

- Same channels as selected signals
- Average along the channels
- (Just to see if it is near 0)

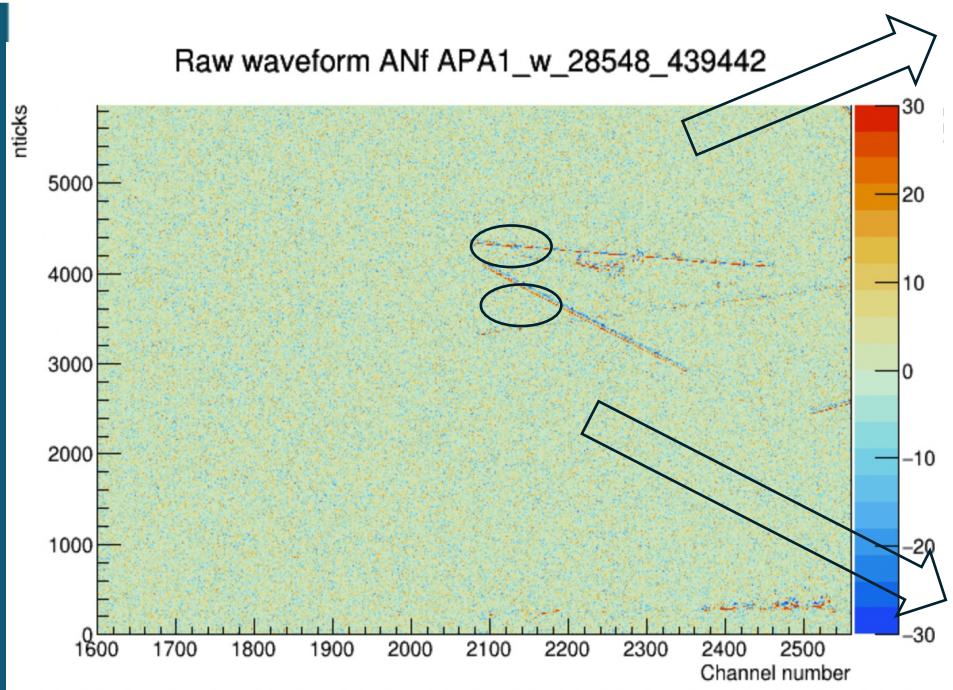


Failure situation

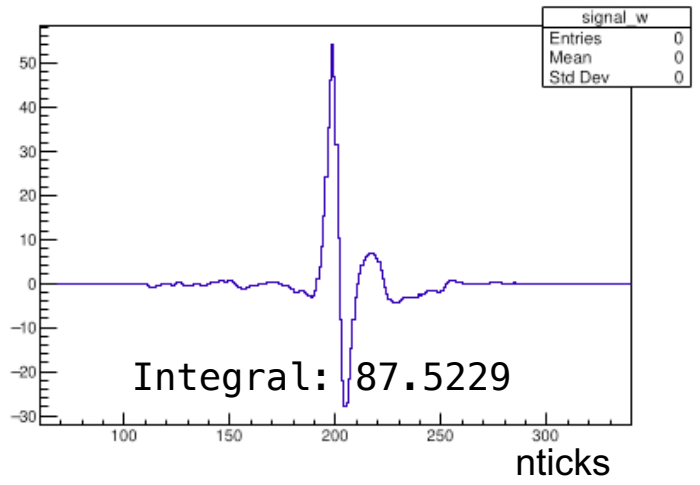




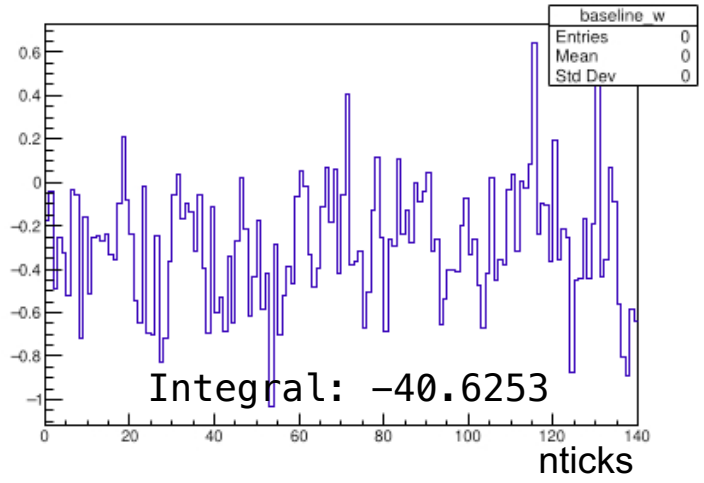
Align signal from Data; w plane



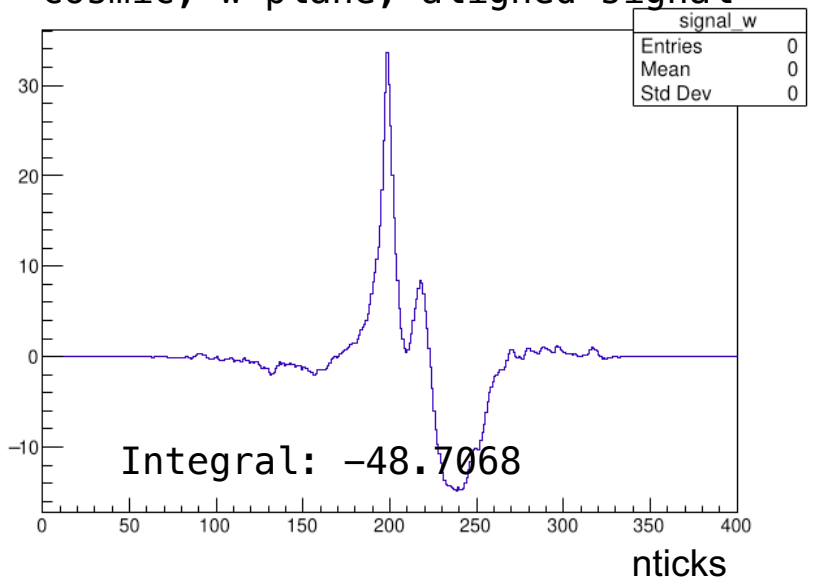
Beam; w plane; aligned signal



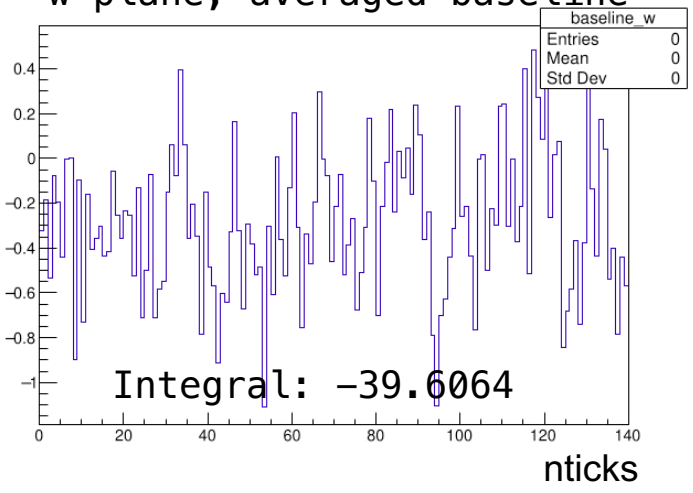
w plane; averaged baseline



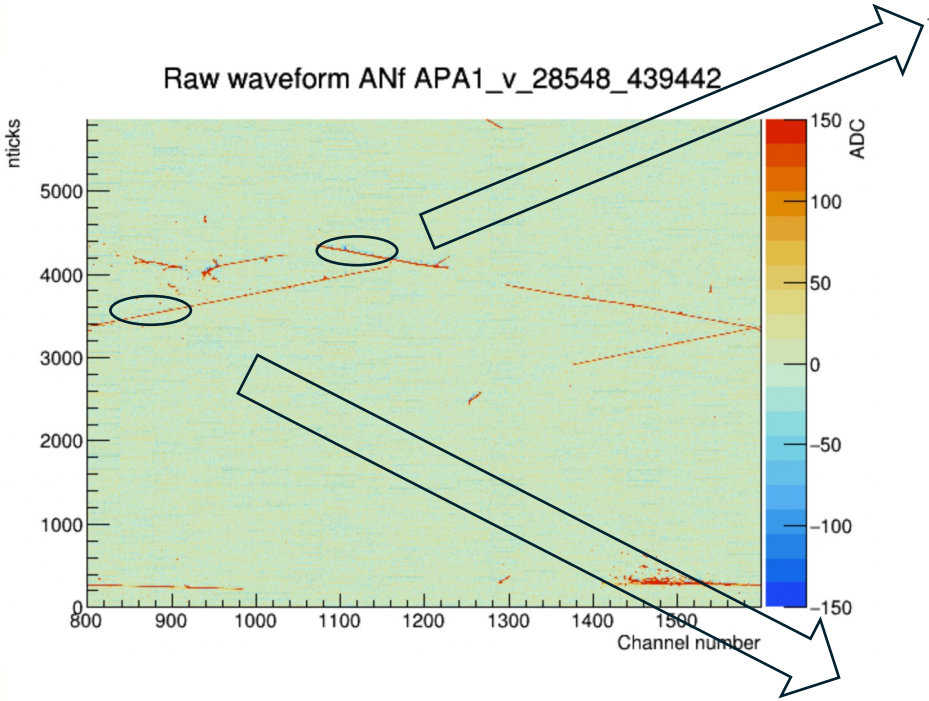
Cosmic; w plane; aligned signal



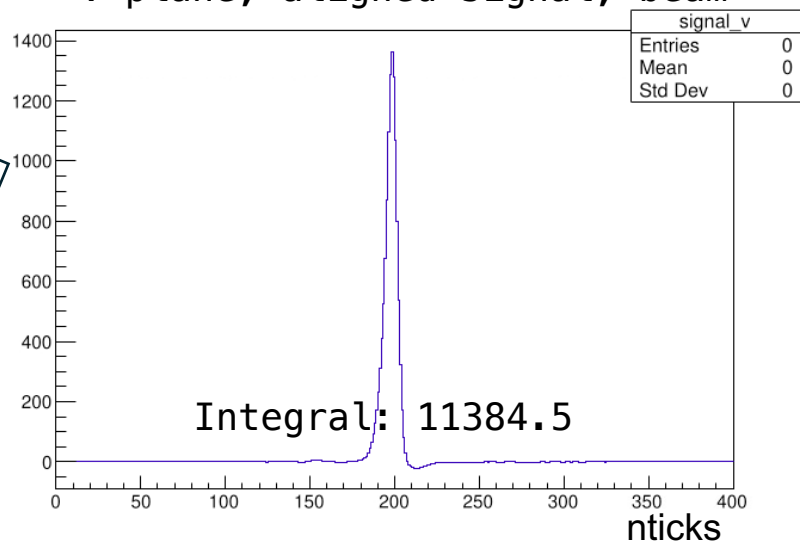
w plane; averaged baseline



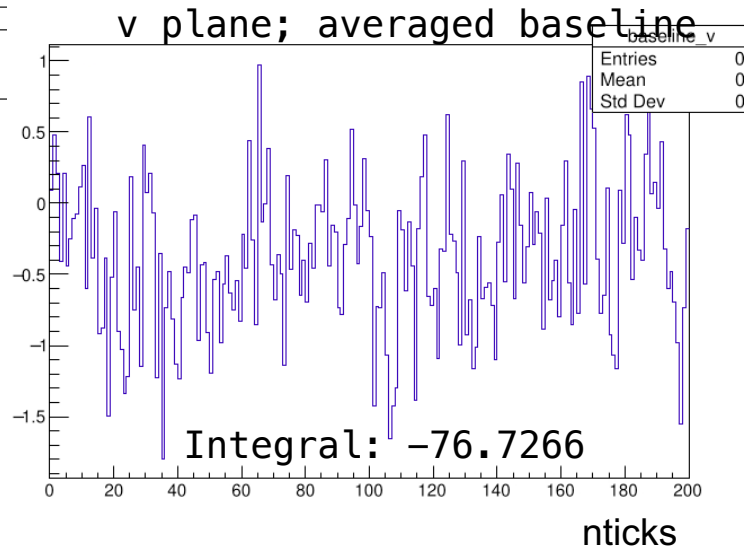
Align signal from Data; v plane



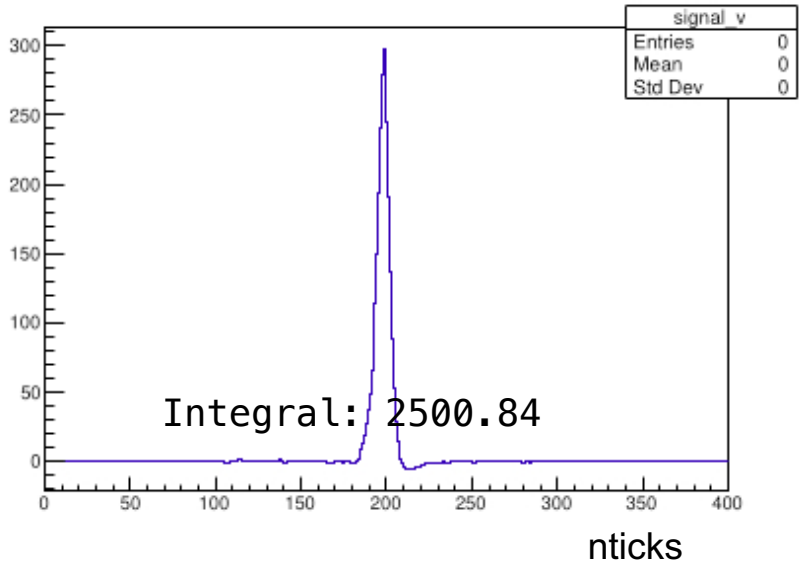
v plane; aligned signal; beam



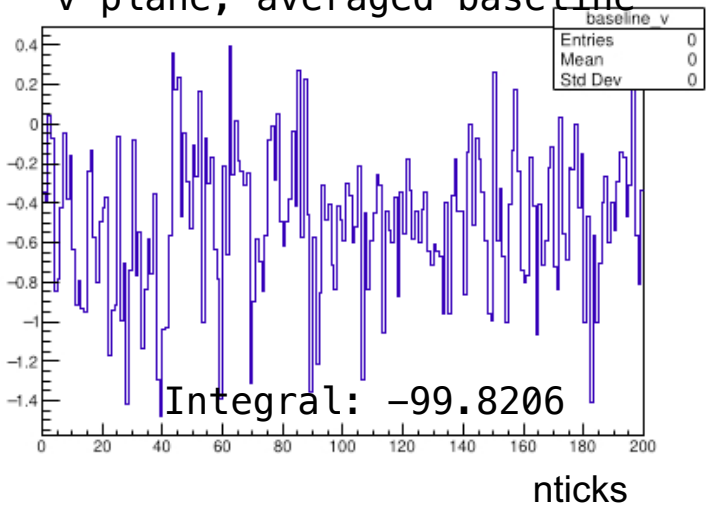
v plane; averaged baseline



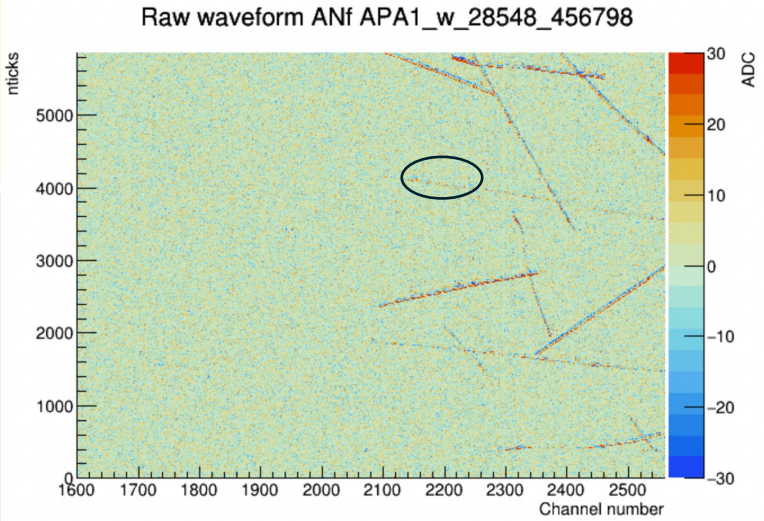
v plane; aligned signal; cosmic

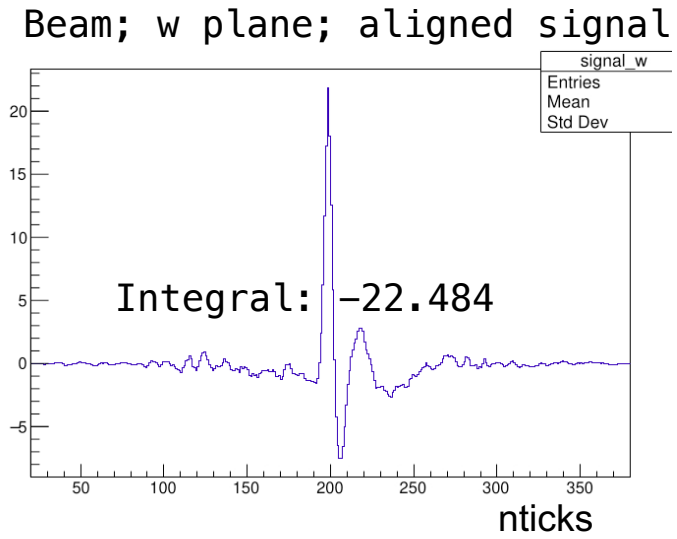


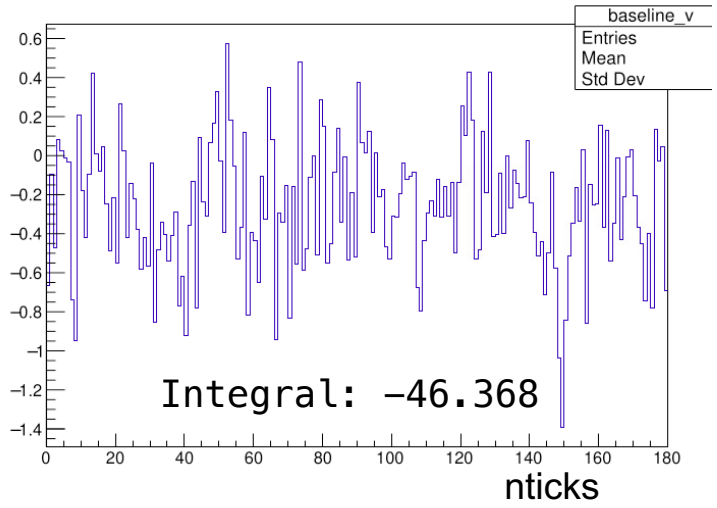
v plane; averaged baseline

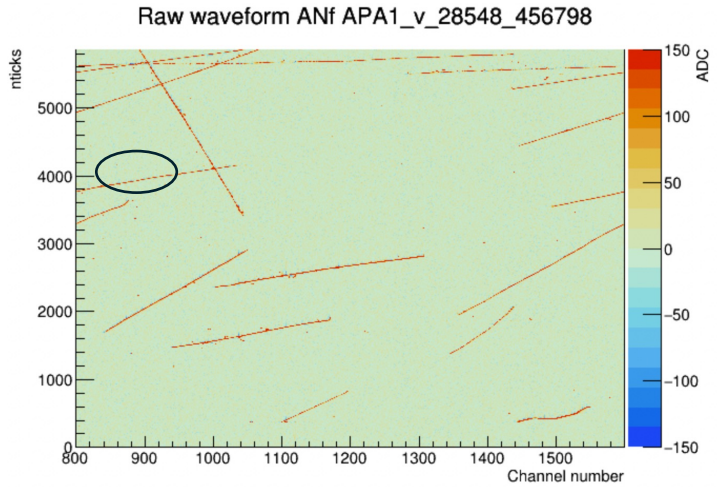


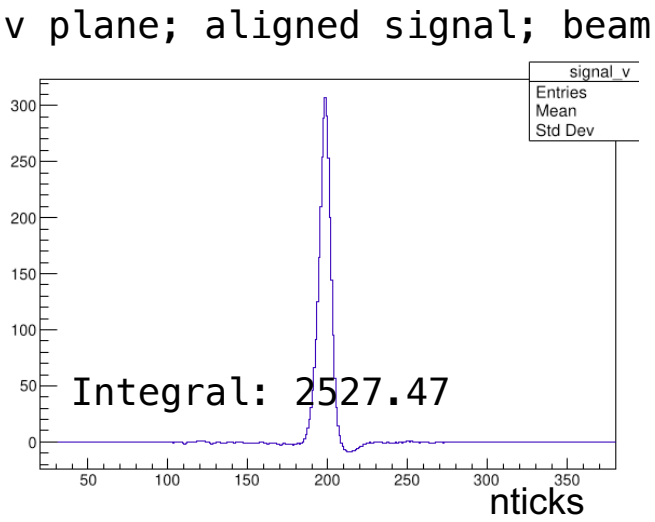
Align signal from Data, another one

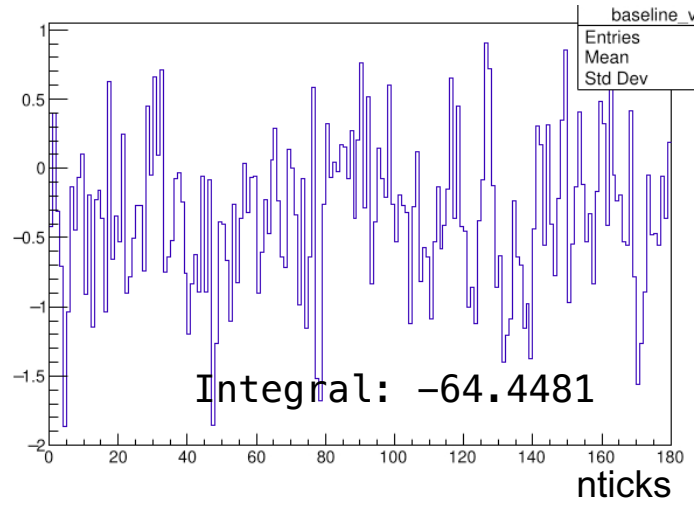




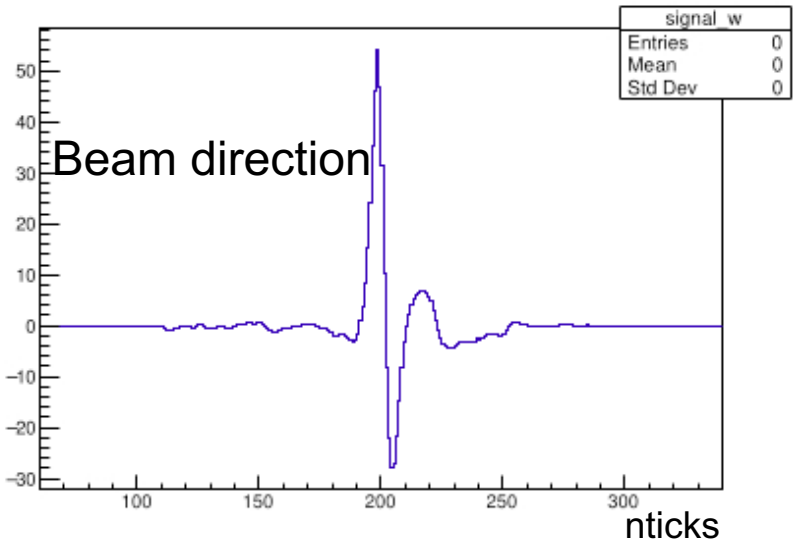




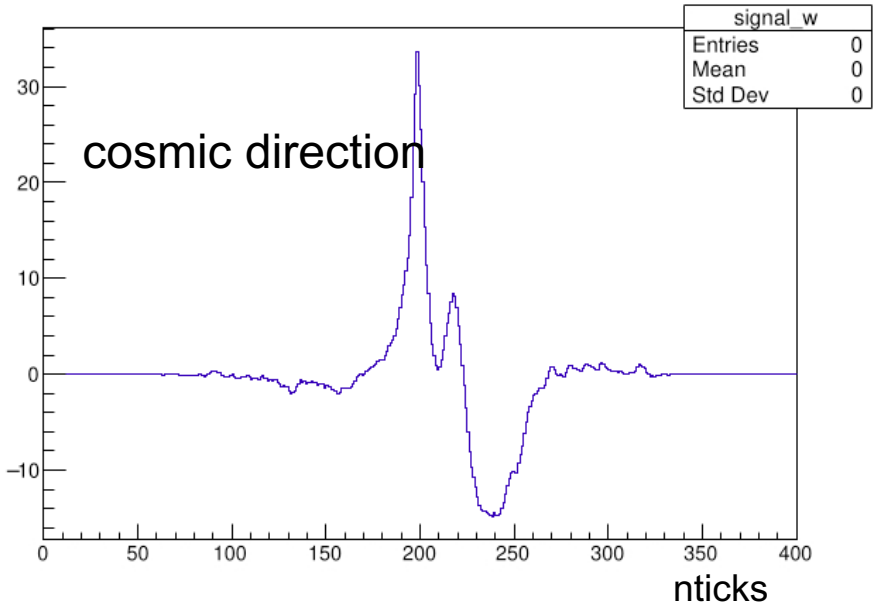


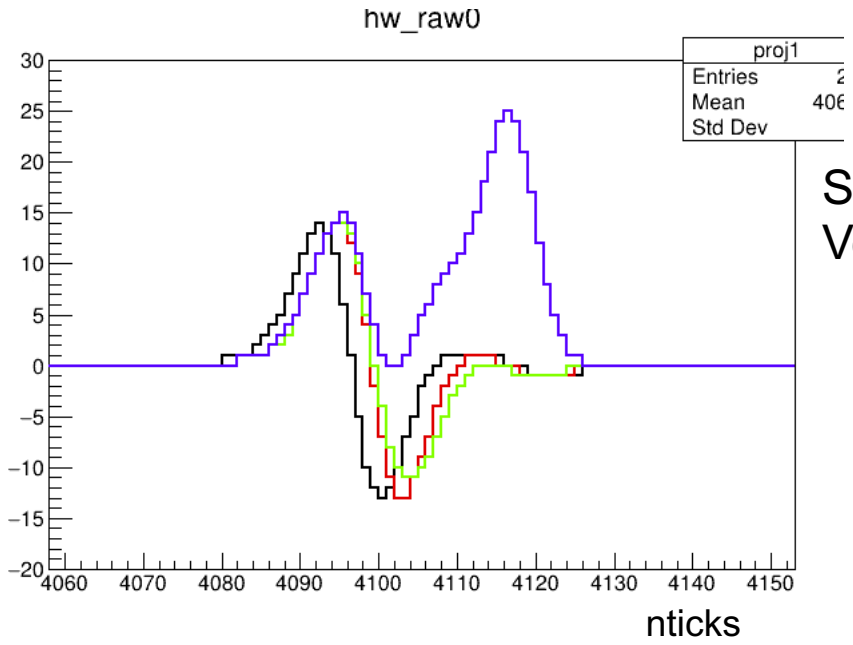


Waveform from Data and simulation



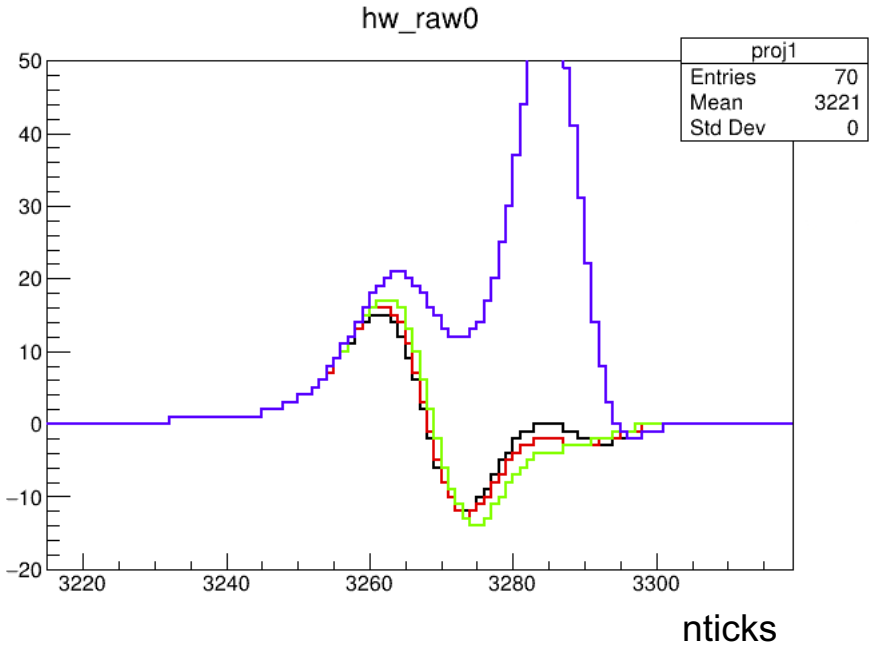
Data





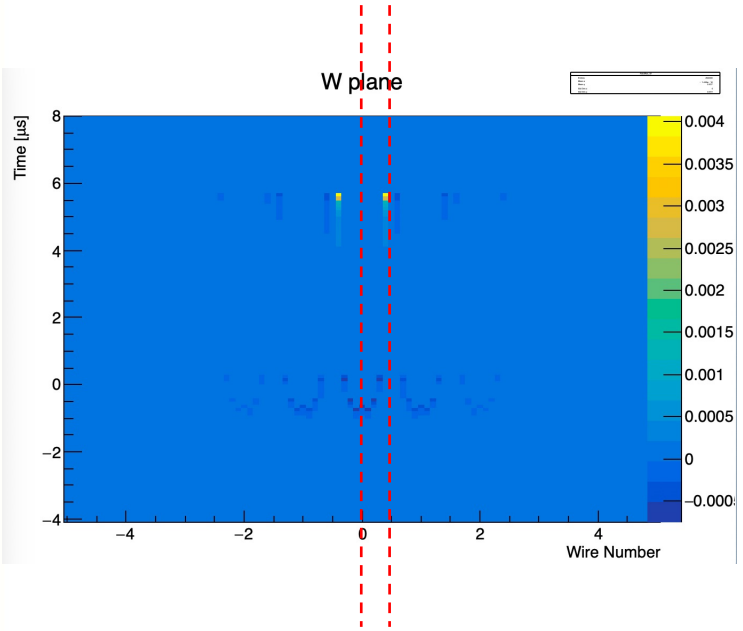
Simulation;
Voltage on W

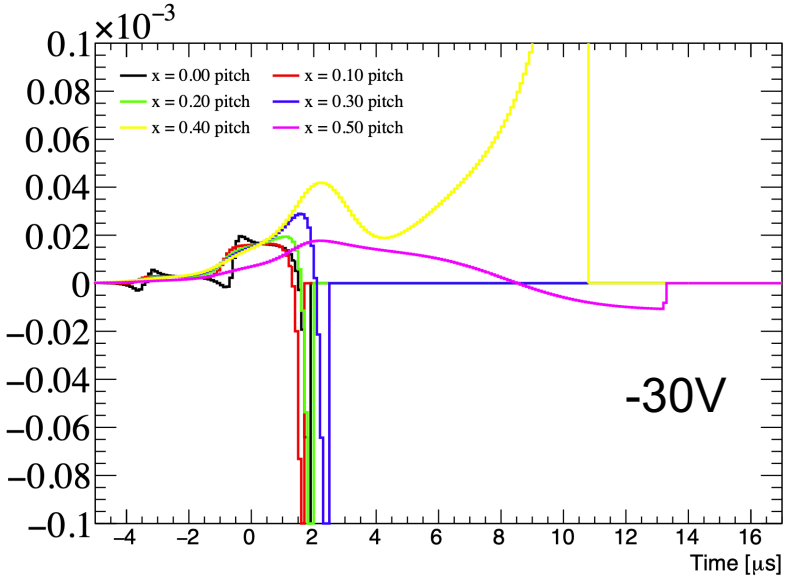
-100V
-70V
-50V
-30V

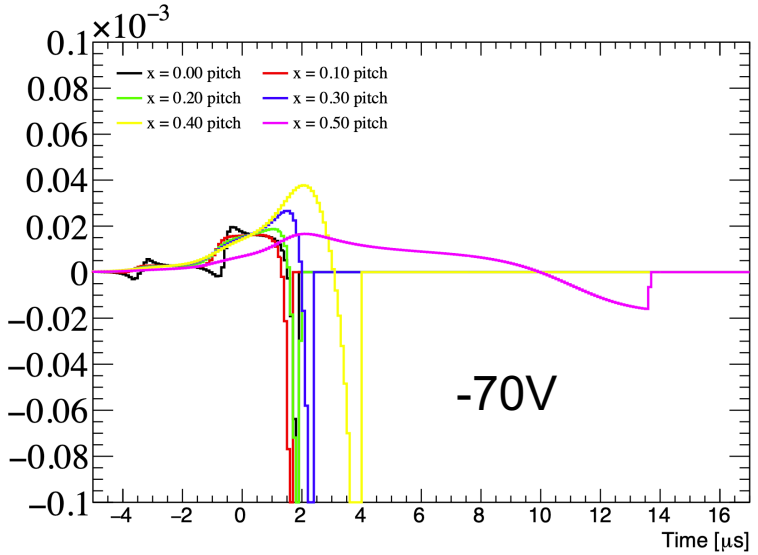


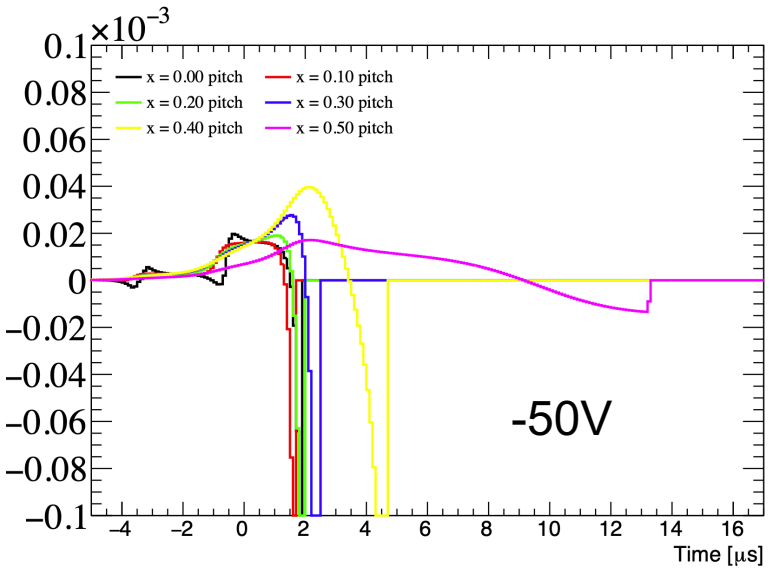
Garfield Simulation

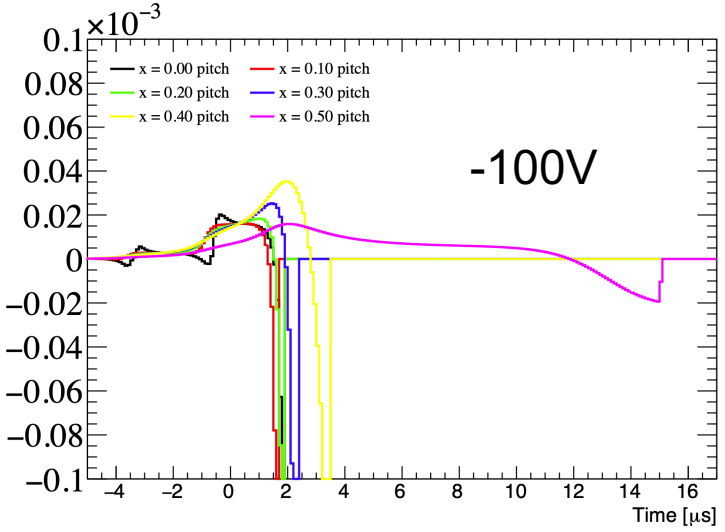
Draw projection along 0-0.5 wire







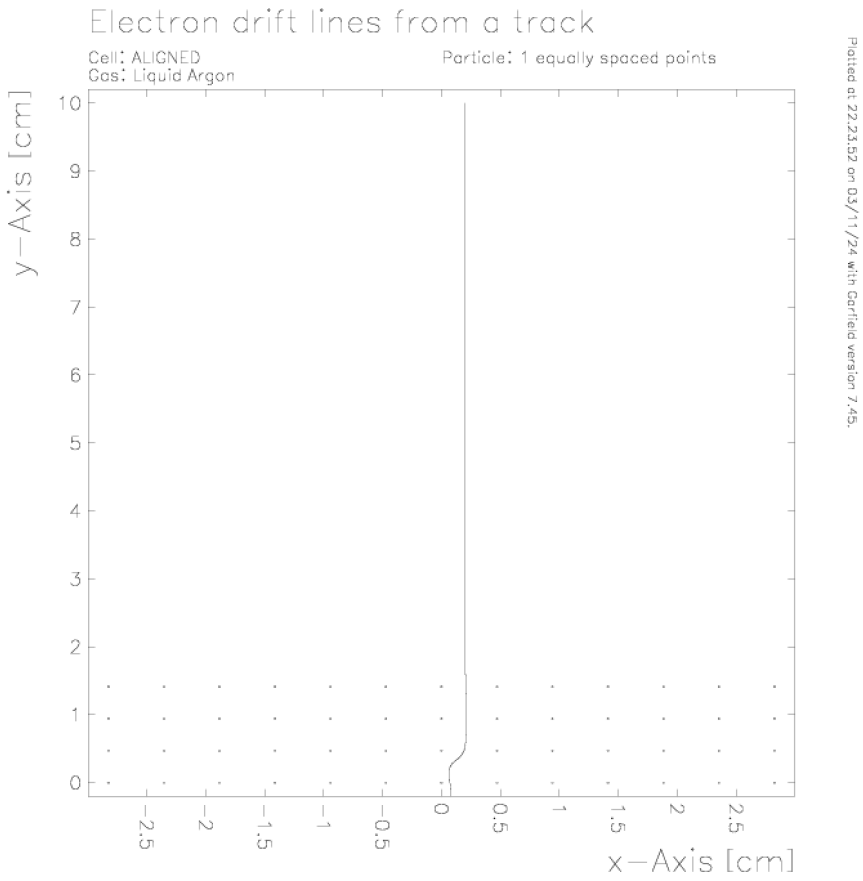


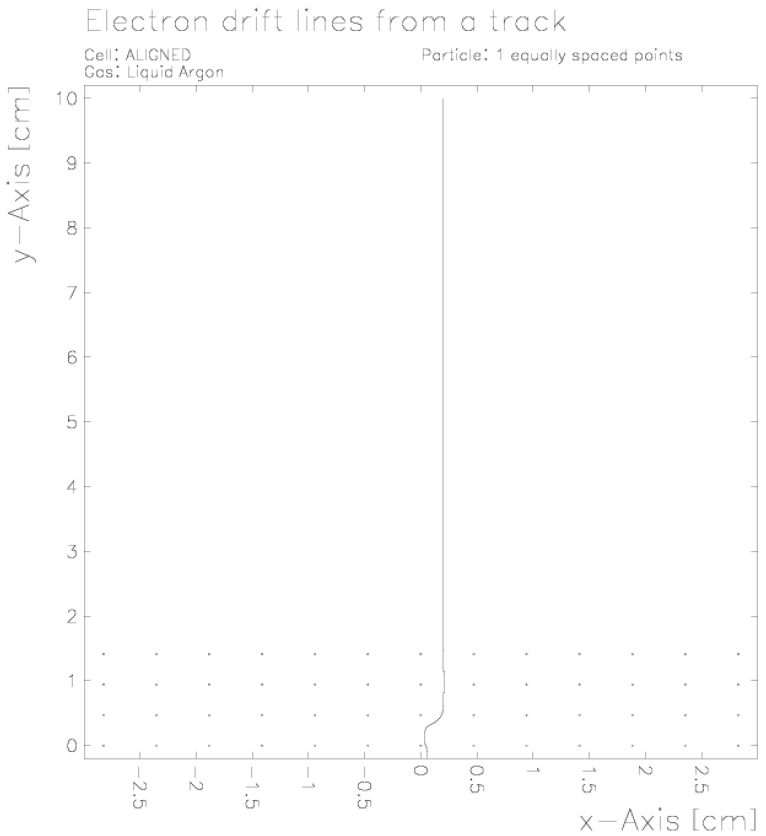


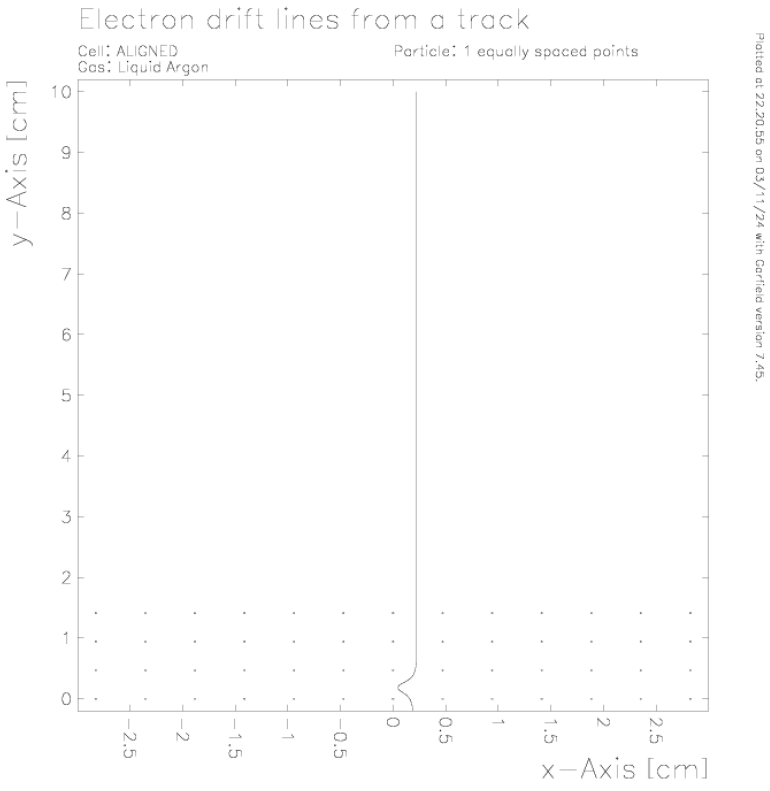
Next

- 3D effect: wires are alternated
- Finer simulation: now only 6 electron between 0-0.5 pitch
  - ➢ They all need to modify wire-cell-python

Backup


Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]
Plotted at 22:23:52 on 03/11/24 with Garfield version 7.45.


Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]


Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]
Plotted at 22:20:55 on 03/11/24 with Garfield version 7.45.

Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]
Plotted at 21:52:33 on 03/11/24 with Garfield version 7.45.

Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]
Plotted at 21:52:38 on 03/11/24 with Garfield version 7.45.

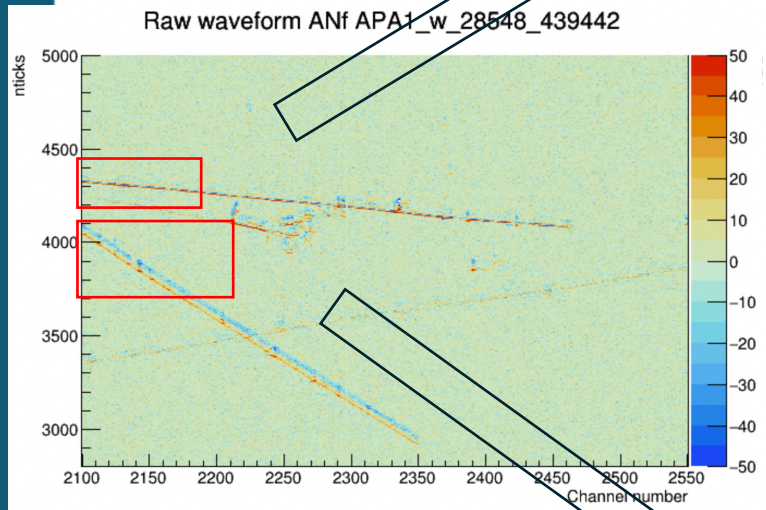
Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]
Plotted at 21:52:42 on 03/11/24 with Garfield version 7.45.

Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]
Plotted at 21:52:47 on 03/11/24 with Garfield version 7.45.

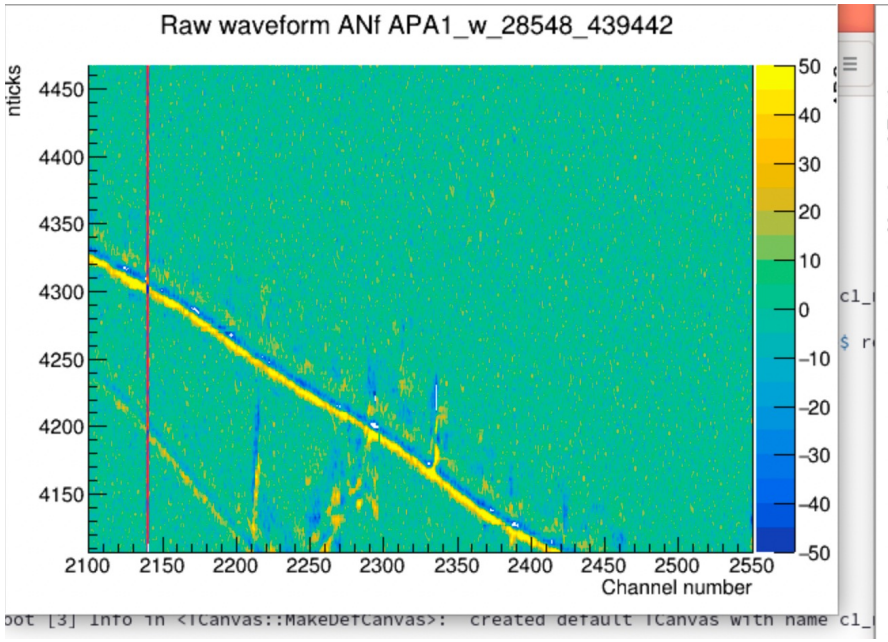
Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]
Plotted at 21:52:52 on 03/11/24 with Garfield version 7.45.

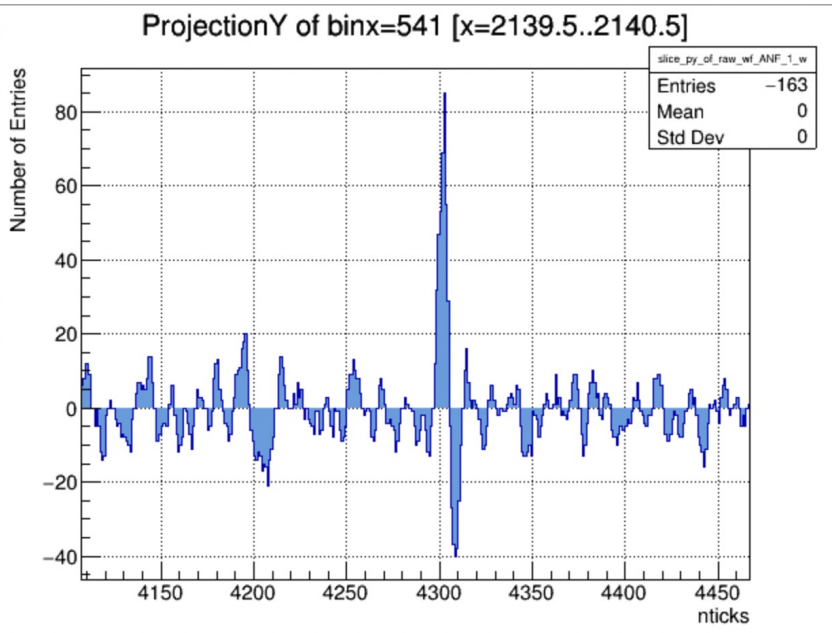
Electron drift lines from a track
Cell: ALIGNED
Gas: Liquid Argon
Particle: 1 equally spaced points
y−Axis [cm]
x−Axis [cm]
Plotted at 21:52:55 on 03/11/24 with Garfield version 7.45.

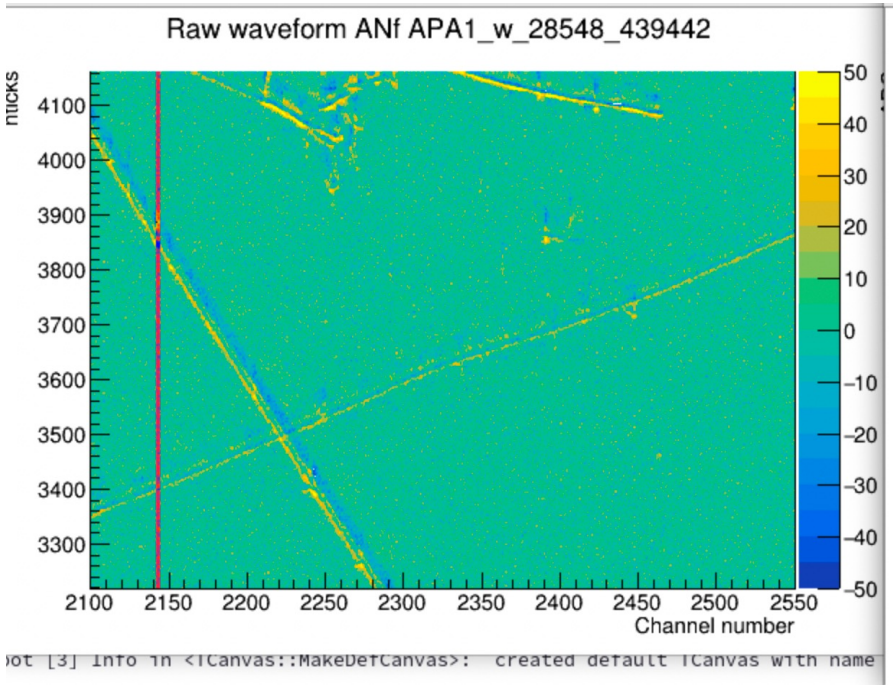
Zoom in

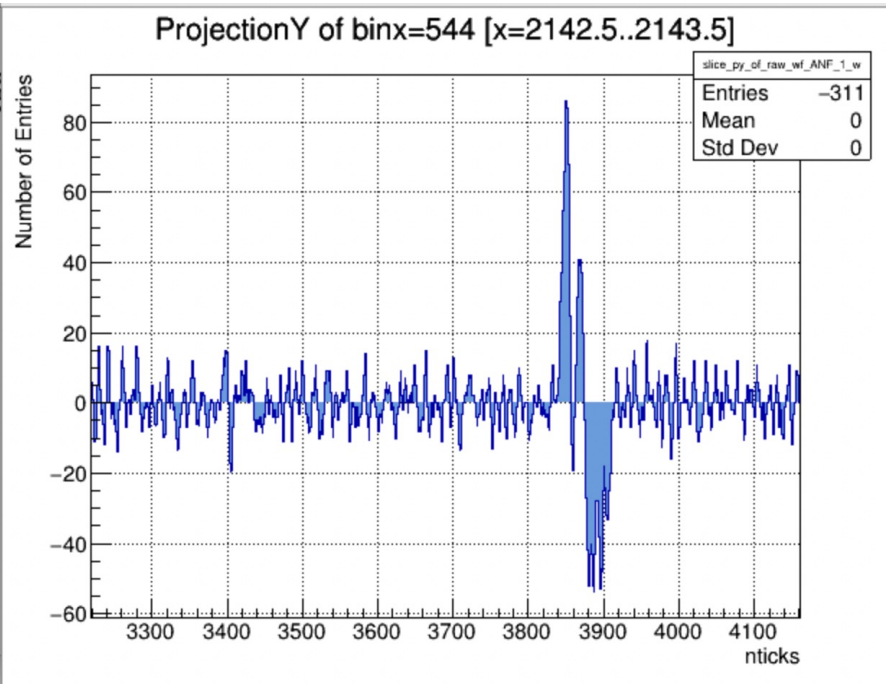


Zoom in









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