PDVD data with different FR

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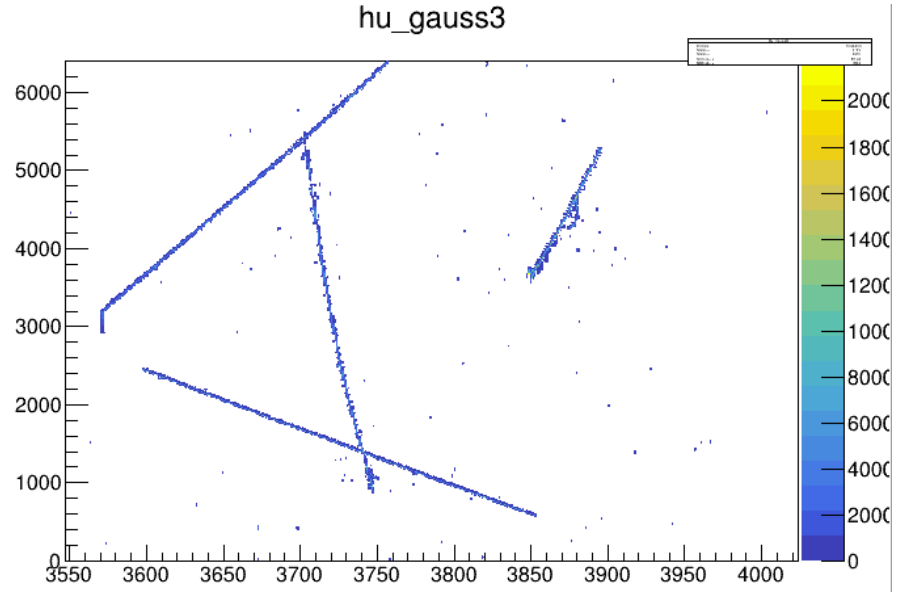
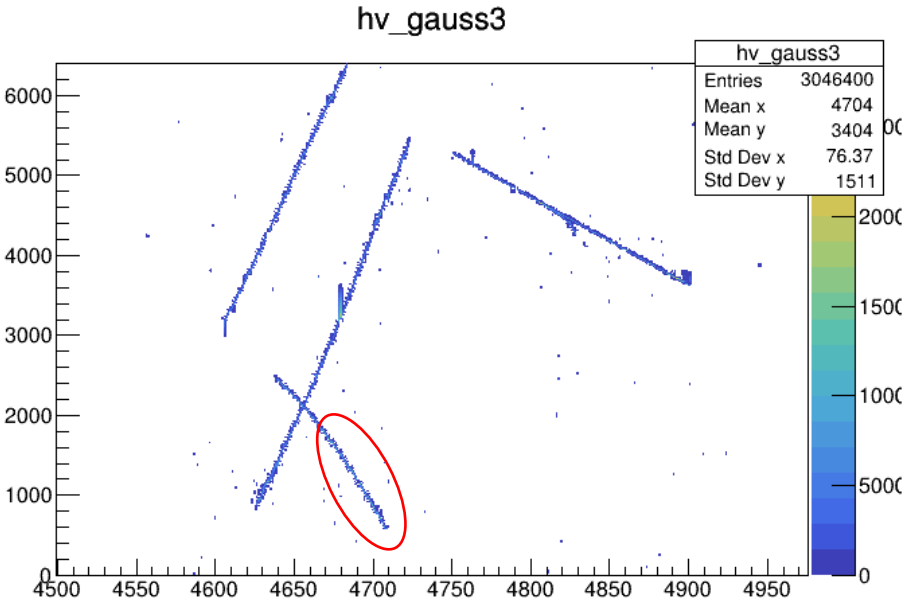
Check the update FR

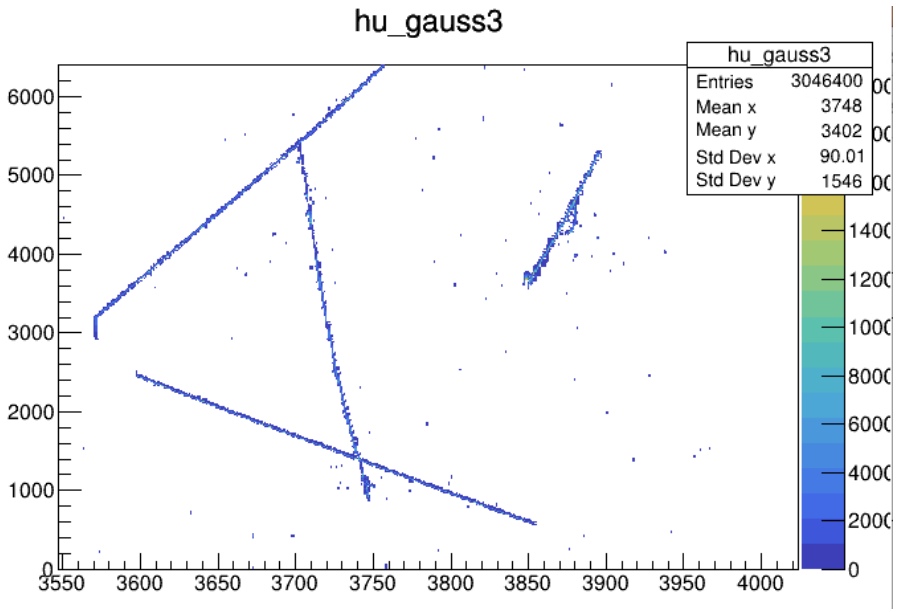
norminal drift field:450V/cm
but this FR ..is 500V/cm

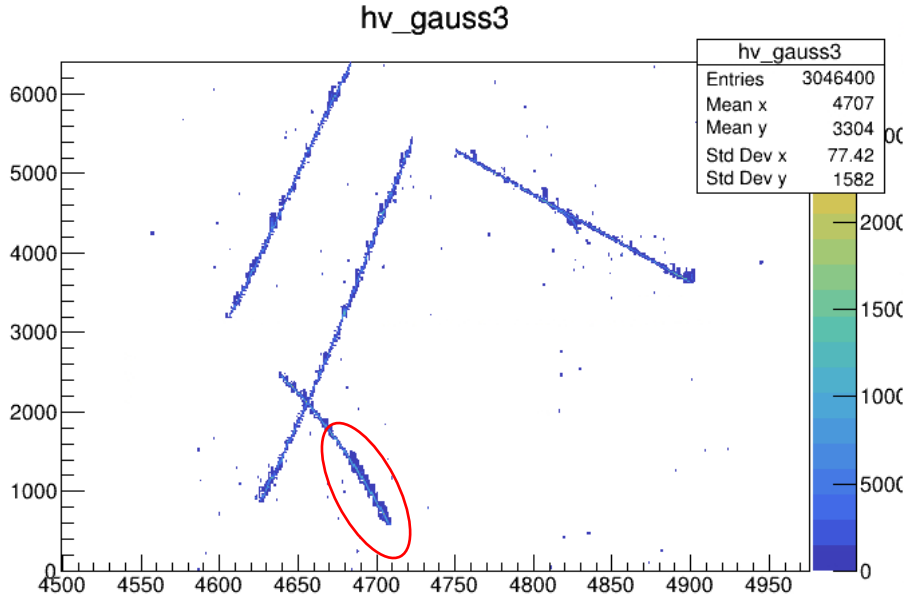
My new FR





Sergey's old FR





V plane is better

CRP2, V_W=10V,

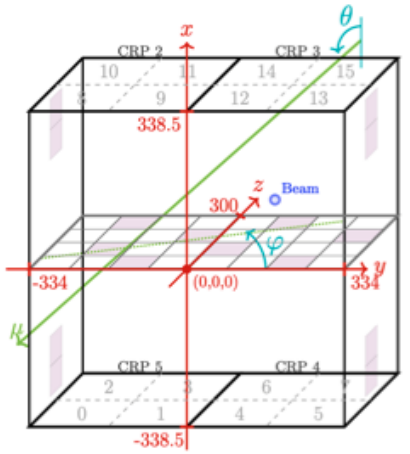
Recent data taken in ProtoDUNE-VD

On November 26th, several cryogenic manipulations occurred in ProtoDUNE-VD:
- The detector was over-pressured to see if it would impact the spike rate
- The VD-Coldbox was filled with LAr from NP02

As a consequence, the level of LAr in NP02 rapidly decreased, to the point that it reached the HV filter boxes of the top CRPs: they were partially (or totally) in gas while voltages was still provided to the top CRPs planes.
It is not clear what happened exactly, but one component delivering the bias to the CRP2 collection view has been damaged at some point.
As a consequence, we cannot deliver more than 50V* to the collection view of CRP2. It cannot be fixed.

Soon after, an unexpected power cut at CERN damaged one crate controller card which could only be fixed last thursday. Since then we are taking data with 10 V on the CRP2 collection view (instead of 1kV)

—> we are in a situation similar to APA1, although less dramatic



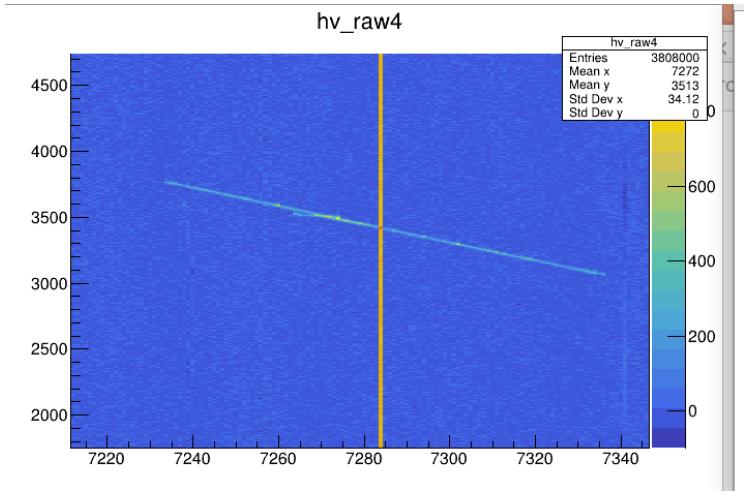
3

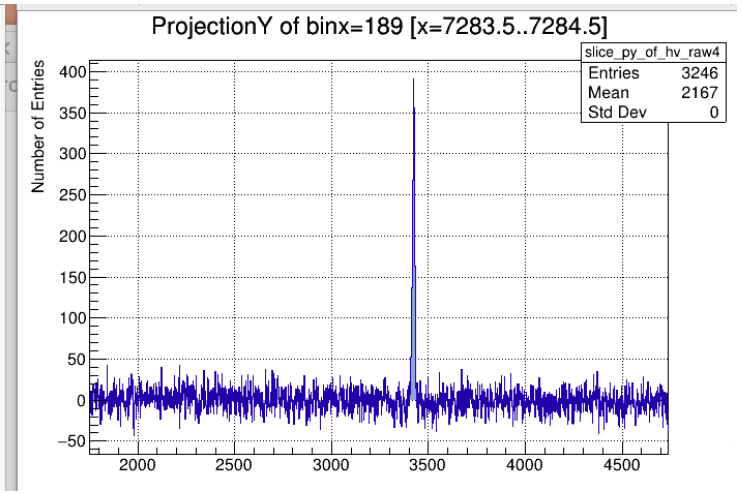
*: may be optimistic

https://indico.fnal.gov/event/72278/contributions/330193/attachments/193948/269024/protodune-vd_news_lz_101225.pdf

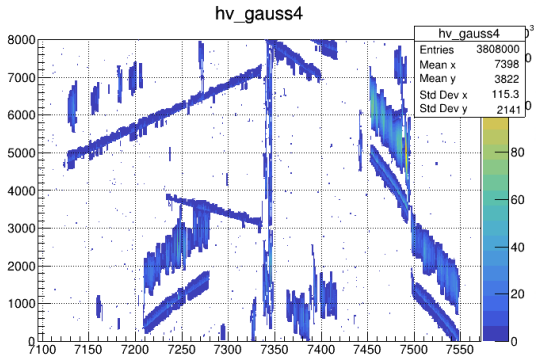
Run 41170, raw waveform

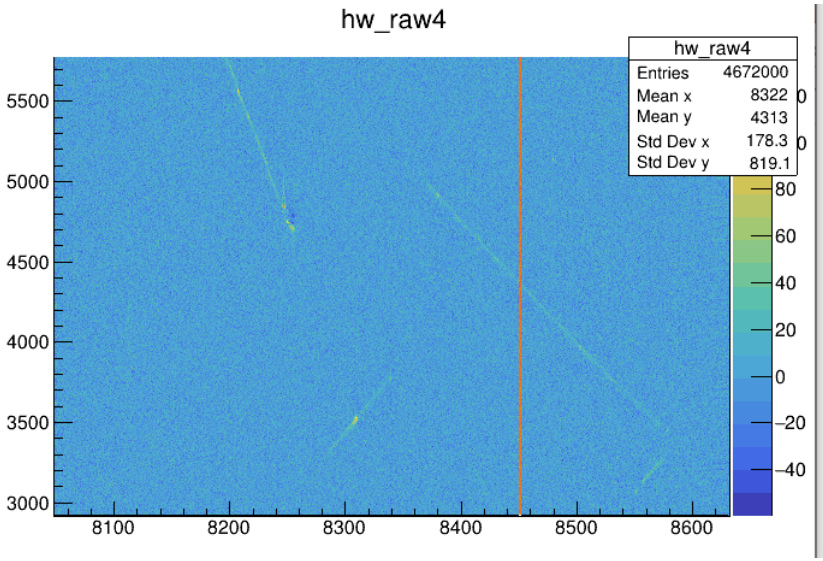
v plane signal is collection

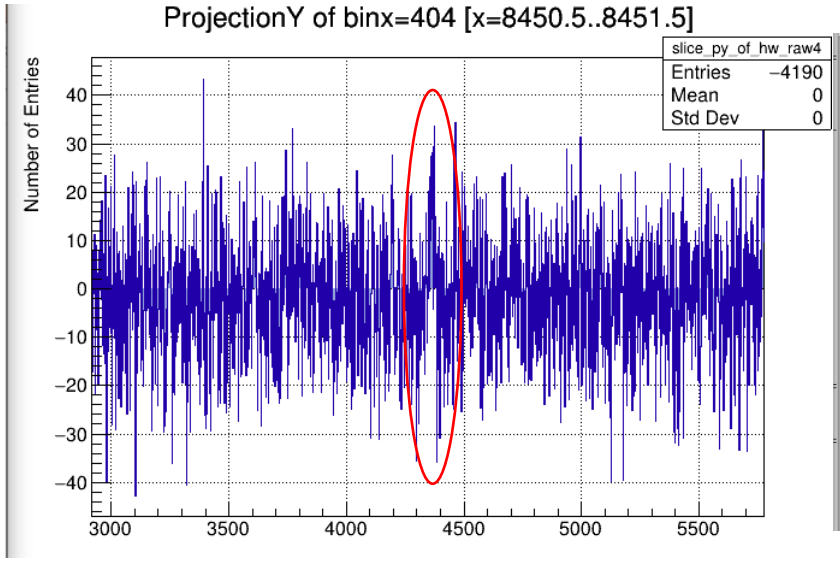


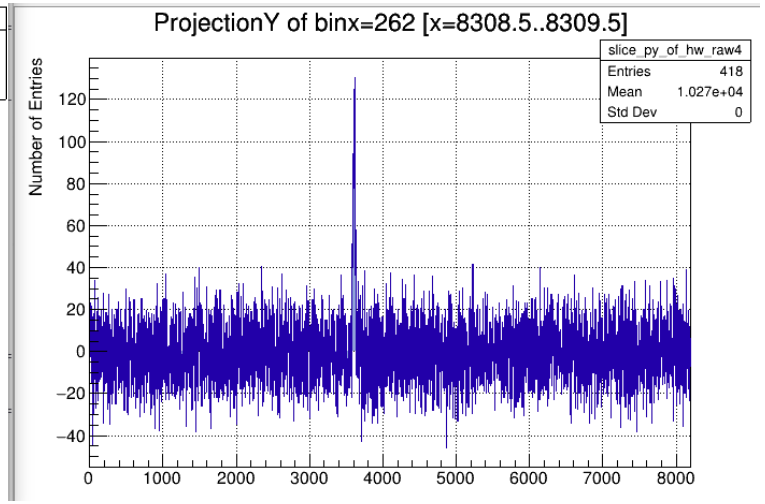


decon v





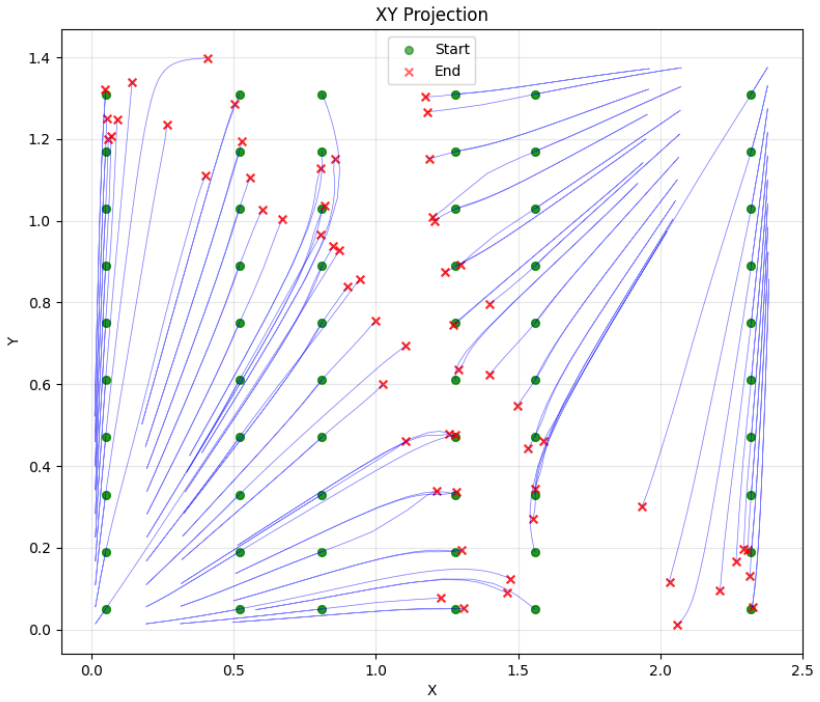


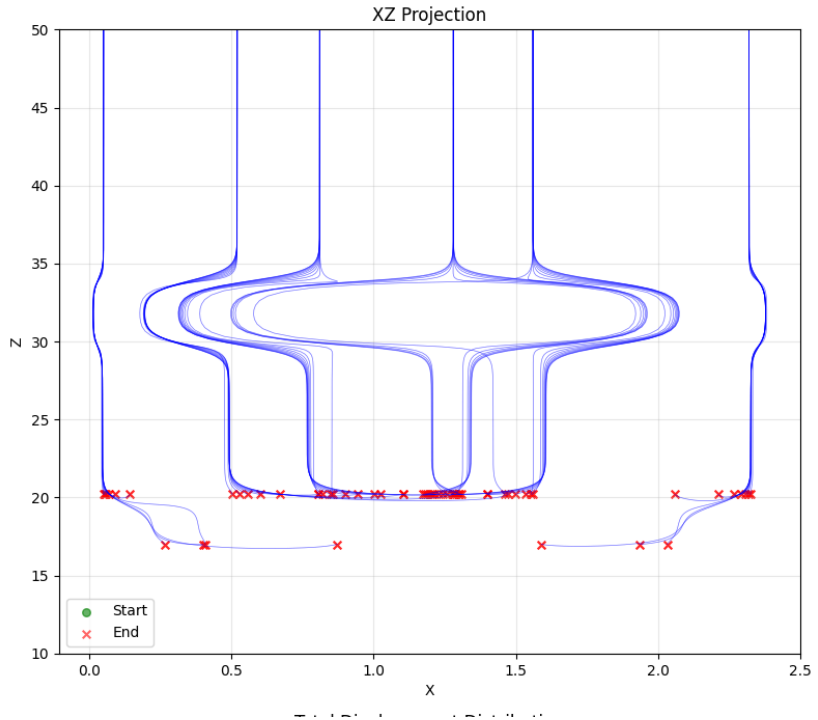


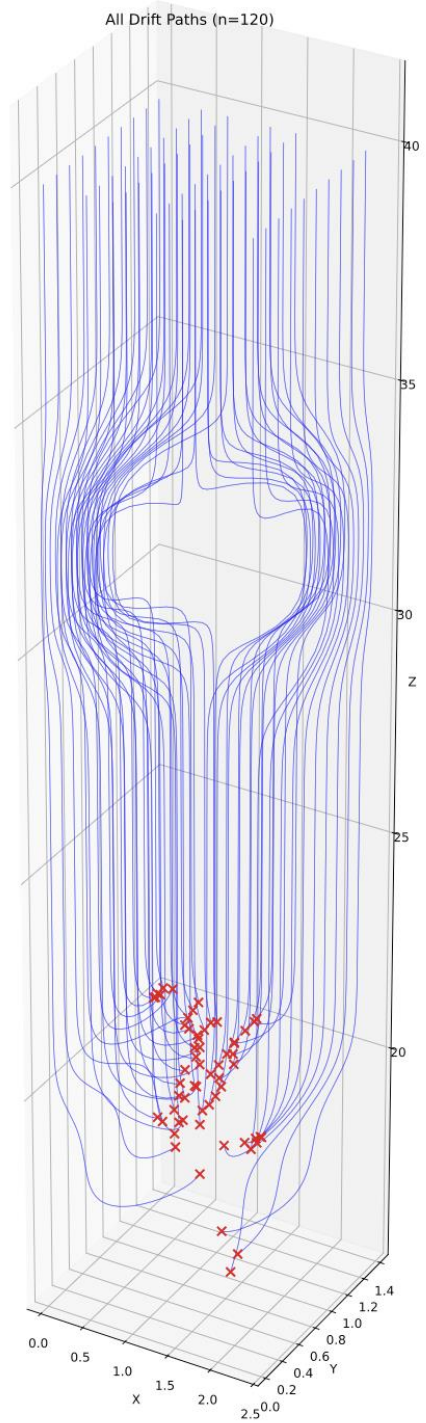
w signal is very weak; decon w is empty

Some large raw signal shows it is positive peak.

Drift path of the new FR



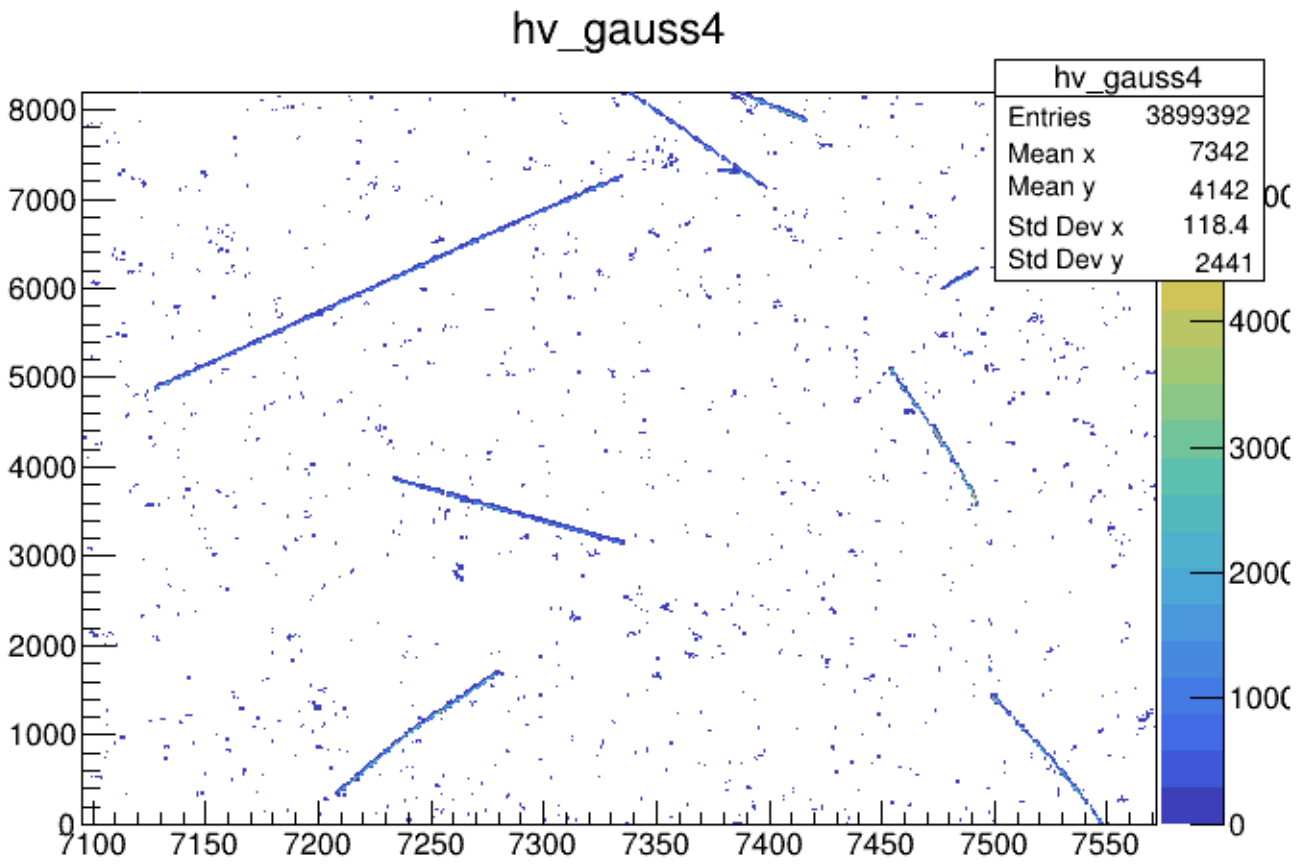




Everything is same but set V_W=10V

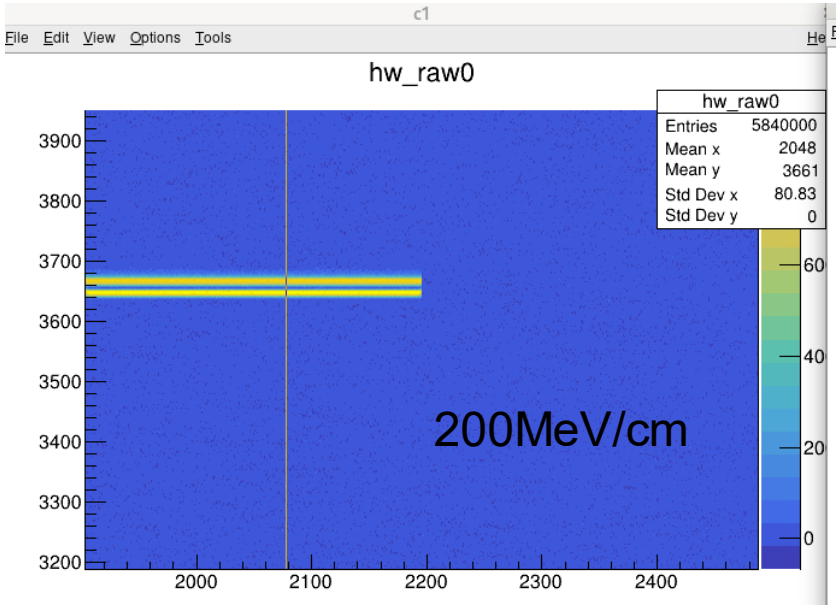
Apply the V_W=10V FR; V plane

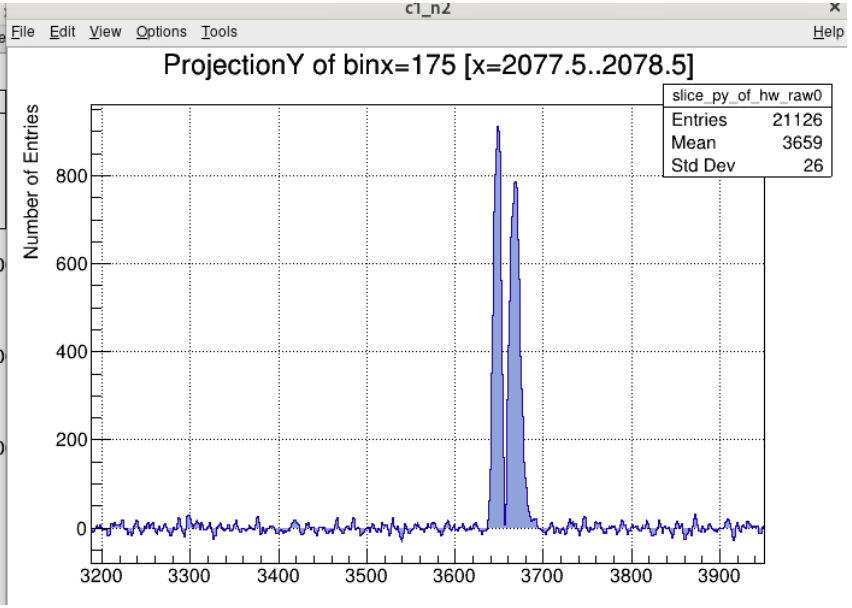
v plane is fine

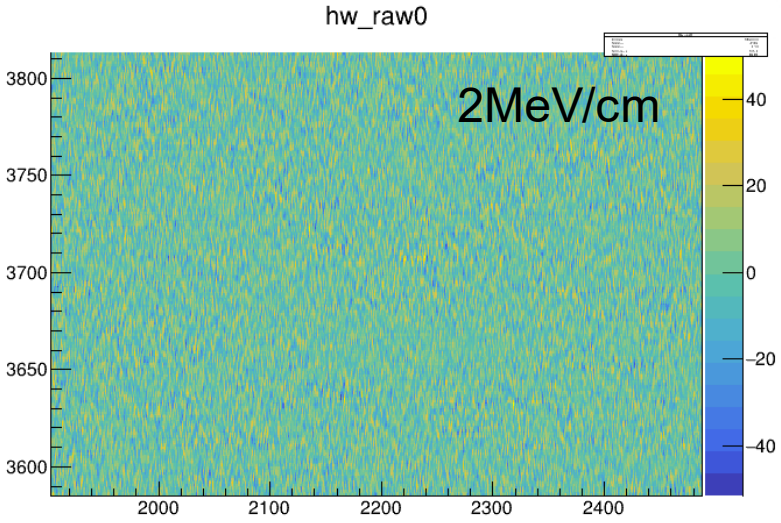


W plane wct standalone simulation

Track direction: Parallel to the w wires;

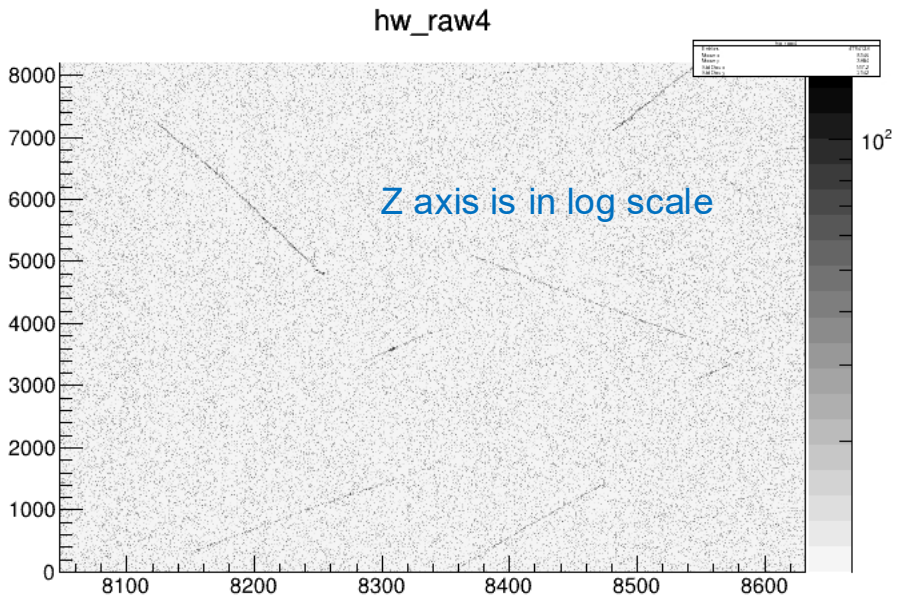




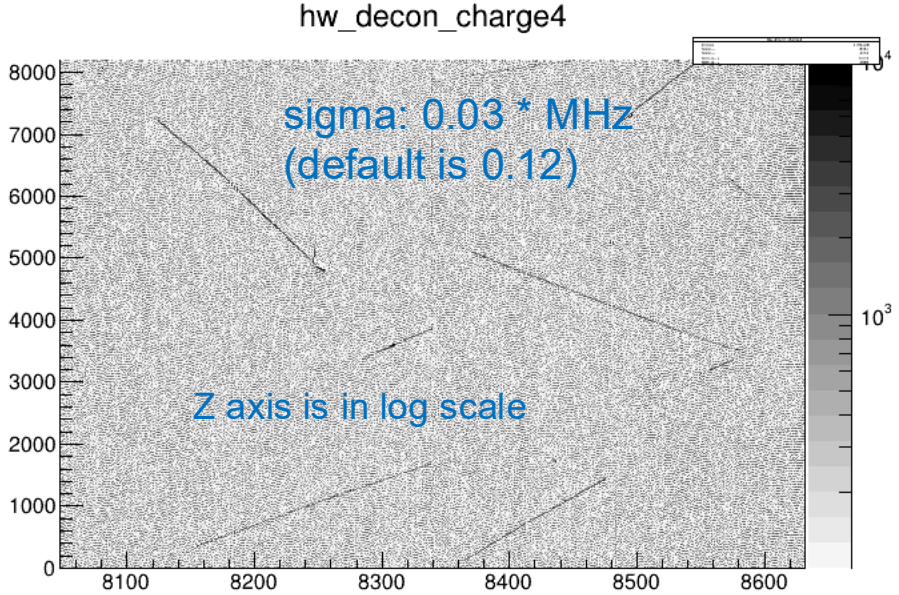


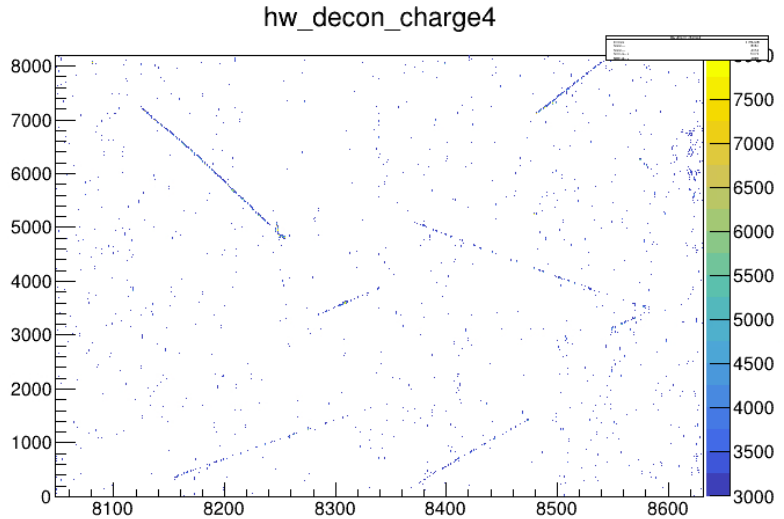
This should have a track as upper…

Apply the V_W=10V FR decon + Gauss filter



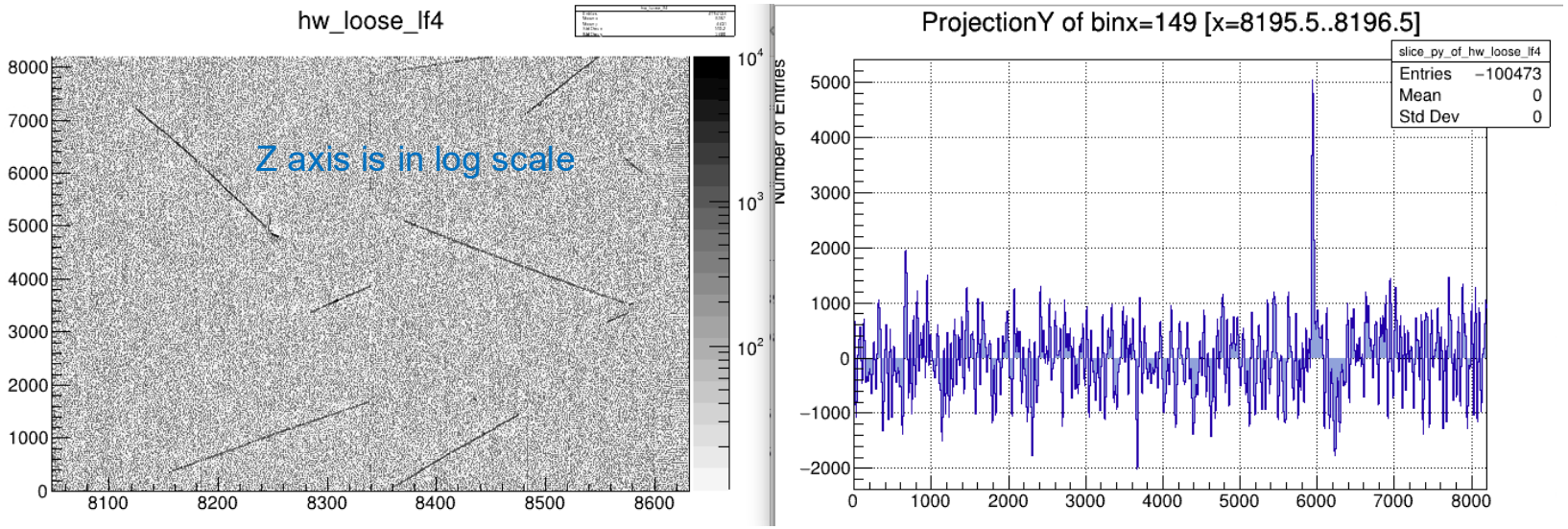
Raw data



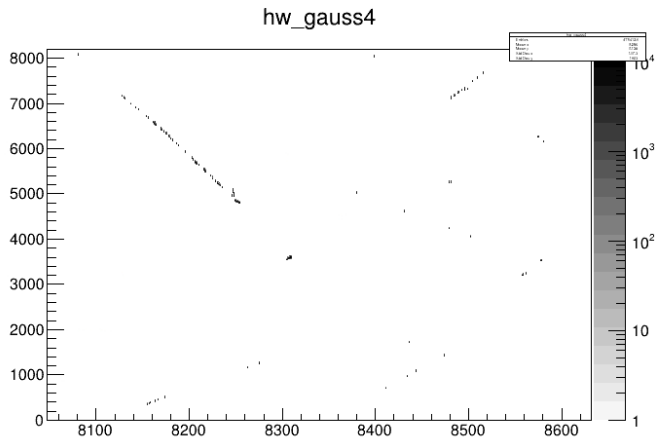


charge>3000; No ROI

Apply the V_W=10V FR decon + Wiener filter



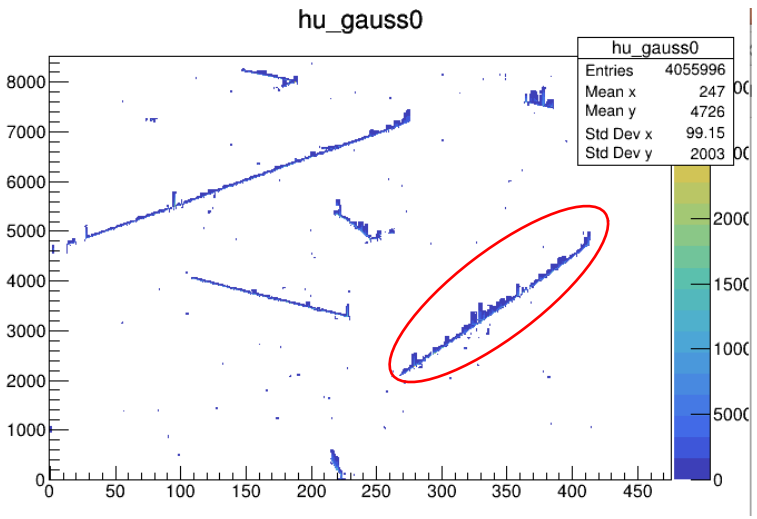

```
hf('Wiener_tight_W', {
   // sigma: 0.13623 * wc.megahertz, //default one
   sigma: 0.03 * wc.megahertz,
   power: 3.35324,
 }),
```

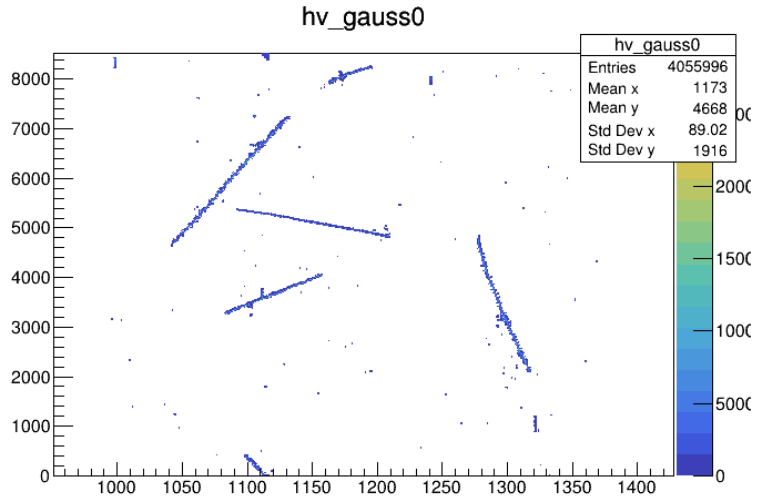


ROI is still almost empty;
Maybe tune threshold a little bit

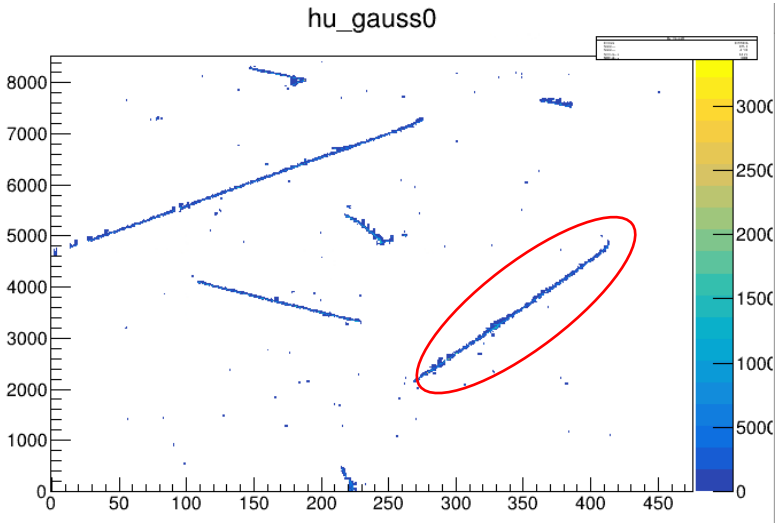
Drift field 700V/cm run040475

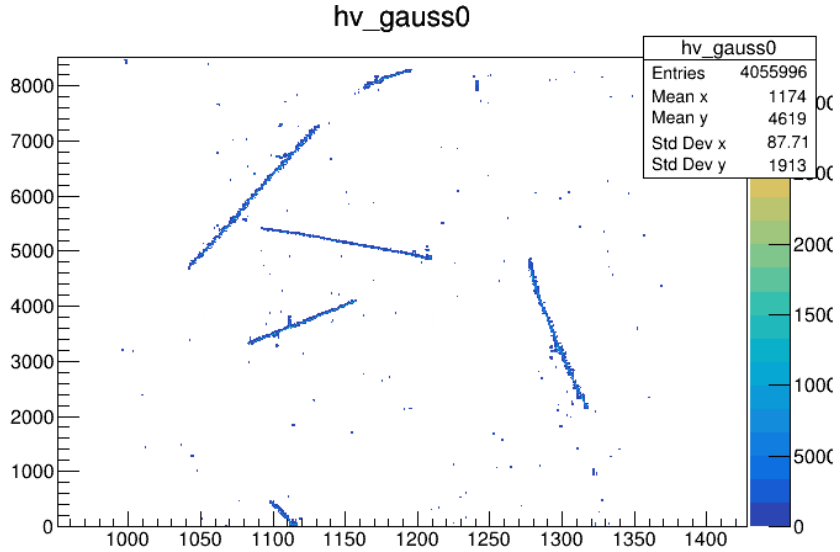
Default FR; 500V/cm





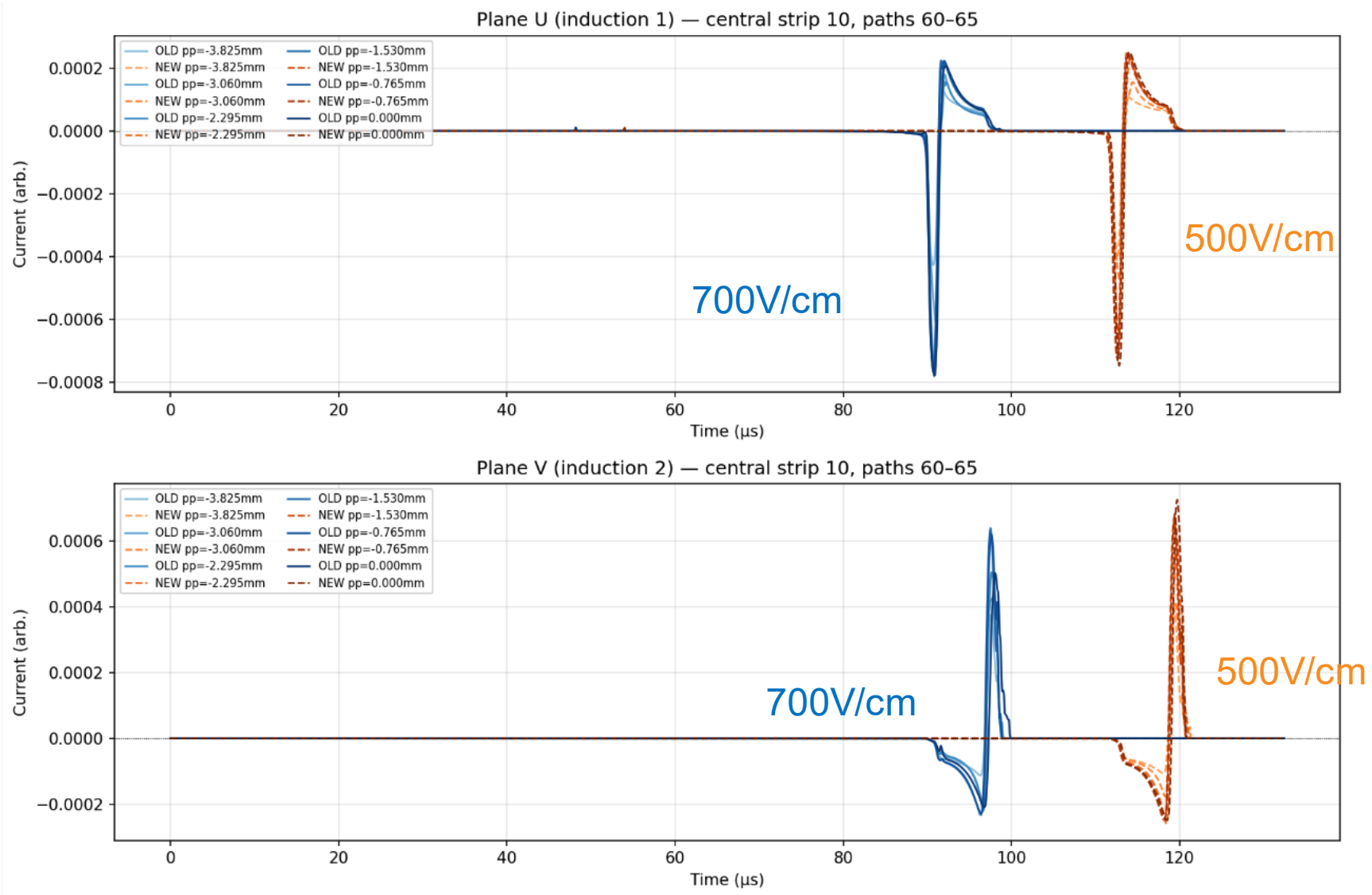
700V/cm FR





PDVD run summary
https://wiki.dunescience.org/wiki/ProtoDUNE_Vertical_Drift_operation_status#keep-up_processing

FR compare


Plane U (induction 1) — central strip 10, paths 60–65
OLD pp=-3.825mm
NEW pp=-3.825mm
OLD pp=-3.060mm
NEW pp=-3.060mm
OLD pp=-2.295mm
NEW pp=-2.295mm
OLD pp=-1.530mm
NEW pp=-1.530mm
OLD pp=-0.765mm
NEW pp=-0.765mm
OLD pp=0.000mm
NEW pp=0.000mm
Current (arb.)
Time (μs)
700V/cm
500V/cm
Plane V (induction 2) — central strip 10, paths 60–65
700V/cm
500V/cm