

PDVD data imaging & clustering

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Build a tool chain:

- Visualize the workflow from **2D signal processing** → **3D imaging** → **clustering**
- Straightforward extraction of **3D track length and direction** from **selected 2D tracks**
 - Signal shape, field response...
 - Signal-to-noise (S/N) performance
 - Charge–light matching (e.g., selected tracks for Siren studies)
- Allow **targeted processing of selected tracks/regions** for efficient imaging and clustering debugging.
 - PDVD imaging & clustering performance evaluation

Larsoft part: run on gpvm

Noise filter + signal processing

[pdvd/wcls-nf-sp-out.jsonnet](#)

output files: .npy

contains gauss+wienner

eg:protodune-sp-frames-anode*.tar.bz2

Add a **GUI**:
[Select_frames.py](#)
select sub region

wct part: run on wcgpu

Imaging

[wct-img-all.jsonnet](#)

Clustering

[wct-clustering.jsonnet](#)

TBD:

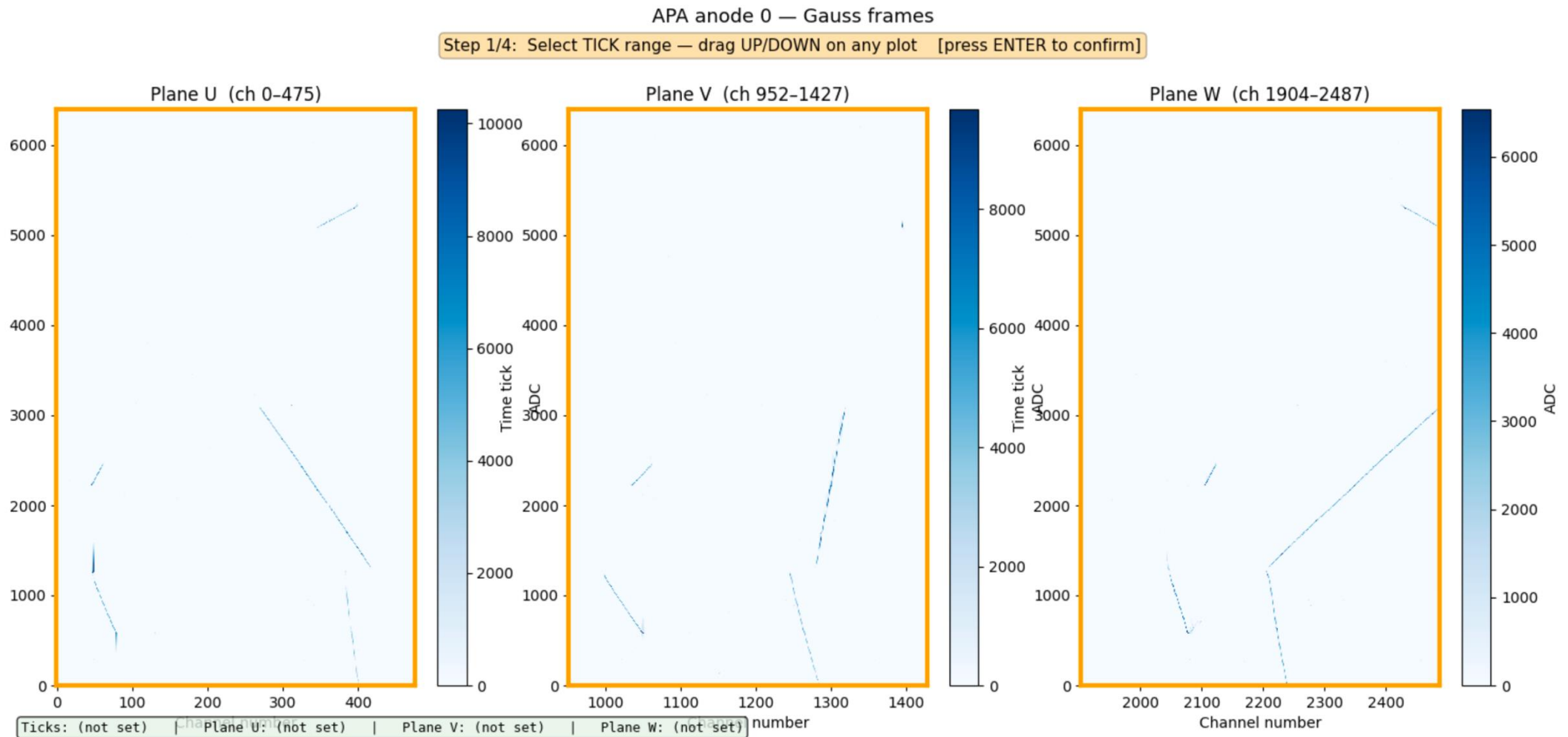
extract track info
from clustering
result

simulate track
from the
extracted info

compare data
and simulation

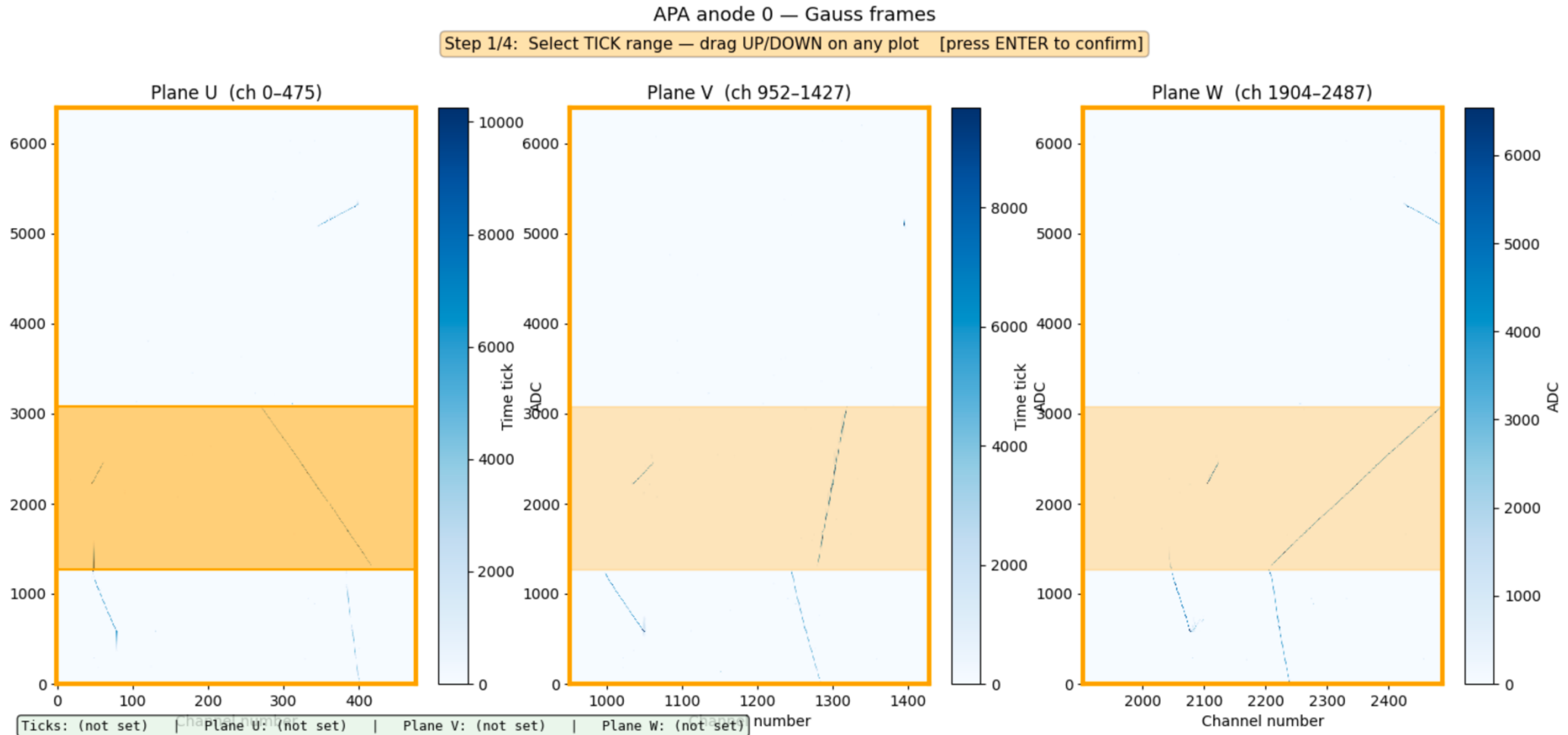
Select frame GUI

- [Select frames.py](#)
- With input npy file, Manually select time ticks and 3 plane channel range



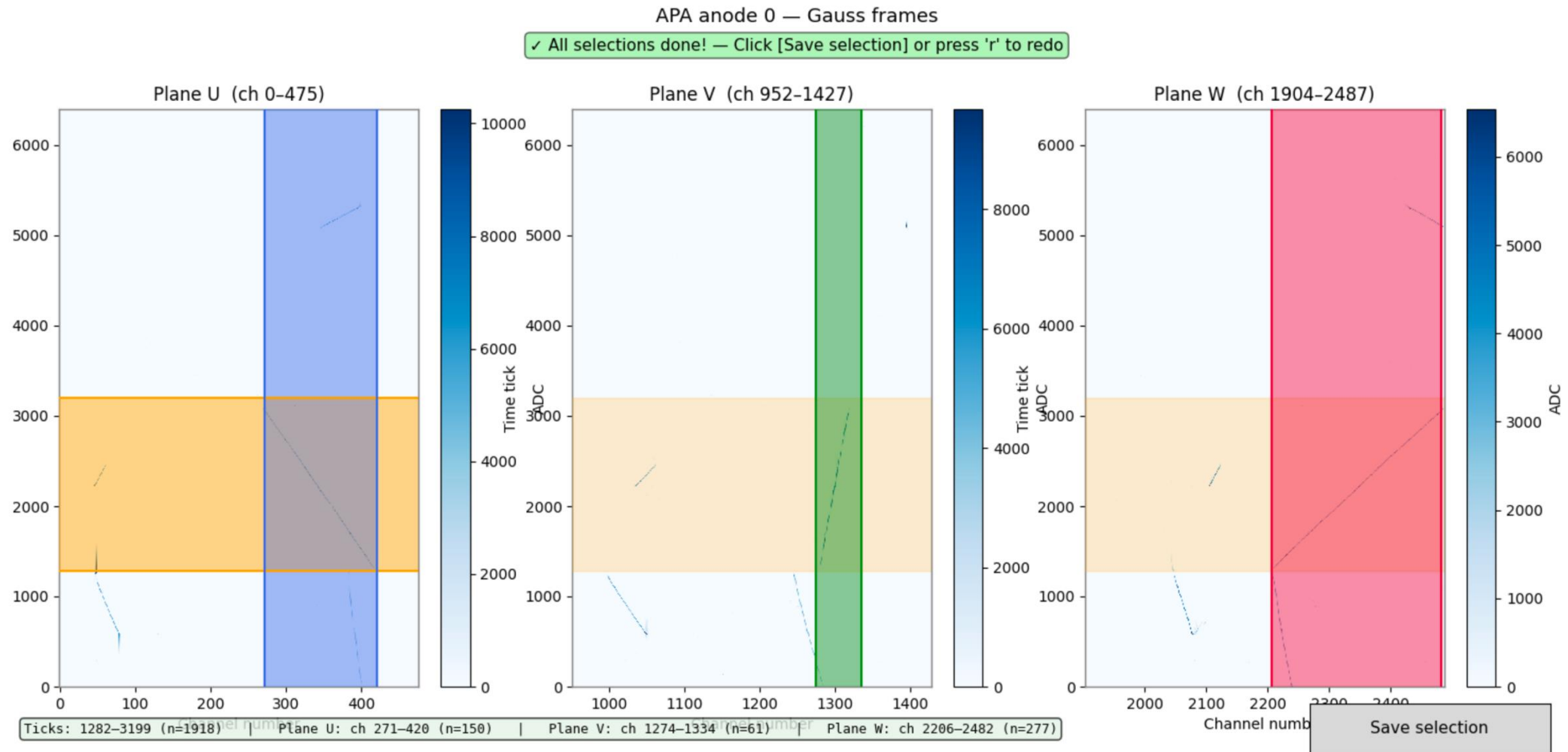
Select frame GUI

- With input npy file, Manually select time ticks and 3 plane channel range
 - **Step1: select time range, same across all 3 planes**



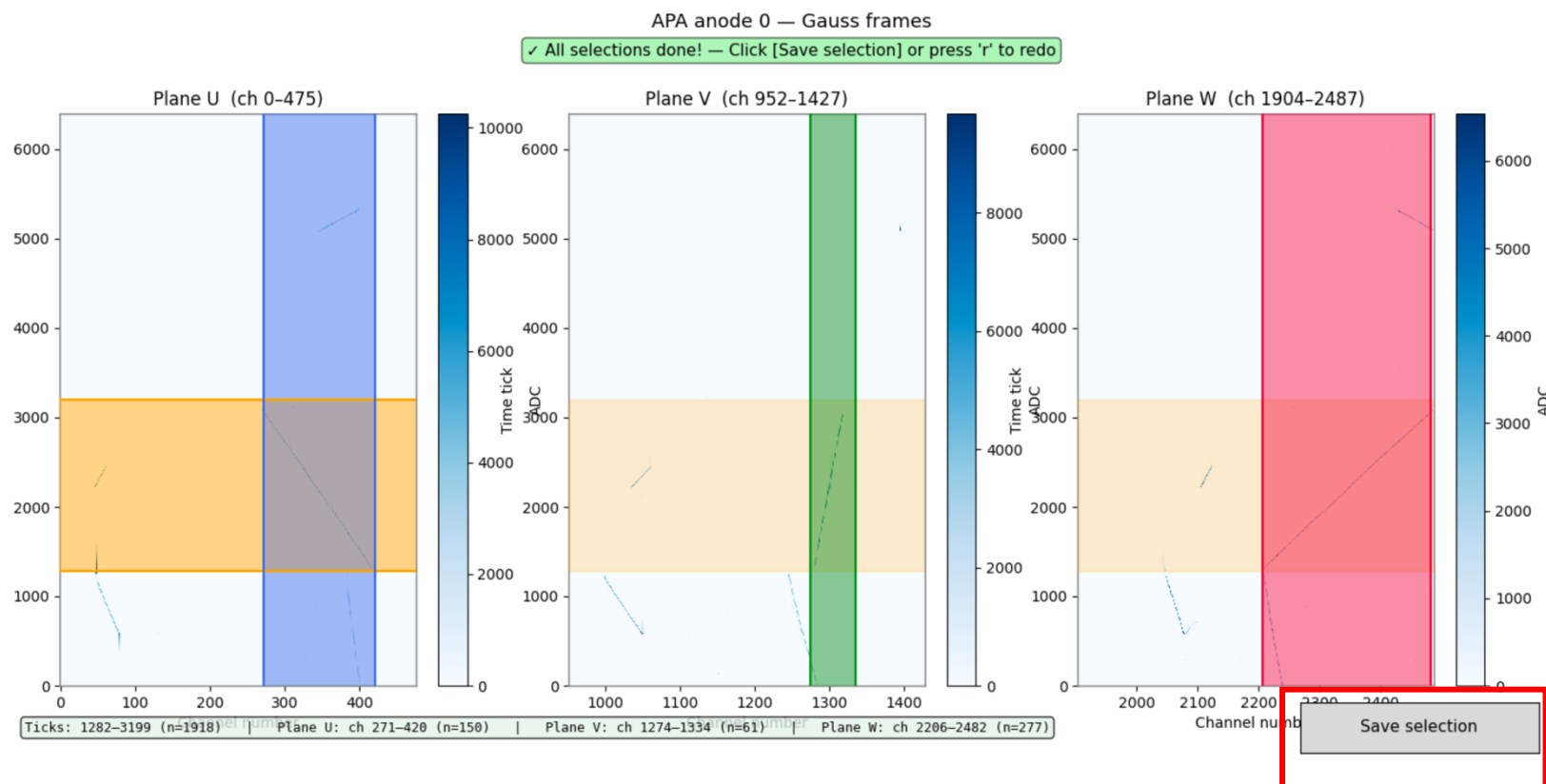
Select frame GUI

- With input npy file, Manually select time ticks and 3 plane channel range
 - Step1: select time range, same across all 3 planes
 - **Step2: select U V W channel range separately.**



Select frame GUI

- With input npy file, Manually select time ticks and 3 plane channel range
 - Step1: select time range, same across all 3 planes
 - Step2: select U V W channel range separately.

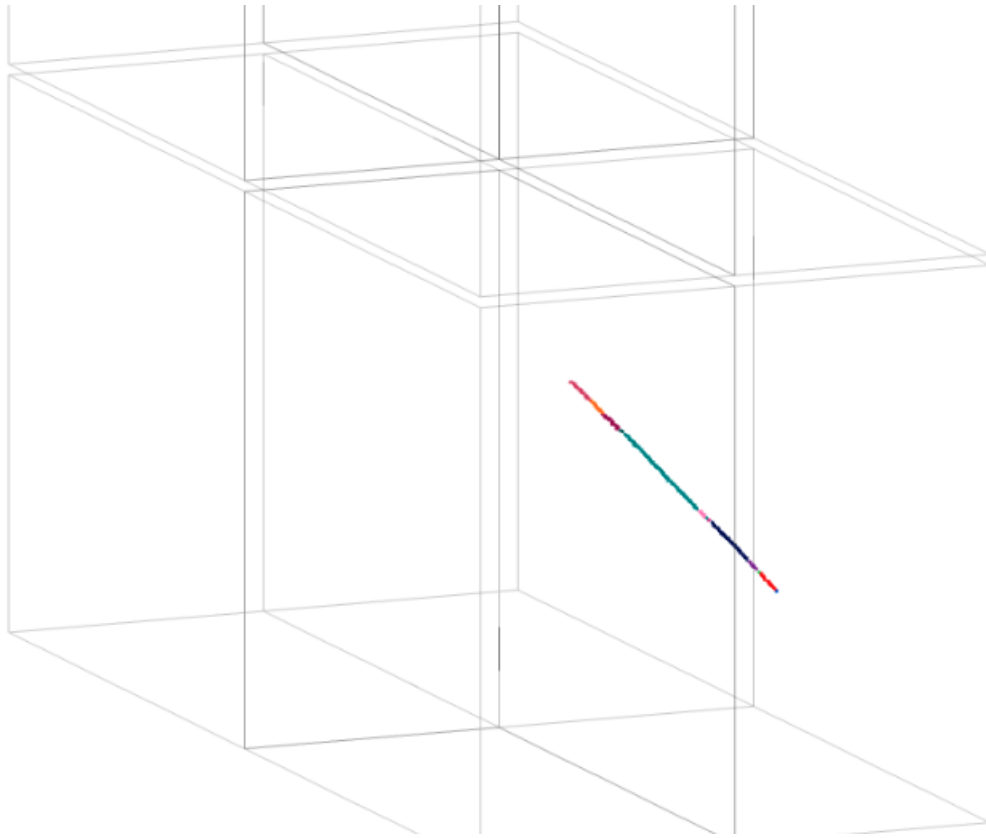


- Finally save the select region, both gauss & wiener

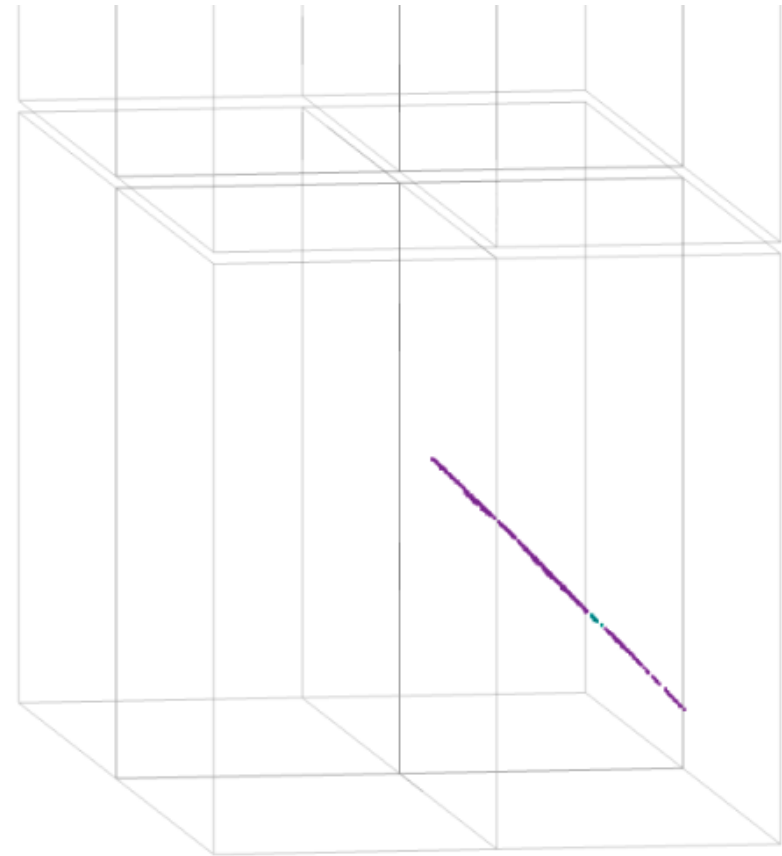
[protodune-sp-frames-part-anode0.tar.bz2](#)

Imaging & clustering on selected region

Imaging:

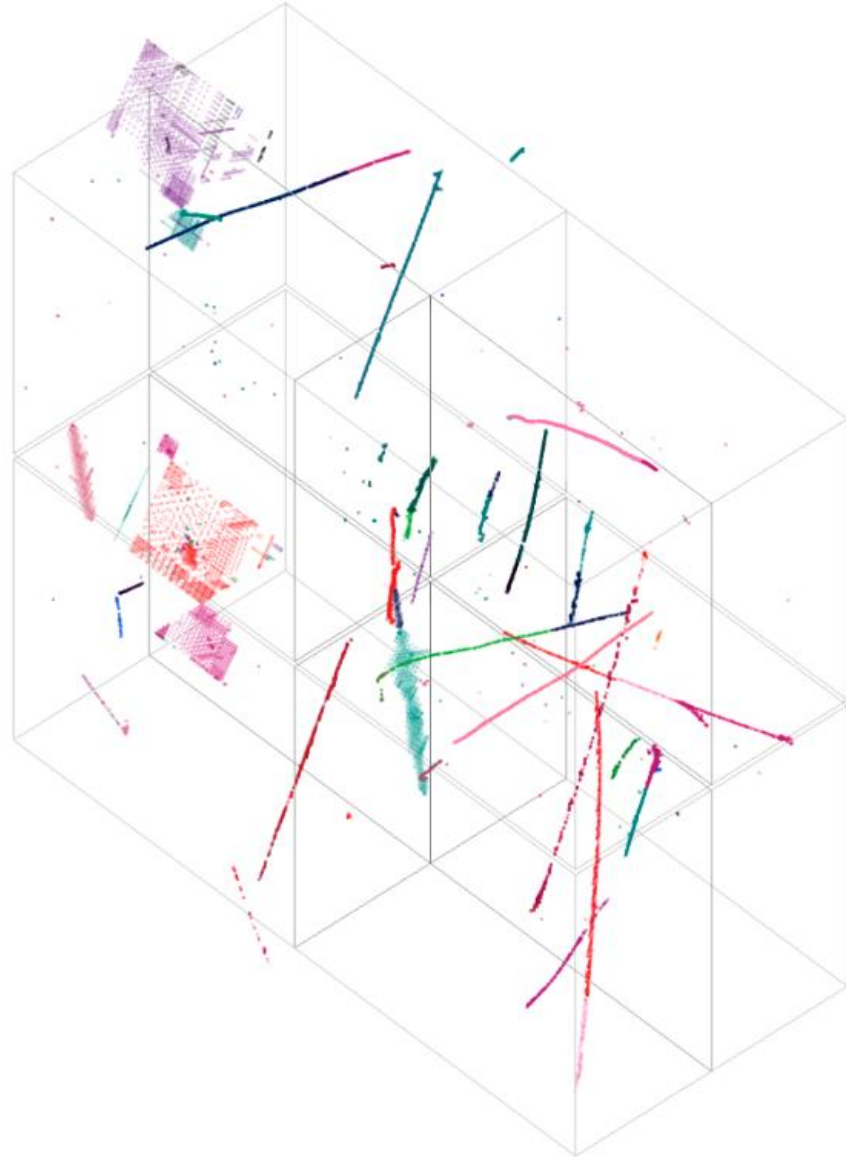


Clustering:

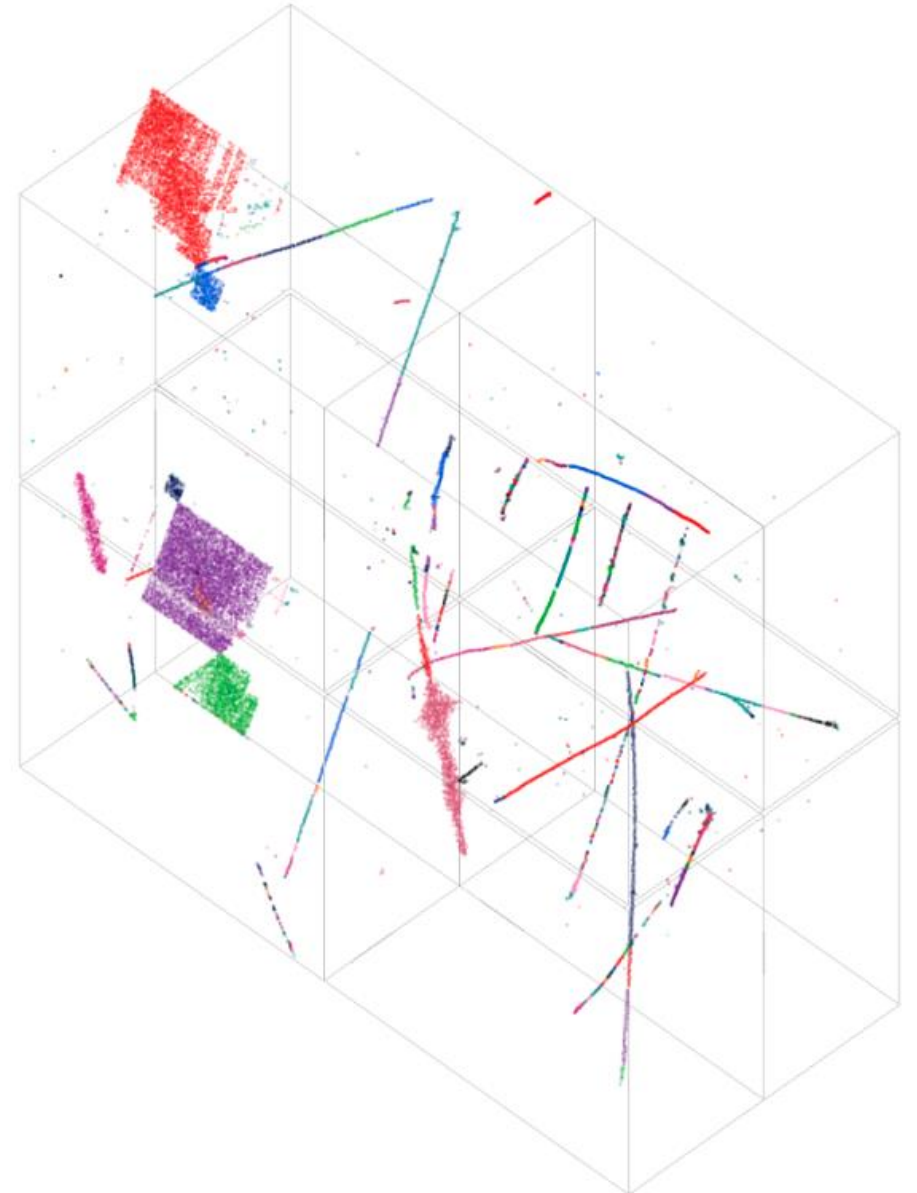


An example of PDVD clustering

PDVD clustering

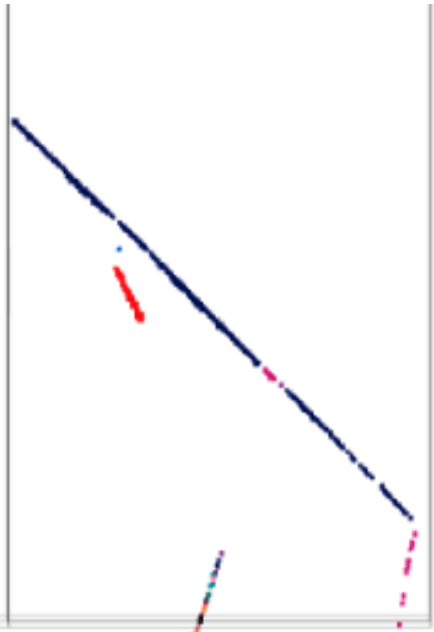


PDVD imaging

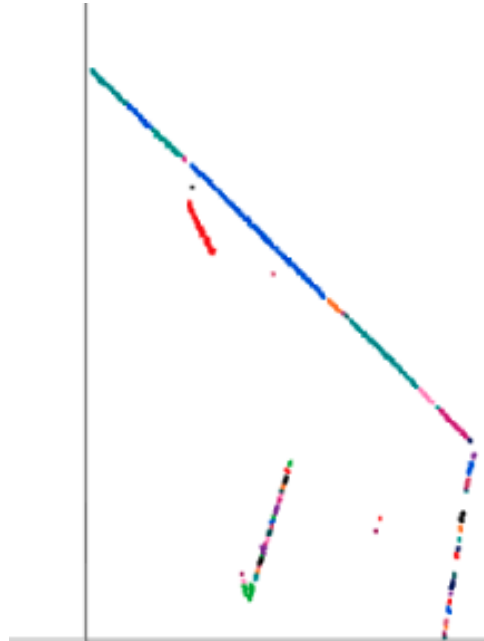


Some details

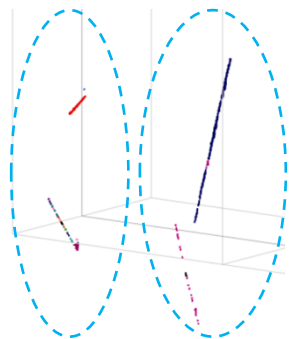
clustering



imaging

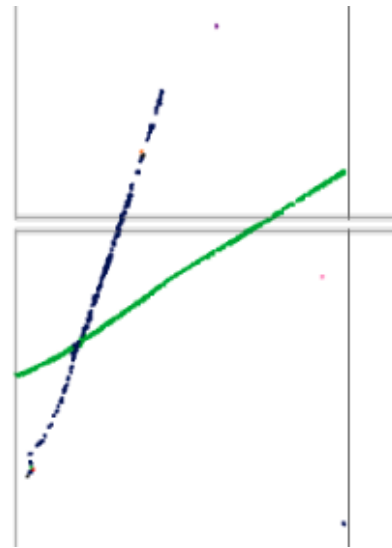


face1

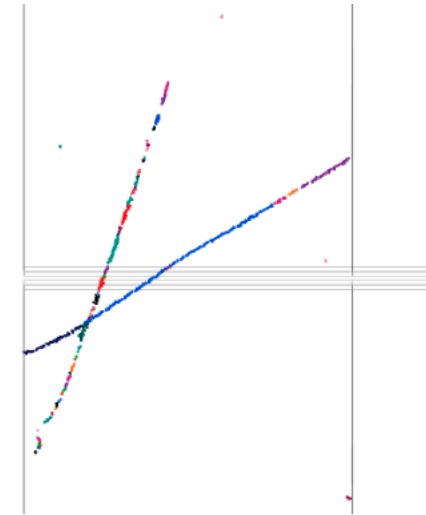


face0

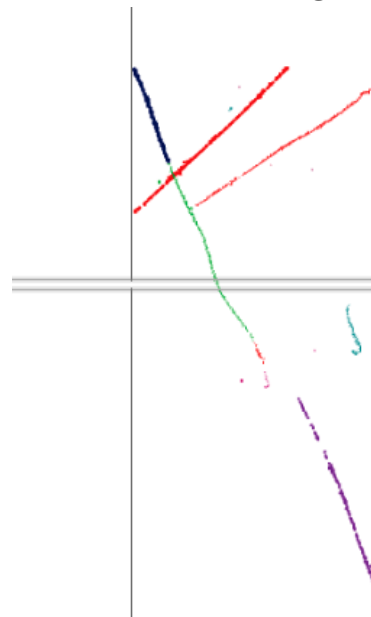
clustering



imaging



clustering



imaging

