

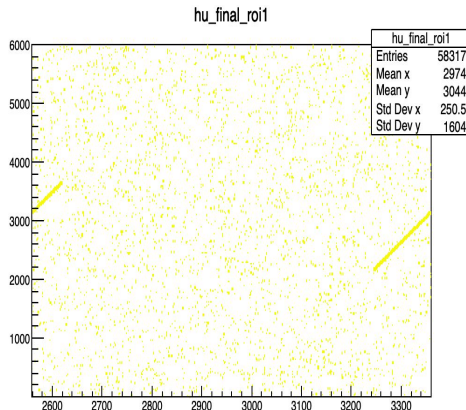


Status report on **DNNROI sigproc**

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Yousen's evaluation metric test

- Split each ROI into fixed time windows of 0.5 us and 1.5 us, starting from the ROI boundary
- e.g.) The ROI pattern [1, 0, 0, 1, 1, 1, 1, 1, 0, 0] is split into continuous segments
 - For the 0.5 us window (1 tick)
 - Total 6 windows: **Segment 1** → 1 window, **Segment 2** → 5 window
 - For the 1.5 us window (3 tick)
 - Total 3 windows: **Segment 1** → 1 window, **Segment 2** → 2 window ([1, 1, 1], [1, 1])
- Then we apply truth threshold to avoid distortion caused by windows with very small truth charge



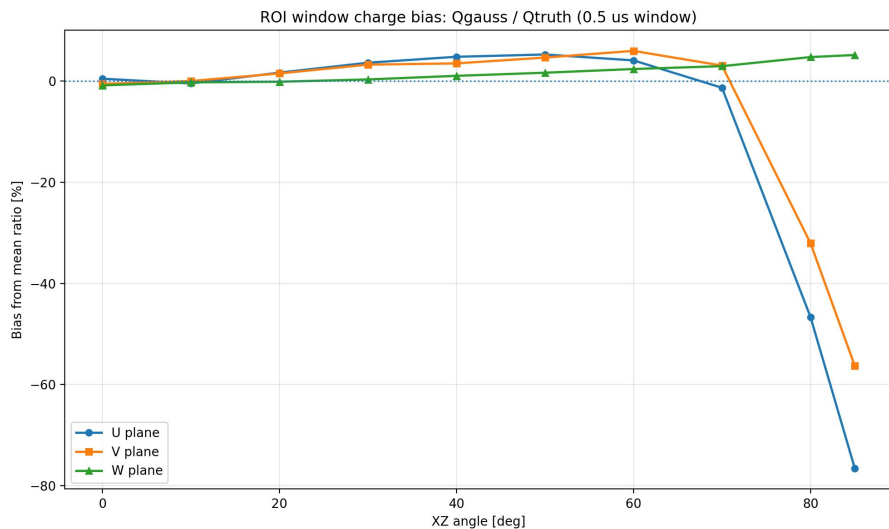
1 wire x 1 tick window



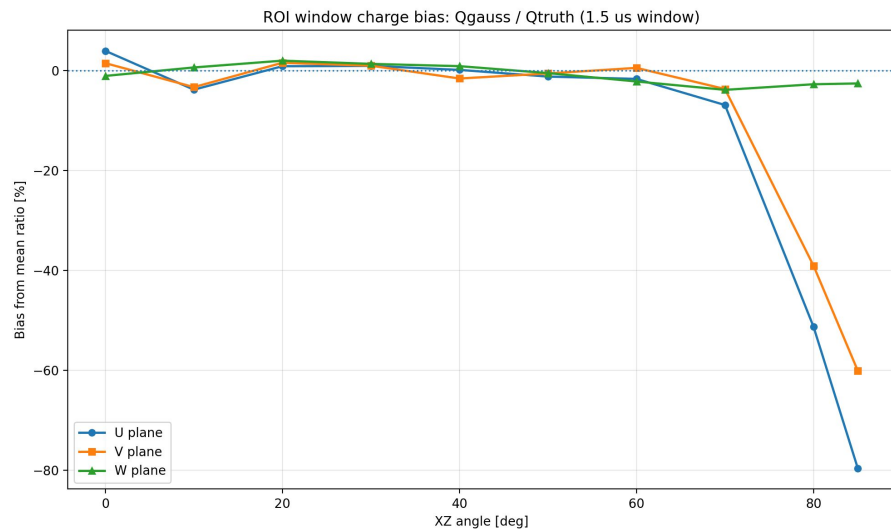
1 wire x 3 tick window

Yousen's evaluation metric test

- Summary results (bias) along the Theta_XZ angle



☐ 0.5 window

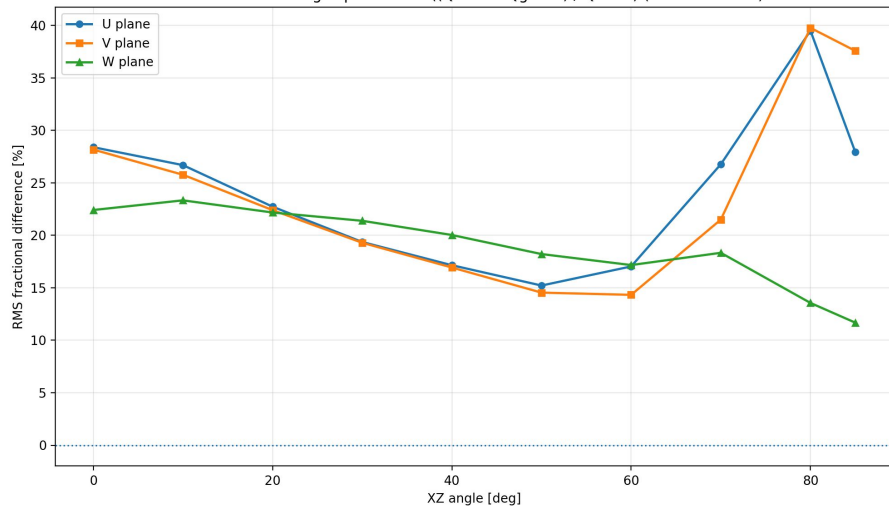


☐ 1.5 us window

Yousen's evaluation metric test

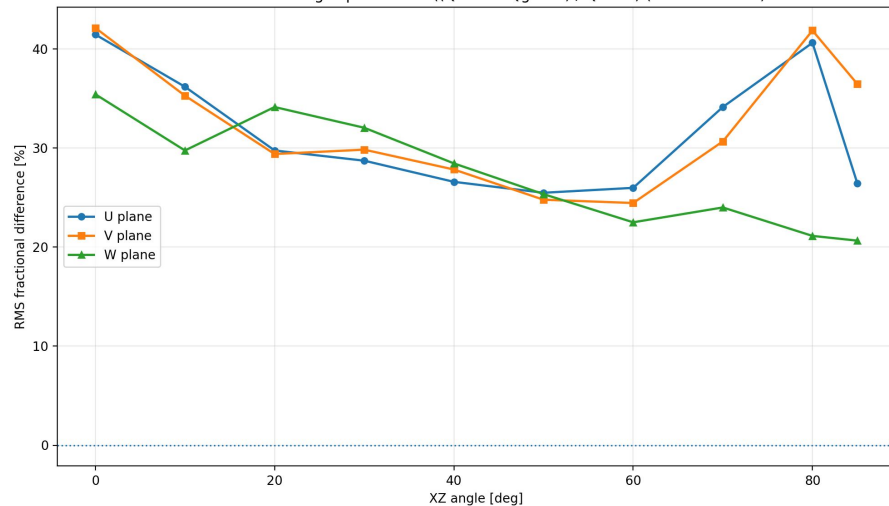
- Summary results (resolution) along the Theta_XZ angle

ROI window charge spread: $\text{RMS}((Q_{\text{truth}} - Q_{\text{gauss}}) / Q_{\text{truth}})$ (0.5 us window)



❑ 0.5 window

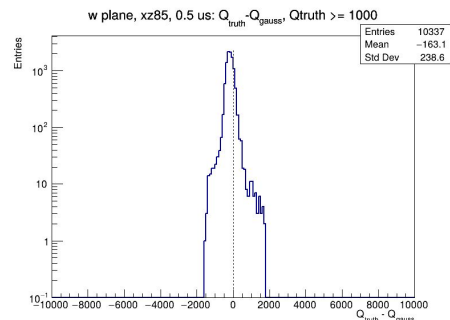
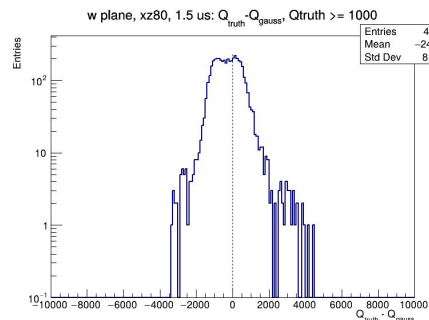
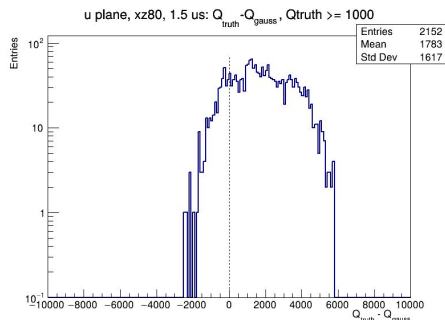
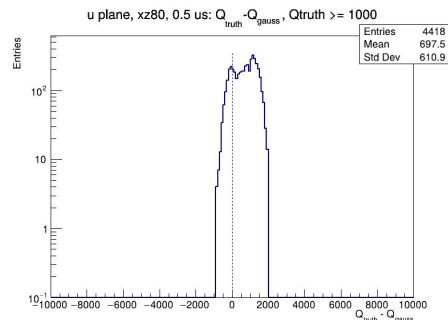
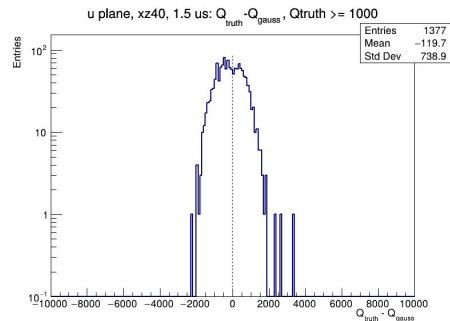
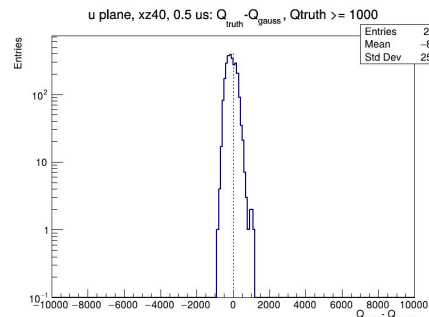
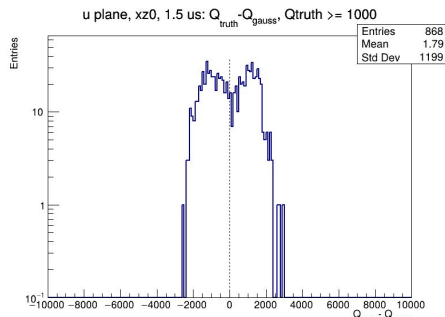
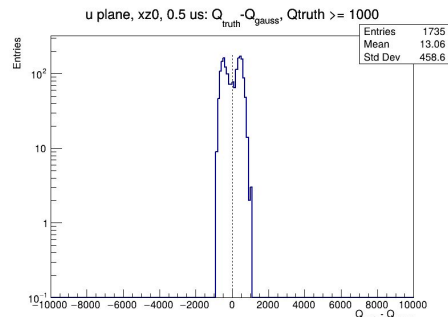
ROI window charge spread: $\text{RMS}((Q_{\text{truth}} - Q_{\text{gauss}}) / Q_{\text{truth}})$ (1.5 us window)



❑ 1.5 us window

Yousen's evaluation metric test

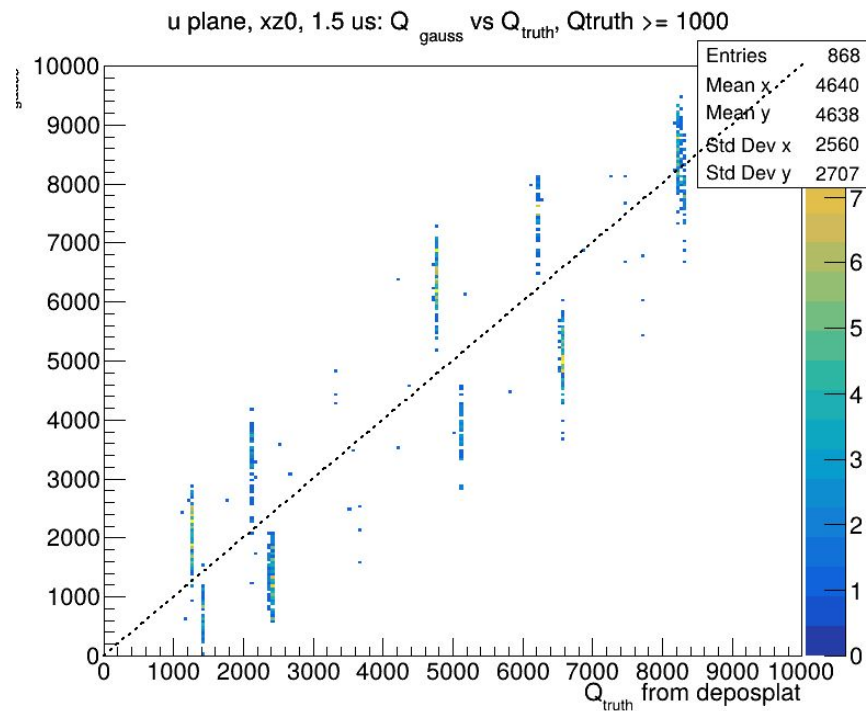
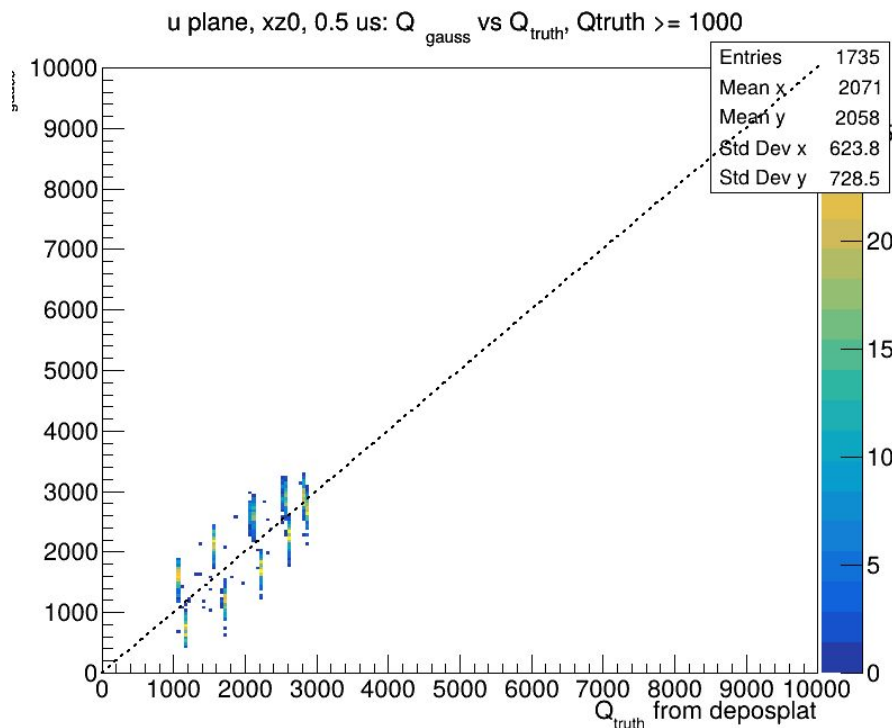
- Q_truth - Q_gauss



□ w plane, 80 degree

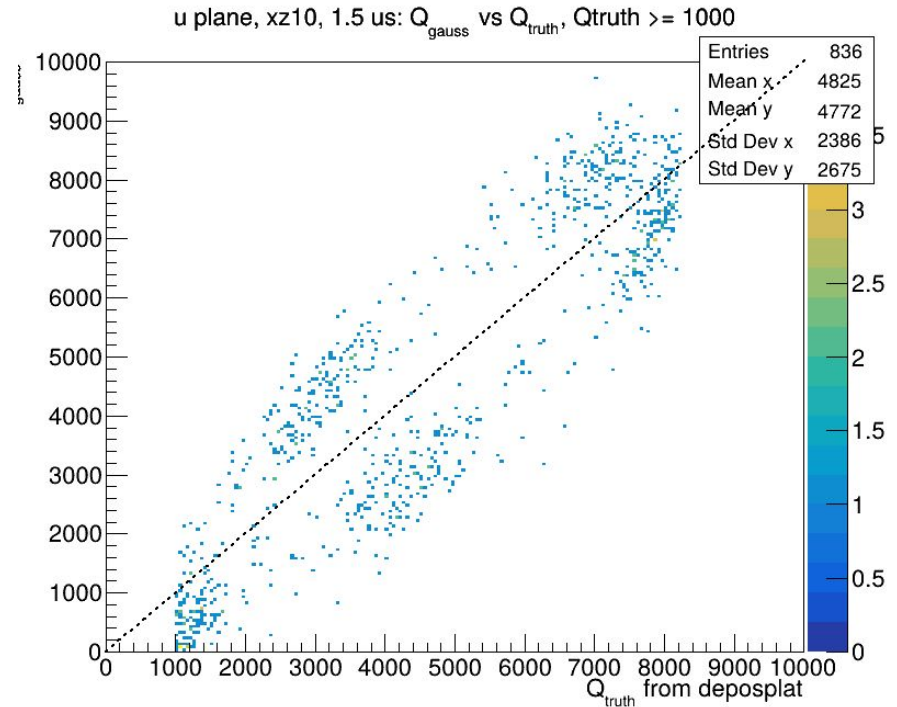
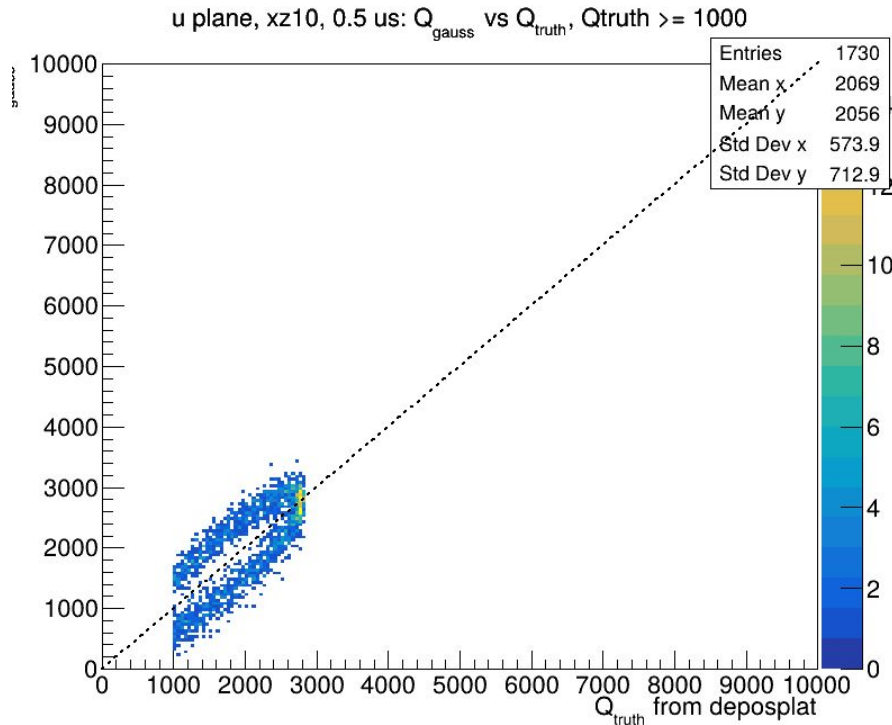
Yousen's evaluation metric test

- Q_truth vs Q_gauss 2D histogram



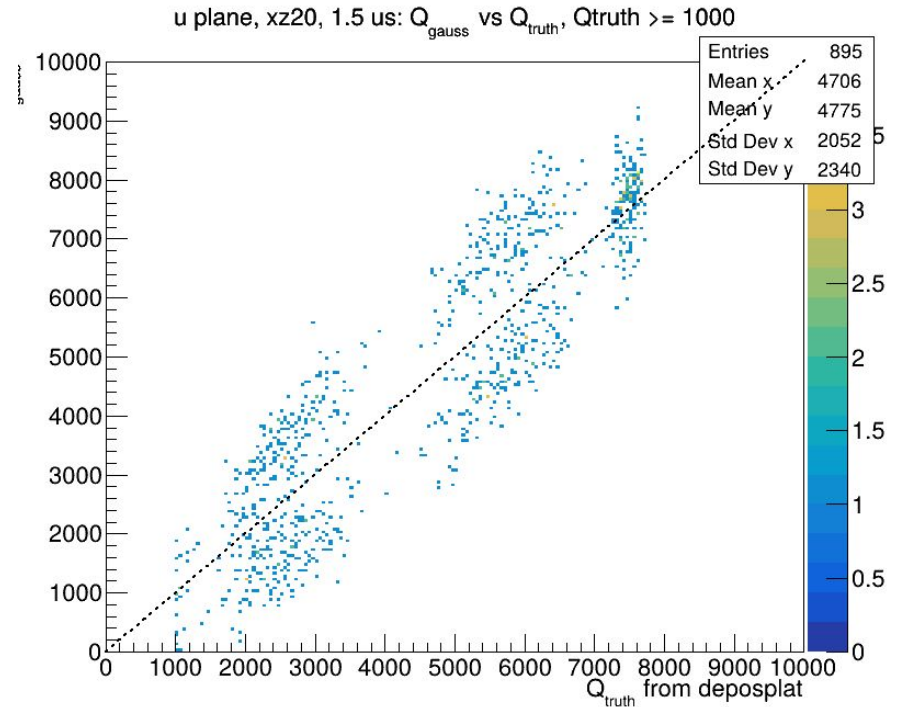
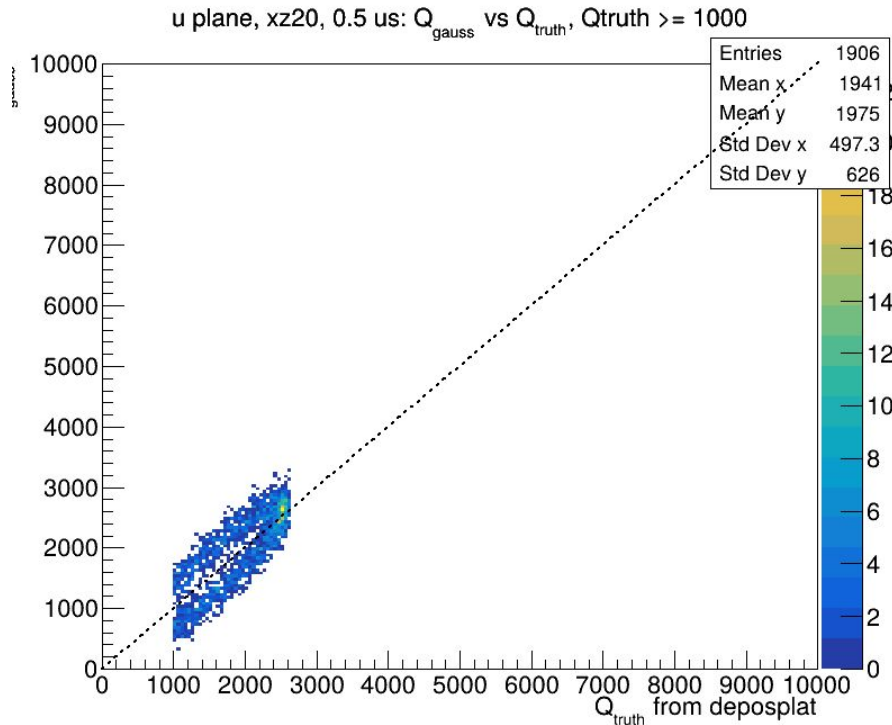
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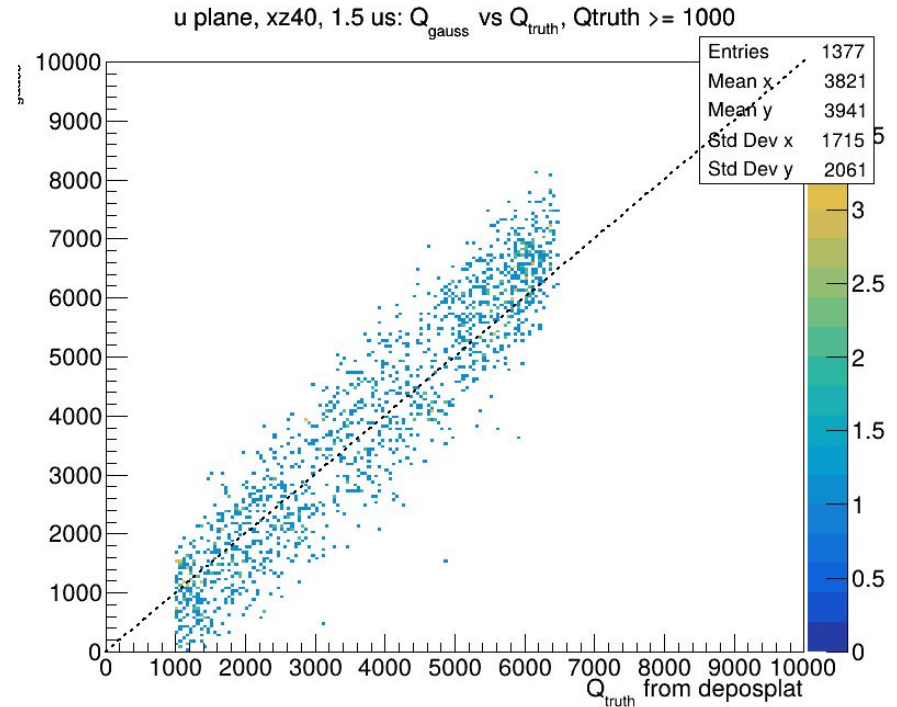
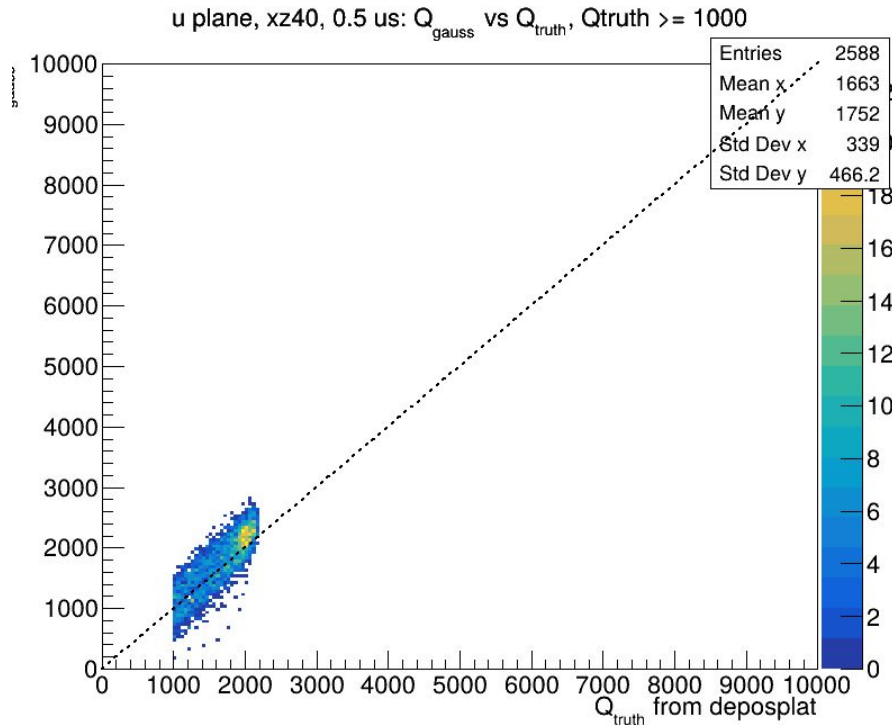
Yousen's evaluation metric test

- Q_truth vs Q_gauss 2D histogram



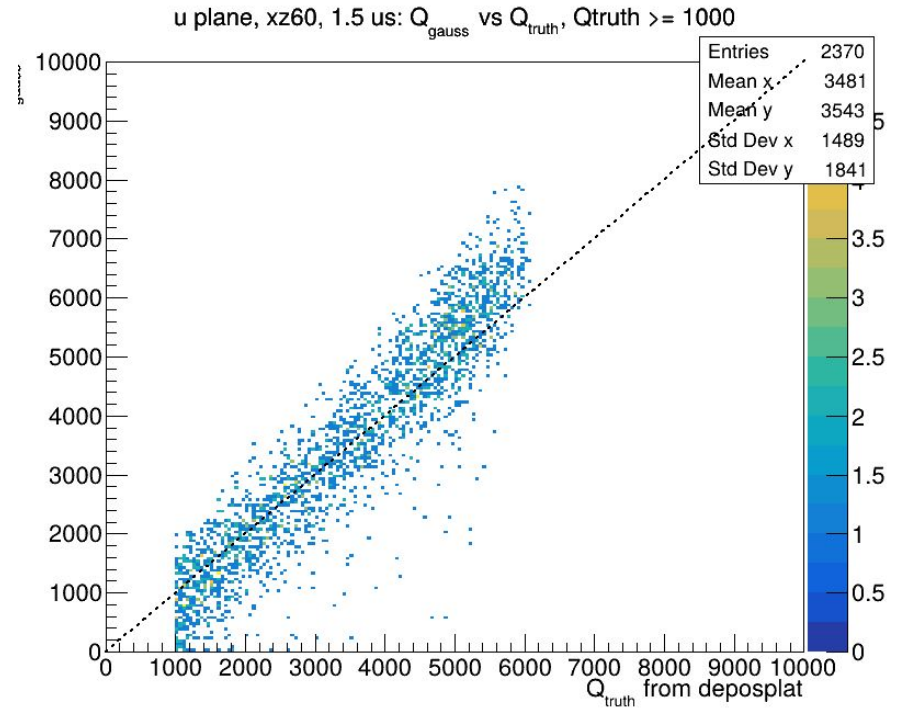
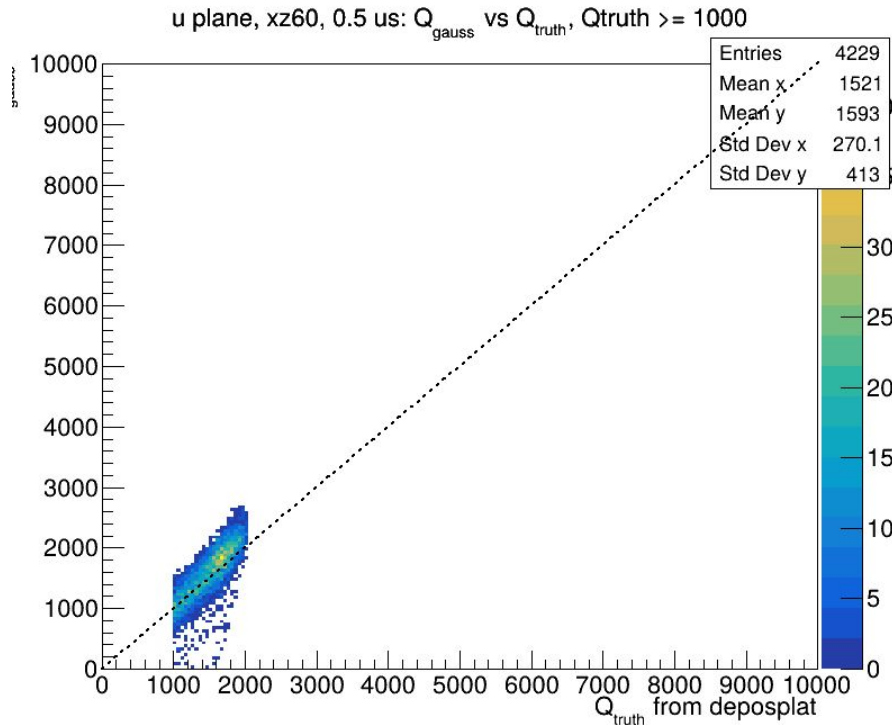
Yousen's evaluation metric test

- Q_truth vs Q_gauss 2D histogram



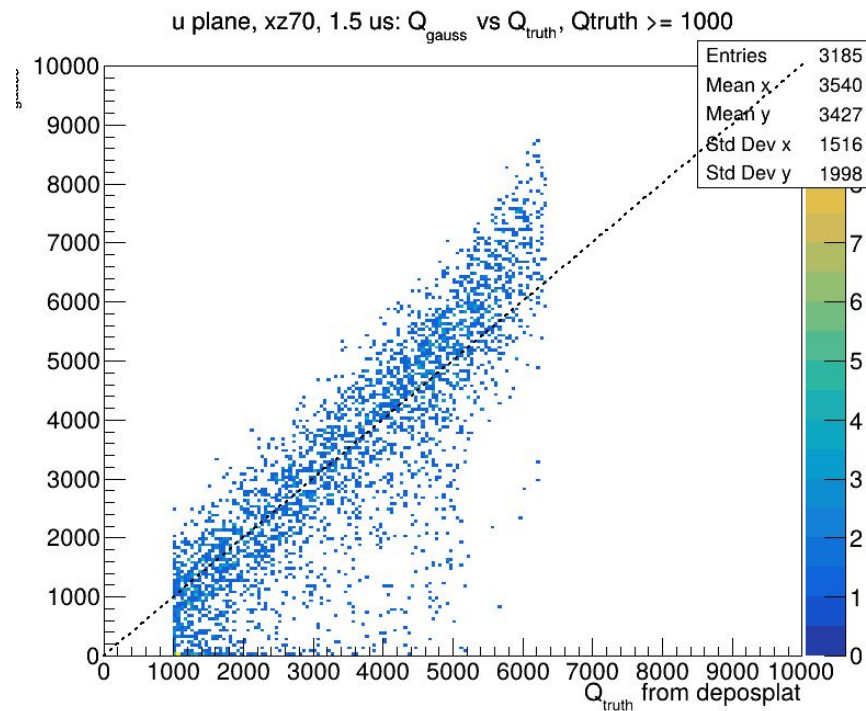
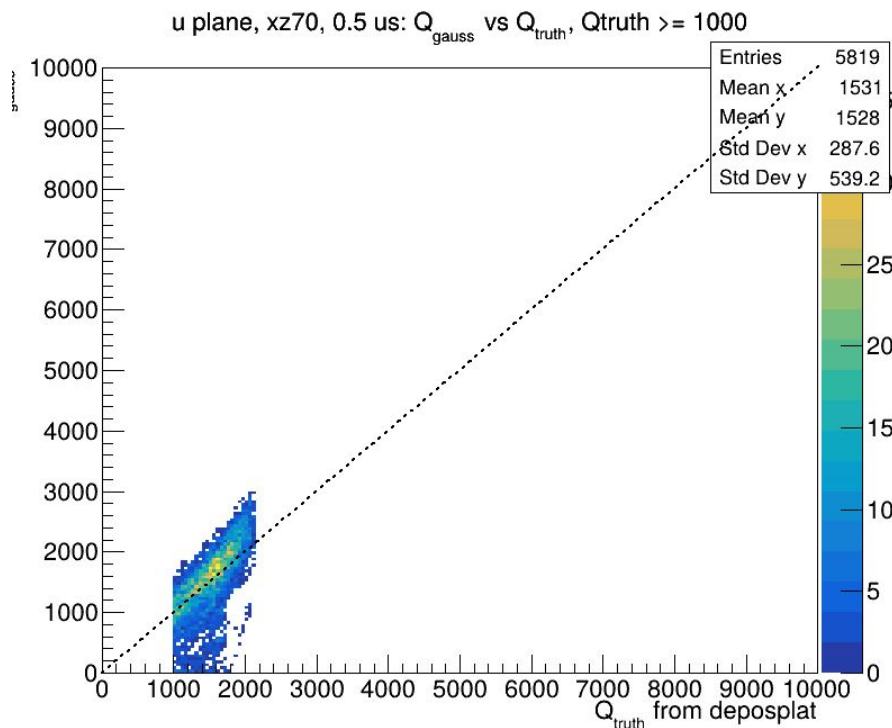
Yousen's evaluation metric test

- Q_truth vs Q_gauss 2D histogram



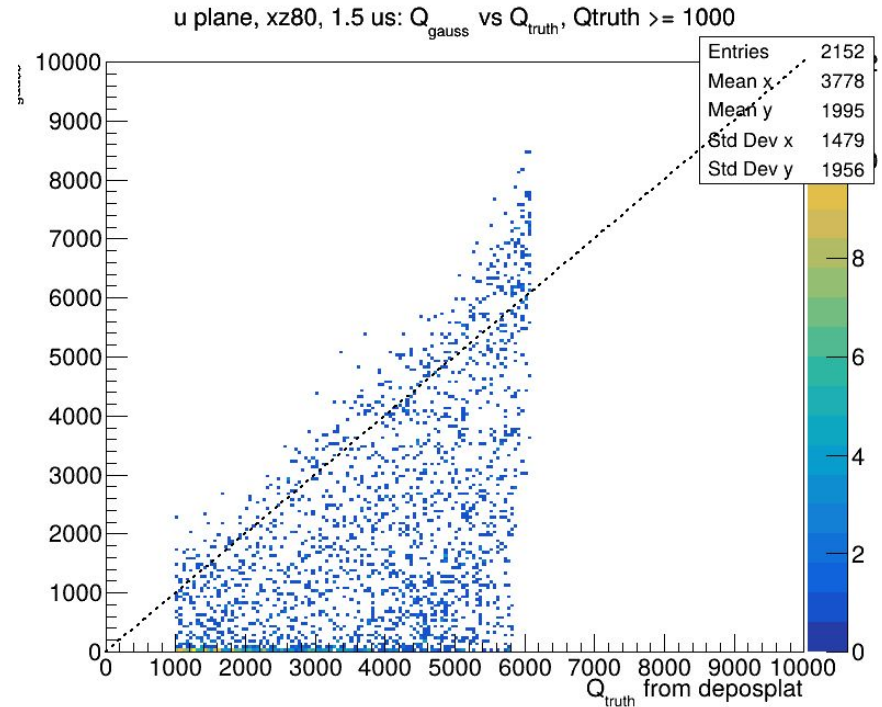
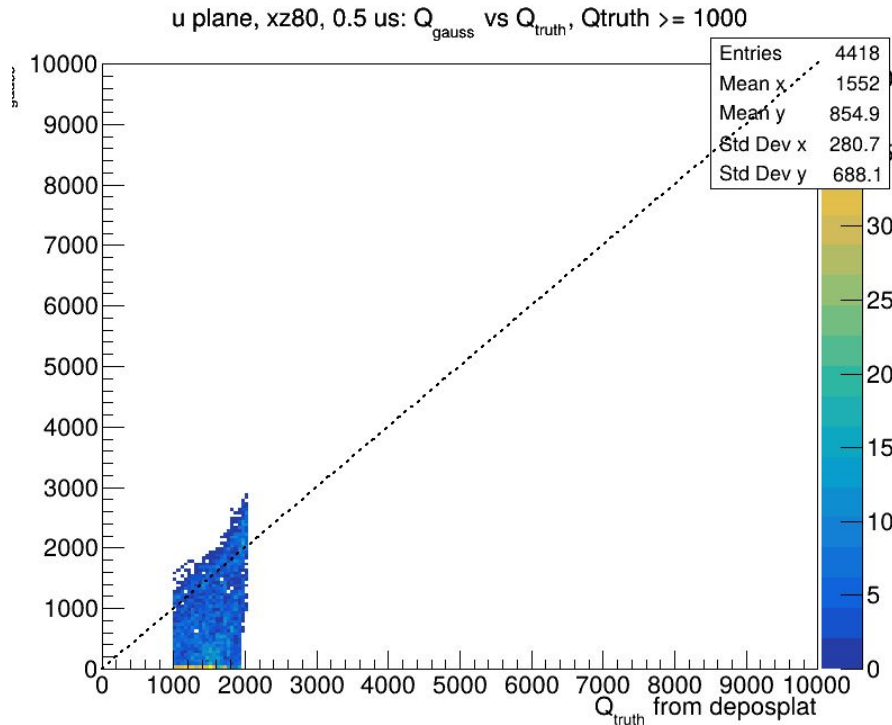
Yousen's evaluation metric test

- Q_truth vs Q_gauss 2D histogram



Yousen's evaluation metric test

- Q_truth vs Q_gauss 2D histogram



Back Up

PD-HD DNN ROI Workflow

- <https://docs.google.com/document/d/1BhloJsJN32LHJFUiSGQT3O4ibWF33XDm3bbFwyeuy24/edit?usp=sharing>
- Tested with stage1 root files provided by Xuyang
- Need to use recent Wire-Cell with activation of the rms-based NF
- Minor changes to the existing workflow
 - For wcls_input, changed “tick: params.daq.tick” to “tick: 512*wc.ns”
 - Added resampler
 - Added the configuration to the wirecell_dune.fcl

PD-VD LArWC track eval. vs. WC standalone track eval.

- Extracting depo from the geant4 simulated file - working in progress
- Shortened the track length of the WC standalone simulation, and compared the results
- WC standalone result is still worse

