Status report on

DNNROI sigproc

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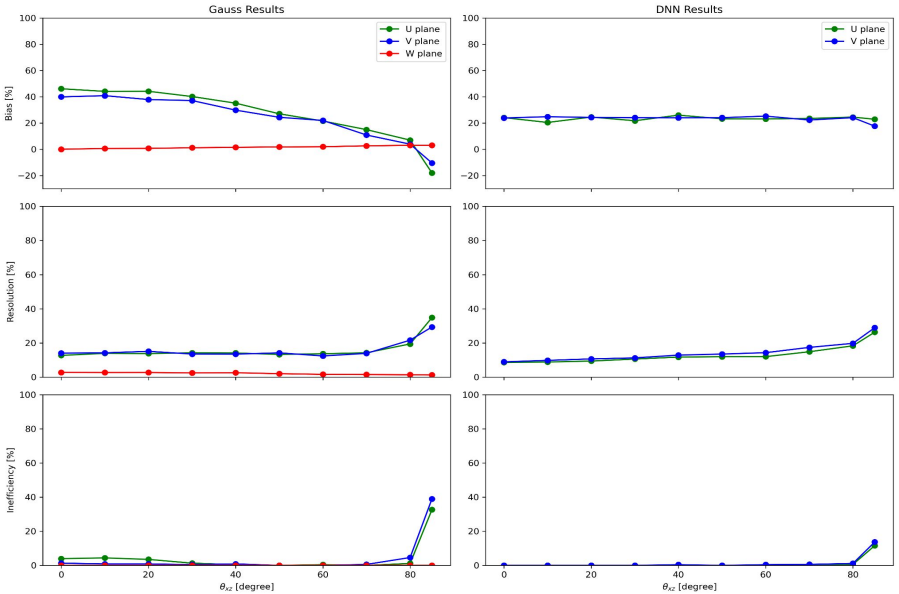
Baseline subtraction in DNN ROI processing



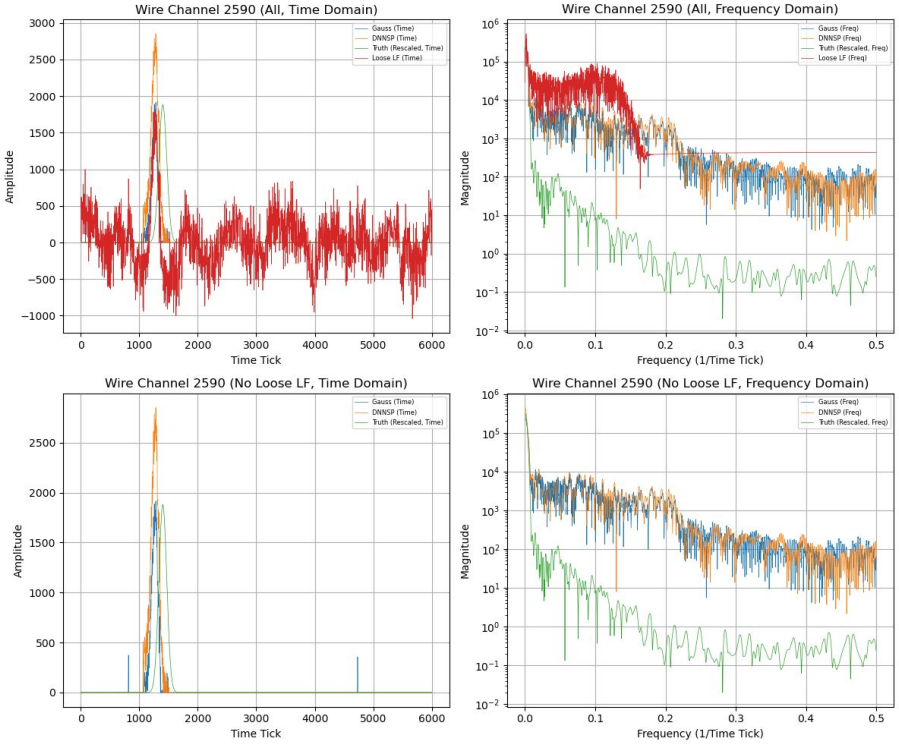
- Baseline subtraction caused a problem with bias
- I checked the metric with Jay, but the definitions of bias and resolution are the same as the MicroBooNE team's

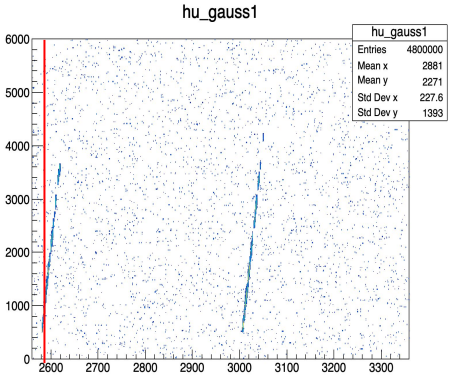
```
    sp_charge_T = Array::baseline_subtraction(sp_charge_T) *
m_cfg.output_scale + m_cfg.output_offset;
```

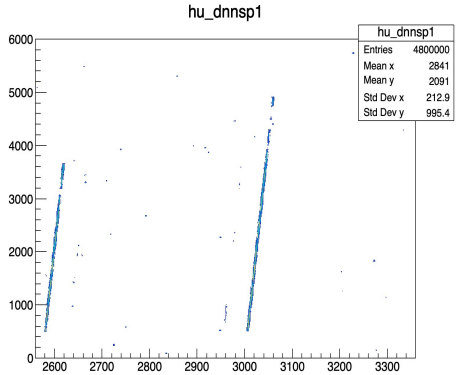
DNNROIFinding.cxx

$$\text{Bias} = 100 \times \left(\left\langle \frac{Q_{\text{reco}}}{Q_{\text{truth}}} \right\rangle - 1 \right) \qquad \text{Resolution} = 100 \times \frac{\text{RMS}\left(\frac{Q_{\text{reco}}}{Q_{\text{truth}}} \right)}{\left\langle \frac{Q_{\text{reco}}}{Q_{\text{truth}}} \right\rangle} \qquad \text{Inefficiency} = 100 \times \frac{\text{Number of bad channels}}{\text{Number of valid truth channels}}$$

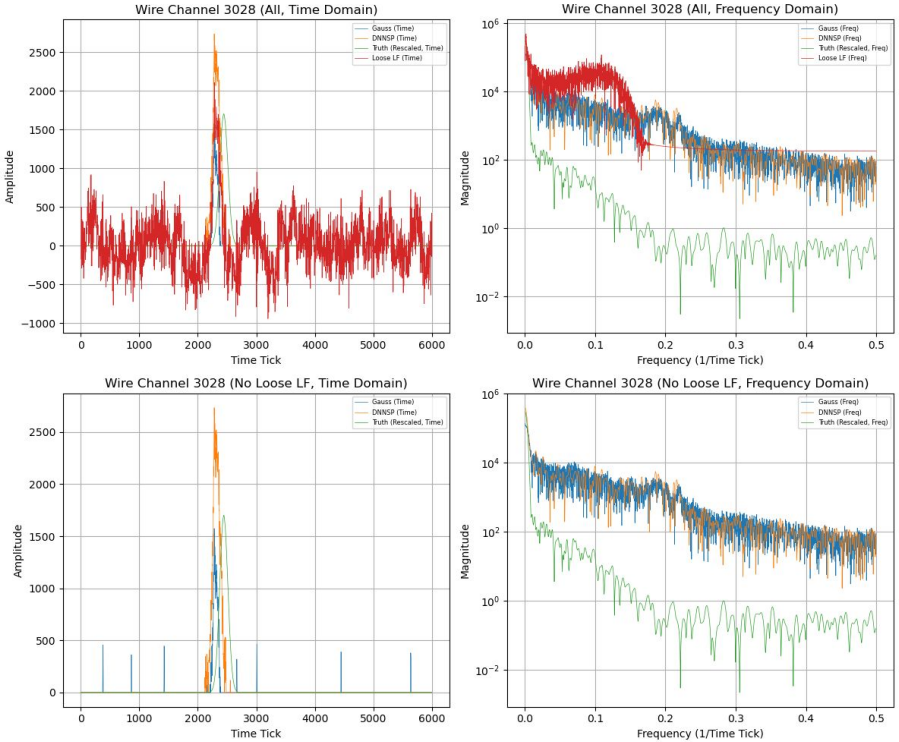
Baseline subtraction in DNN ROI processing

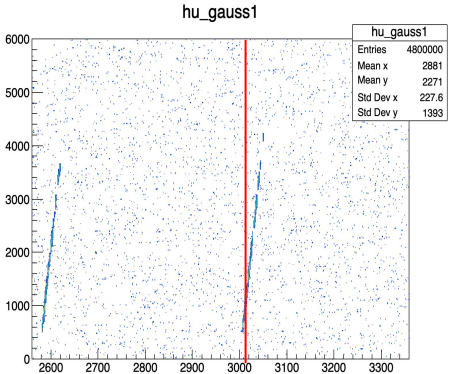


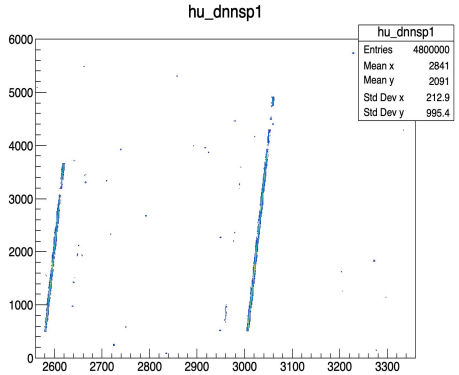




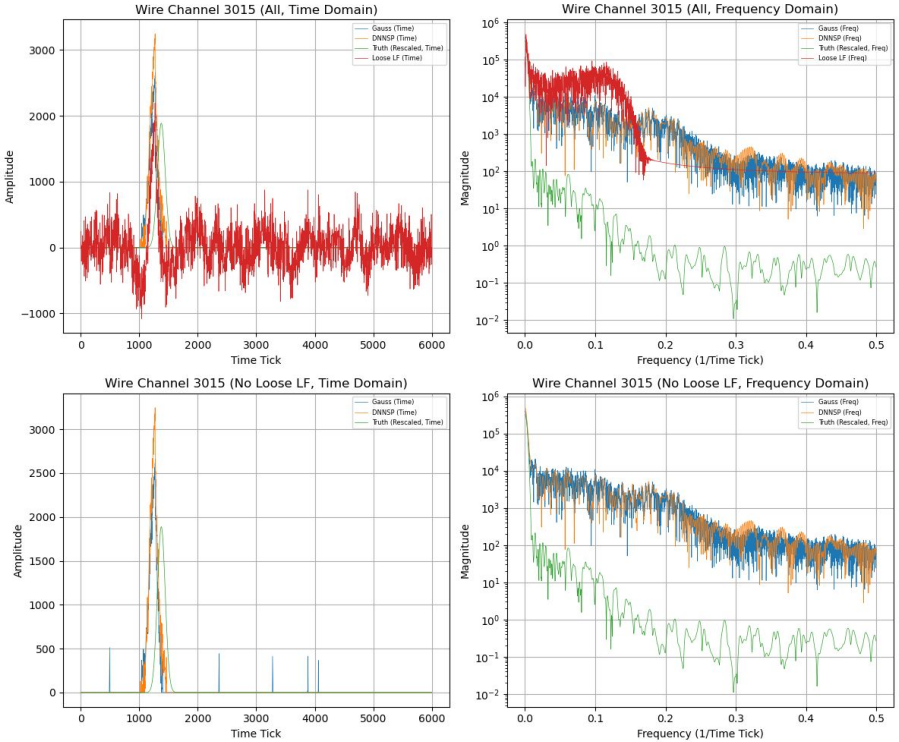
Baseline subtraction in DNN ROI processing

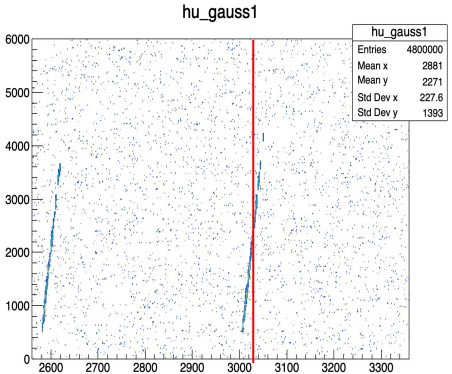


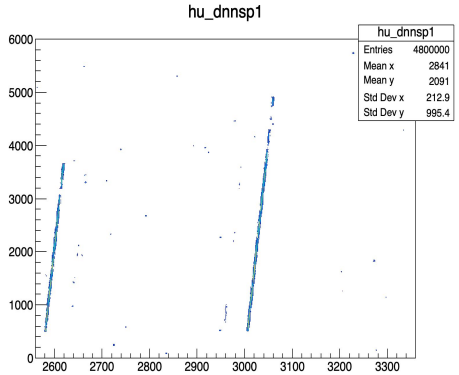




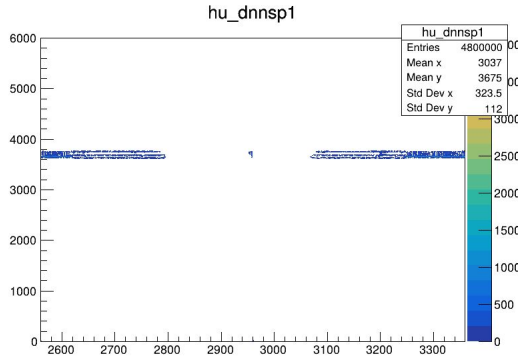
Baseline subtraction in DNN ROI processing

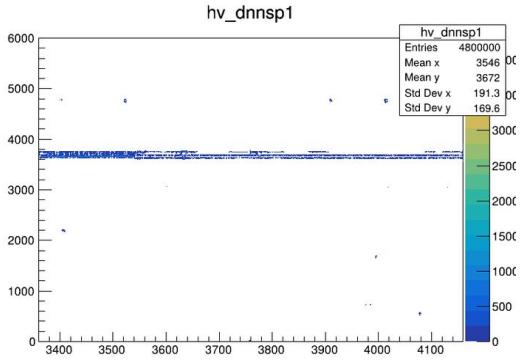


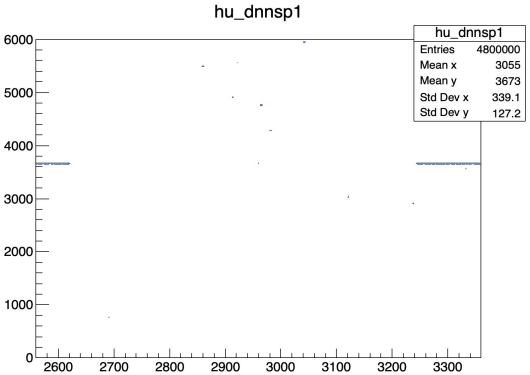


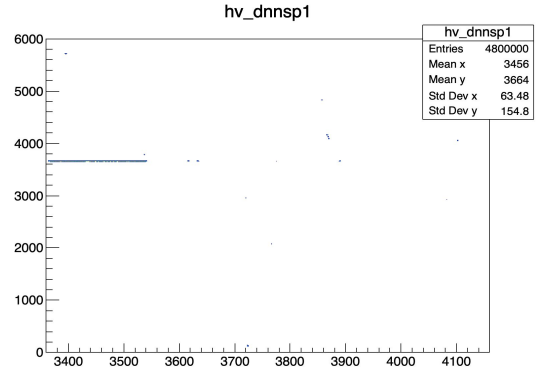


Bug fix in the configuration file for standalone simulation



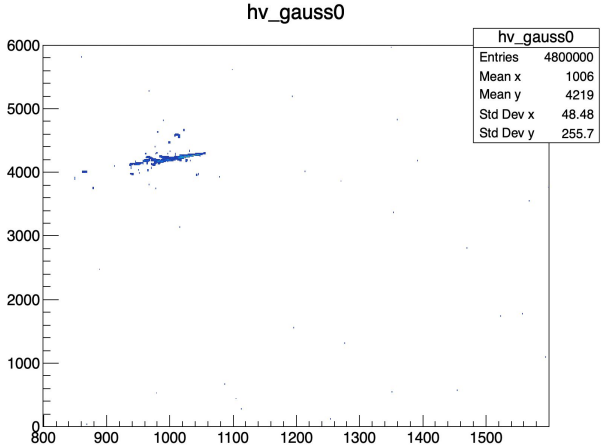


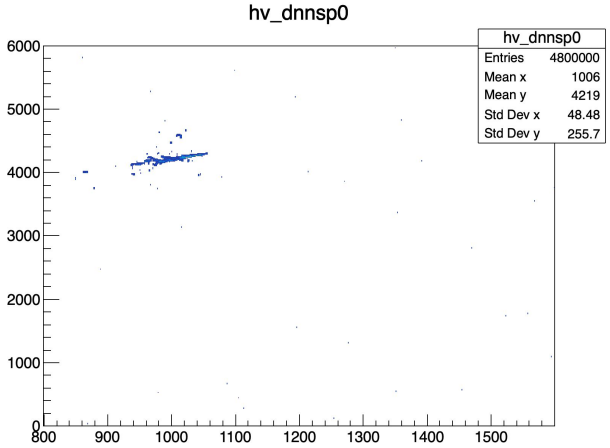


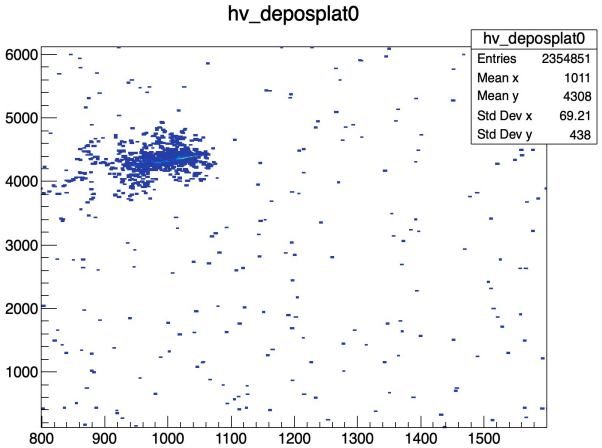



```
local sp_override = { // assume all tages sets in base sp.jsonnet
    // sparse: true, // sigoutform == 'sparse',
    sparse: false, // sigoutform == 'sparse',
    // wiener_tag: "",
    // gauss_tag: "",
    use_roi_refinement: true,
    use_roi_debug_mode: true,
    save_negtive_charge: false, // no negative charge in gauss
    tight_lf_tag: "",
    // loose_lf_tag: "",
    // cleanup_roi_tag: "",
    break_roi_loop1_tag: "",
    break_roi_loop2_tag: "",
    shrink_roi_tag: "",
    // extend_roi_tag: "",
    // decon_charge_tag: "",
    use_multi_plane_protection: true,
    do_not_mp_protect_traditional: true, // do_not_mp_protect_traditional to
                                         // make a clear ref, defualt is false
    // mp_tick_resolution: 10,
    mp_tick_resolution: 4,
    // MP_feature_val_method: 1,
    MP_feature_val_method: 0,
};
```

Single Shower event generation







- The above DNN SP results used the weight file "unet-cosmic390-newwc-depofluxsplat-pdhd.ts"
- Plan to retrain the UNet for the classification of shower events
  - Training sample: Cosmic ray events (80%), Single electron events (20%)
- Check the performance of DNN ROI for the APA1 and the normal APAs

Back Up