



WCT Signal Processing

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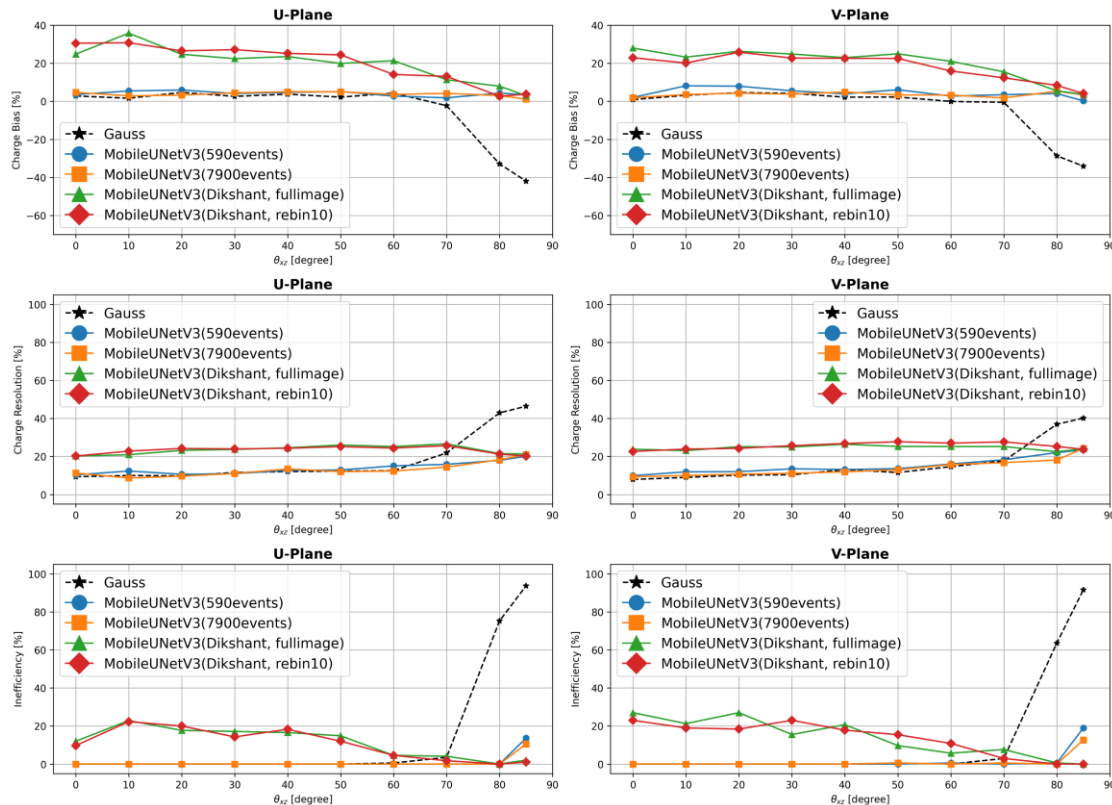
1. DNN Model Training Comparison

Training Code comparison

UCI's model :

- <https://huggingface.co/WireCell/dnn-roi/tree/main/pdhd/dikshant/>

```
mobileunetv3_largedataset_fullimage.ts Unsafe
mobileunetv3_largedataset_rebin10.ts Unsafe
```



- BNL code: <https://github.com/HaiwangYu/Pytorch-UNet>
- UCI code: <https://github.com/dikshantsagar/LArTPC-Segmentation>

DNN Model : MobileUNetV3

	BNL	UCI
Loss Function	Binary Cross-Entropy Loss	BinaryFocalLoss + DiceLoss
Optimizer	SGD(Stochastic Gradient Descent)	AdamW
Running Rate Scheduler	No(fixed to 0.1)	CosineAnnealingLR(flexible)

Green : Need to check

	BNL	UCI
Dataset	590 or 7900 cosmic events(90:10)	??? (80:20)
Rebin	Same	
Channel Range	[0,1600) U & V planes	800 channels
True_th	10	Not included
Image normalization	1/4000	Scale the image by its maximum charge difference

Loss calculation

- BNL: Calculate loss on rebinned images like (1600, 600)
- UCI: Calculate loss after restoring original size (800, 6000)

1. DNN Model Training Comparison

Performance Evaluation

UCI

- mobileunetv3_largedataset_rebin10.ts

BNL

- model trained with conventional method
- <https://github.com/HaiwangYu/Pytorch-UNet>

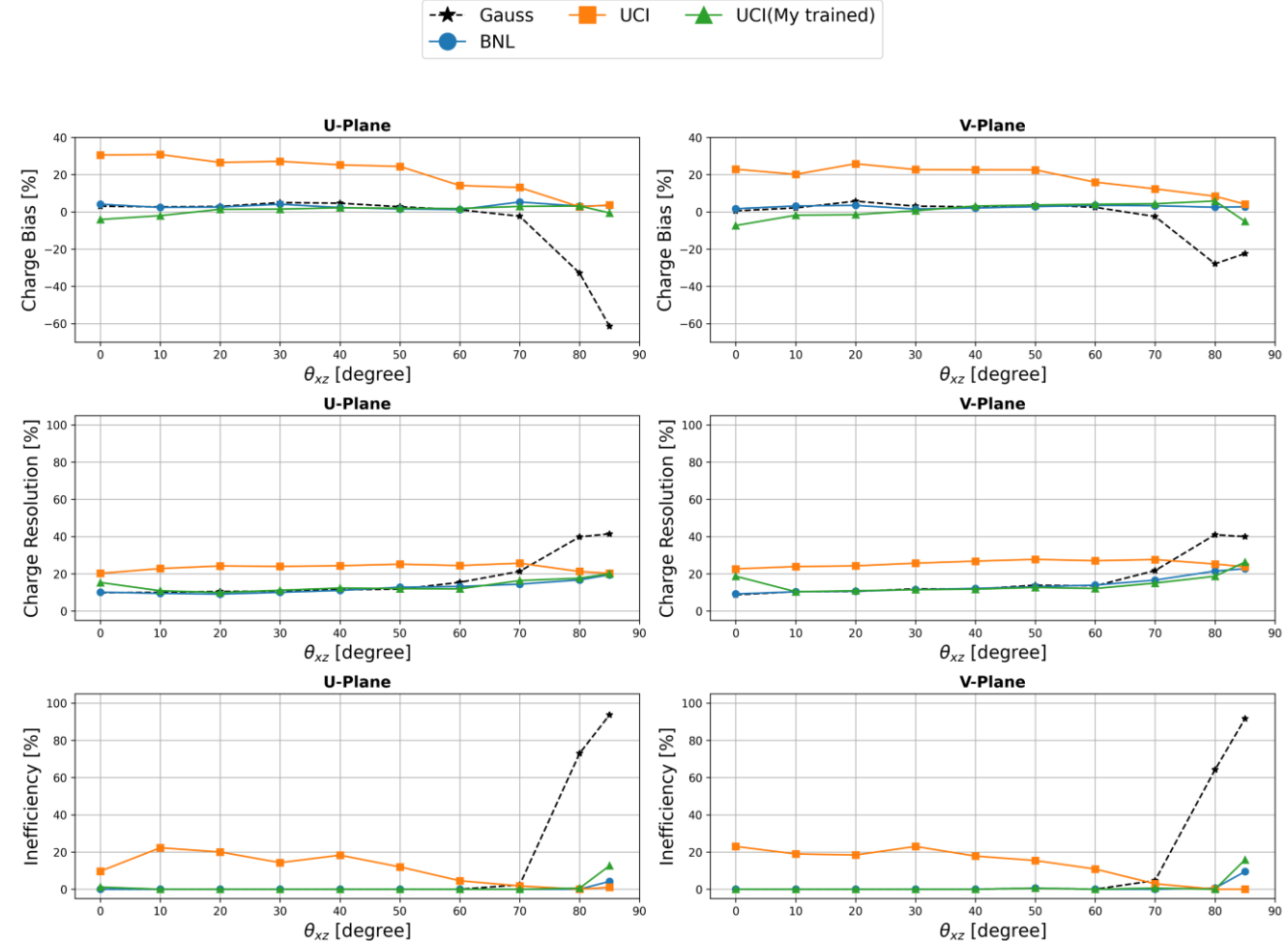
UCI(My trained)

- Used training code from <https://github.com/dikshantsagar/LArTPC-Segmentation>
- Modified training code to load this dataset
- True label binarization is not included.
 - Use True_th=10
- Used U plane images

	BNL	UCI (My trained)
Split ratio	90:10	80:20
True_th	10	
Rebin factor	10	
Channel Range	[0,1600) U & V planes	[0,800) U planes

Dataset : 600 events in:

- /nfs/data/1/renney/train_data_PDHD_fixedbug_separateWC
- (total 7900 events)

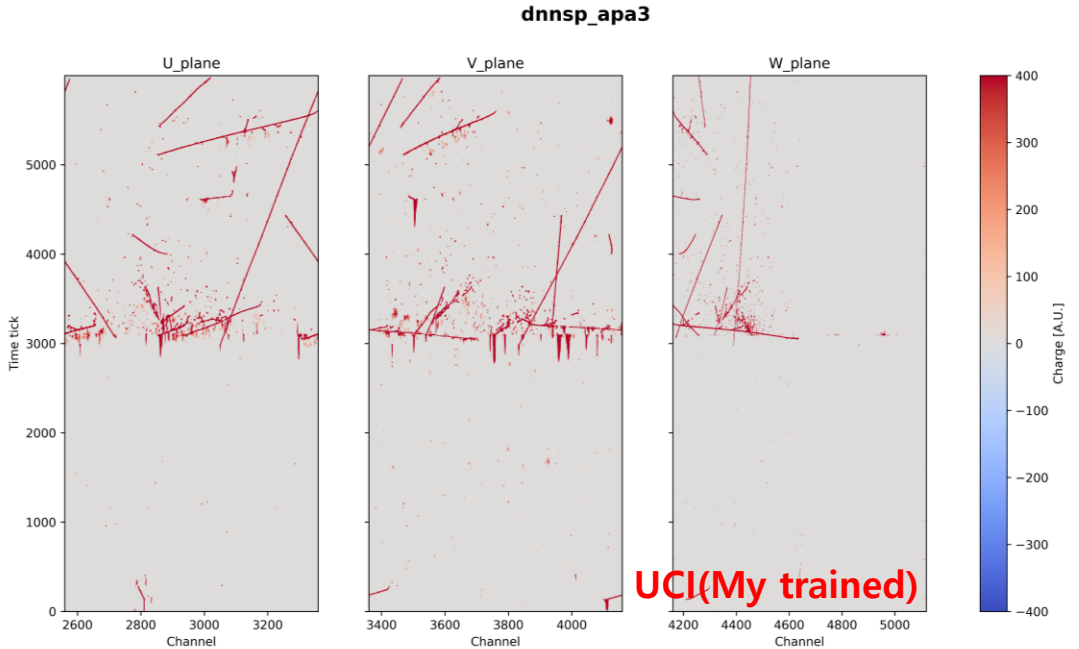
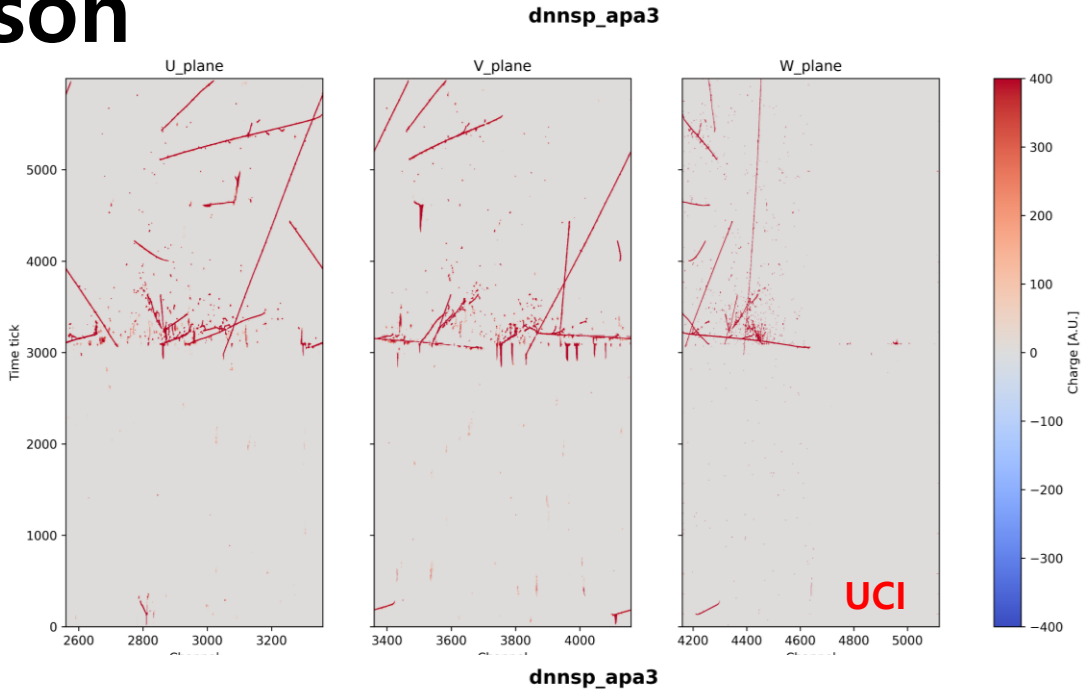
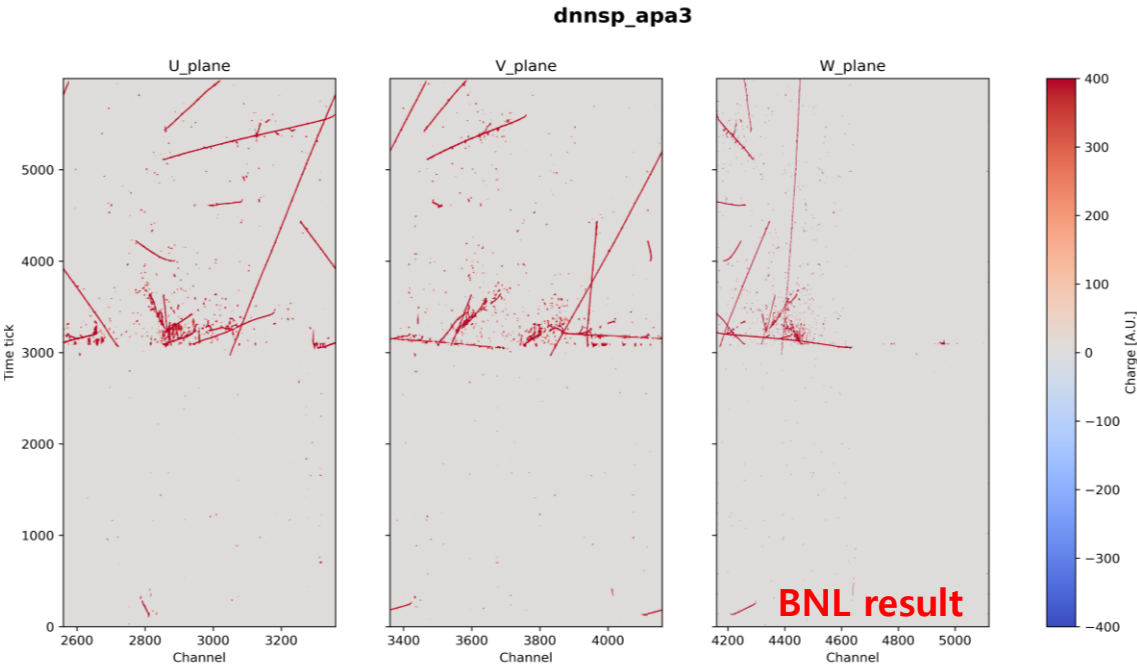


- When I trained with the dataset on the WC machine, performance evaluations for track simulations show similar curves.

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Data Processing Comparison

Data: run026763



Backup