# Wire-Cell ProtoDUNE Local Meeting

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*Mar 4, 2026 (Wed)*

# Outline

## 1. Study on PDHD Memory Consumption Issue

- Reproducing Hokyeong's results

## 2. Wire-Cell 3D Imaging & Clustering

- Adding true information in 3D Imaging

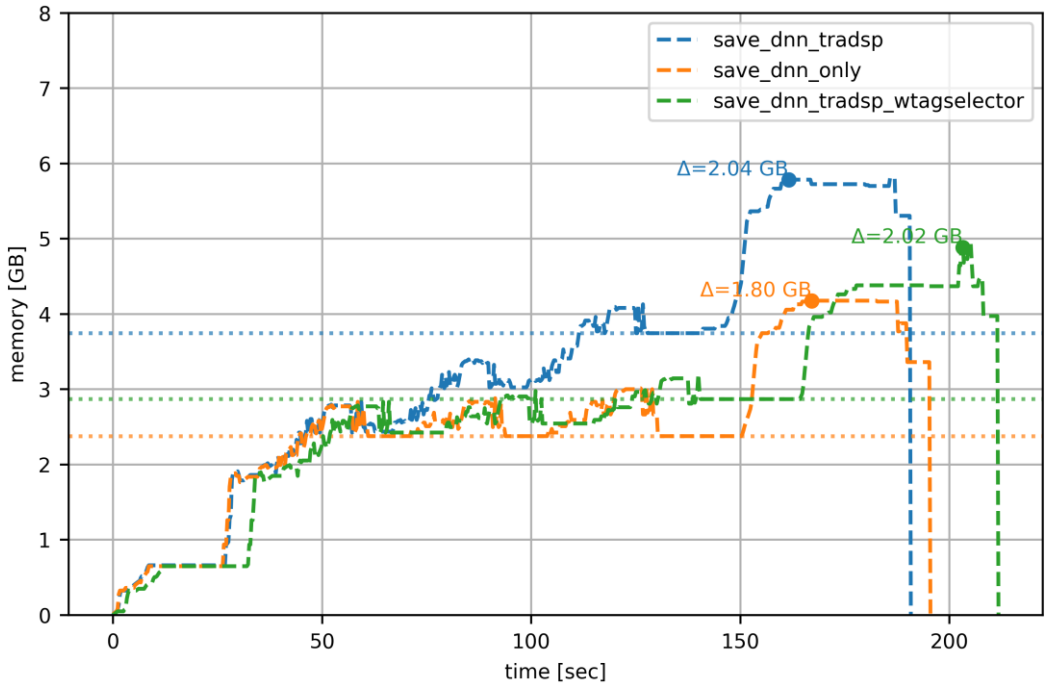
# 1. Study on PDHD Memory Consumption Issue

## Reproducing Hokyeong's results

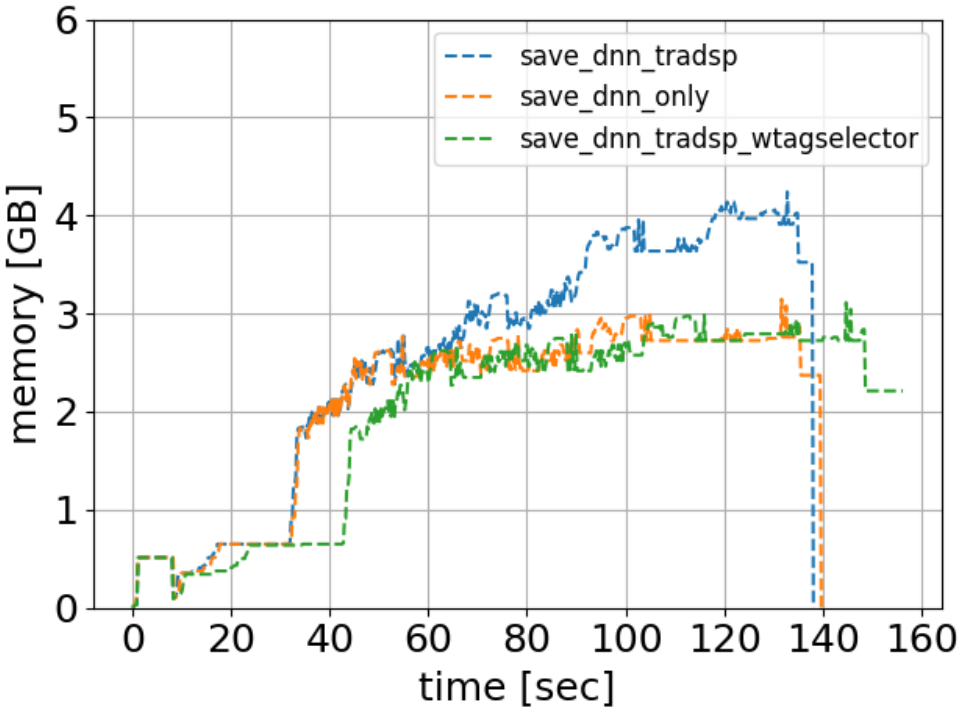
- **save_dnn_tradsp**: saving both DNN SP & Trad SP results (w/ splice)
- **save_dnn_only**: saving only DNN SP result (w/o splice)
- **save_dnn_tradsp_wtagselector**: w/ TagSelector

* Using Top command in gpvm / WCT ver: 0.34.2 / dunesw ver*: v10_20_01d01*

- Hokyeong's result

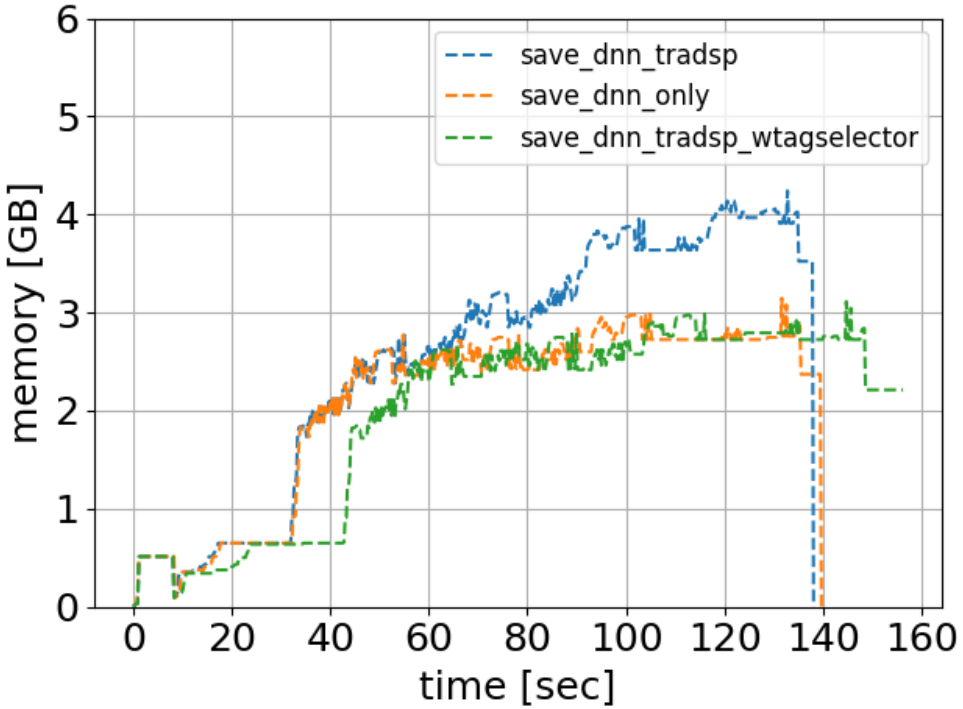



- My result

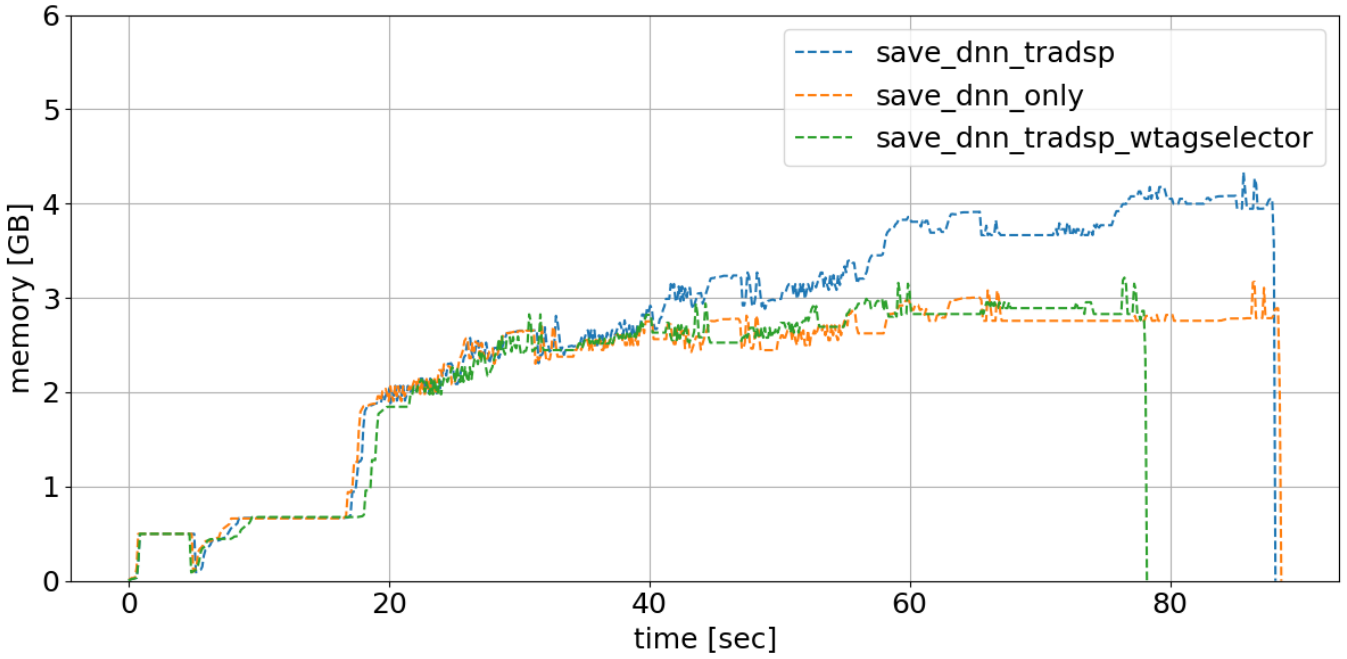


# 1. Study on PDHD Memory Consumption Issue
## Reproducing Hokyeong's results

- gpvm




- wc cluster



# 2. Wire-Cell 3D Imaging & Clustering
## Blob Depo Fill: Adding true info in the conventional pipeline

**Metrics**

- Two metrics for 3D Imaging performance evaluations in the **Blob level**

$$\text{Purity} = \frac{\text{Number of blobs with non-zero true charge}}{\text{Total number of reconstructed blobs}}$$

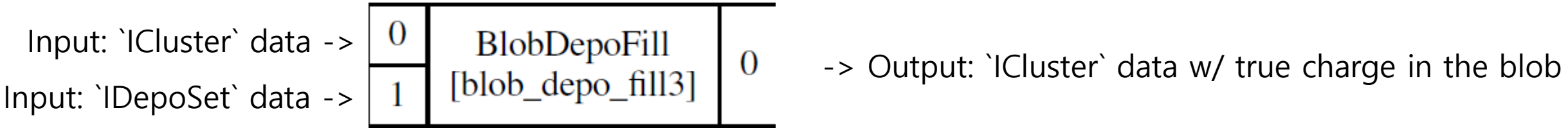
$$\text{Efficiency} = \frac{\text{Total true charge in blob}}{\text{Total true charge}}$$

**BlobDepoFill**

(https://github.com/WireCell/wire-cell-toolkit/blob/18a8a5c06c8f8001e8dea5e3a577570ee473b79b/img/src/BlobDepoFill.cxx#L2)

- Replace charges of reco blob with true charges in the blobs
- This node only replace the charge info, not position info, giving the position of reco blob

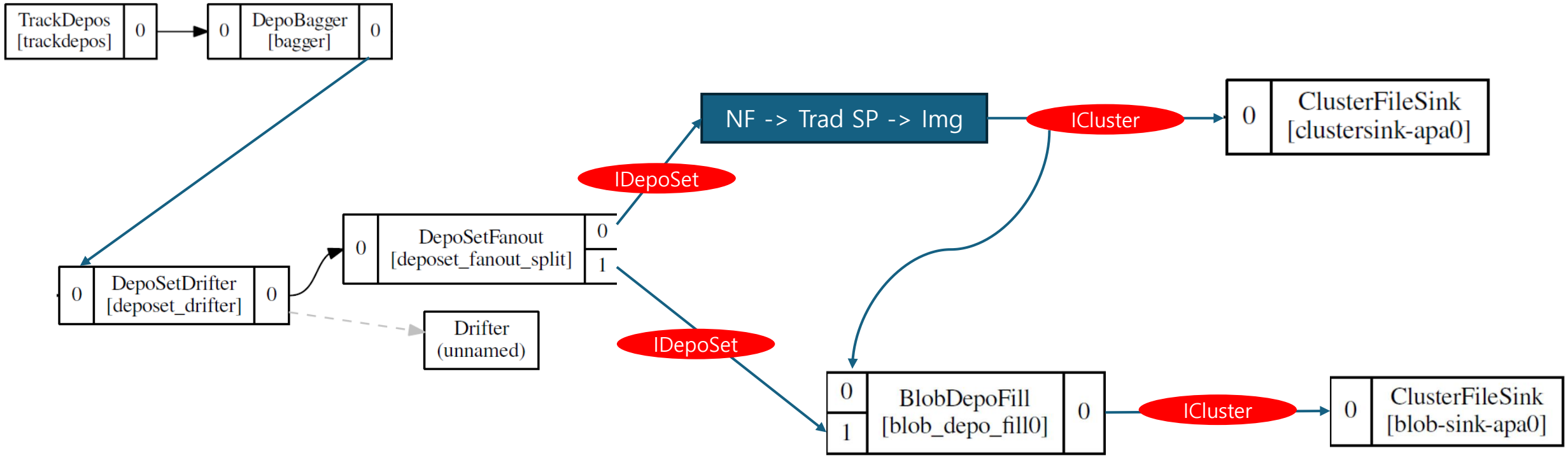
→ BlobDeopFill approach can be used for only evaluating about charge



# 2. Wire-Cell 3D Imaging & Clustering
## Blob Depo Fill: Adding true info in the conventional pipeline

**New PDHD configuration including BlobDepoFill nodes**

- Wire-Cell standalone simulation: NF -> Trad SP -> Img
- Add BlobDepoFill nodes to the conventional img pipeline



# 2. Wire-Cell 3D Imaging & Clustering
## Blob Depo Fill: Adding true info in the conventional pipeline

**New configuration including BlobDepoFill nodes**

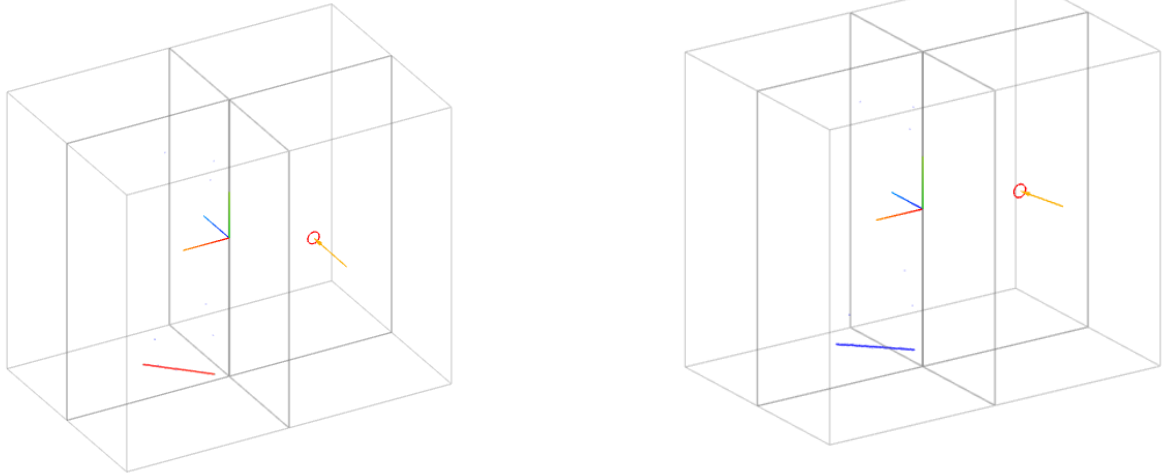
- This produced two data files:

outputs from img

```
clusters-apa-apa0.tar.gz
clusters-apa-apa1.tar.gz
clusters-apa-apa2.tar.gz
clusters-apa-apa3.tar.gz
```

outputs from BlobDeopFill

```
blobs-filled-apa0.tar.gz
blobs-filled-apa1.tar.gz
blobs-filled-apa2.tar.gz
blobs-filled-apa3.tar.gz
```



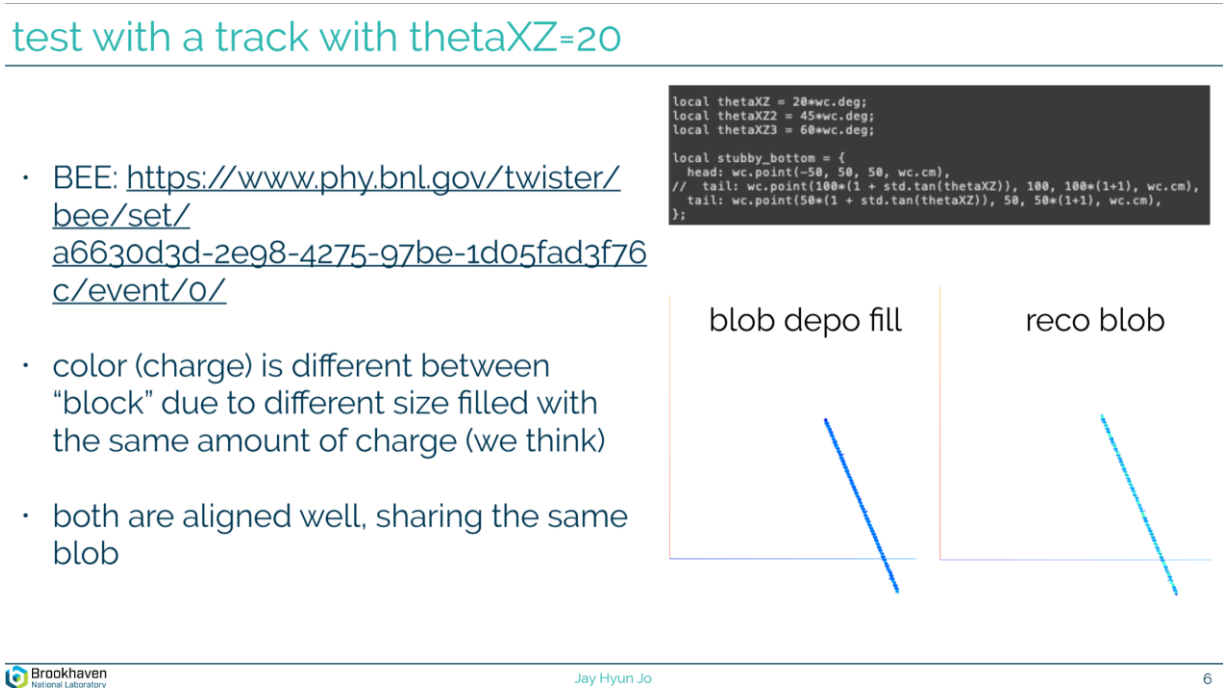
single track sim (apa2, thetaXZ=45 deg)

Not yet explore the data files

- Need to check how they save data and the data structures

# 2. Wire-Cell 3D Imaging & Clustering
## Blob Depo Fill: Adding true info in the conventional pipeline

**Previous Jay&Haiwang's study**
- BlobDepoFill requires some time offsets
- Hard coded now




- ➢ Investigation of time offsets
- ➢ Reproducing and comparing results with those of Jay&Haiwang will help validate my work
- ➢ Calculating metrics about charge with respect to different track angles

# Summary & Plan

## 1. Study for PDHD Memory Consumption Issue

- Reproduced Hokyeong's results
- (Plan) Finding some mismatch b/w results

## 2. Wire-Cell 3D Imaging & Clustering

- Generated & Debugged PDHD WC standalone simulation with img & BlobDepoFill
- (Plan) Reproducing and comparing with Jay&Haiwang result + Time offset
- (Plan) Validating my results -> Calculating metrics related to charge
- (Sub-Plan) Considering other metrics and methods related to positions

# Backup