Siren pipeline for cosmic calibration

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The difference found in last week was due to the bug fixing

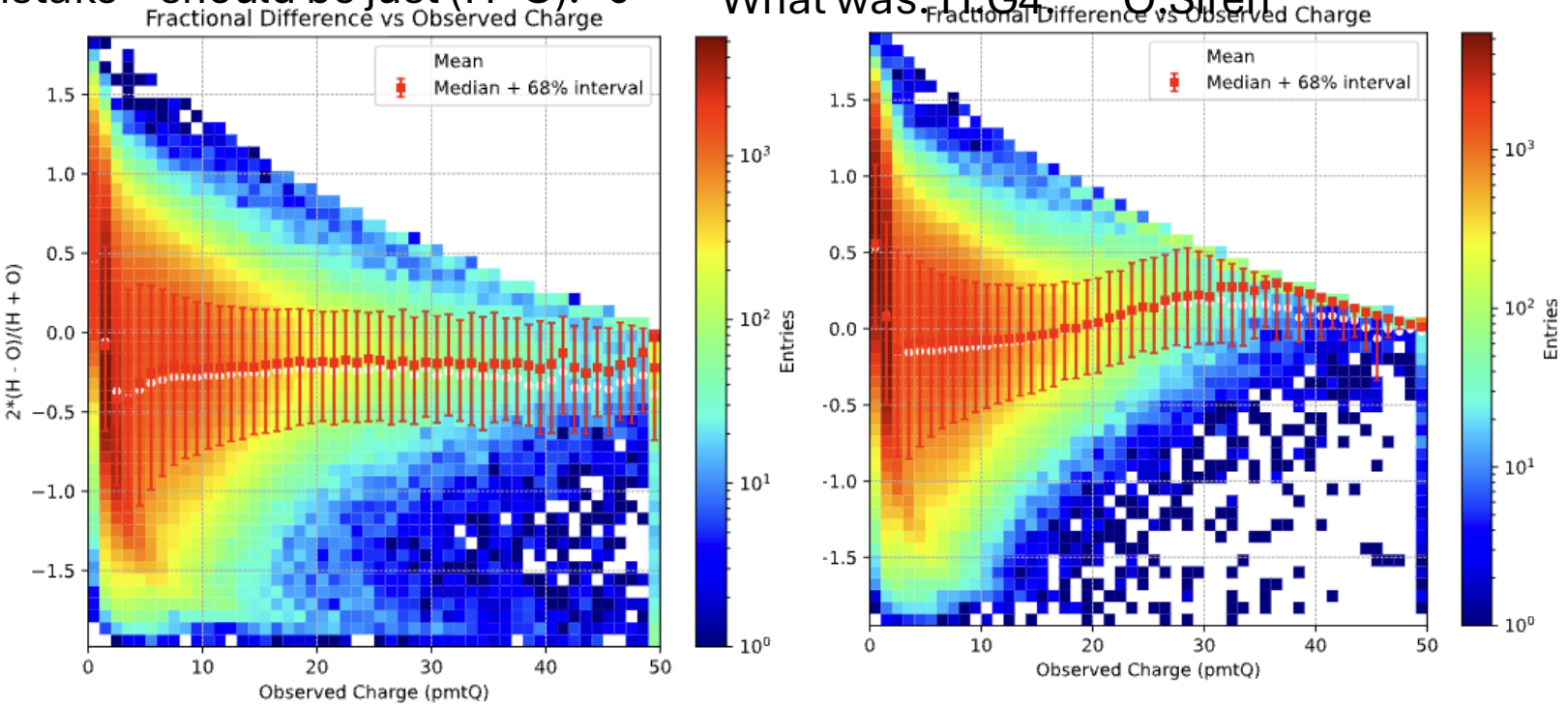
```
# Remove division by zero
valid = (H + O) != 0
valid &= (O != 0)
valid &= (H != 0)
H = H[valid]
O = O[valid]
```

1. Selected out all the 0 PE by mistake – should be just (H+O)!=0

```
def fractional_difference_2D(hypothesis, observed, bins=100):
    """
hist_ratio_true = fractional_difference_2D(truth_all, pred_all, bins=charge_max)
```

Geant4 OpticSiren

2. Messed up the hypothesis and observed for 2*(H-O)/(H+O)
We want: H: Siren O: G4
What was: H:G4, O:Siren



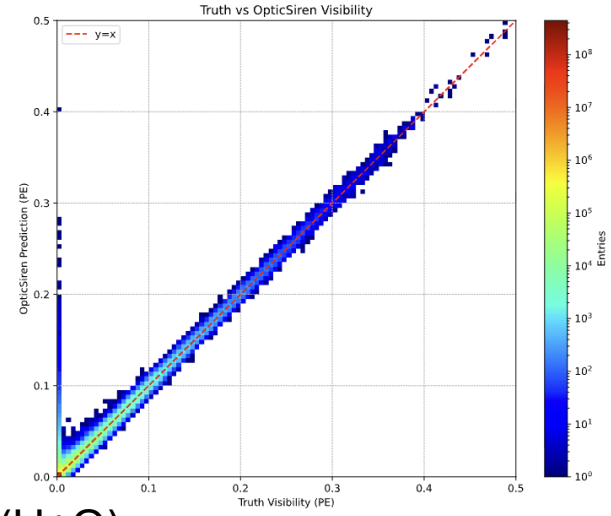
Put those two incorrect part back can reproduce the similar plot

The dataset for training and validation are already separated

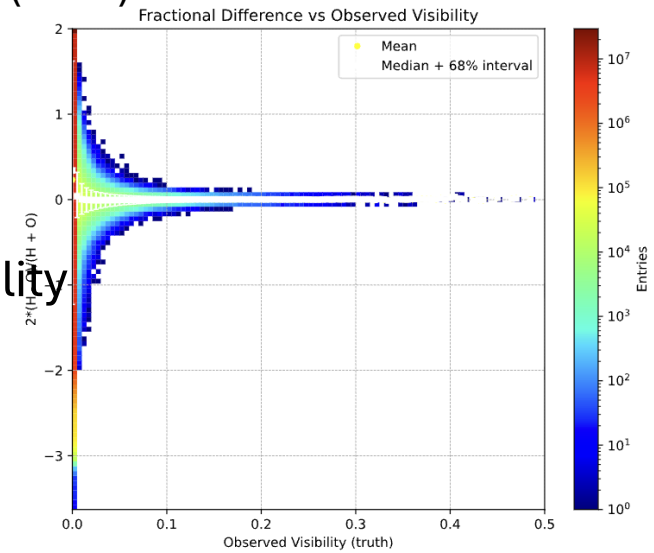
Updated plots

Photon shotgun

Visibility vs OpticSiren prediction



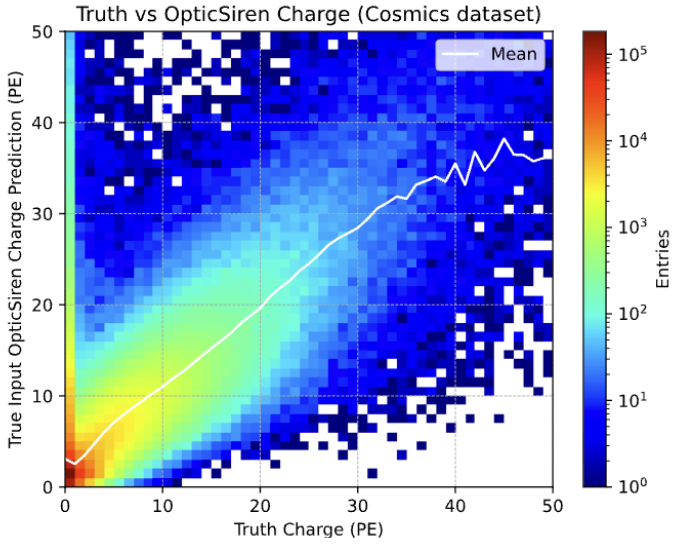
2*(H-O)/(H+O)

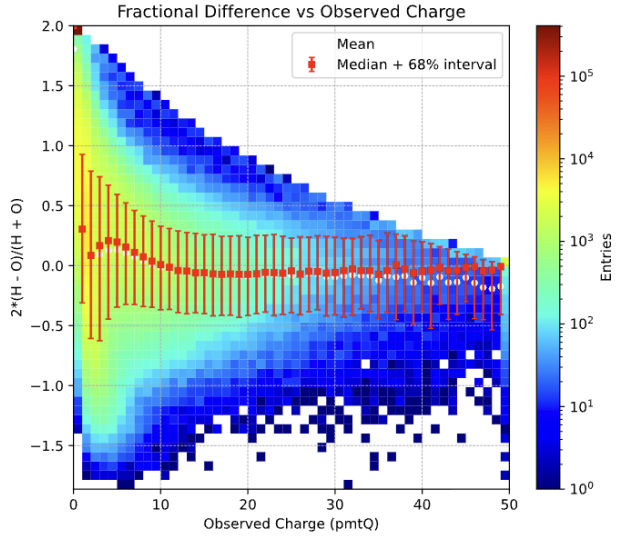


H: Siren
O: visibility

Pre-tune, cosmic

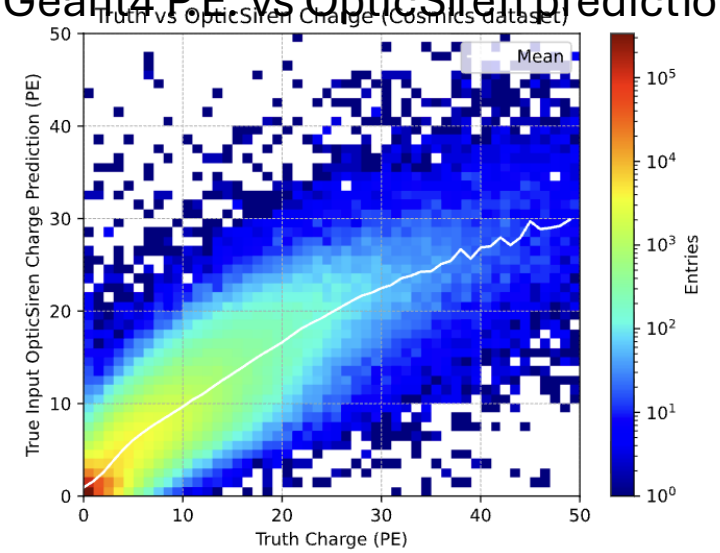
Geant4 P.E. vs OpticSiren prediction



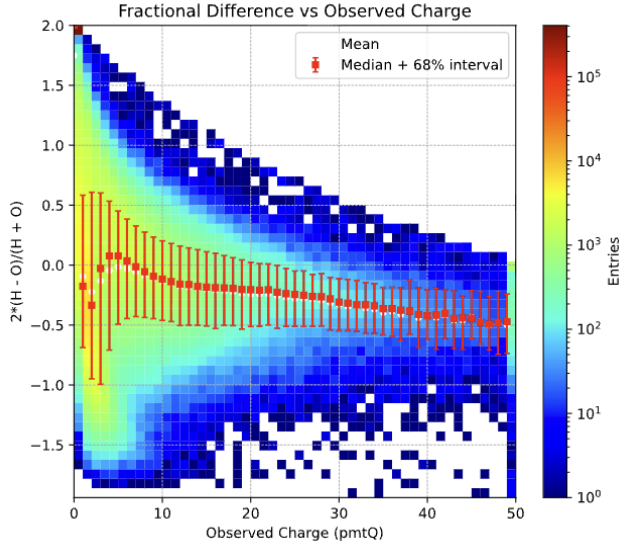


Post-tune, cosmic

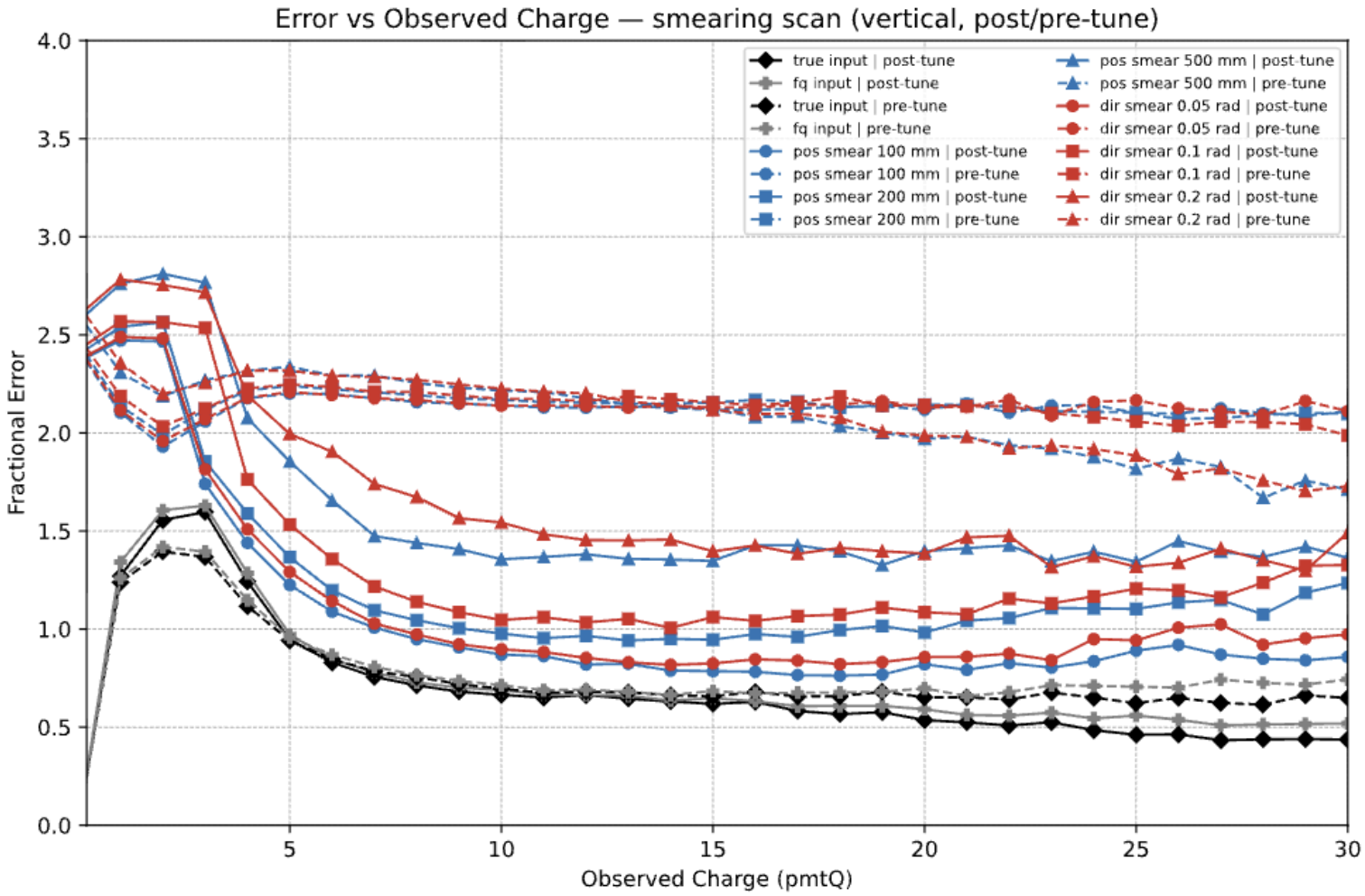
Geant4 P.E. vs OpticSiren prediction

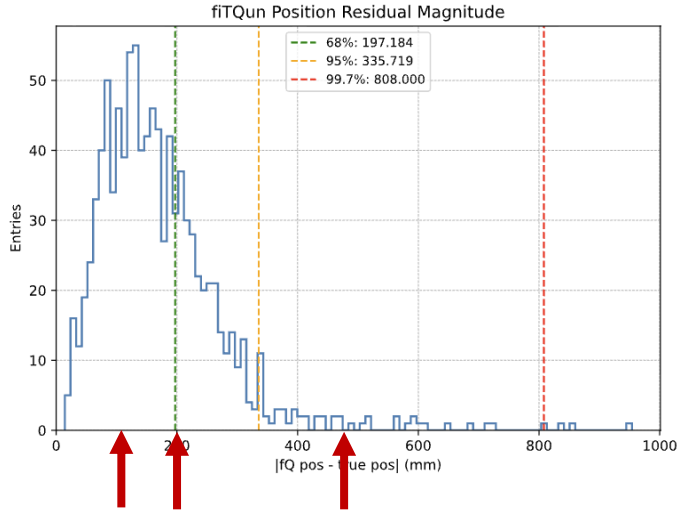


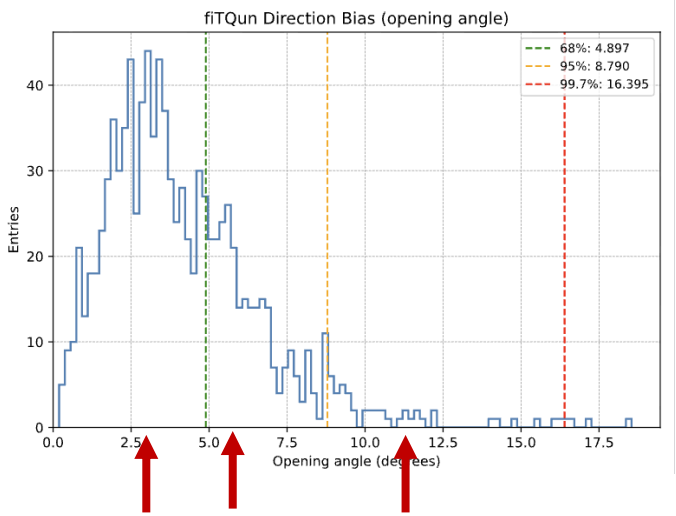
H: Siren
O: G4



Updated fraction plot & 1-D 68% interval







To-dos

Due to the large bias observed after post-tuning, further investigation is needed:

- Test different sampling schemes for track generation as suggested.

- Study the Cherenkov Siren model to obtain a more accurate profile for cosmic muons.

In parallel, go through the reconstruction pipeline to evaluate calibration performance using reconstructed information.