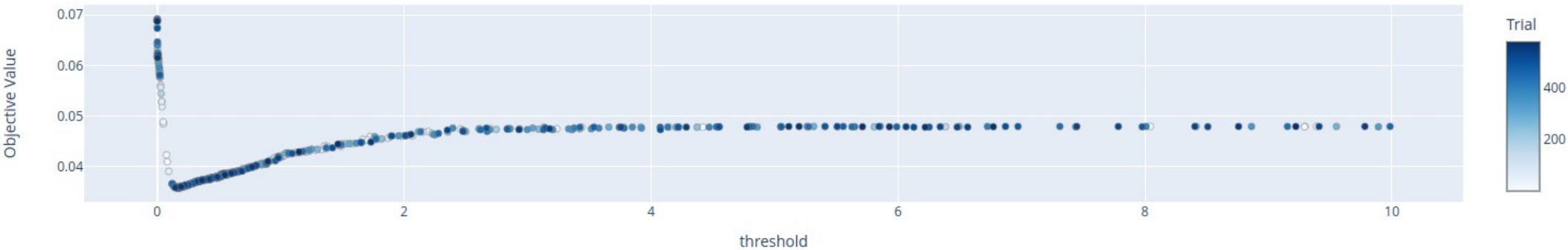
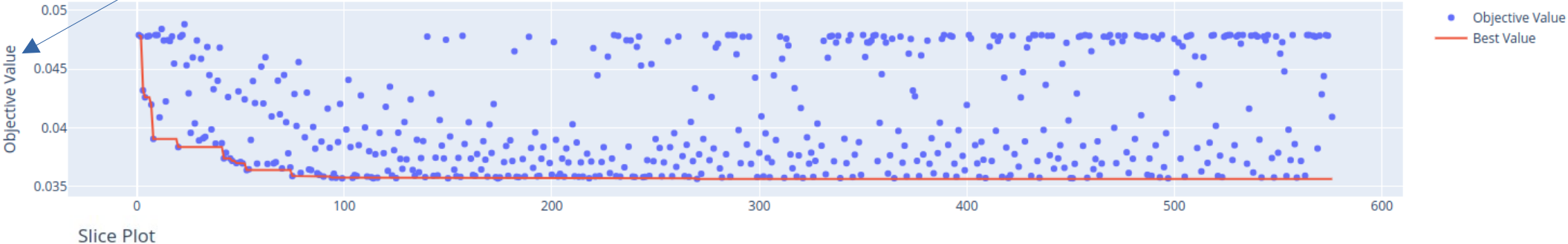


# Updates:

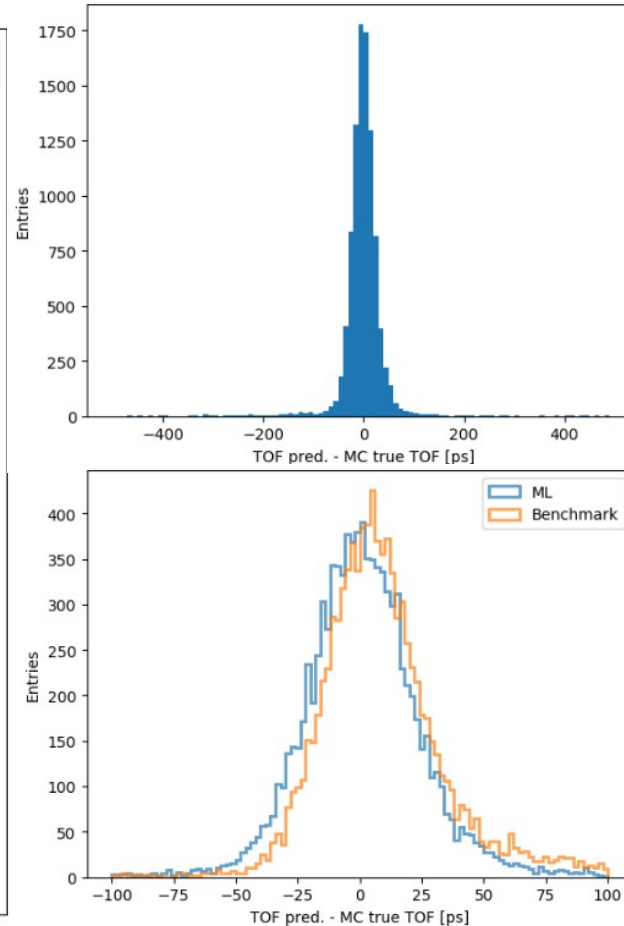
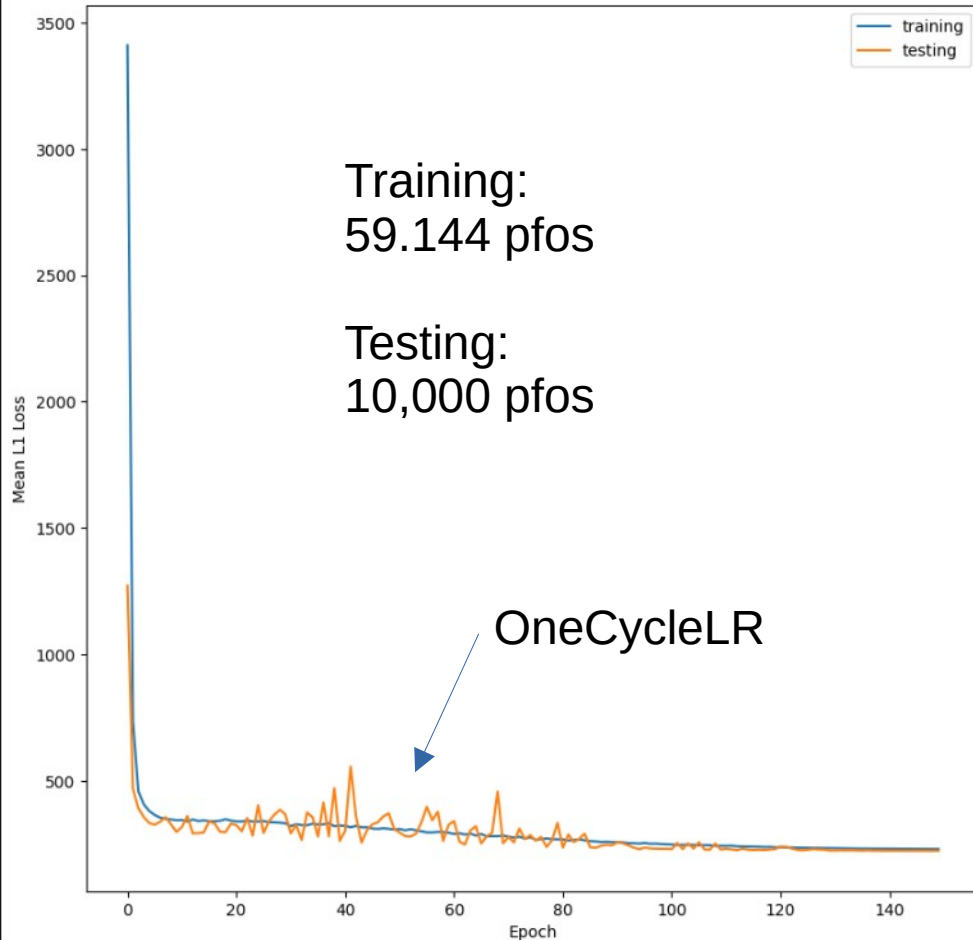
## - optimised RANSAC

Objective:  $\text{RMS90}(\text{RANSAC TOF pred.} - \text{true TOF}) [\text{ns}]$

Optimization History Plot



# Used optimised RANSAC in NN



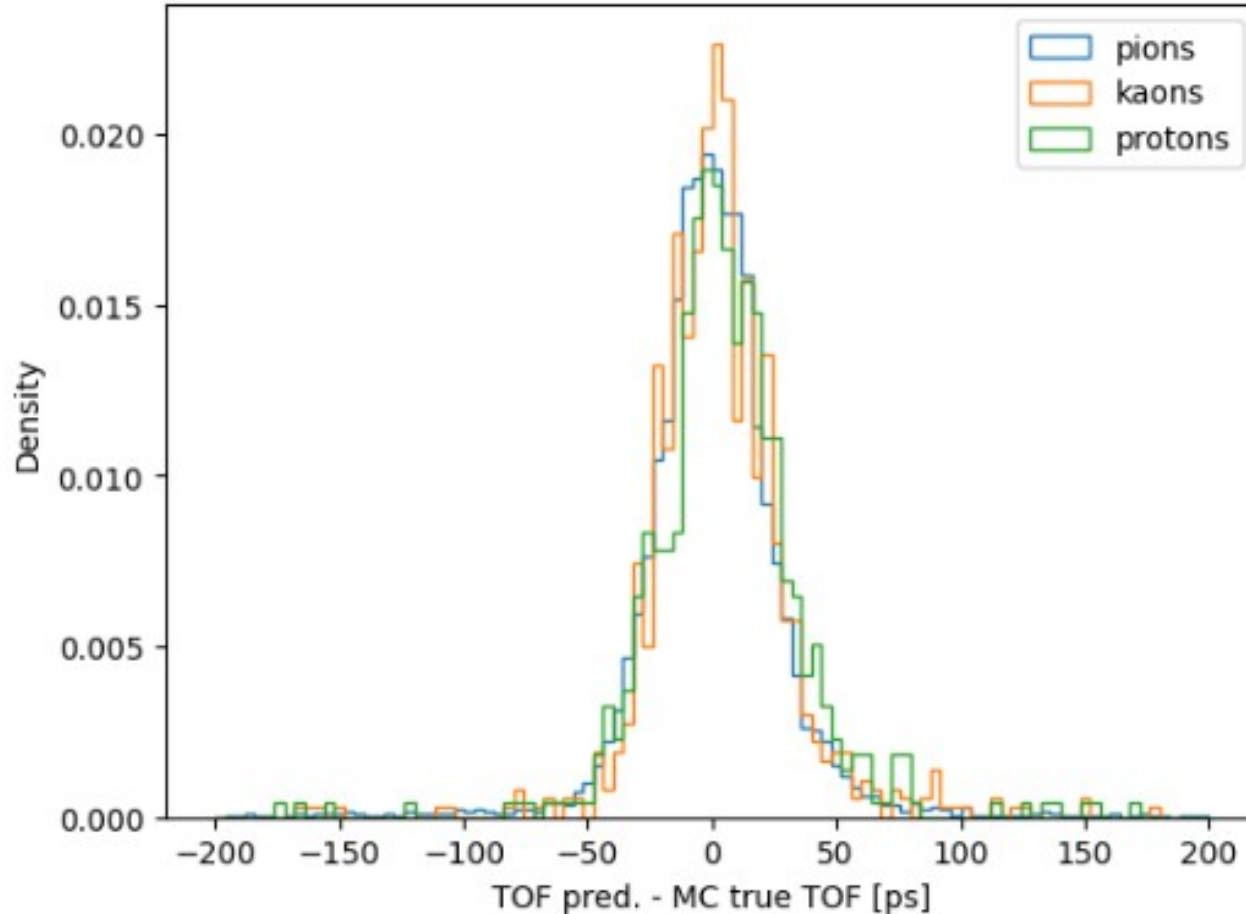
With optimised  
RANSAC RMS90s  
Improved:

Benchmark:  
23.62ps → 20.5ps

NN:  
18.95ps

Only operates on  
the shower:  
(x,y,z,t (50ps),e)  
In the first 10 ECal layers

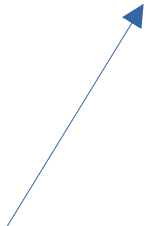
# Performance for K/pi/p



# Results:

- Same hit selection used as in benchmark algorithm
- No additional information
- Using ML we can do better than classical algorithm

# Questions:

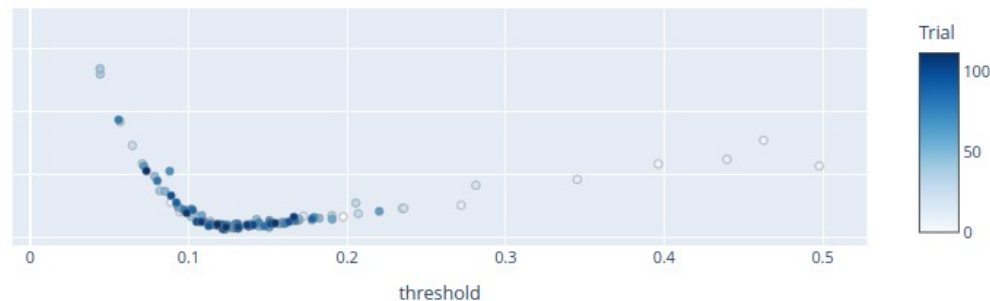
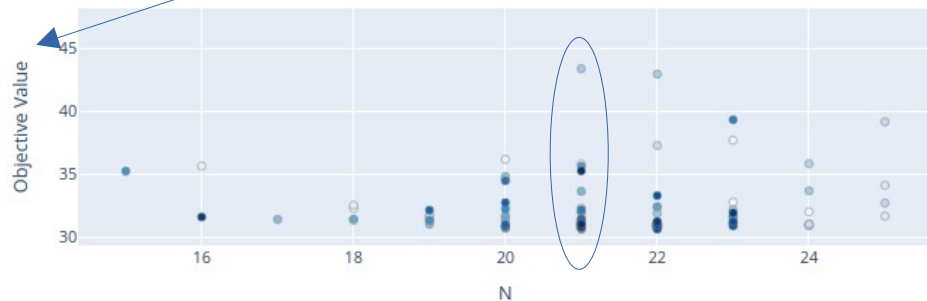
- No significant improvements when training on 10x more pfos
  - Mean number of hits:  $\sim 9$
  - Achievable resolution:  $50\text{ps}/\sqrt{9} \sim 16.7\text{ps}$
  - → Now: use more hits to push down
- 

# More Hits:

- Use Optuna to scan number of layers vs. threshold
- Here: selecting hits closest to trk. extrapolation

Slice Plot

Objective: RMS90(RANSAC TOF pred. - true TOF) [ps]



# To Do:

- Do not use the hits closest to trk. extrapolation
- Scanning: layer cut vs. threshold at the moment
- ...