Neurotrigger Software Status

S. Baehr, J. Becker, T. Jülg, C. Kiesling, A. Knoll, A. Lenz, P. Luger, F. Meggendorfer, S. Skambraks, K. Unger

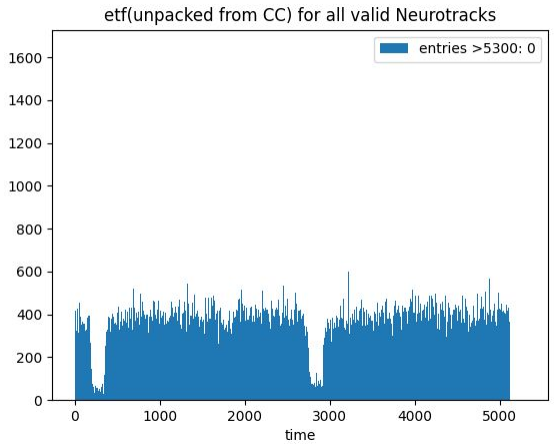
Neurotrigger Software Status

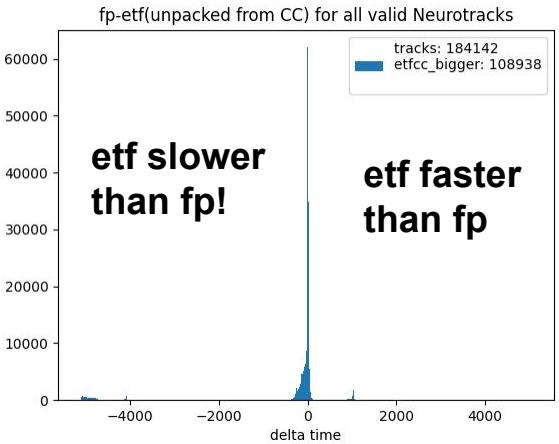
Outline:

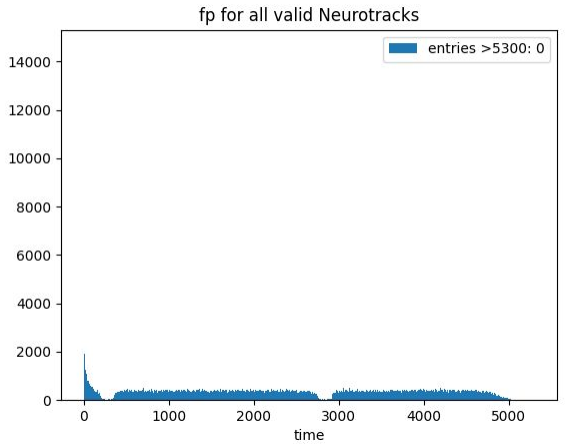
- ETF Timing
- Firmware Check
- New Training (preview)

ETF Timing

- Look at difference between ETFCC (in clock cycle of track) and fastestpriority





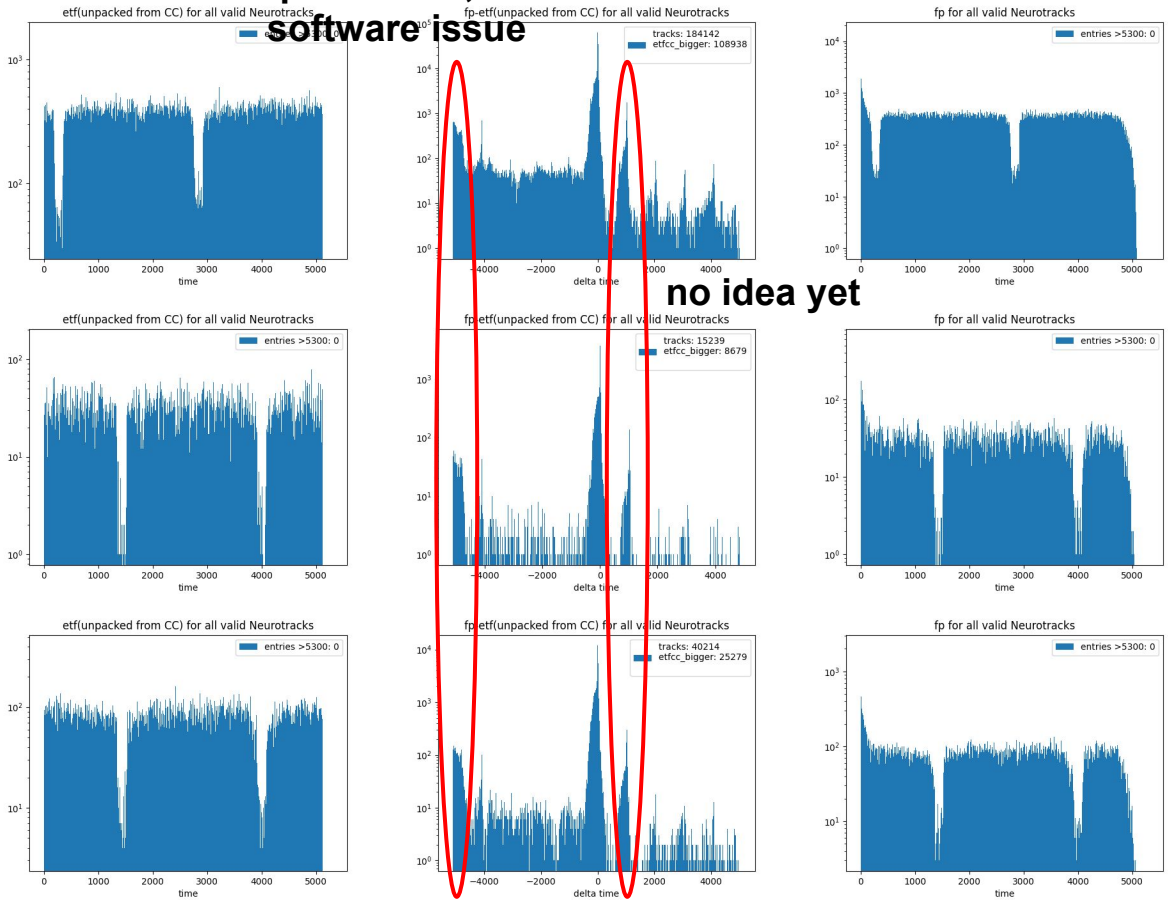


ETF Timing History

- First Row: e26, r03xx, HLT1+10
- 2nd Row: e26, r139x, HLT1+10
- 3rd Row: e26, r19xx, HLT1+10

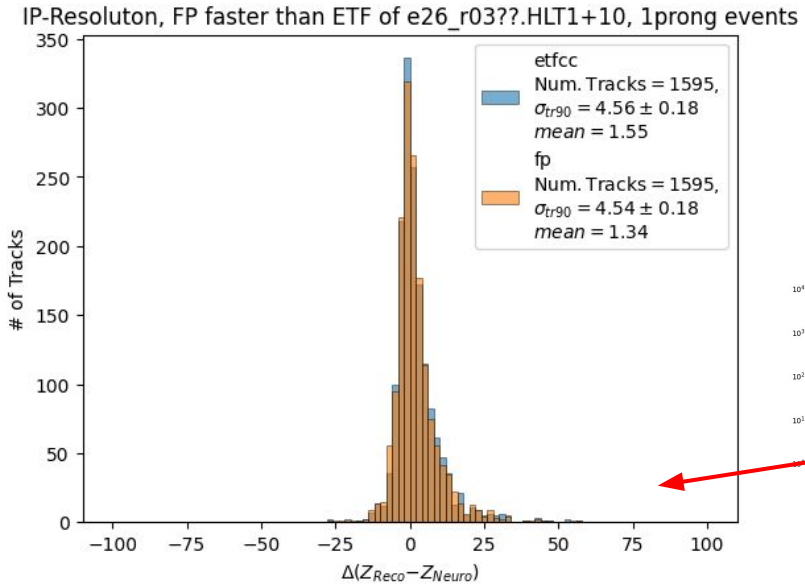
fp overflow, software issue

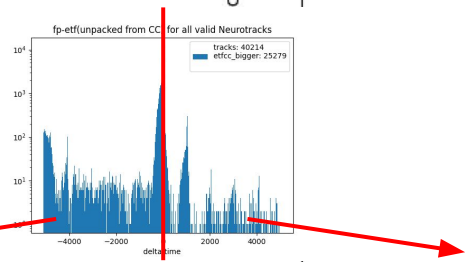
no idea yet

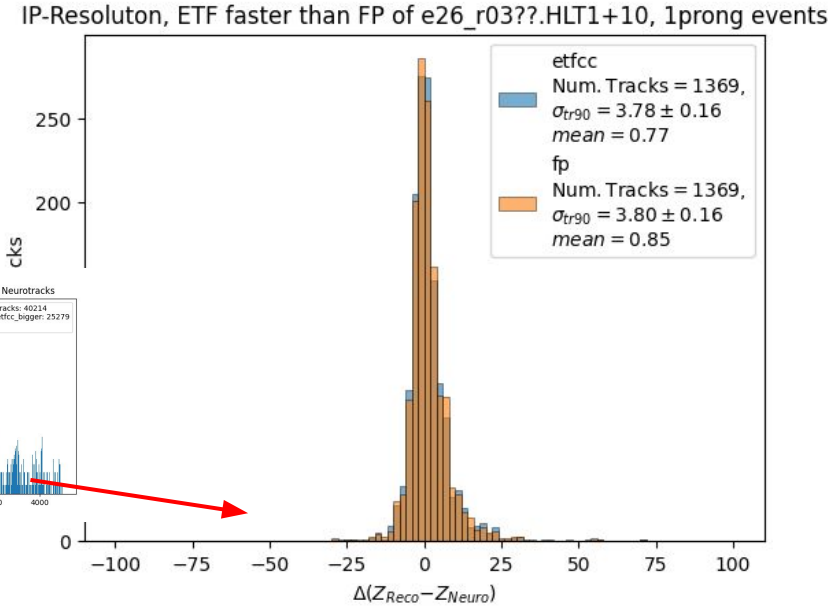


Time Dependent IP-Resolutions

Now, look at the z resolution of tracks, where etf was faster, and where fp was faster, separately:





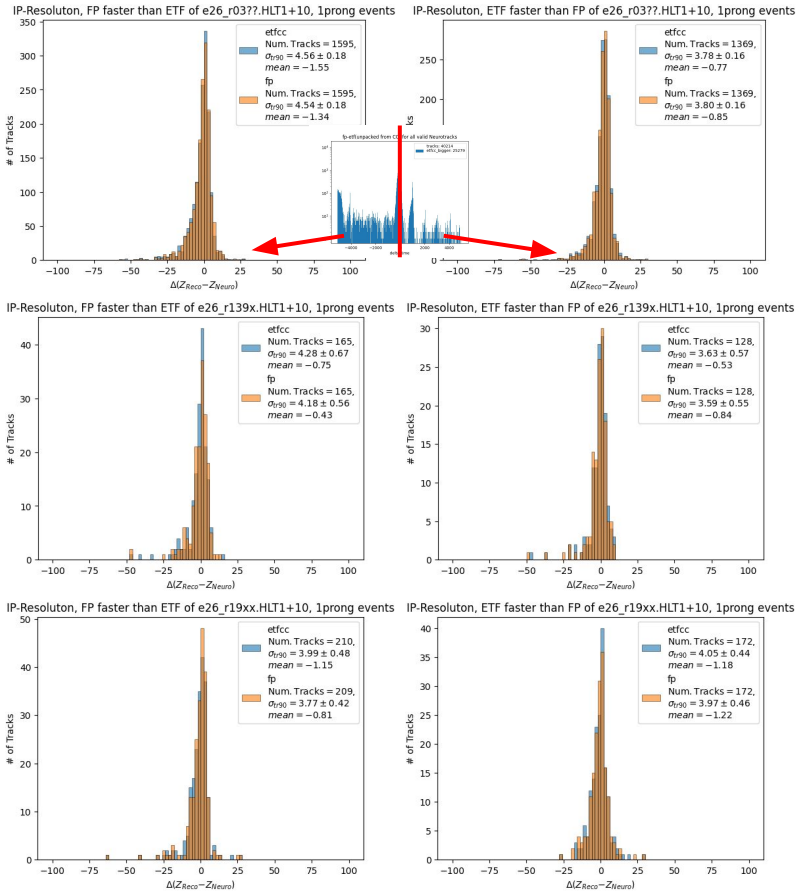


Time Dependent IP-Resolutions
Compare Different Runs

- First Row: e26, r03xx, HLT1+10
- 2nd Row: e26, r139x, HLT1+10
- 3rd Row: e26, r19xx, HLT1+10

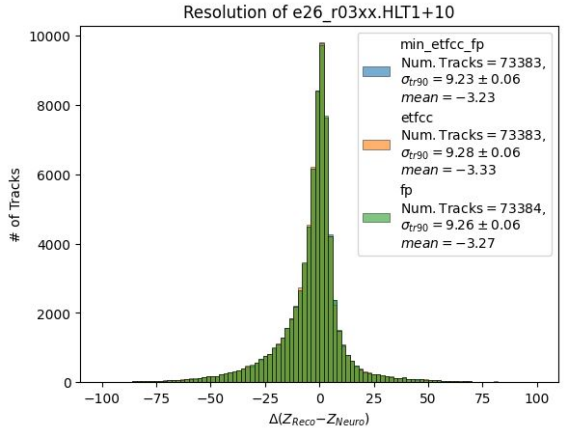
There are 2 features to be noted:

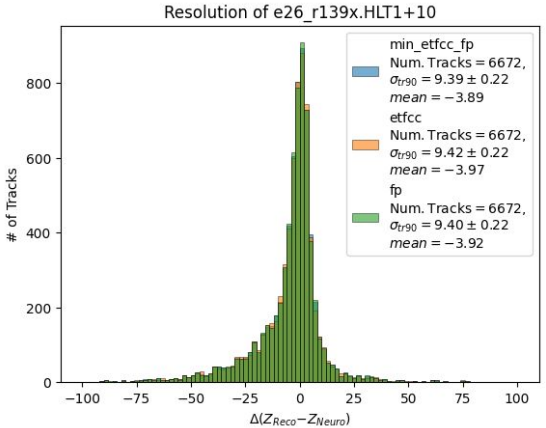
1. The IP-Resolution does not get worse at the end of Exp26 with very high BG
2. The (presumably more BG affected) Events where the FP was faster yield better resolutions for high BG Runs

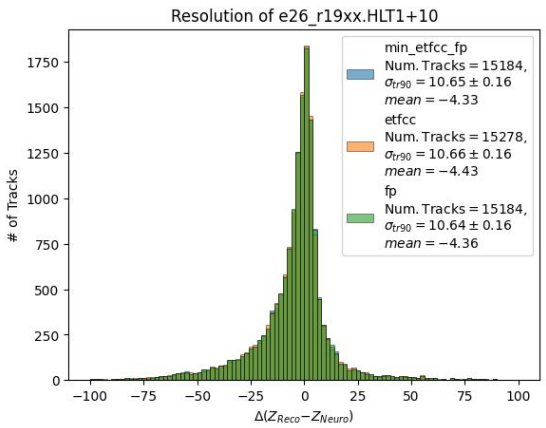


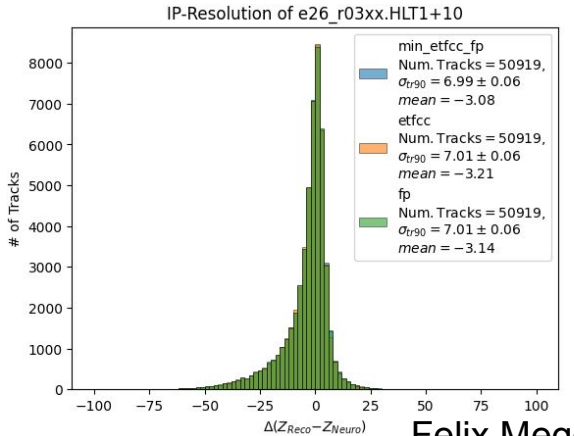
Resolutions with New Time

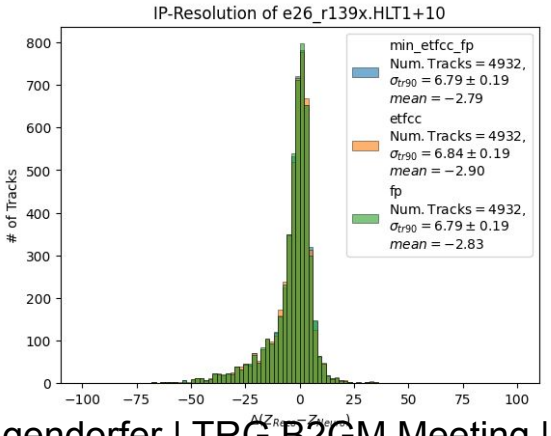
Look at performance of new timing option (1st row: overall Resolution, 2nd row: IP Resolution.):

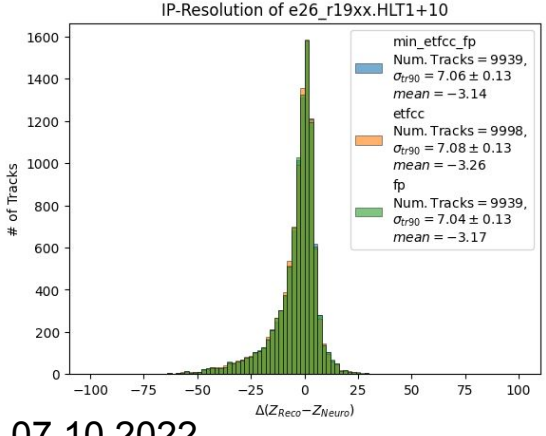












Resolutions with New Time

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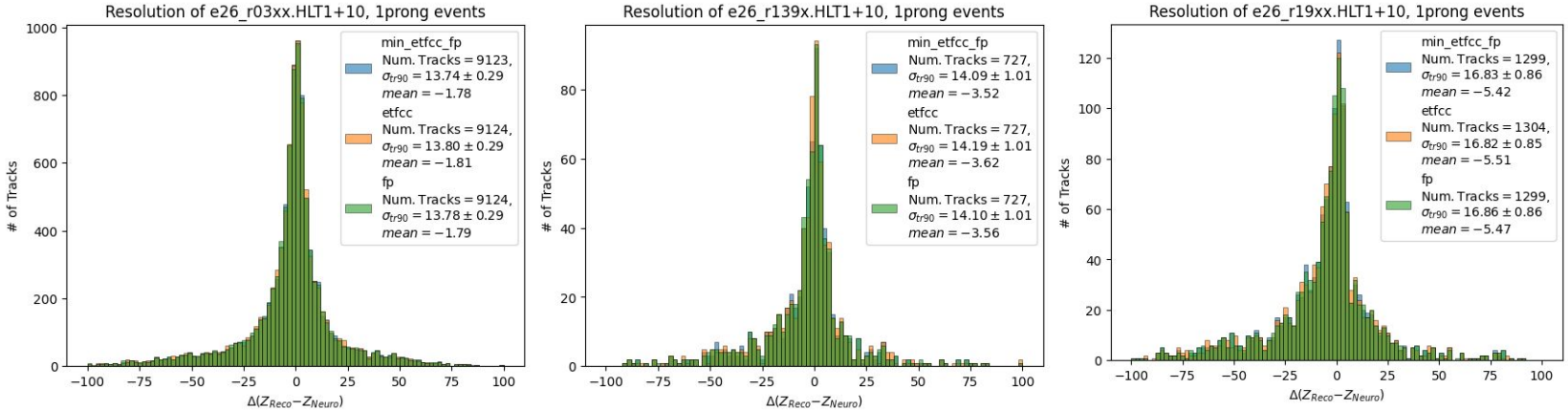


Firmware Check

Firmware loaded during 2022 lumi runs had a few flaws:

- wrong NN input scaling for wireID in SL0
- wrong NN input scaling for wireID in SL8
- using fastestpriority instead of etfcc (etf from clock cycle) as event T0 option

→ Kai compiled a few new firmware versions, which were tested during the recent cosmic runs:

- **fixed_NN**: SL0 and SL8 fixed, fastestpriority timing
- **ETF_NN**: SL0 and SL8 fixed, etfcc timing

Those two will be compared to the lumi firmware:

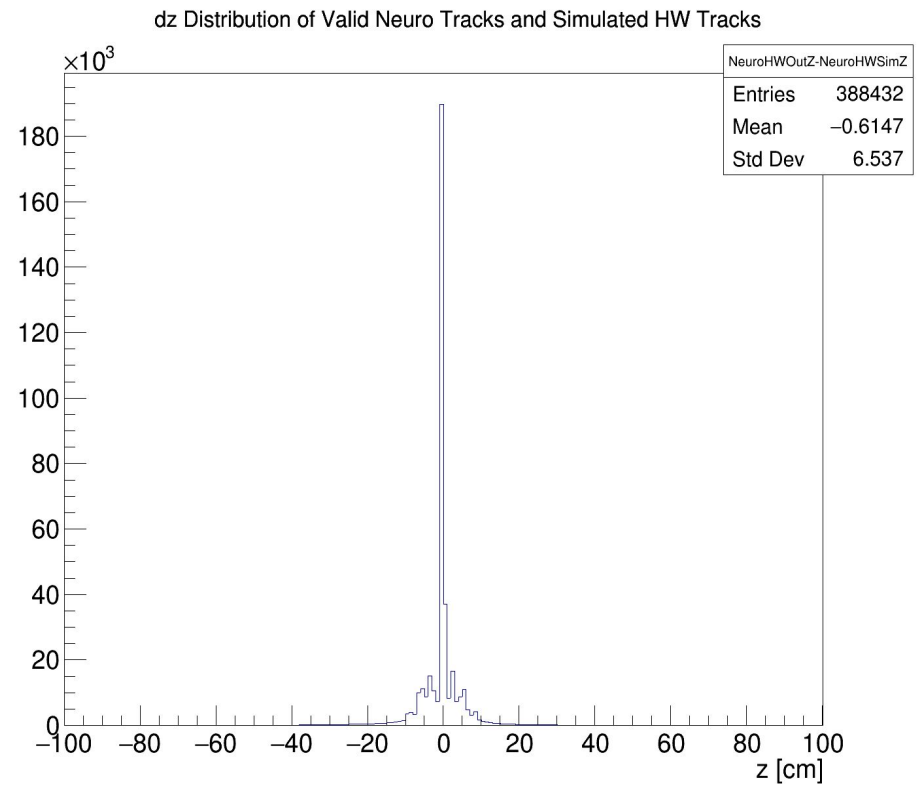
- **tobi_NN**: SL0 and SL8 scaling error, fastestpriority timing

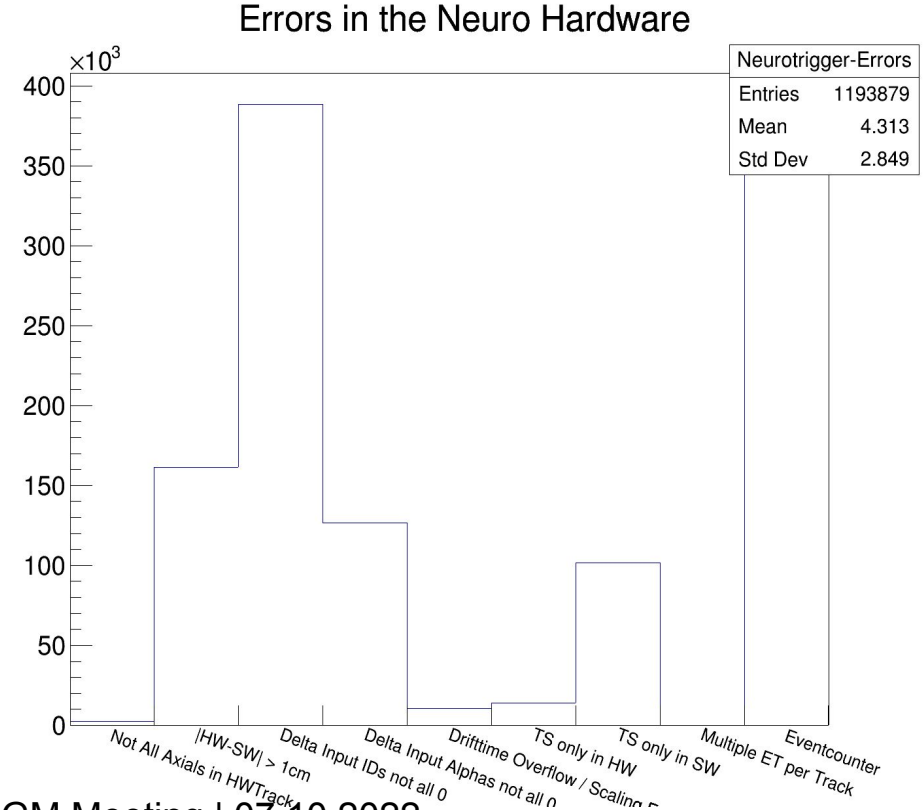
and the old firmware used during Exp20:

- **old_NN**: no errors, etf timing, old network weights

Firmware Check

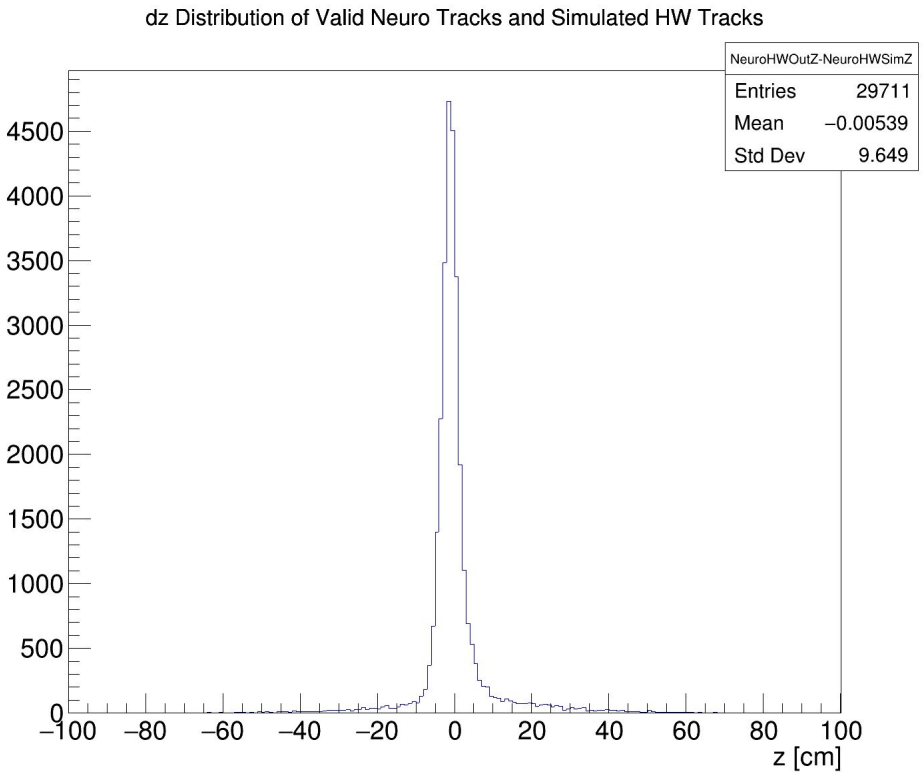
Old Firmware before Exp 24

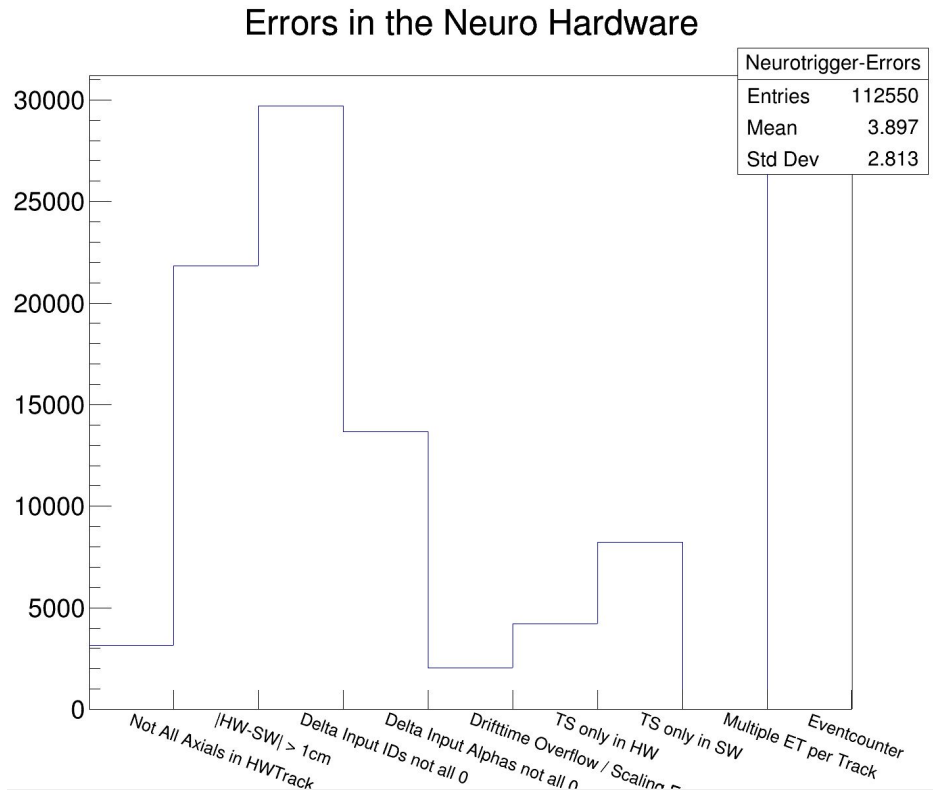




Firmware Check

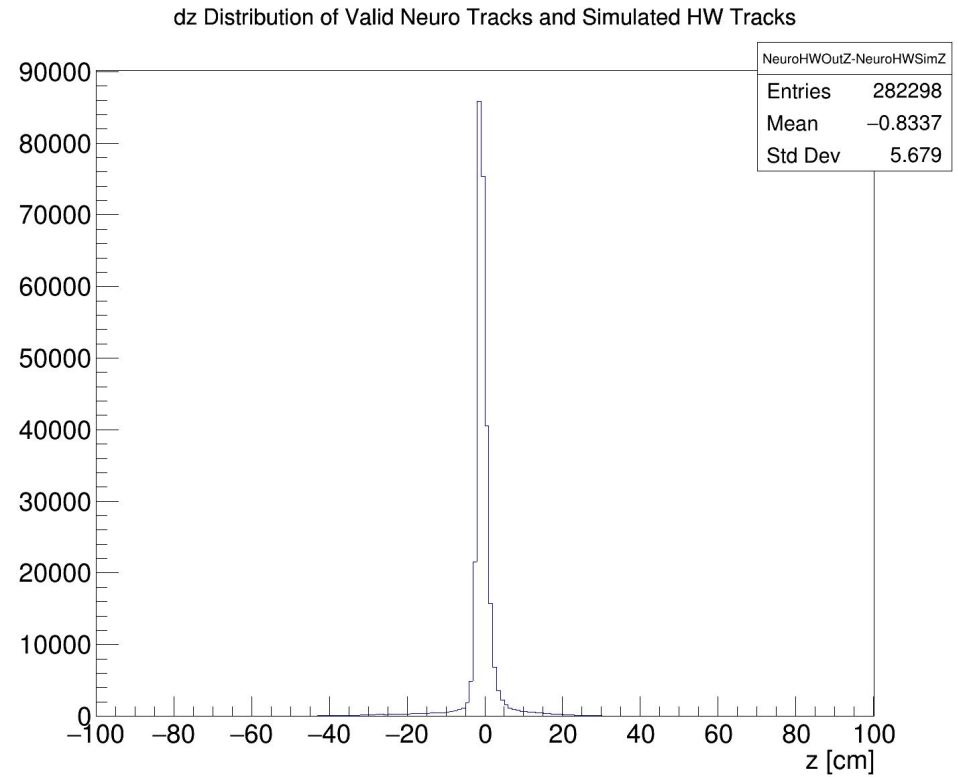
Firmware during 2022

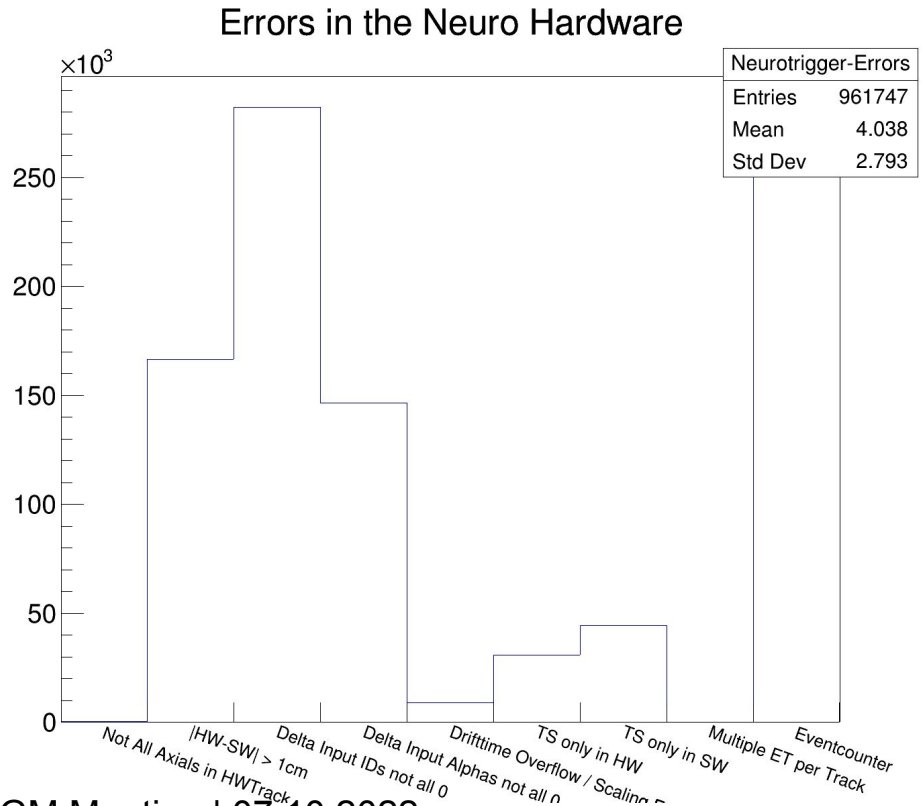




Firmware Check

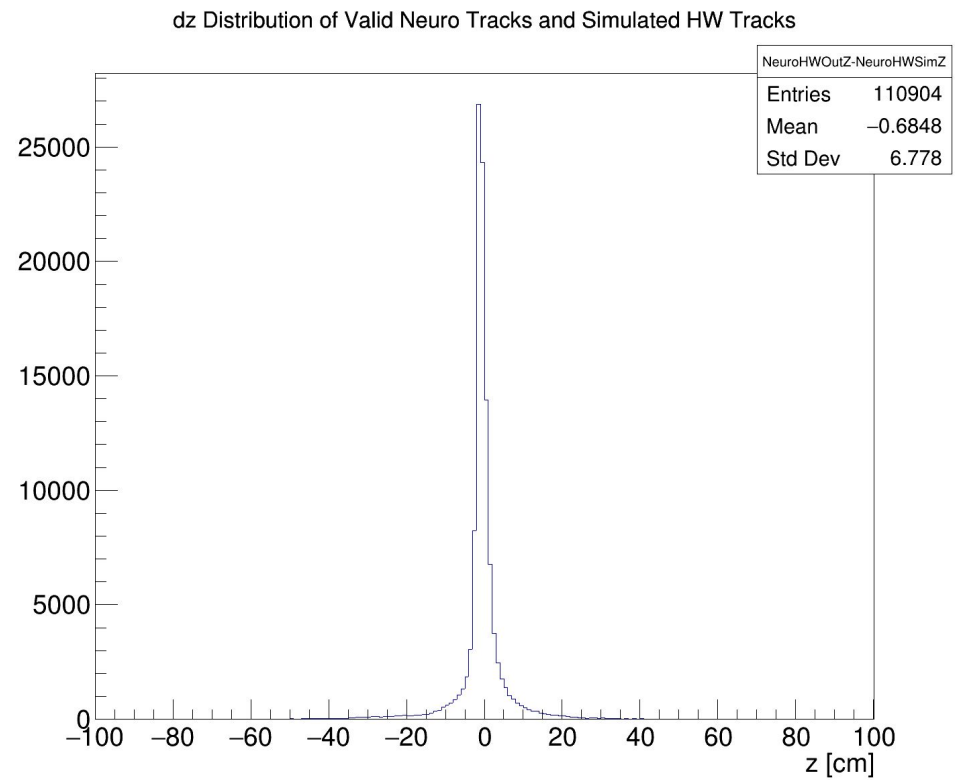
New Firmware 1 (Cosmic Data)

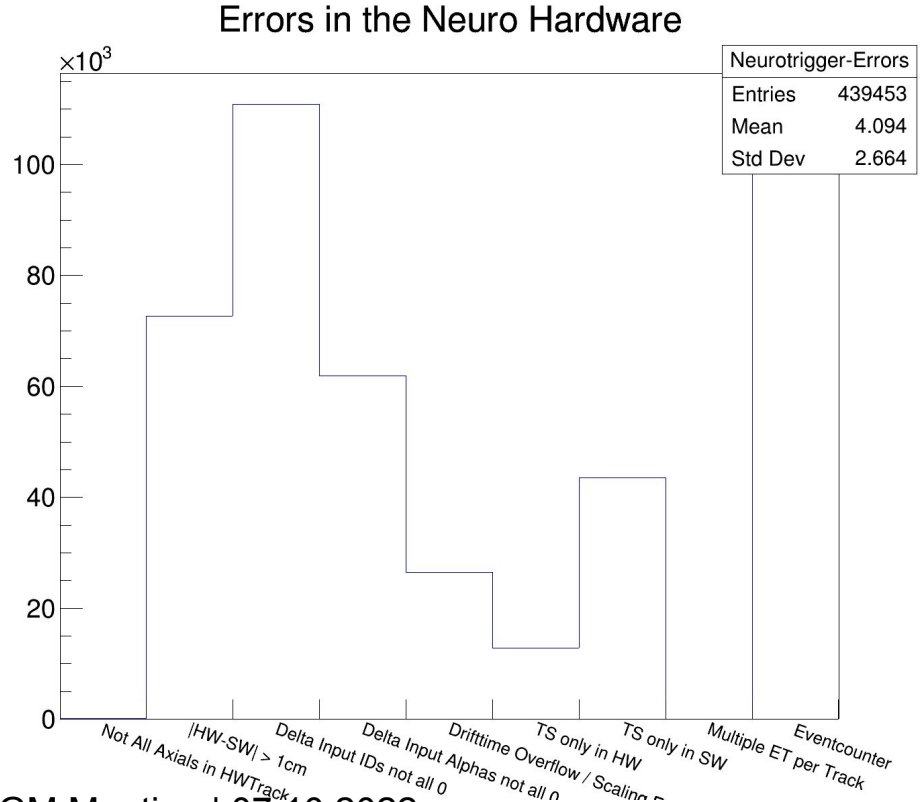




Firmware Check

New Firmware 2 (Cosmic Data)





Firmware Check

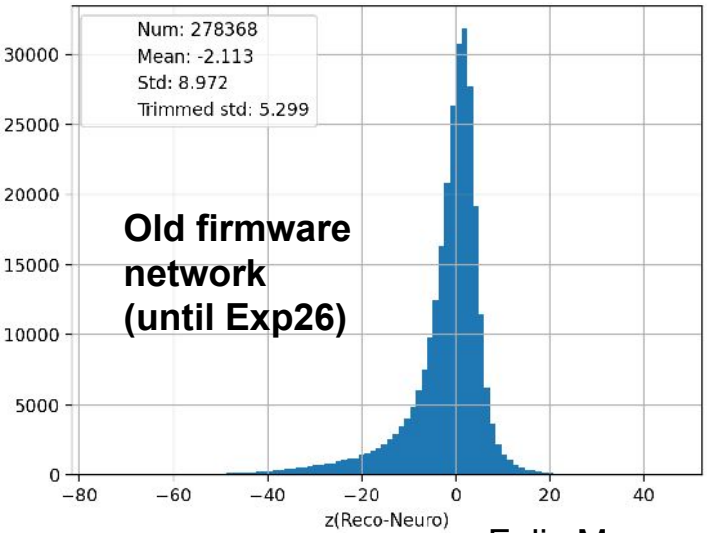
- Errors during lumi runs are mostly due to noisy events
- Small deviations come from rounding errors (HW/SW delta z <1cm)
- New Firmware still has some errors, we are working on it

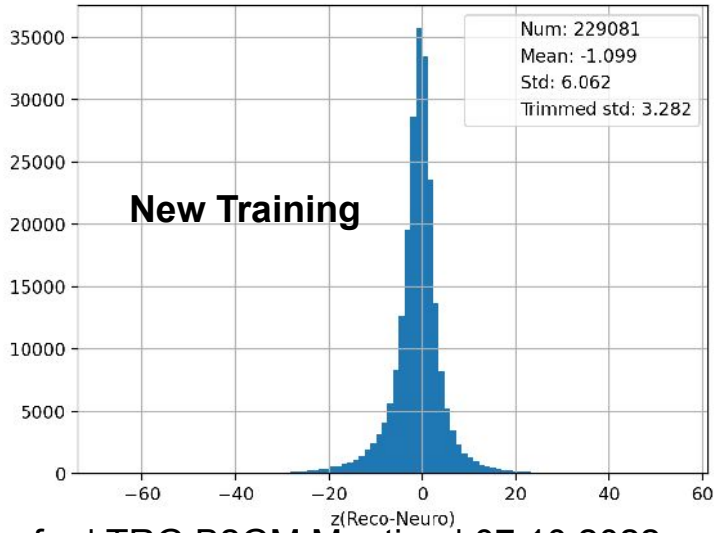
New Training (preview)

- A new network training is ongoing (very, very fresh results):
  - Exp 26 data
  - etfcc timing

→ **Looks very promising so far!**

expert 0





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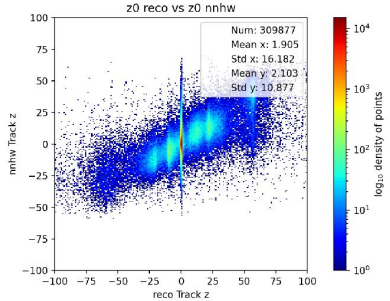

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