ePIC Update

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Data Links

DATA FILES
https://cernbox.cern.ch/files/link/public/PoA5TnvLyyzIEO8?tiles-size=1&items-per-page=100&view-mode=resource-table

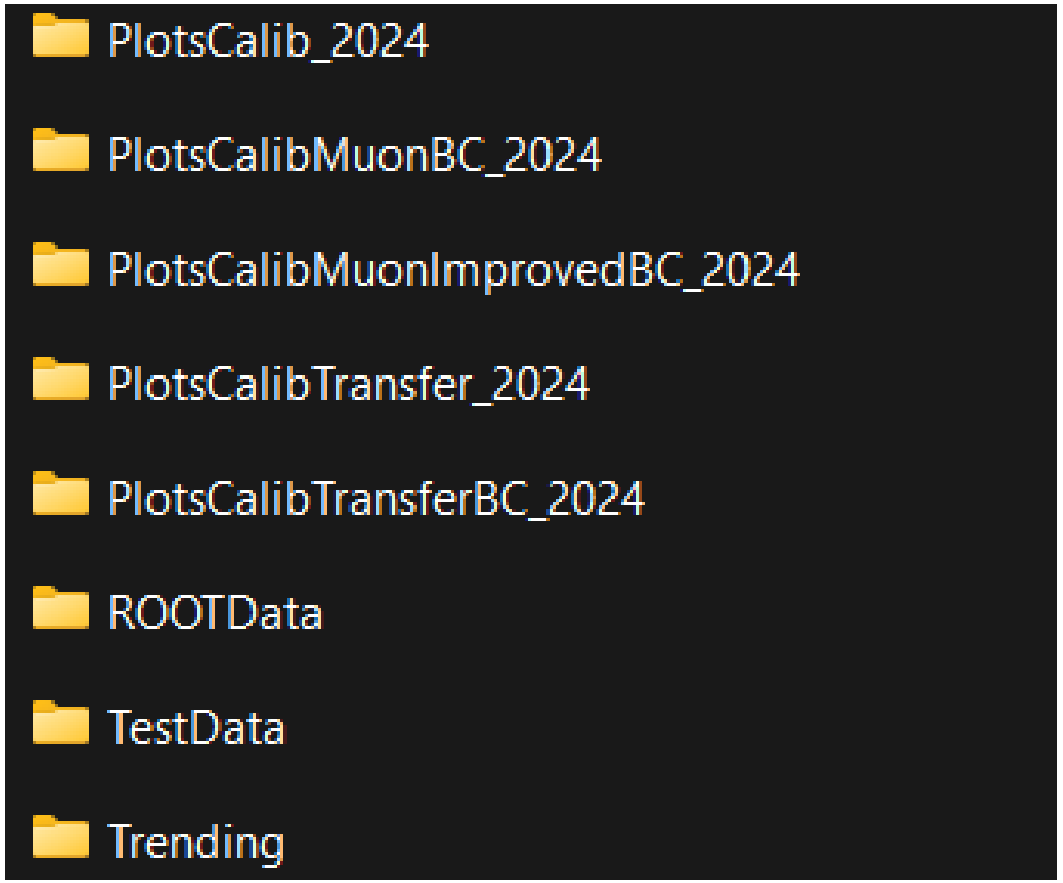
REFERENCE WIKI
https://wiki.bnl.gov/EPIC/index.php?title=LFHCal_Fall_2024_Test_Beam

ORIGINAL SPREADSHEET COPY
https://docs.google.com/spreadsheets/d/1XaiSmG4jBaBOyjbjdiNuSeehjeZC03_2A7Ccoq0nIbI/edit?gid=0#gid=0

SHARED WORKING SPREADSHEET
https://docs.google.com/spreadsheets/d/1eFIf9zpuHhEJHpiDnX0yi_t4SWDuHf2e6rELOapgVFI/edit?gid=0#gid=0

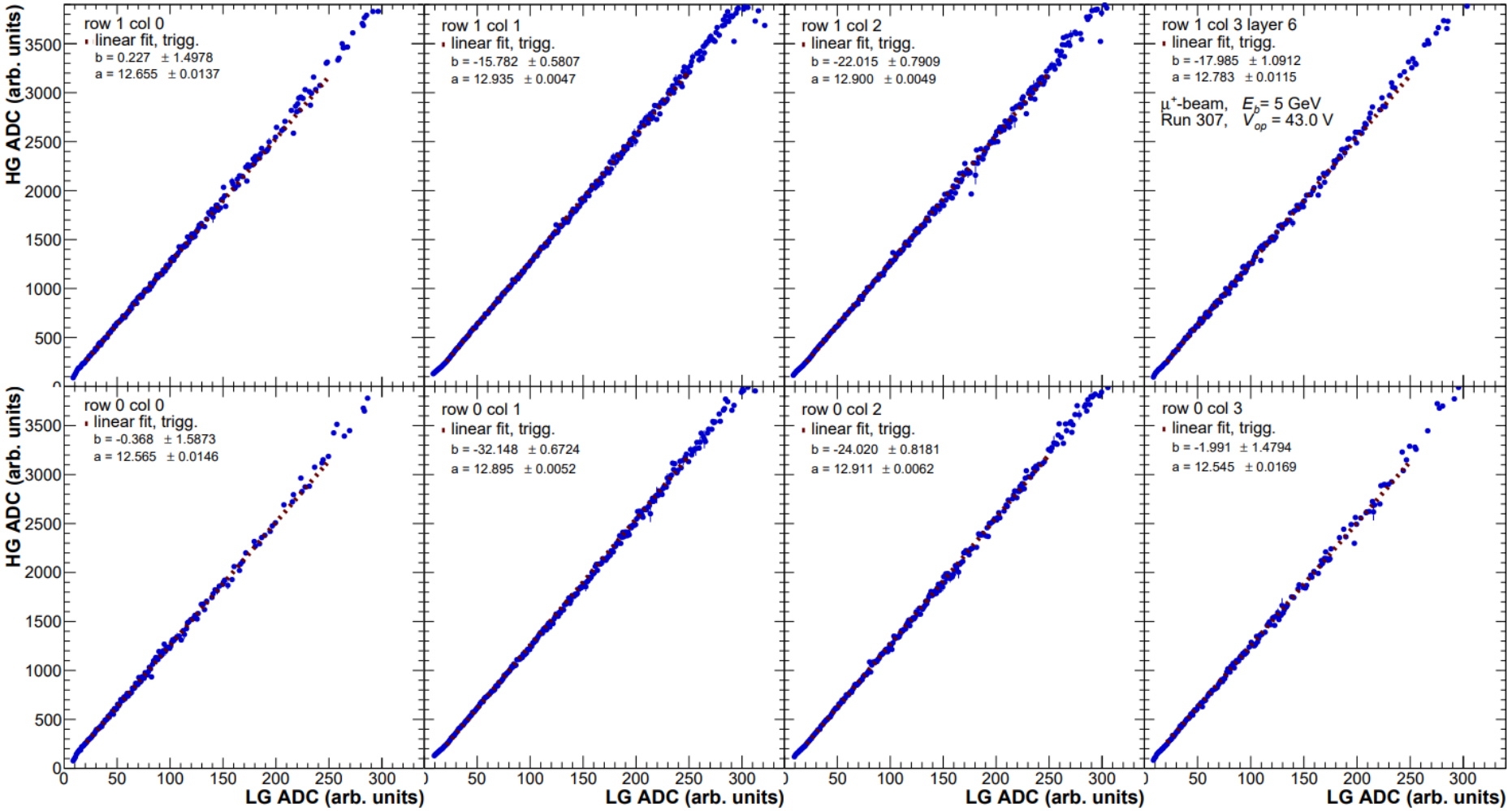
REPOSITORY
https://github.com/eic/epic-lfhcal-tbana/tree/main

Folder Organization



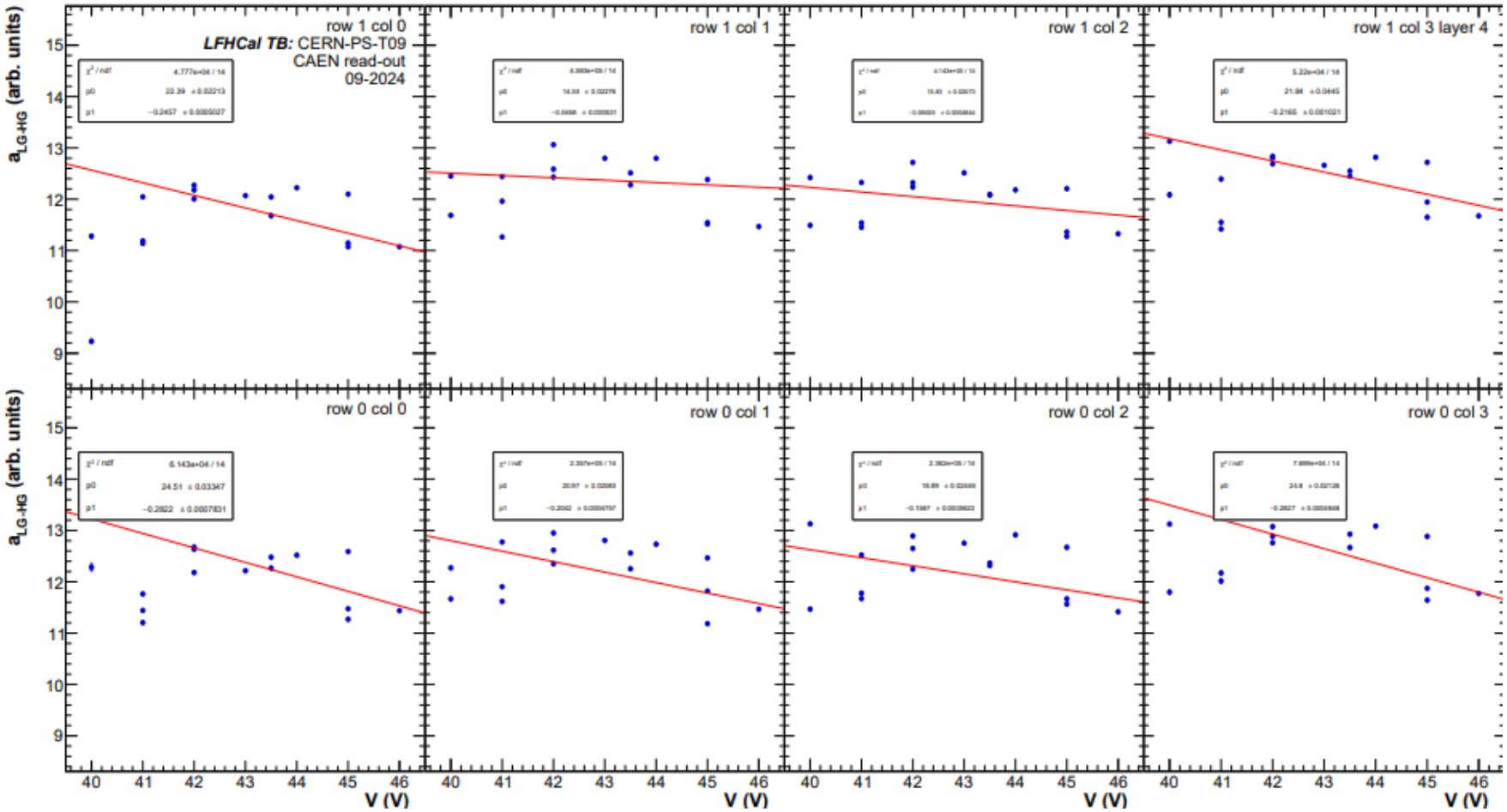
- PlotsCalib_2024: pedestal run output
- PlotsCalibMuonBC_2024: muon group “step 1” output
- PlotsCalibMuonImprovedBC_2024: muon group “step 2” output
- PlotsCalibTransfer_2024: pedestal transfer to muon group output without removing bad channels (UNUSED)
- PlotsCalibTransfer_2024: pedestal transfer to muon group output with bad channels removed
- ROOTData: initial ROOT files extracted from text documents of run files
- TestData: downloaded text documents for each run
- Trending: output of Compare function between multiple muon groups

Origin of LGHG Slopes



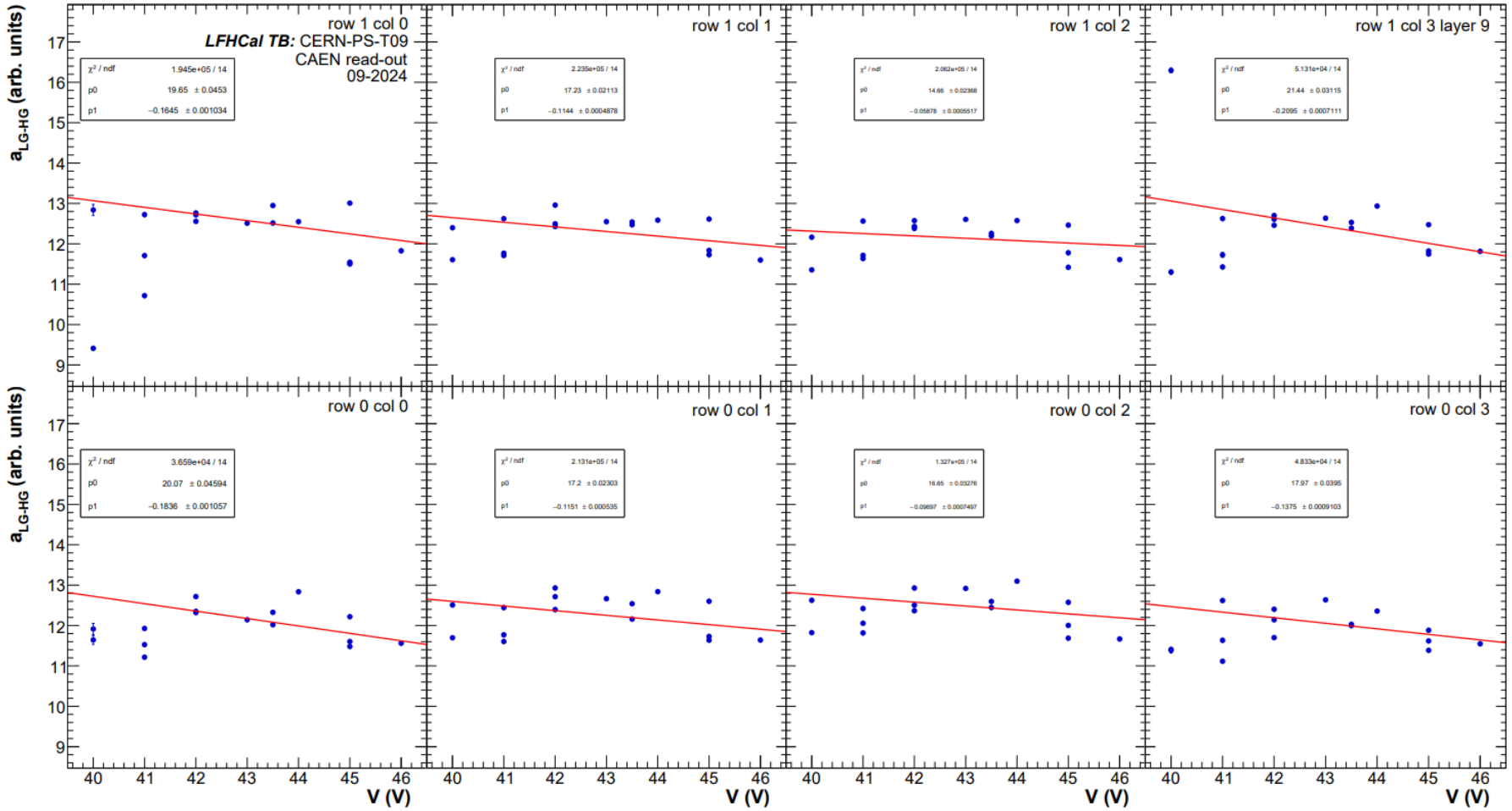
- Whenever the detector registers a count, the LG and HG values are saved as a pair
- These pairs are saved as points on a scatterplot for each tile
- Ideally, the ratio between HG and LG should be consistent. We can test how consistent it is across tiles by fitting a line to each tile and comparing the slopes
- Each muon group gets one set of these scatterplots for all tiles

Comparing Runs



- With the Compare function, the slope on a tile from the previous slide is plotted as a point for each muon group so that the muon groups can be compared
- Here, I modified the code to ignore points for tiles that could not properly fit a line to make the trendlines on these scatterplots more relevant

Comparing Runs



- As seen in this sample layer, most tiles have a slightly negative slope trend with voltage
- Out of all 512 tiles, only 3 of them displayed a slightly positive slope

LG and HG Scale

- The LGHG slope is typically around -0.05 to -0.15. Both the LG and HG values consistently increase with voltage

LG and HG Scale

Layer 54 sample tiles

- The LGHG slope is typically around -0.05 to -0.15. Both the LG and HG values consistently increase with voltage, as seen below