

MINERVA Nearline Update

Abbey Waldron

Imperial College London

Module Set 11 Cabling Update

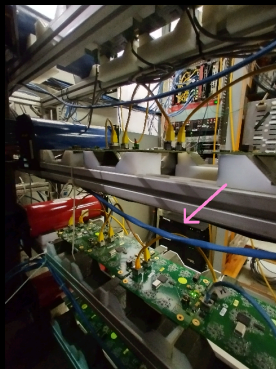


Nearline Goals

As we reinstall the module sets, need to make sure everything is working properly.

- ▶ Find broken Photo-Multiplier Tubes (PMTs) as soon as possible
- ▶ Make sure there are no light leaks
- ▶ Make sure everything is connected and connected as expected
- ▶ Find any broken Front End Boards (FEBs) as soon as possible
- ▶ Find any other issues that may be lurking (DAQ, high voltage *etc*)

The Nearline Machine



Currently in Lab F (we don't have things powered underground yet),
mnvonline07. Need access? Contact Geoff! To log in:

```
kinit -f <your username>@FNAL.GOV
```

```
ssh -YK minerva@mnvonline07.fnal.gov
```

Overview of the Nearline

There are a few different steps in the nearline:

- ▶ Raw data is saved here: `/work/data/rawdata`
- ▶ These files need converting into DST format
- ▶ These root files then need to be analysed (two different paths):
 - ▶ RawDataChecker and GMBrowser
 - ▶ Your own analysis script

Converting data to DST Format

This can be done interactively on `mnvonline07`:

```
setup_nearline
```

```
source RawDataChecker_2022.sh -r <run number> -s <subrun  
number>
```

Converting data to DST Format

The output files end up here:

```
/minerva/data/users/minerva/nearline_2022/test/output
```

- ▶ root DST files written to output
- ▶ log files written to logfiles

Note you can access these files from any MINERvA gpvm.

How to Run GMBrowser

```
GMBrowser -f <HistogramFile.root>
```

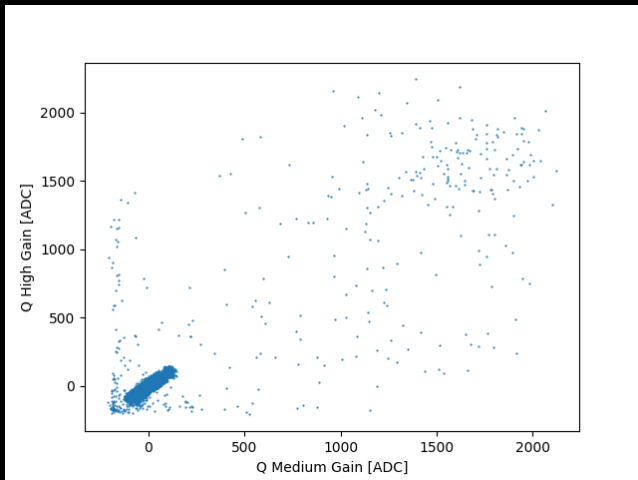
Plots only exist for `ToolSvc.RawDigitCheckerTool` right now, possibly to be expected from the pedestal data? Or something is wrong.

Analysis Script

Analysis Script Goals

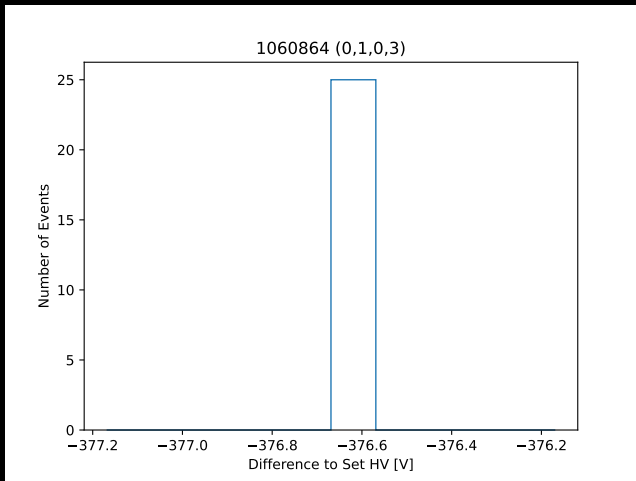
- ▶ Check for light leaks (per pixel)
- ▶ Check Trip-t working properly (per board)
- ▶ Check high voltage compared to reference high voltage (per PMT)
- ▶ Check for high voltage stability within runs (per PMT)

Checking Trip-t Gains Reasonable



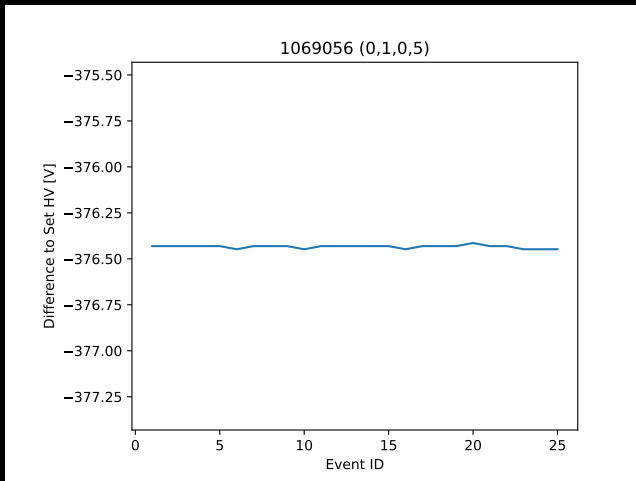
Pedestal data, should get more interesting with some signals!

Voltage Offsets to Set Voltage



Numbers at top are PMT ID and electronics location in crate, croc, chain, board system

Voltage Drift



Numbers at top are PMT ID and electronics location in crate, croc, chain, board system

Summary

- ▶ Everything set up to convert raw data into DST format
- ▶ Log files are back
- ▶ GMBrowser installed
- ▶ Analysis script for finding issues in development
- ▶ Hopefully we can switch on first module set very soon

Thank you!