





### **Electronics Response Calibration Update**

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### In progress

#### Running the most upto-date analysis on VD data

#### Electronics Response Visualizer is live now

Starting preparation of plots for the Electronics
Performance paper

- Aiming for runs 21010 -21073 (14 mV/fC gain) and/or 21214 - 21277 (7.8 mV/fC gain).
- Data is very old now, so we need to stage from tape to access it.
- Painful.
- In progress!

- Thanks to Chao for sharing his wisdom!
- Visit here:

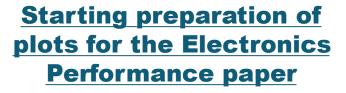
https://www.phy.bnl.gov/~cha o/response-visualizer/

- 1. Pulse shape studies/fits.
- Gain/calibration plots using internal LArASIC pulser data.
- 3. Linearity plots using the same pulser scans.
- 4. Cross-talk plots, using the single-ASIC-channel pulser data.
- Cross-checks on gain calibration using the WIB-DAC and internal gainmatching-off data.





- a. Examples of a response function fit to a channel
  - A near-ideal response
  - A very non-ideal response
  - The corresponding example of ideal electronics response function fit to the same channel <u>after deconvolution</u>.
- b. Histogram of distribution of some choice response function fit parameters of interest.
  - Maybe some 2D histograms if there are interesting correlations?
  - Suggestions?





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- a. Example of linear fit of response parameter (amplitude?) vs. injected charge for one channel.
- b. Is the above plot different for induction and collection channels? If so, elaborate on this.
- c. Histogram of distribution of the above calibrated gain from all available channels.
- d. Show the above for both 7.8 mV/fC and 14 mV/fC gain pulser scans.

# Starting preparation of plots for the Electronics Performance paper

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a. Plot of % non-linearity vs ADC code, evaluated by extrapolating a linear fit to the response of pulse injections that give amplitudes around the middle of the ADC range, and checking the actual deviation from this linear extrapolation.

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- a. 16 x 16 cross-talk table, showing with a large injection to channel X, how much response does channel Y show.
- b. Possibly do this for both single-ended and differential mode. But maybe not needed if it's already very low for the single-ended data.

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These would be to show how much the gain obtained from WIB-DAC and gain-matching-off pulser scans deviate from the gain obtained from internal pulser scans (which are our main calibration method)

- a. Overlay of response vs. injected charge data points and linear fits from the 3 types of pulsers for some representative channel.
- b. Histogram of the ratio of the gain obtained from one method vs. the gain obtained from the "main" calibration for all channels.

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- 5. Cross-checks on gain calibration using the WIB-DAC and internal gain-matching-off data.



