d_2^n BB

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Čerenkov Voltage Change Maps

- ADC Flash Runs 1244-1252, also in BB change list on wiki
- Went through hallog and made tables for all Big Bite *Čerenkov* high voltage changes.
- Found five high voltage changes and one period where flash ADCs were installed
- High Voltage tables can be found:

https://hallaweb.jlab.org/wiki/index.php/HV_Tables

- Calibrated one photoelectron peaks for late Feb./March running
- Need to do early Feb, but a little more complicated (no LED runs) .
- Also made list of BB kinematics and target polarization:

https://hallaweb.jlab.org/wiki/index.php/Big_Bite_Kinematics_Run_Breal

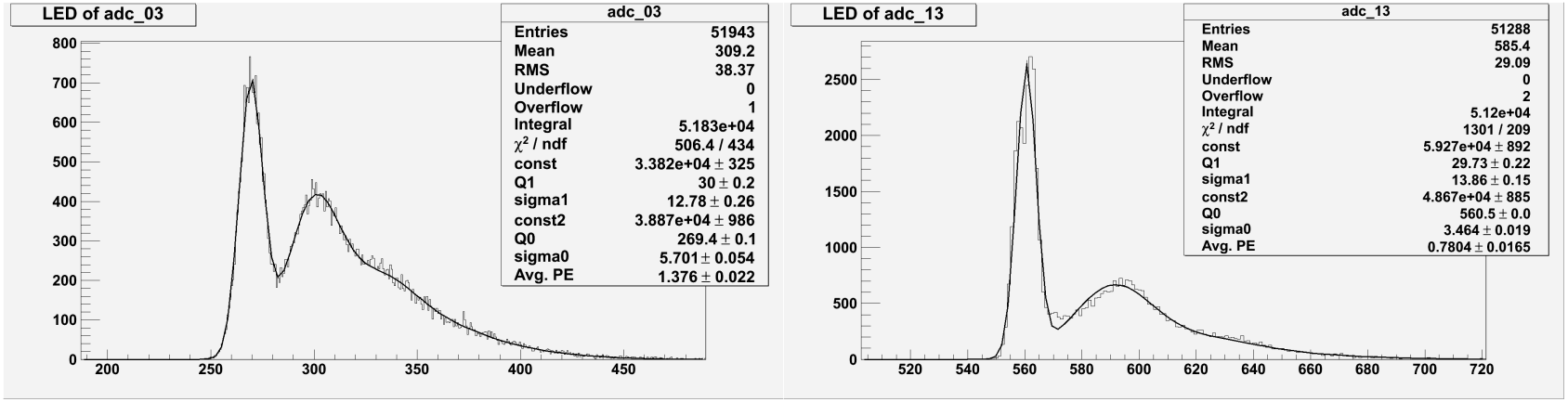
1pe LED Fits

- Fit used for the LED runs is a Poisson and Gaussian convolution.

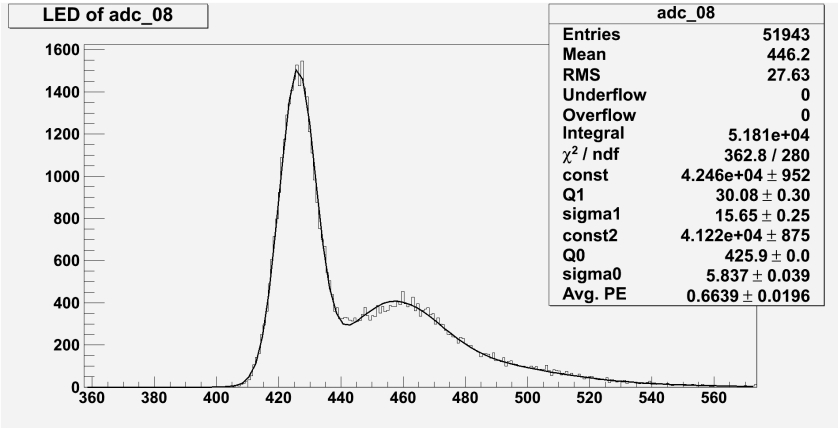
$$C_0 \frac{exp\left[\frac{(x-ped)^2}{2\sigma^2}\right]}{\sigma\sqrt{2\pi}} exp(-\lambda) + \sum_n C_n \frac{exp\left[\frac{(x-ped-n\times pe)^2}{2n\sigma_n^2}\right]}{\sigma_n\sqrt{2n\pi}} \lambda^n \frac{exp(-\lambda)}{n!}$$

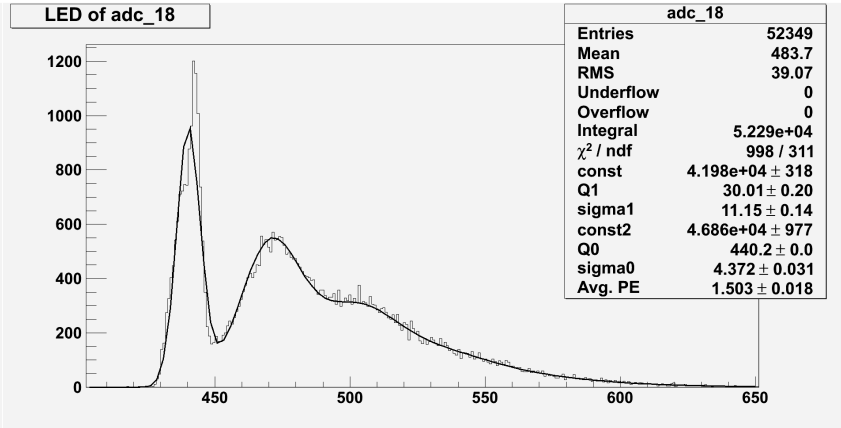
- n is number of photoelectrons
- C_0 constant for pedestal
- C_n constant for n^{th} photopeak
- pe is location on one photoelectron
- λ is the average photoelectron number

Some LED Fits After Calibration



Some LED Fits After Calibration





Some LED Fits for HV 4

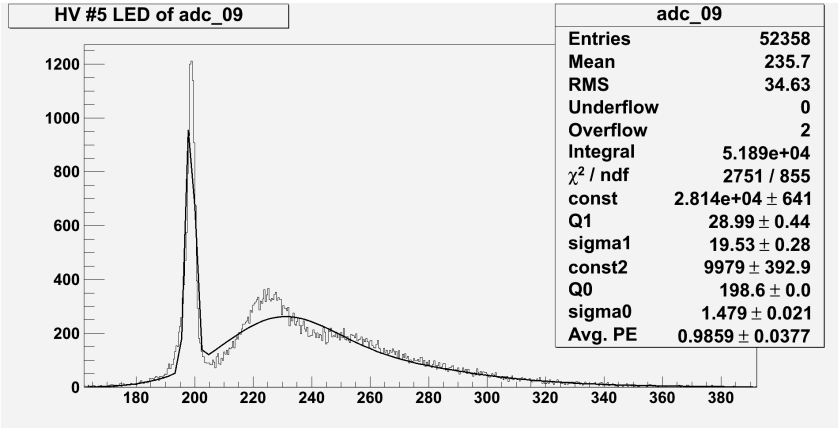
PMT	HV	1pe(chan.)	PMT	HV	1pe(chan.)
10	1401	29.9±0.20	20	1522	30.28±0.29
09	1411	29.6±0.20	19	1750	30.00±0.30
08	981	30.08±0.30	18	1469	30.01±0.20
07	1251	30.01±0.36	17	1555	30.01±0.64
06	1150	30.04±0.47	16	1371	29.99±0.23
05	1166	29.96±0.44	15	2070	30.01±0.23
04	1390	30.03±0.20	14	1821	29.84±0.16
03	1151	30.0±0.20	13	1451	29.73±0.22
02	850	30.01±0.38	12	1403	30.0±0.20
01	1291	30.29±0.25	11	1657	30.02±0.21

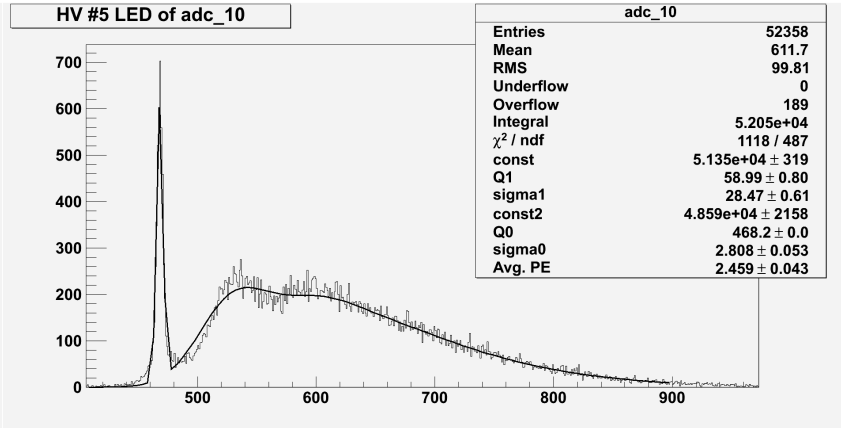
Some LED Fits for HV 5

- only PMT 9 and 10 changed HV

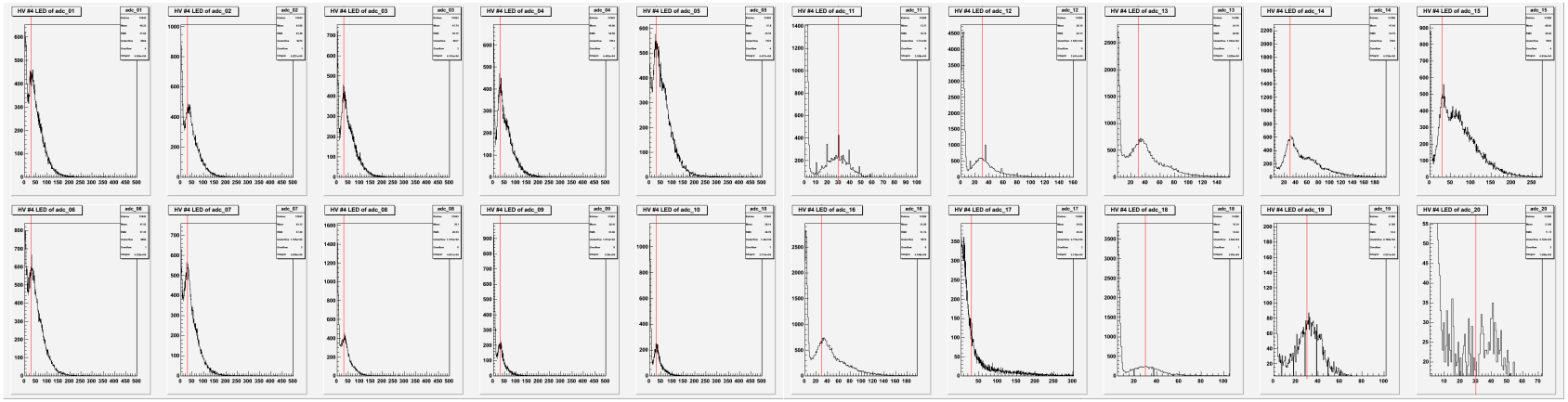
PMT	HV	1pe(chan.)
10	1950	$\pm$
09	1972	28.99$\pm$0.44

LED Fits For HV5 ADC 9 and 10

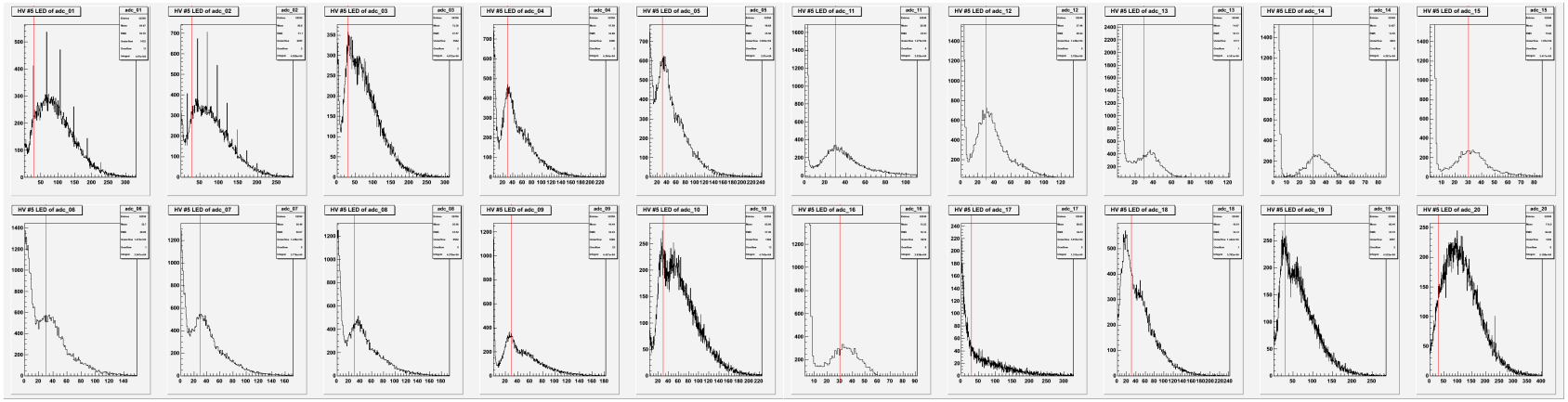




LED Fits For HV4



LED Fits For HV5



Čerenkov Multi-Hit TDCs

- Implemented multi-hit TDCs to loop over all TDC[Ndata]
- TDC histograms are drawn by filling TDC values from $TDC[0]$ through $TDC[Ndata - 1]$ for each mirror
- Where Ndata is the number of hits received on a particular TDC
- Ndata is obtained from the replayed ROOT files

Beam Line TDC Hits and TDC

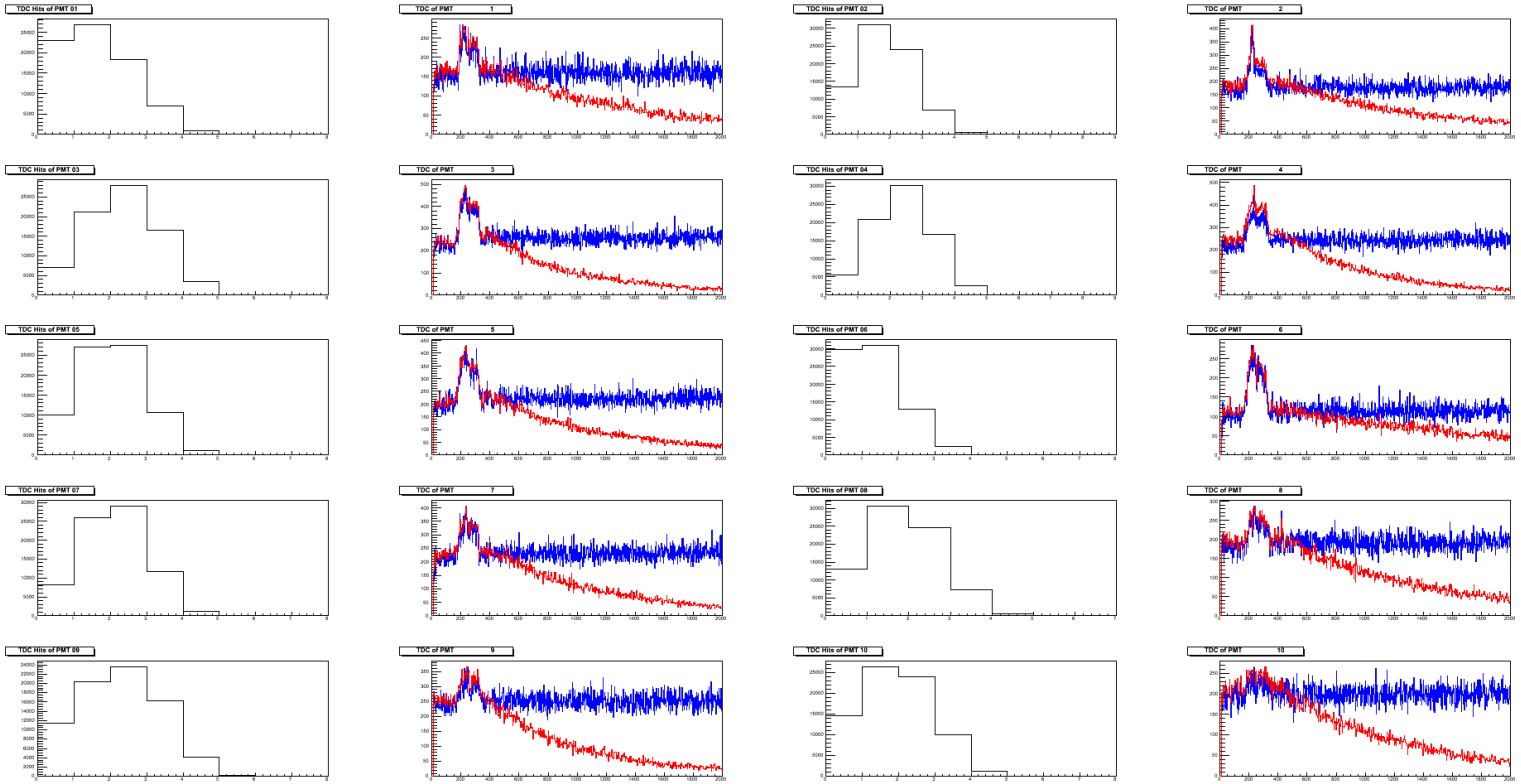


Figure 1: TDC hits and TDCs for run 1849 Red is $TDC[0]$ Blue is $TDC[Ndata]$

RHRS TDC Hits and TDC

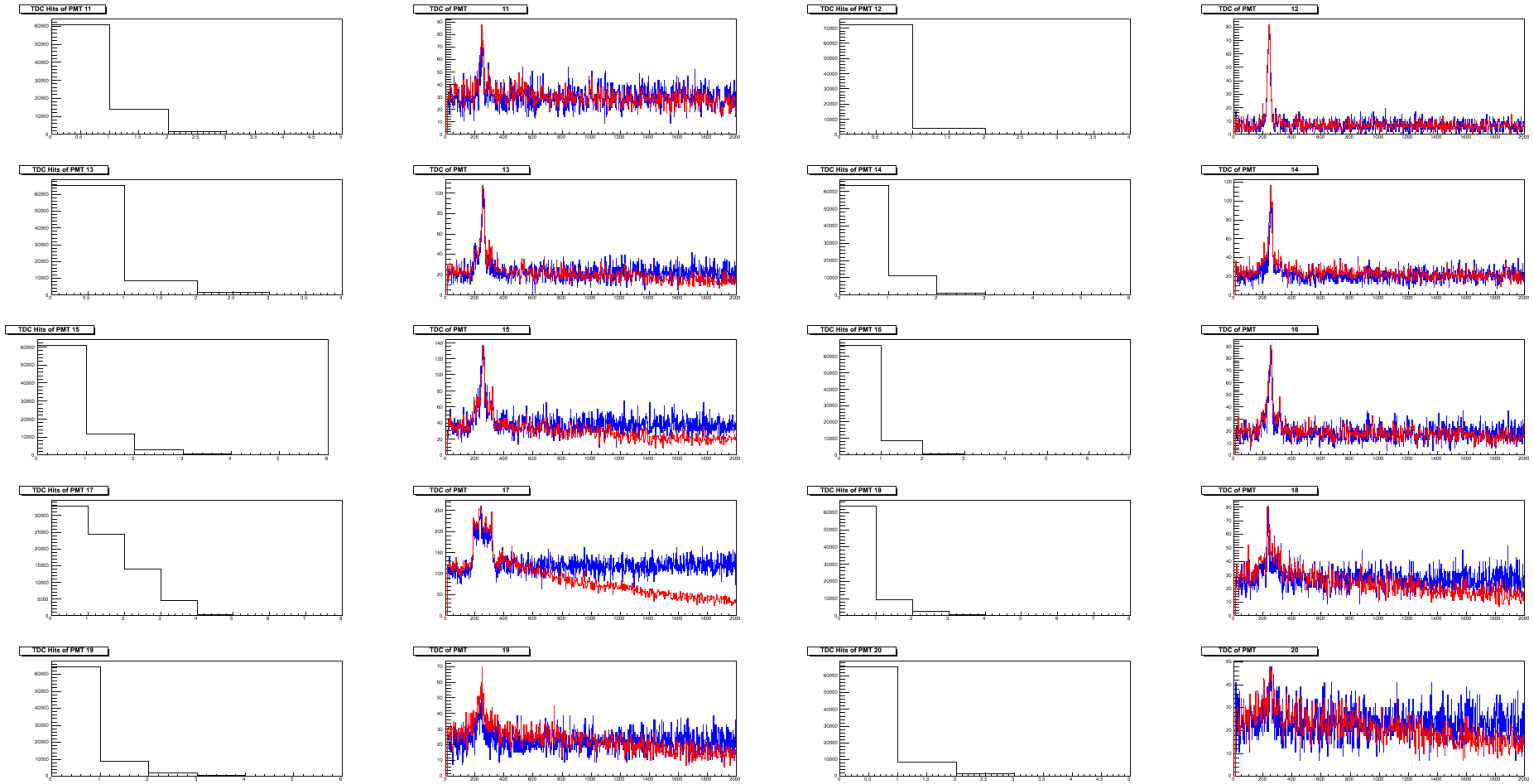


Figure 2: TDC hits and TDCs for run 1849 Red is $TDC[0]$ Blue is $TDC[Ndata]$

BB Shower

Look to calibrate shower at 4-pass?

- More uniform shower coverage and events than at 1-pass.
- More stable *Čerenkov* to include *Čerenkov* cuts.
- Use ps/sh to select electrons and find *Čerenkov* rejection factor

Data Quality check

- Begin doing data quality checks for BB and LHRS
- Follow Xin's skim-root procedure
- Start with cutting away beam trips from all BB and HRS runs
- See Dave's talk for more details on procedure

APS Talk

- I will be presenting the d2n experiment at the February 13^{th} APS meeting
- Sent out first talk draft a few days ago. Any comments?
- If you have any plots, you can send them to me. I will send out a reminder again in a couple days.