July 15$^{\text{th}}$ Weekly Update

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July 19, 2013

Outline

1. PMT Status Check GUI
2. Shaper/FEM Linearity Test
3. PMT Readout Studies - Kazu Decoder & Analysis

PMT GUI

Purpose

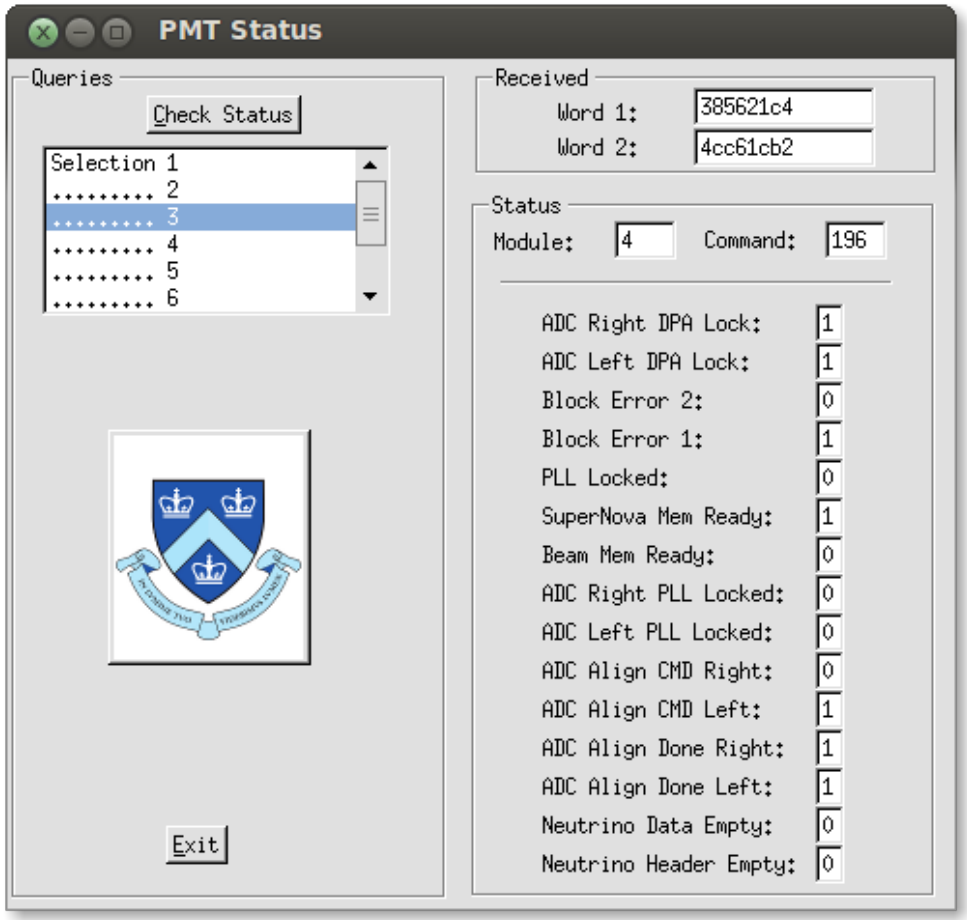
Query the PMT board for status and interpret its response word

Currently

- Generate fake 32-bit words
- Access appropriate bits and detemine status

Future

- PMT board selection
- Interface with WinDriver functions



Shaper & FEM Linearity Tests

Procedure

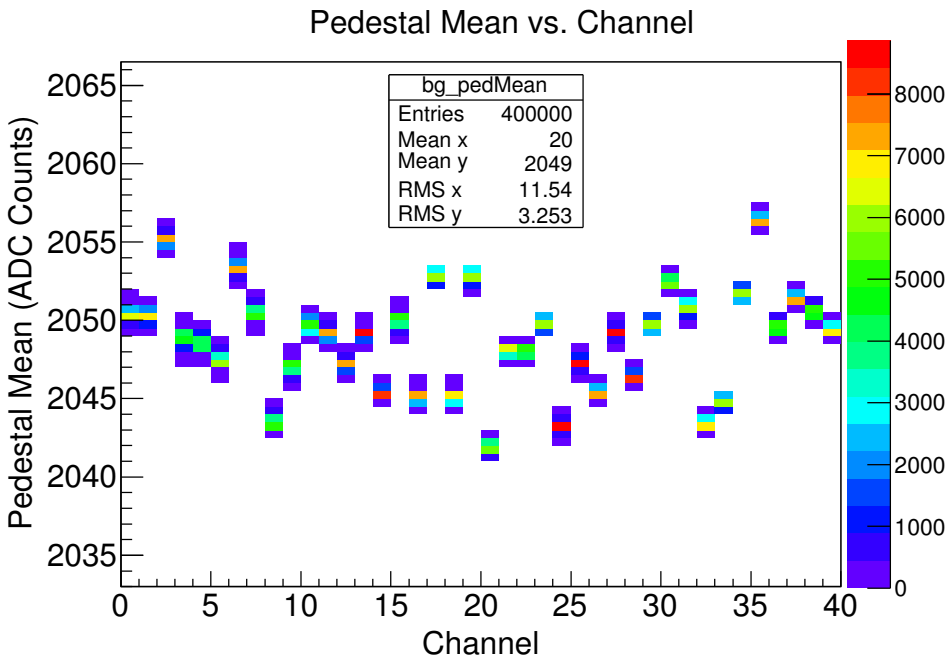
- Use the controller module to trigger a pulse generator
- Feed the pulse to the RC circuit built for the ringing tests. This generates a narrow (few nanosecond) PMT-like pulse of variable charge depending on the pulse amplitude.
- Feed into the shaper and read out through the FEM

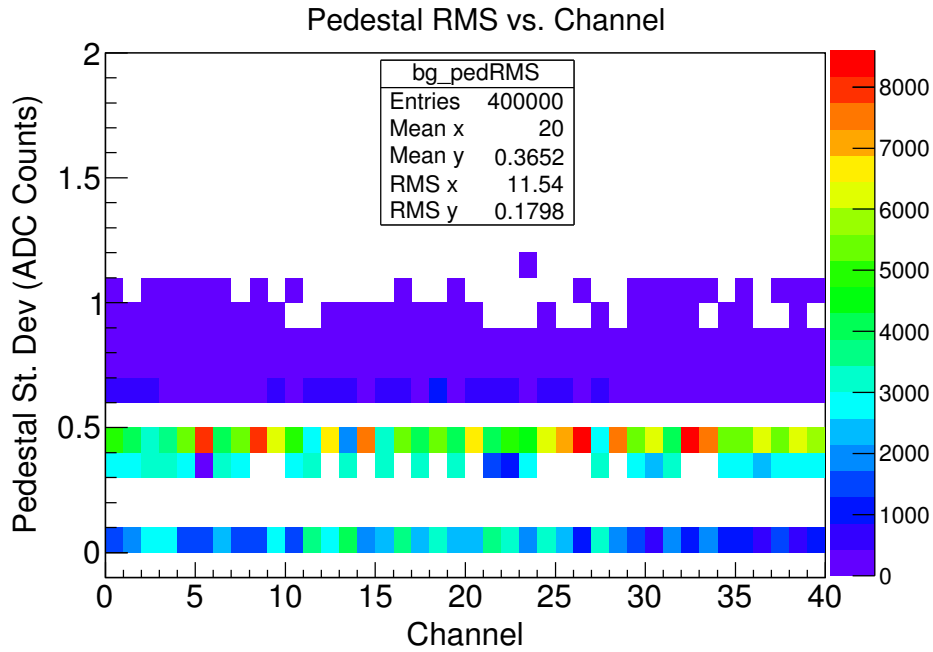
Decoder & Analysis Module

- Written with Kazu's framework
- Pedestal calculation and subtraction per shaper channel
- Calculate signal peak and area

Beam Gate Pedestal

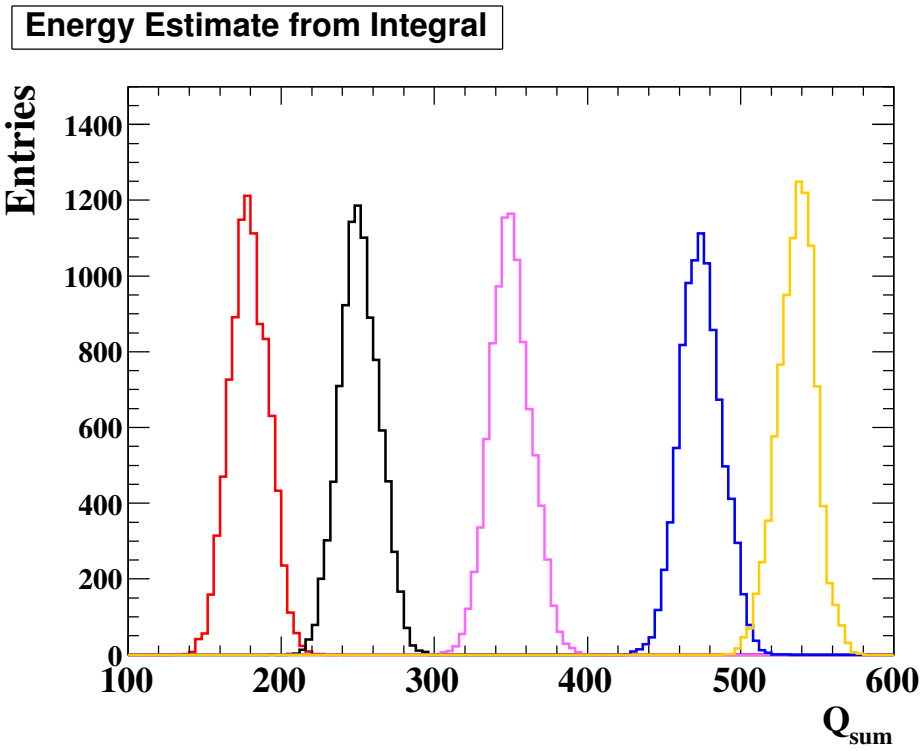
Pedestal mean and standard deviation calculated from first 5 points of beam gate sample

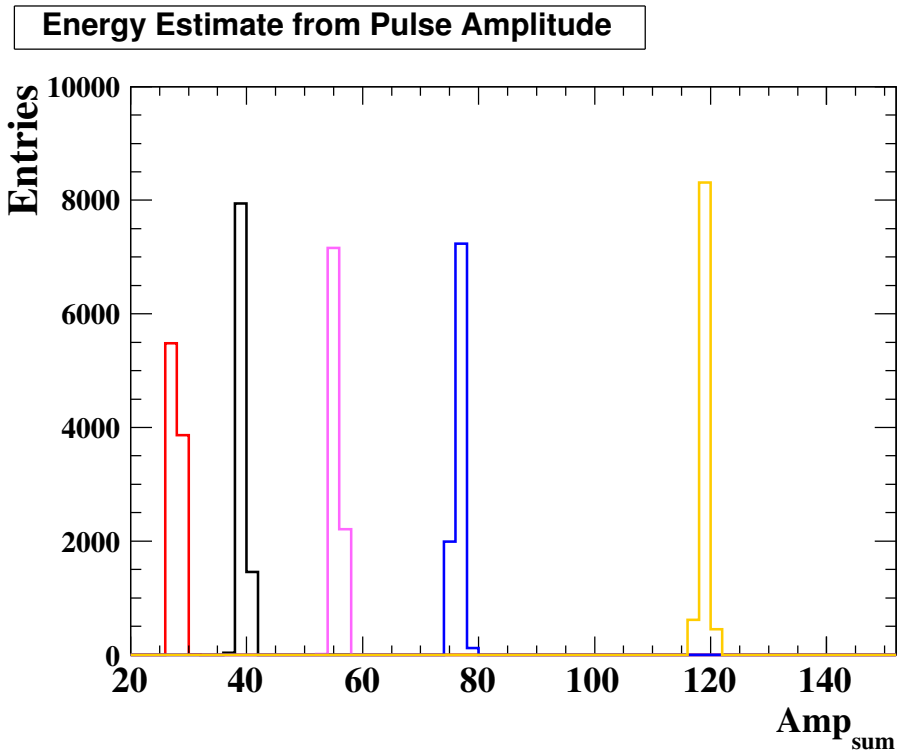




- Pedestal mean: ~ 2049
- Pedestal rms: ~ 0.365

Energy Estimation with Dan





- Energy estimated from integral and peak height of "fake" PMT pulse
- PMT pulse height increasing to the right from pulser (Kazu knows by how much)

Summary & Future

To-Do's For Dan, Vic & Kazu

- Include Vic's pedestal analysis package as the standard analysis code (with add a simple pulse reconstruction algorithm)
- Make the peak-sum energy distribution with finer bins
- Take data with even higher energy.
- Take data for all channels
- Fit energy spectra to estimate mean error