First Weekly MicrobooNE Meeting

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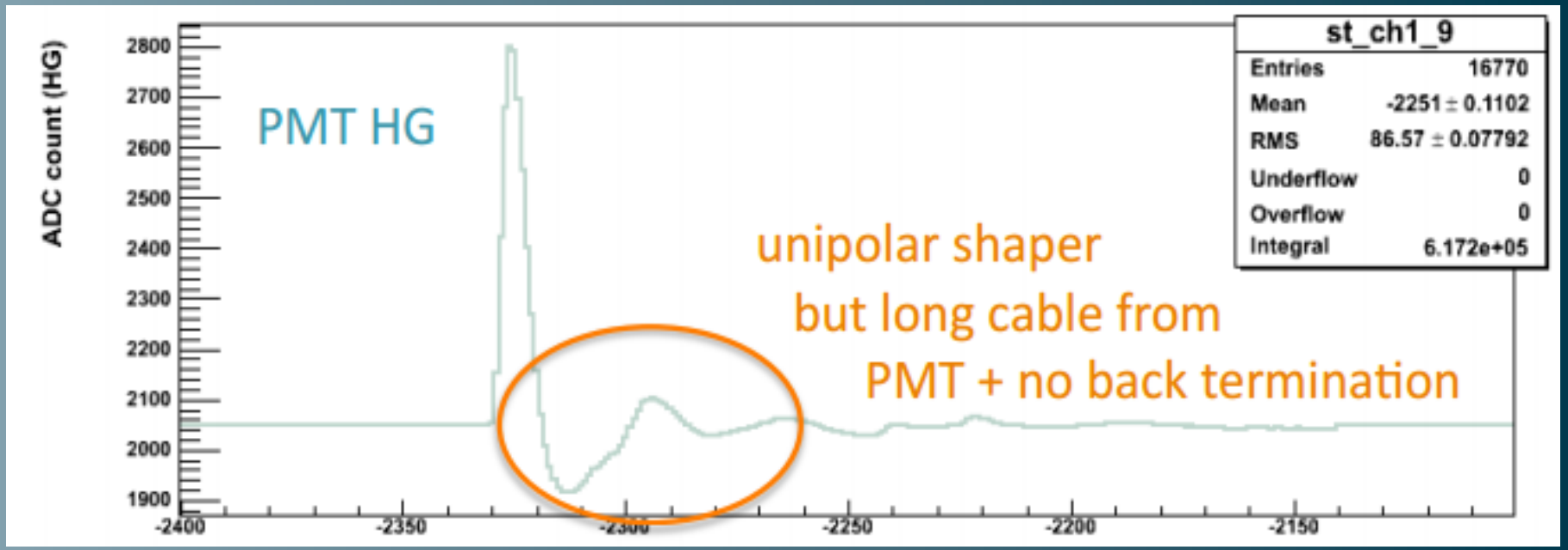
Hardware

Unipolar Shaper Pulse

Since it's UNIpolar, why are there 2 peaks?



Negative adc values?

– Blame noise, effects from cables and electronics

“Noise” vs. Standard Noise

- Alright, so there will be a change in the pulse shape, so what is it?!
- -Answer: Noise is random, so having many pulses will eliminate the random effects and give a better idea of the shaper.
- In few words, average the pulses.

Programming Developments!

- A lot of work has been done on the analyzer code
  - -The averaging code has correspondingly changed

  Basic Idea: Create a range for the peak, ignore all others, add each value at each point (bin), divide by the number you took (typical average)

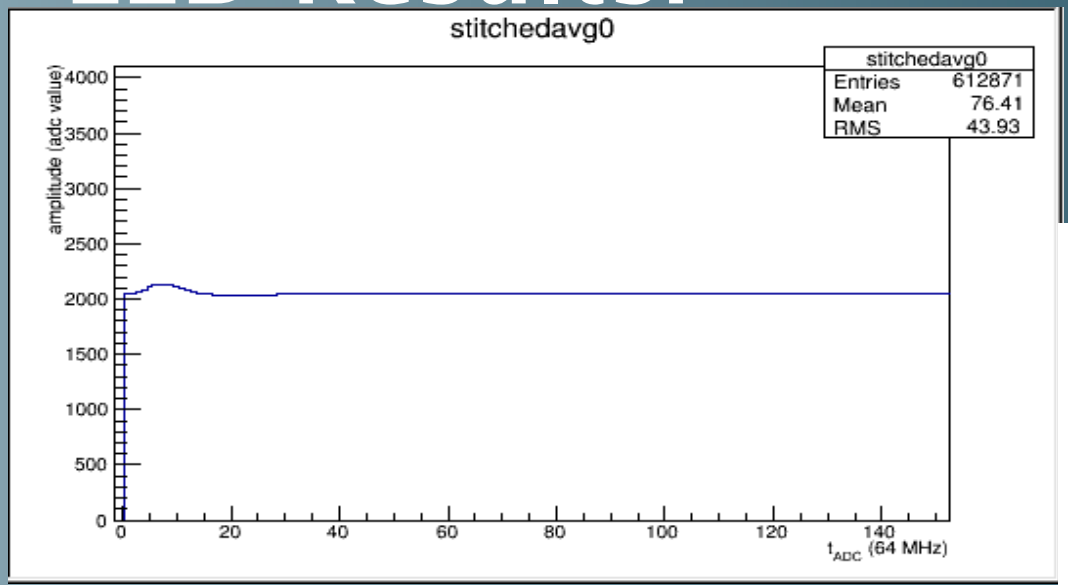
  -Done with an event limit of 1,000

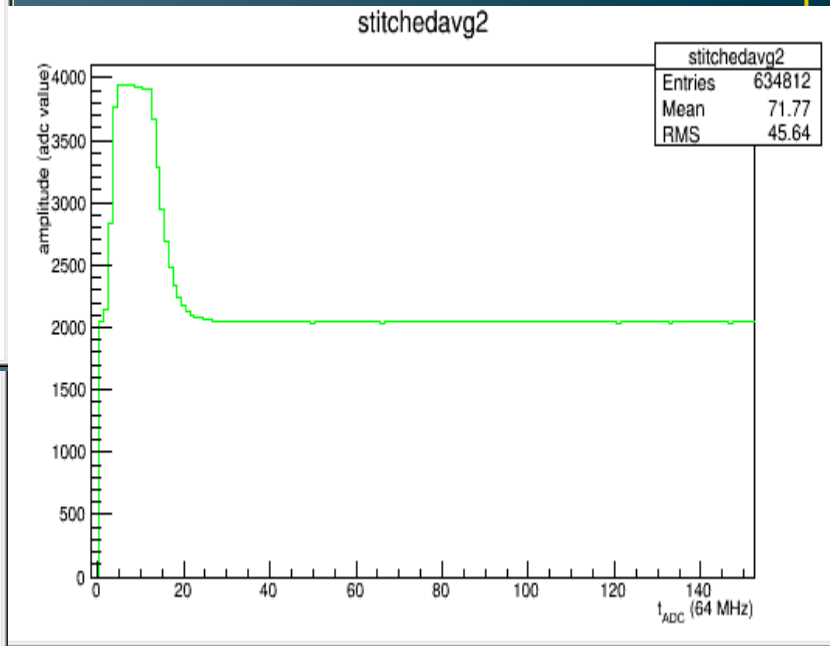
  - From LED data within the first 100 there are ~20 pulses
  - From the cosmic that number drops to ~8 (fewer with higher threshold)

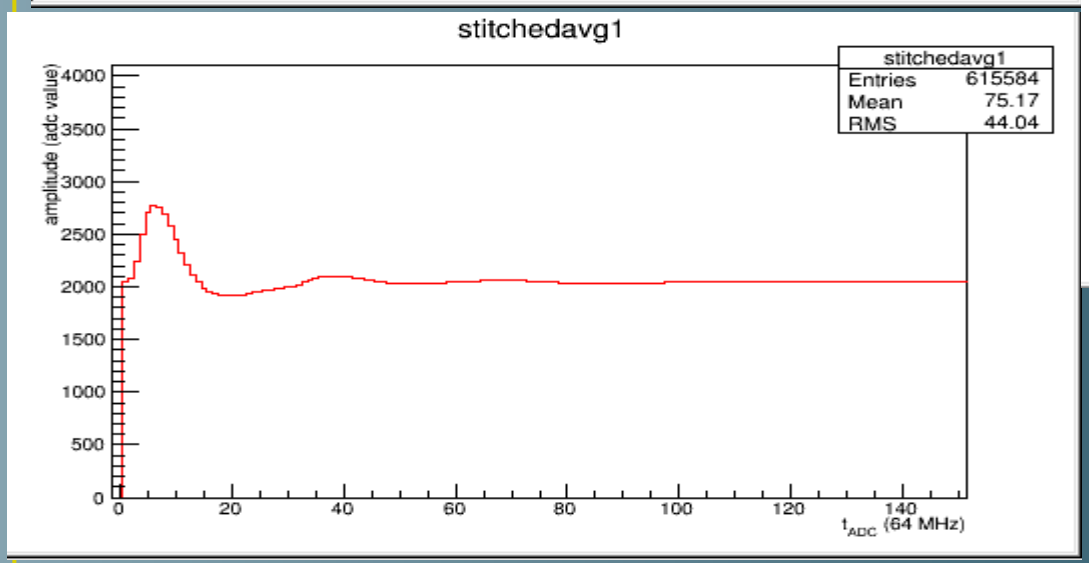
  Important: Averaging pulses alone will average peaks/noise with baseline values and thin out information throughout 512 microseconds.

  - To avoid this, find the bin with the peak value and work your way backwards to baseline. That will be the first bin of your average!

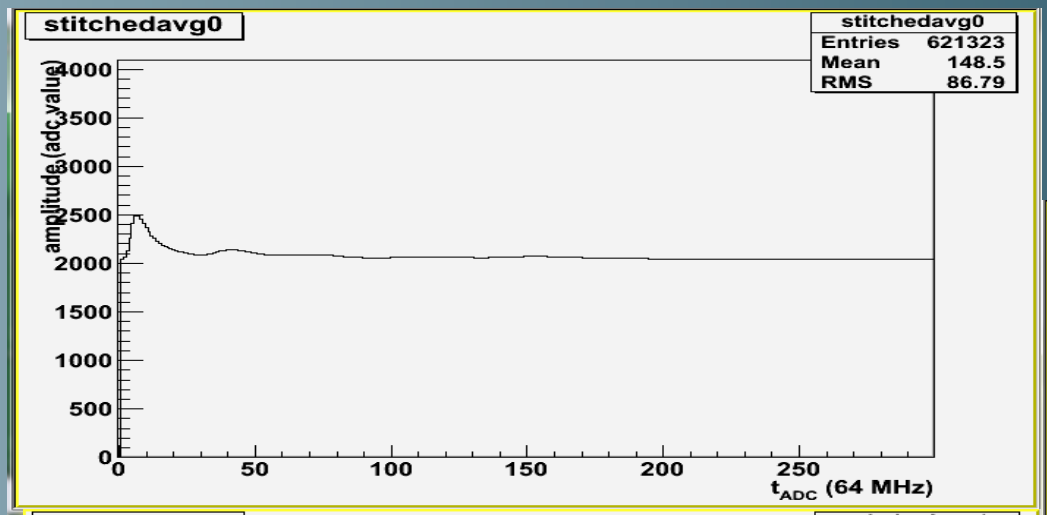
LED Results:

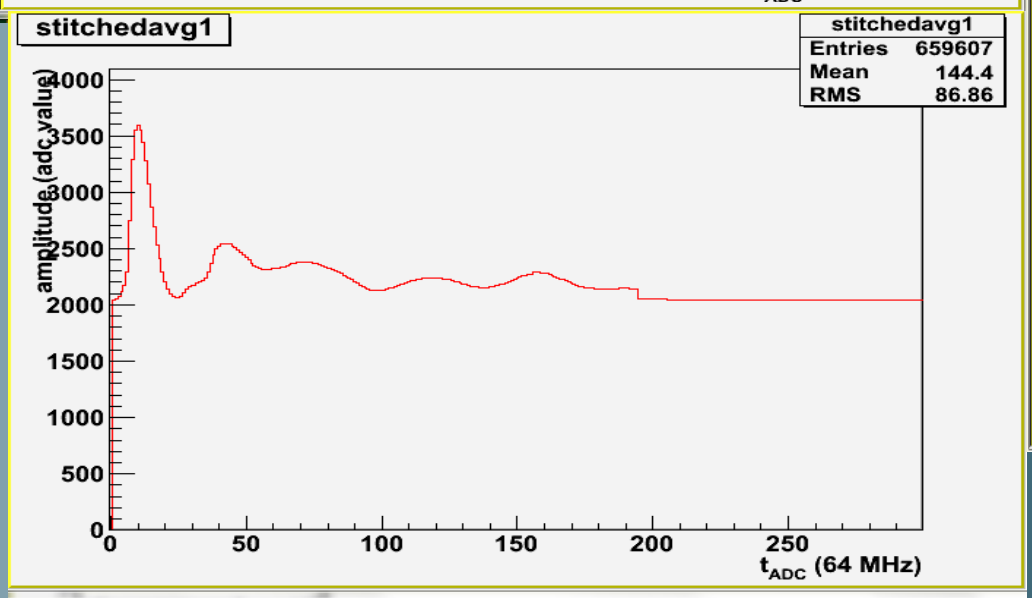

stitchedavg0
stitchedavg0
Entries 612871
Mean 76.41
RMS 43.93
amplitude (adc value)
t_{ADC} (64 MHz)

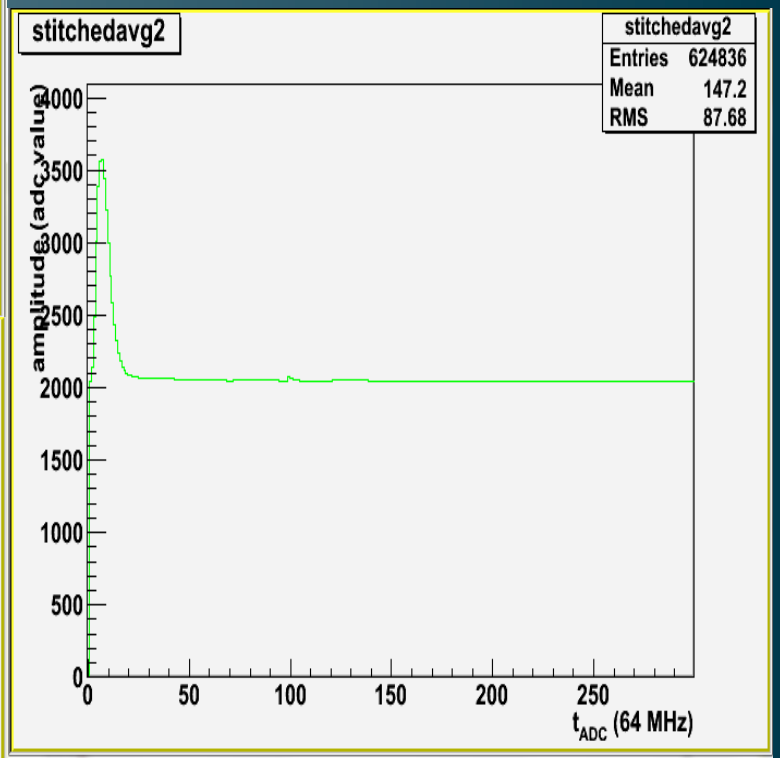

stitchedavg2
stitchedavg2
Entries 634812
Mean 71.77
RMS 45.64
amplitude (adc value)
t_{ADC} (64 MHz)


stitchedavg1
stitchedavg1
Entries 615584
Mean 75.17
RMS 44.04
amplitude (adc value)
t_{ADC} (64 MHz)

Cosmic Results







Developments Ahead

- TPC Crate Testing has commenced. Should take about a week (aiming for a crate each day).

- Deconvolution! Want to extract the shaper to find when the PMT was fired to find the difference between fast and late light.
  - -Need the shaper pulse to be clean and certain before the convolution has meaning.

  My questions:
  - -Kazu has the original unipolar shaper?
  - -Where do we go from these averages?