DOM-Cal Transit Time Calibration

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Motivation

- Signal we measure is actually delayed by:
  - PMT transit time
  - Delay board

- Varies with temperature, voltage, and from DOM to DOM

- Eternal struggle for truth
Concept of Measurement

- Flash mainboard LED
- LED-trigger the ATWD
- Record current pulse in channel 3, light pulse in channel 0 or 1
- Find 50% point of leading edges, convert difference to nanoseconds
Fun “Features”

Higher brightness DAC setting means lower brightness (of course!)
More Fun

High-amplitude flashes at 1.2 kHz will saturate the PMT!
Even More Fun

There is a consistent delay in ATWD channel 0 (black)!

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Unbearably Fun

Brightness affects transit time (scary!)

Ideas???
Preliminary Results

Sigma at a given voltage: \(~0.8 \text{ ns}\)
Error in mean at a given V: \(~0.05 \text{ ns}\)

10^7 gain

Transit time vs. \(1/\sqrt{HV}\)

- Titanium
- Platypus

Equations:
- \(2503^*x + 73.6\)
- \(2505^*x + 72.0\)