

A bunch of updates

Alex Himmel, Fermilab

Dune Photon Detector Meeting

September 24th, 2015

A Grab Bag of Updates

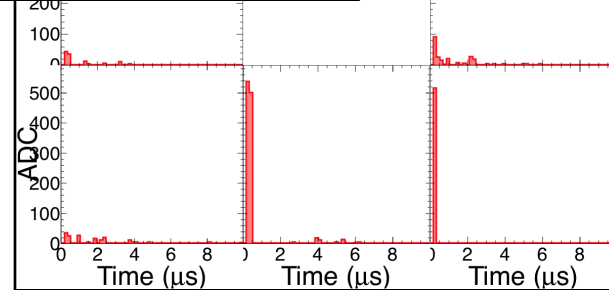
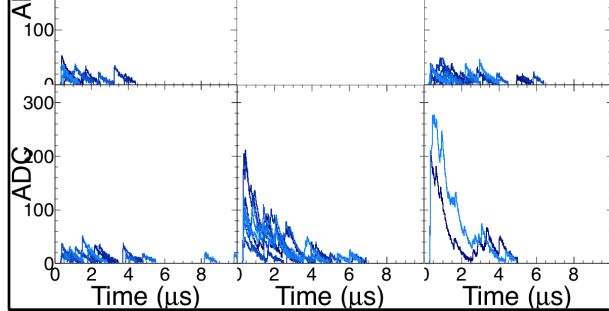
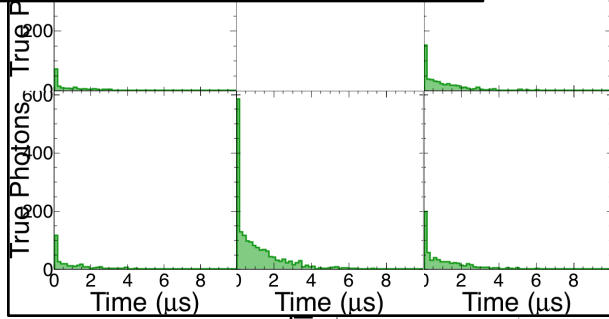
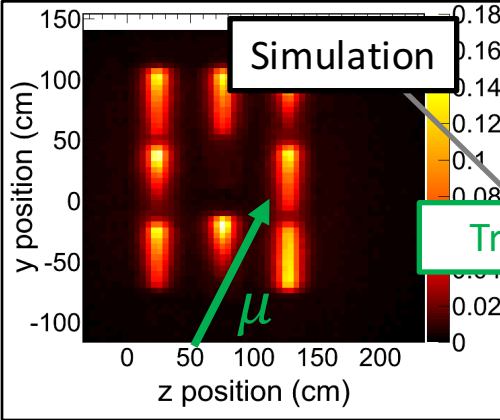
- FD Physics/Performance Group
- Photon Detector Simulation and Reconstruction
- PDs in the 35ton Prototype
- PD noise in Microboone commissioning

FD Physics/Performance Group

- We were told our first priority should be requirements for the photon detector system
- Work with this group
 - A rep from this group to the FDPG meeting
- Working with the physics groups as well
 - Supernova and proton decay care the most here
- The tightest constraints likely to come from supernova
 - Need to clarify exactly what the physics goals for SN are
 - To this end, Alex Friedland and SLAC are putting together a workshop of theorists to determine what the goals are
 - November-ish time scale
 - Then with the SN group and this group we translate those goals into system requirements.

Photon Detector Simulation and Reconstruction

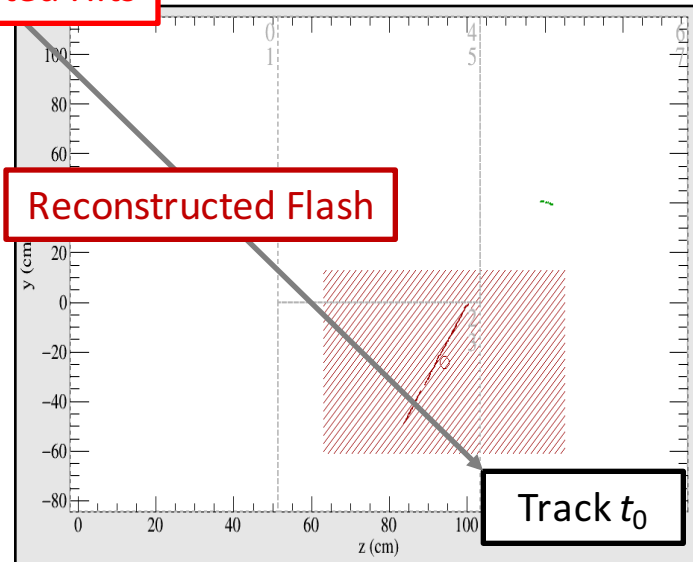
- The “full chain,” from simulation to t_0 finding, now running
- Prepared for 35ton, but applicable to FD as well



Digitized Waveforms

Reconstructed Hits

Reconstructed Flash



Gleb Sinev, Duke
Karl Warburton, Sheffield
Alex Himmel, Fermilab

Ongoing PD Sim/Reco Work

- Studies with photon detectors
 - Noise rate from ^{39}Ar
 - Gleb Sinev
 - Absolute light level from Michele electrons
 - Blake Carroll with Jonathan Insler
 - Light output vs. field strength
 - Tyler Boone, Shih-Kai Lin, Norm Buchanan
- Infrastructure work
 - Improved simulation of SSP electronics
 - Gleb Sinev
 - Full simulation without libraries
 - AIH
 - Reading in 35ton data
 - AIH

High Priority Needs

- **35ton Prototype**
 - Validate PD simulation to cosmic data
 - Validate t_0 reconstruction and timing resolution with 35ton cosmic rays
- **Usefulness of late late**
 - Add radiologicals to default simulation
 - Reconstruct early and late light
 - Does it carry PID information?
- **Electronics development**
 - Reconstruction performance with passively ganged SiPMs
 - Do we need to readout each SiPM separately?
 - Simulate non-waveform electronics

35ton Photon Detectors

- Getting ready to turn them on and take noise data this week (I hope)
- Going to jury-rig 1 ANL diffuser to try out the calibration system and further test the PDs
- Questions:
 - Other tests that people want?
 - Do we have a calibration plan?
- Probably need a list of PD system experts

Microboone

