DEEP UNDERGROUND NEUTRINO EXPERIMENT

Brookhaven National Laboratory

U.S. DEPARTMENT OF ENERGY

Quick Update: CRP5 Coldbox Pulser Runs, Waveform Fitting

Karla Téllez Girón Flores

04/18/2024

@BrookhavenLab

The Setup

- **The Dataset:** NP02 Second Coldbox pulser calibration runs for CRP5.
- **Runs:** 21040, 21050, 21070 (April 28, 2023).
- 14 mV/fC gain and 2 μs nominal shaping time.
- Each run at a different DAC setting (30, 40, 60)

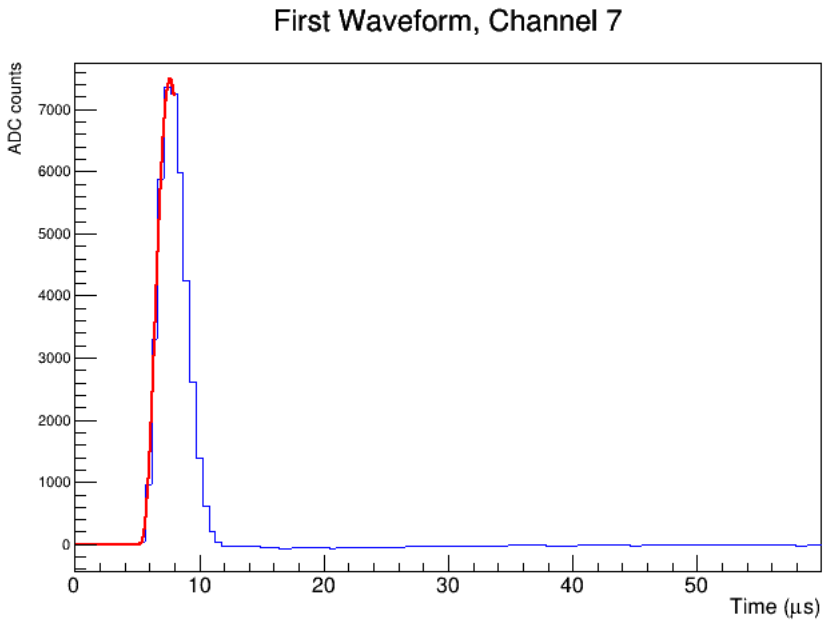
The Method (so far):

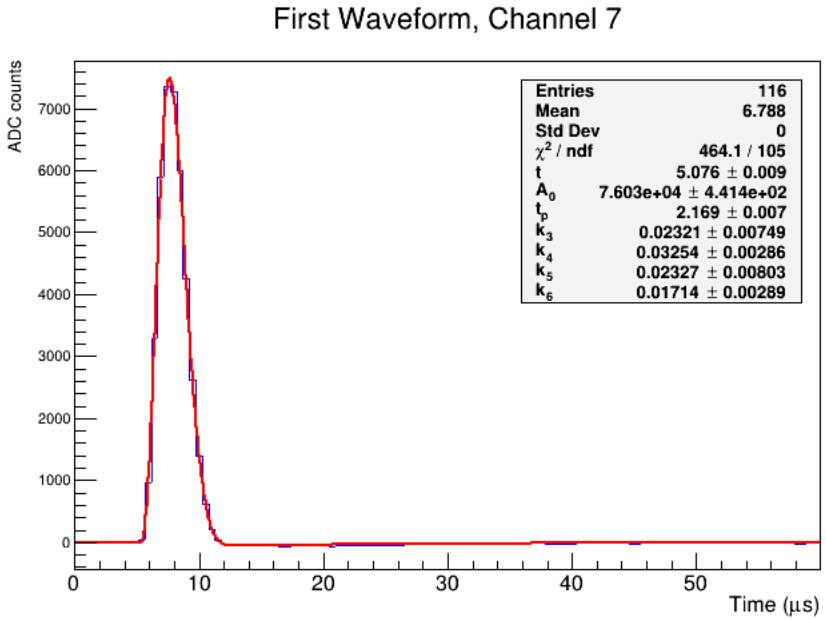
- A peak finding algorithm finds the positive and negative peaks for each channel in data.
- Finds noisy channels and skips them (for now).
- **Not averaging waveforms (for now).**
- **NEW: Fitting waveforms using a two-step process.**
  - **Pre-fitting using old electronics response function (F_0).**
  - **Fit using newest electronics response function (F_1).**

Fit is looking great!

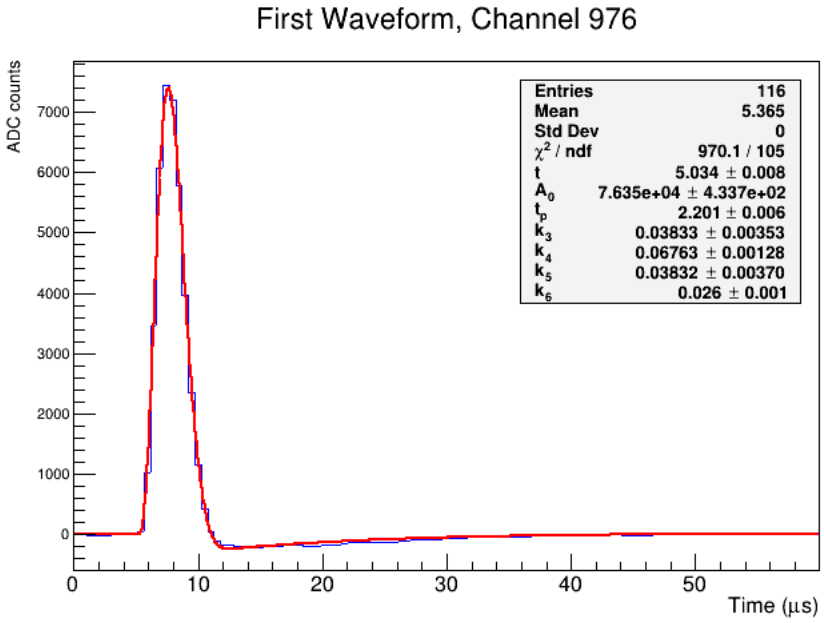
Run 21040	
# Channels where fit did not work BEFORE	500
# Channels where fit did not work AFTER	189

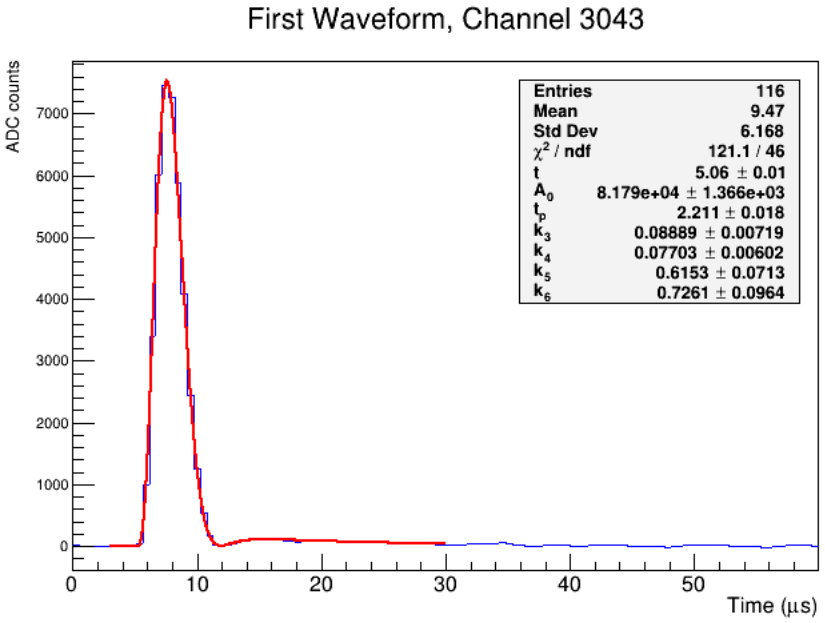
- **BEFORE:** One step fit with F_1 only.
- **AFTER:** Two-step fit.

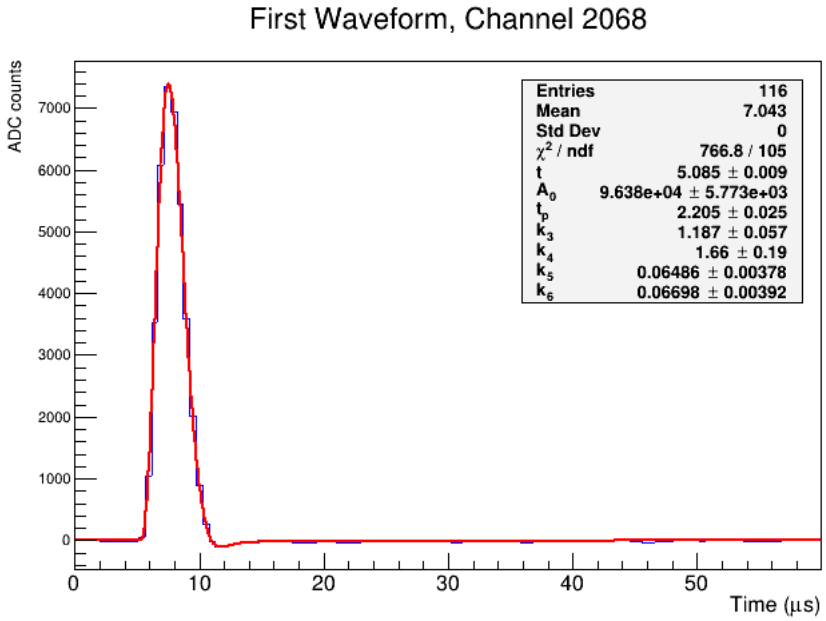


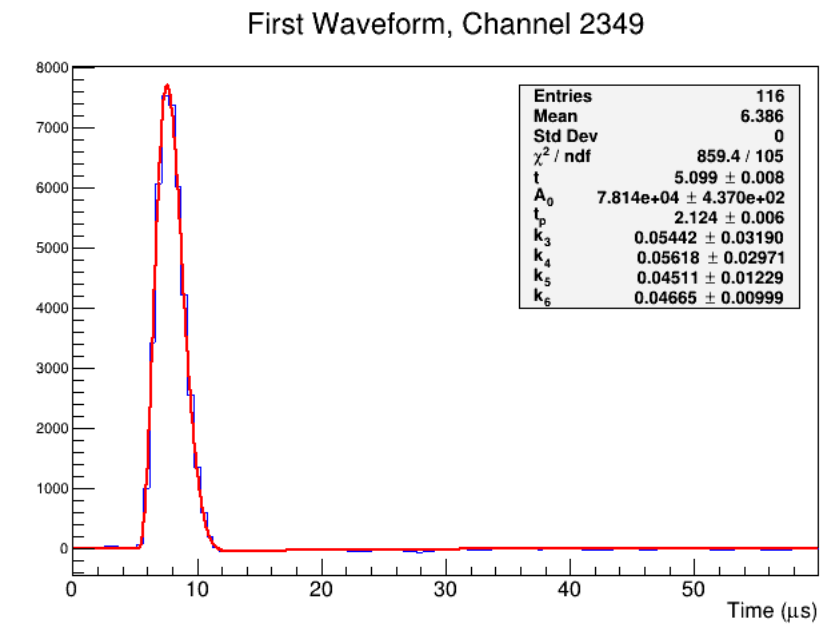


Some examples (Run 21040)

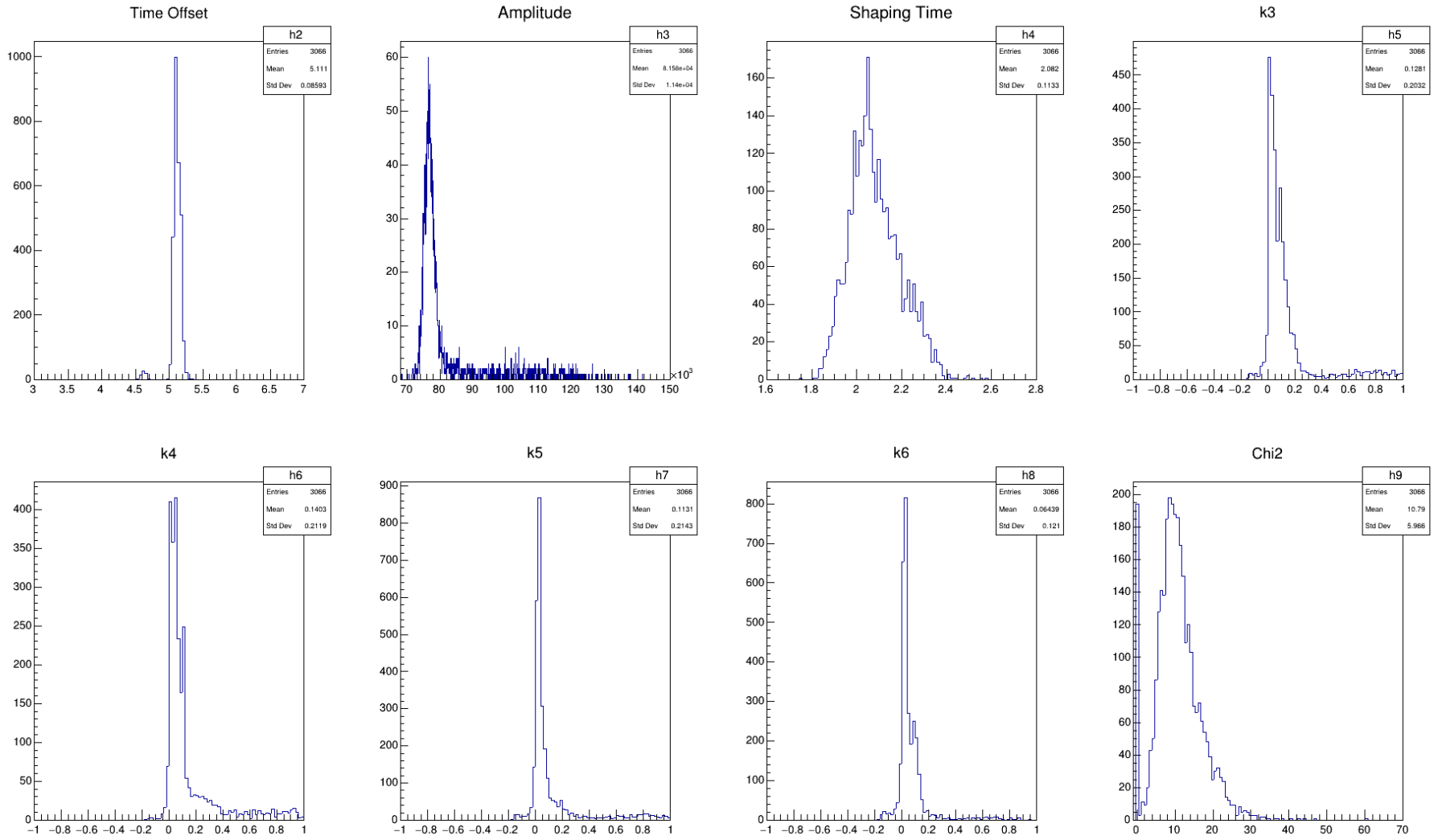








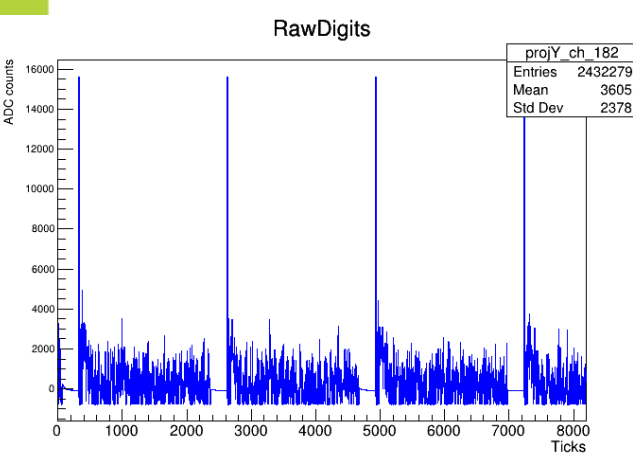
Fit Parameters (Run 21040)

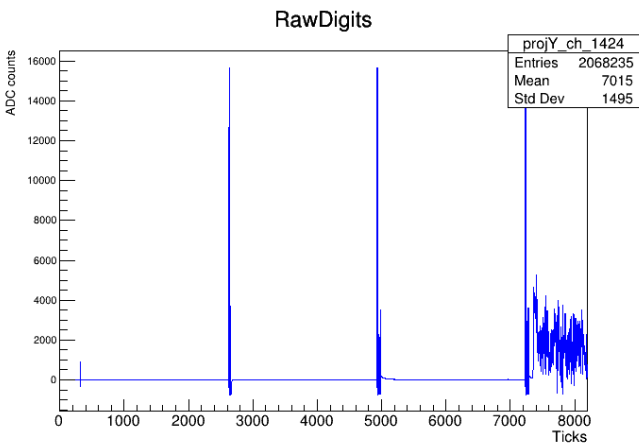


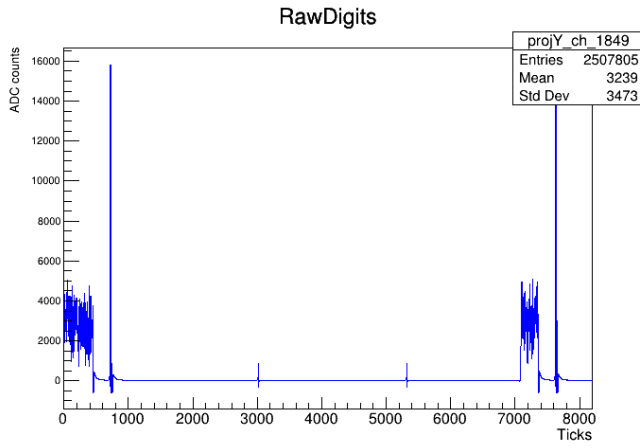
Some channels are consistently noisy…

Noisy Channels		
Run 21040	Run 21050	Run 21070
183	183	183
1425	1425	1425
1850	1850	1850
2950	2950	2950
2998	2998	2998
3020	3020	3020

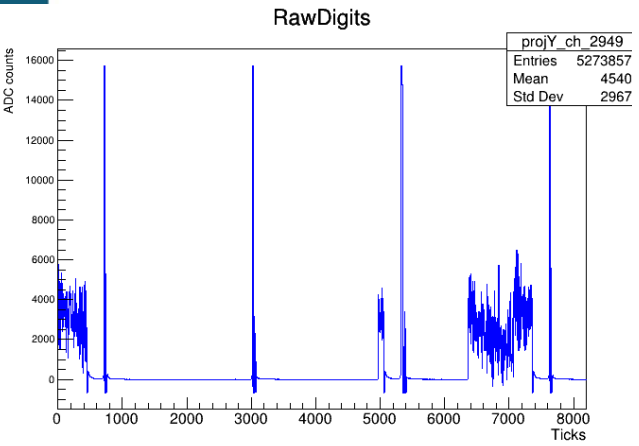
Some channels are consistently noisy…

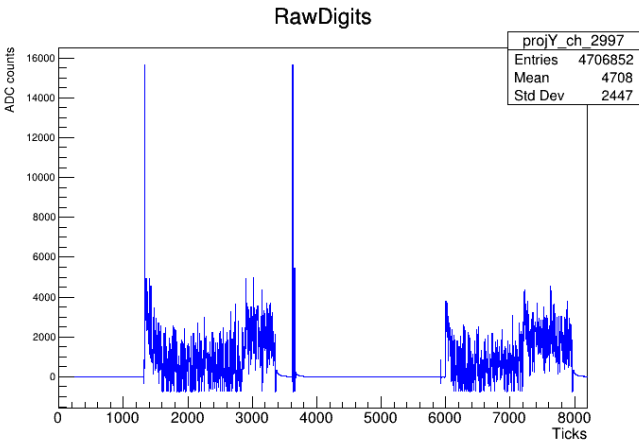


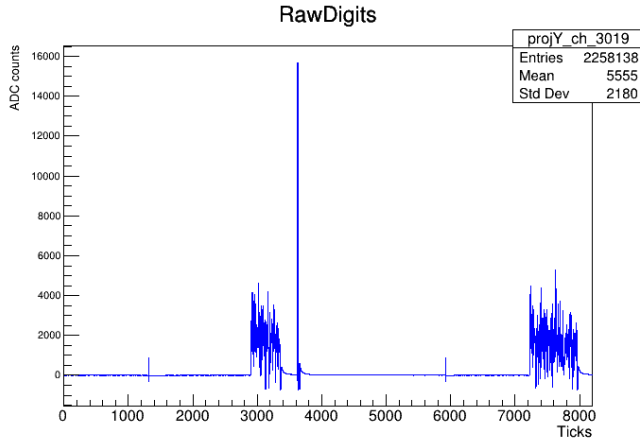




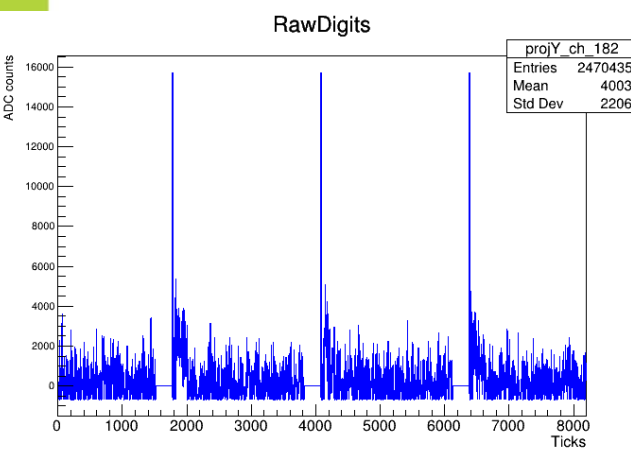
Run 21040

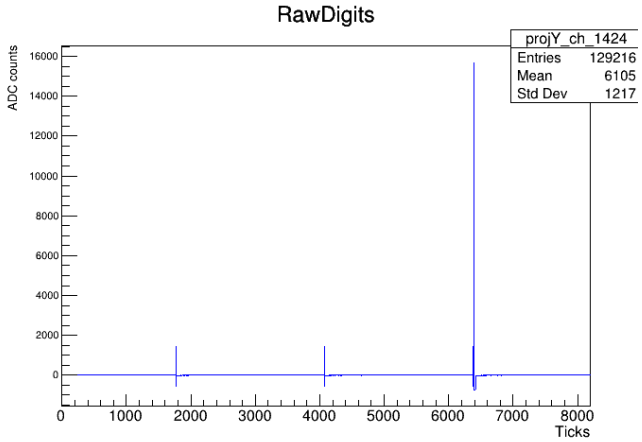


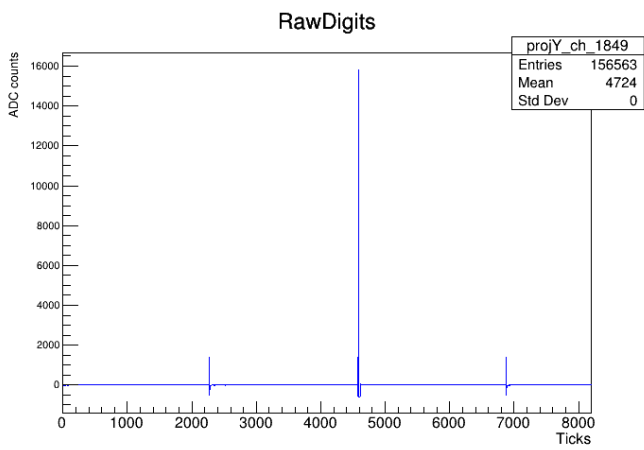




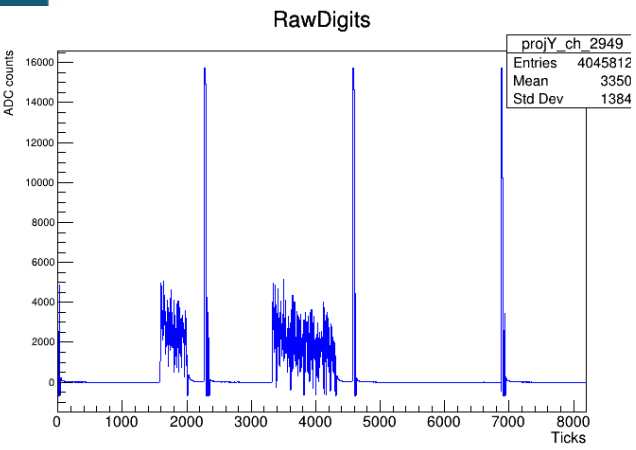
Some channels are consistently noisy…

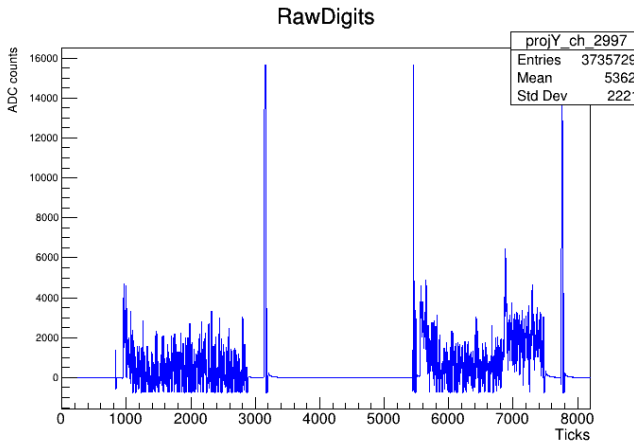


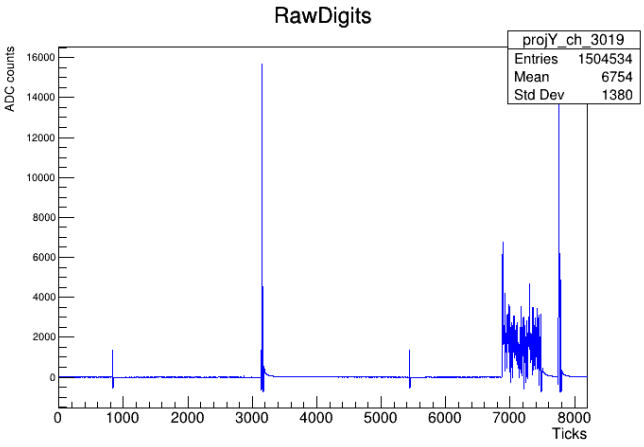




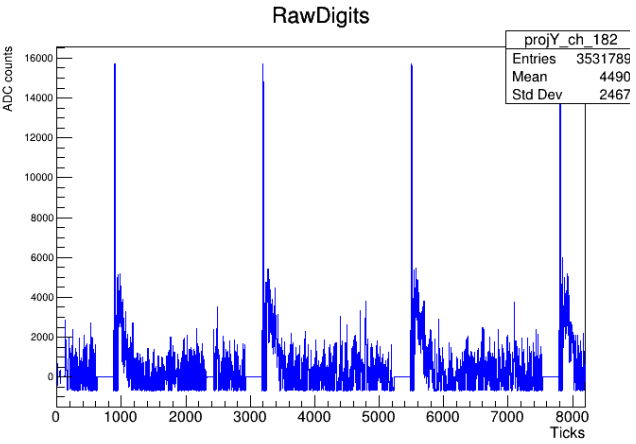
Run 21050

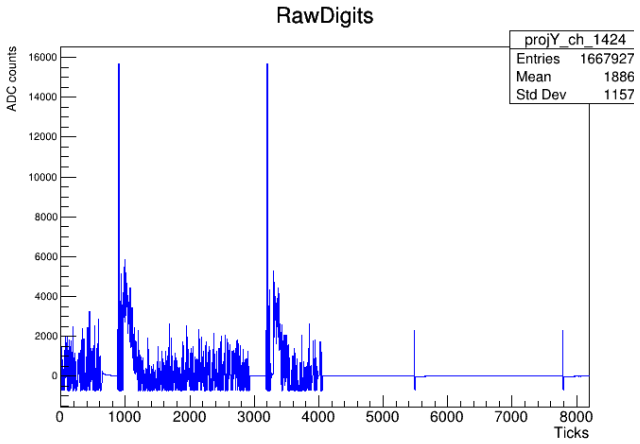


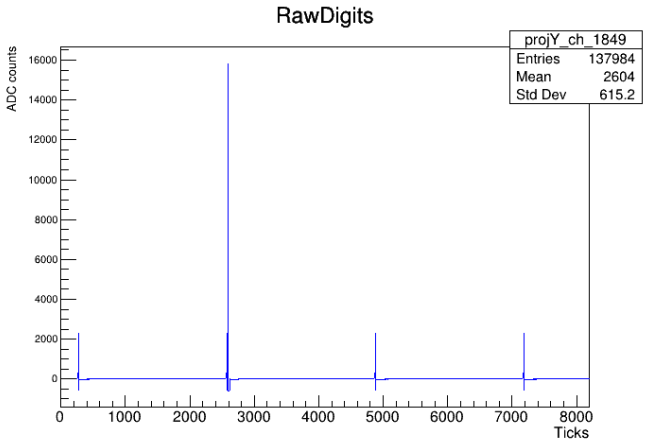




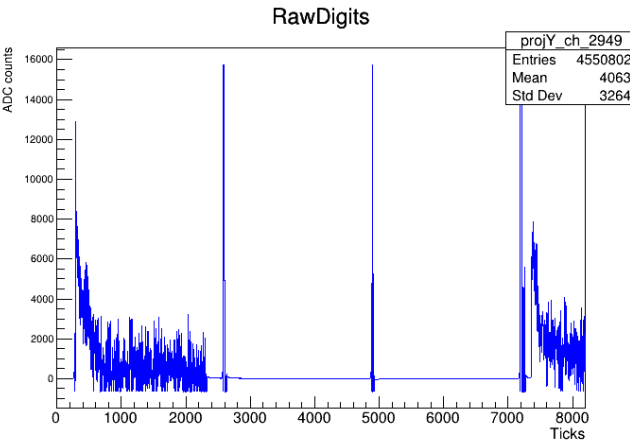
Some channels are consistently noisy…

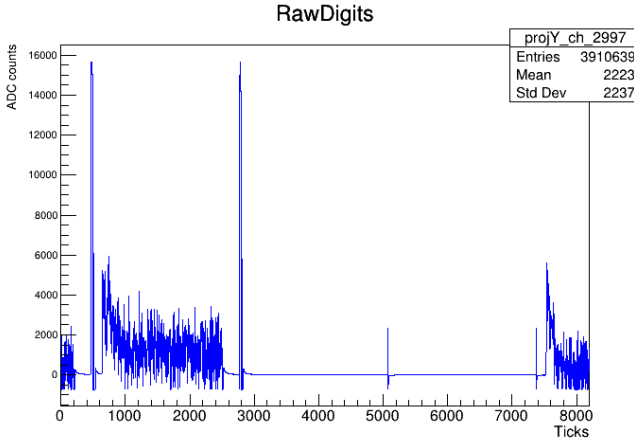


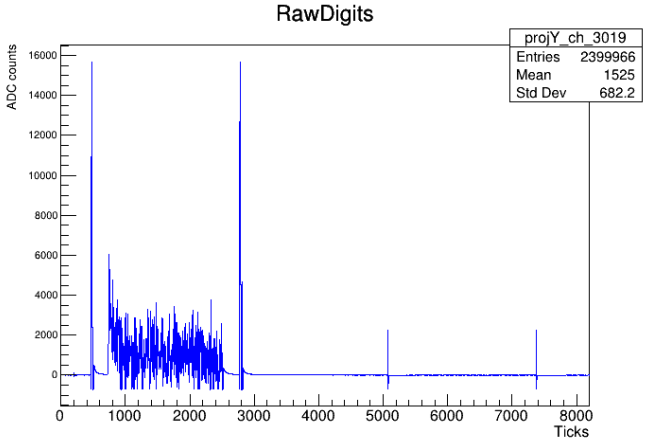




Run 21070







Next Steps

- Investigate Noisy Channels.
- Keep working on improving the fittings.
  - Collaborating with Lynn to come up with the most efficient fitting tool.