

New Electronics Sim

Andrzej and Ryan Linehan

New Electronics Sim

Currently running simulation using ArgoNeut Sim

We are using new CMOS chips, etc...

The framework has been there for some time, but needed final implementation and debugging

Lives in /feature/lariatelectronics

A Quick Look at the Electronics Simulation

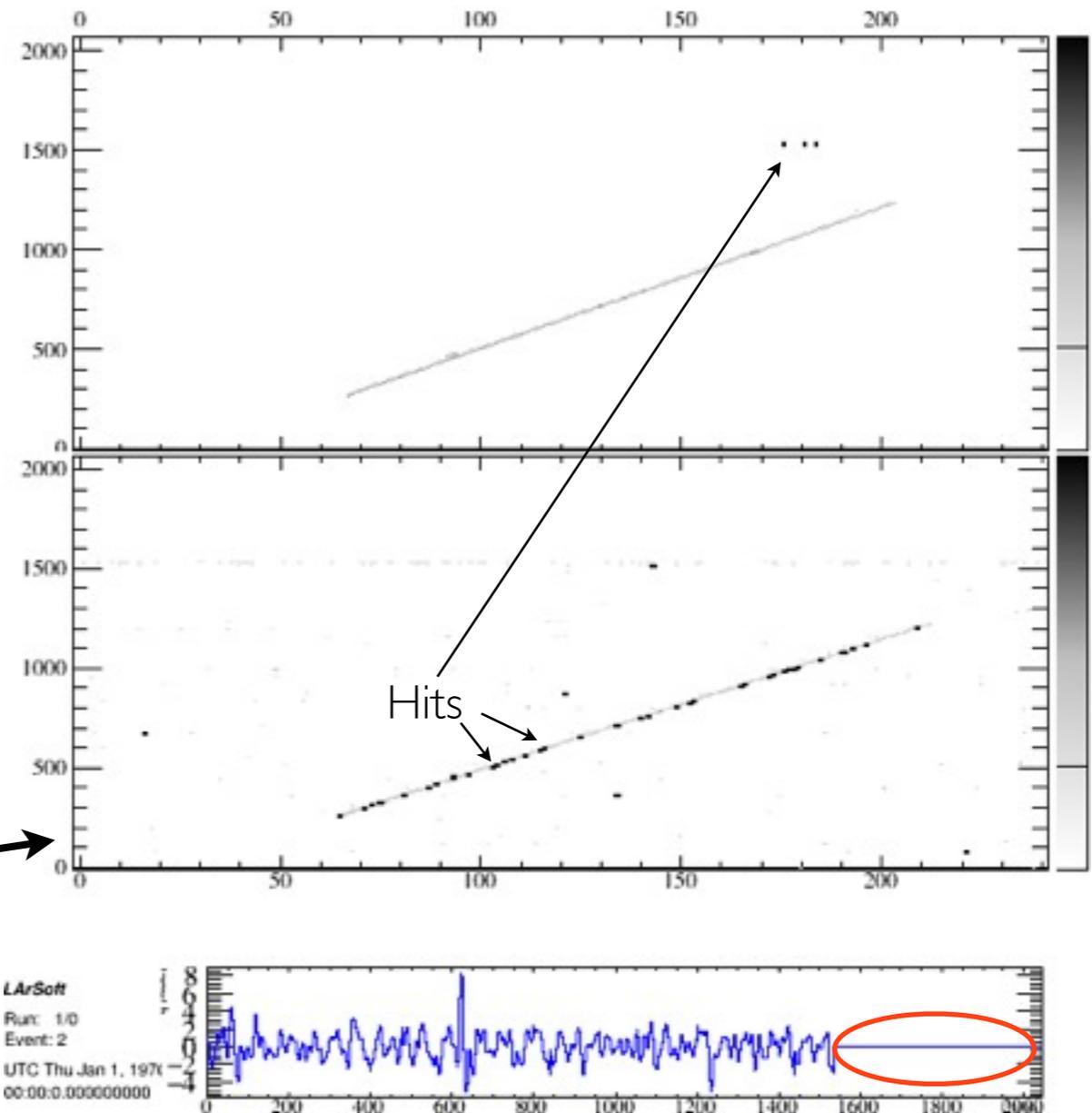
Andrzej has been setting up the correct LArIAT electronics response for wire calibration

- Goal: to use properly calibrated wires to measure charge collected by a MIP

- Will enable us to find the conversion constant between charge collected and energy deposited

Had some issues with wire signals and hitfinding using the new response:

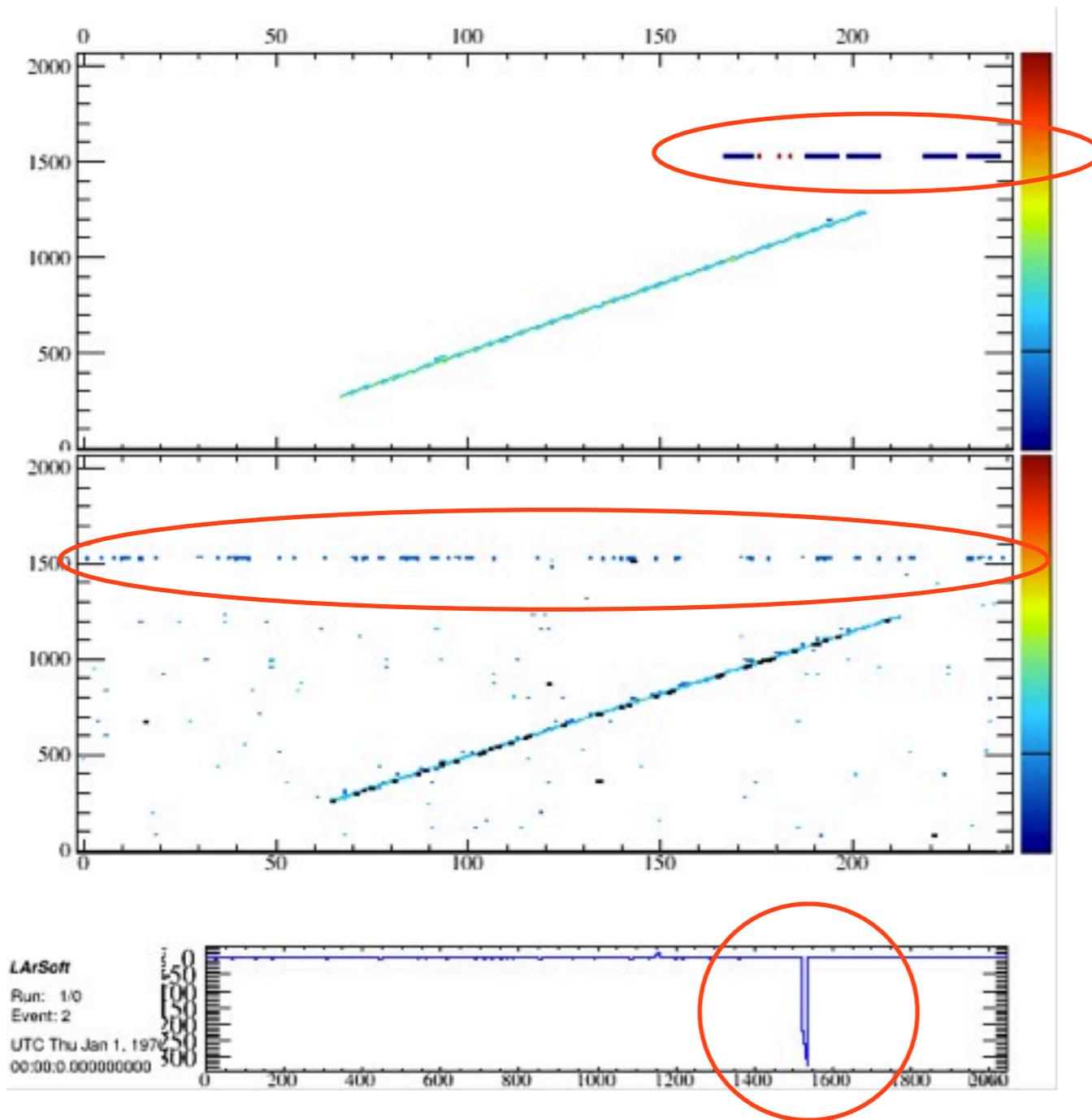
- uses default parameters in current larreco's standard hitfinder module



Standard 6 GeV muon, with out-of-the-box new electronics

Noise only simulated for 1536 ticks

Edge Issues with Wire Calibration



Same event as before, but in color - weird spikes appear around tick 1536

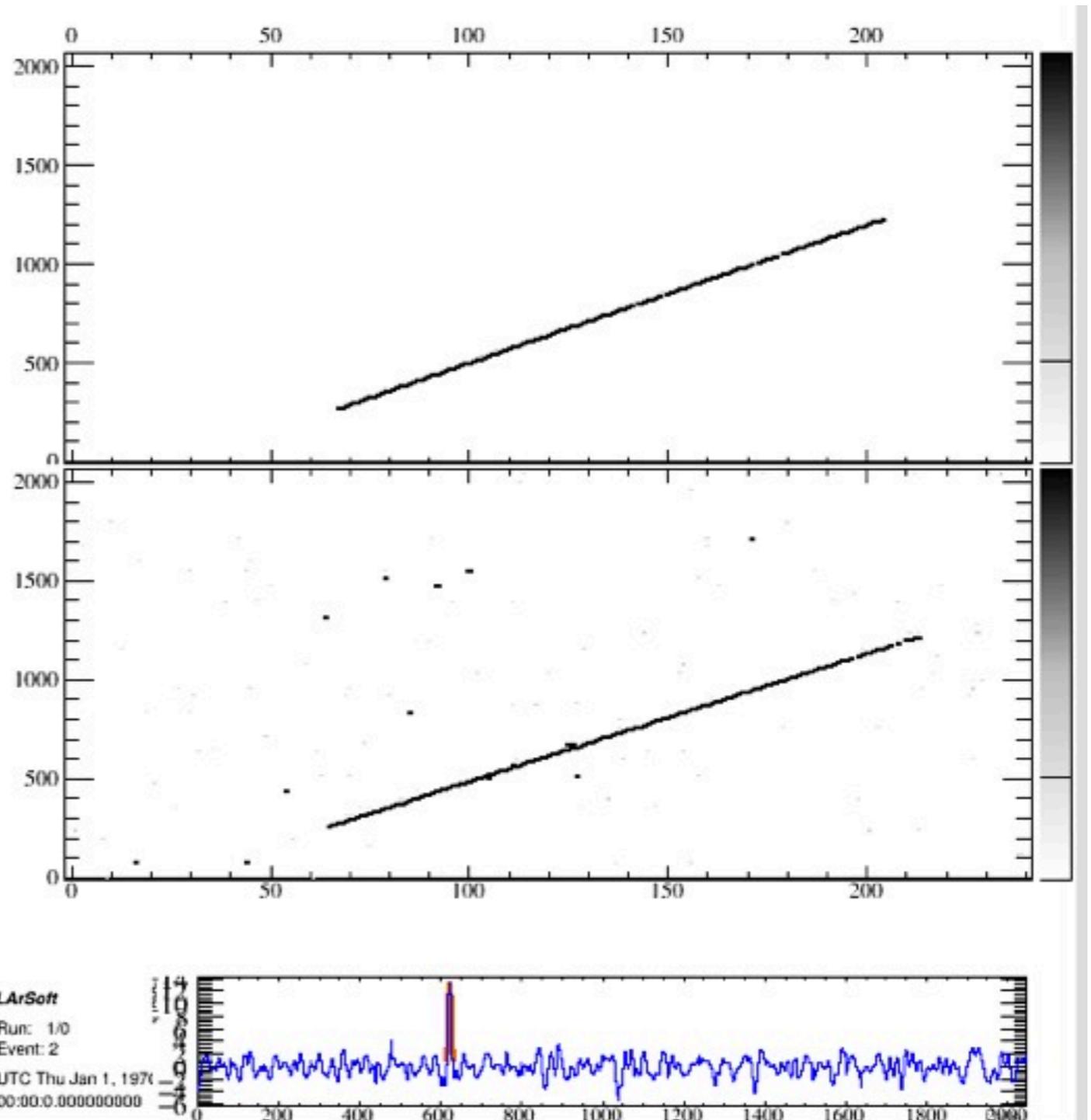
- likely due to FFT used in Calwire in deconvolution of signal and electronics response

A Series of Quick Fixes

I made a few modifications:

- Changed hitfinder parameters:
 - MinSigInd: 6.0
 - MinSigCol: 11.0
 - Ind(Min)Width: 2.0
 - Col(Min)Width: 2.0
- Tweaked the SimWire module to extend the noise generated
- Used a corrected .root file containing filters for Calibration
 - Filter file is now for 2 planes instead of 3
 - Thanks to Nate Norton for making the filters and finding that bug

Results: decent hit reconstruction!



Standard 6 GeV muon, with
debugged new electronics

Done/To-Do List

Electronics sim debugged and largely ready to go (and merge into develop)

Hit finding works.

2 Plane filters work and installed as LArIATFilters v01_01

Future: generate proper filters

Future: calibrate electronics response using muons