

# Some Features Observed in Data

Mark Convery (SLAC)

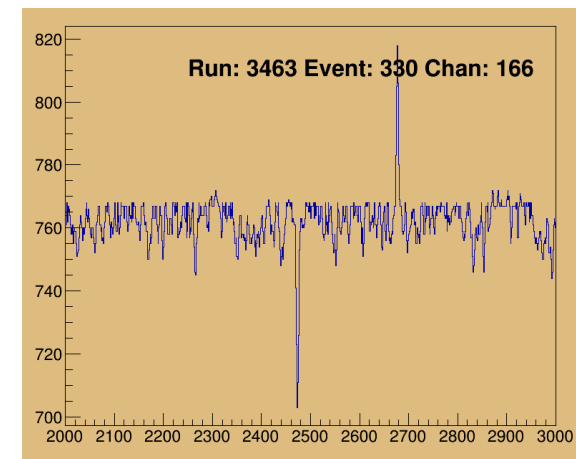
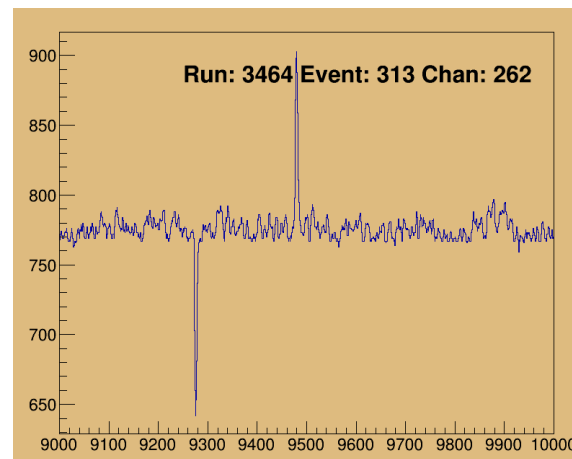
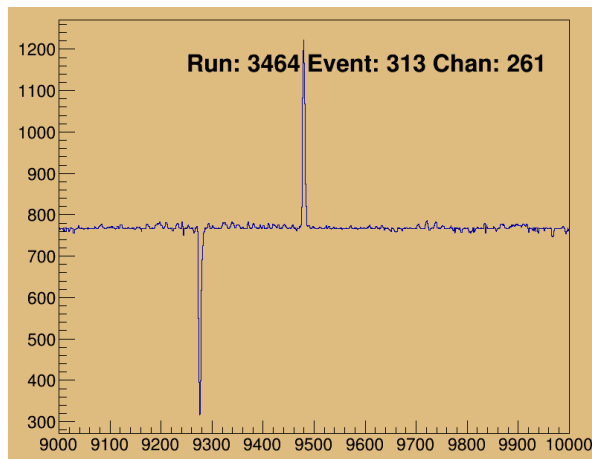
16 Oct 15

- Now that we are looking at real data, starting to learn about some features in data
- Some are permanent
- Some will likely improve as we work on electronics and DAQ
- Analysis details
  - Fresh data stored on lbne35t-gateway01 in /data/lbnedata/daq directory
  - Analysis shown here uses TPCDAQToOffline.fcl and OnlineMonitor/RawEVD35tTree.cc
  - Then some private root code to display waveforms (could put this in OnlineMonitor if desired)

- In triggered mode, every millislice makes a LArSoft event, but only the only the ones surrounding trigger have data
  - Currently millislice (5mS) has 10 micro-slices (1000 samples, 500 micro-seconds)
- Tickler data was taken at 2 Hz, so every 100<sup>th</sup> LArSoft event has data, and (usually) two consecutive LArSoft events contain the two consecutive millislices
- I suggest modifying input modules to reject “empty” events

# Tickler Results

- Strong signals observed
  - U wires ~ 400 ADC counts
  - V wires ~ 120 ADC counts
  - Front-side X wires ~40 counts (depends on x-position)
  - Back-side X wires – probably can't see signals

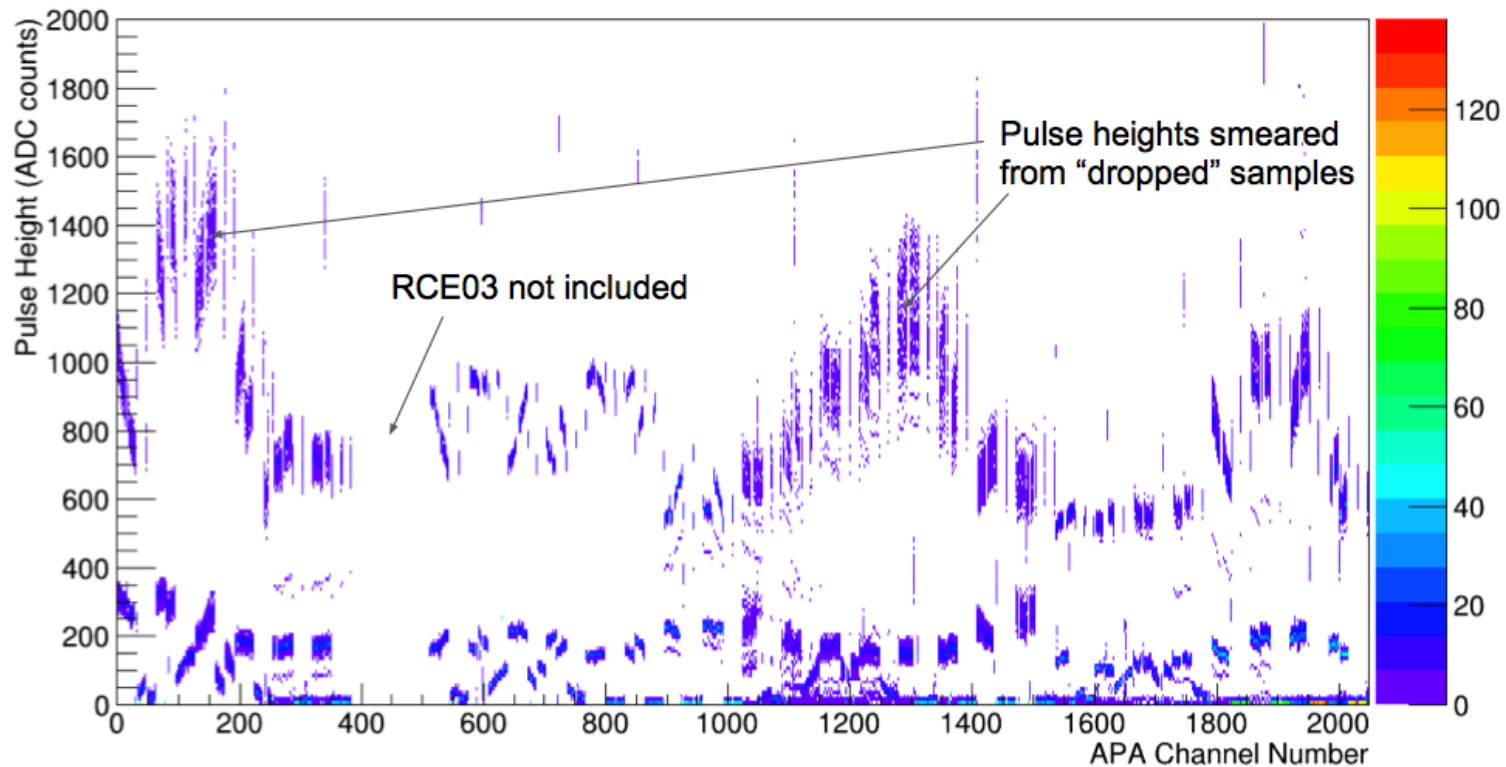


Inducing signals in 35-ton - Mark Convery

# More Tickler Results

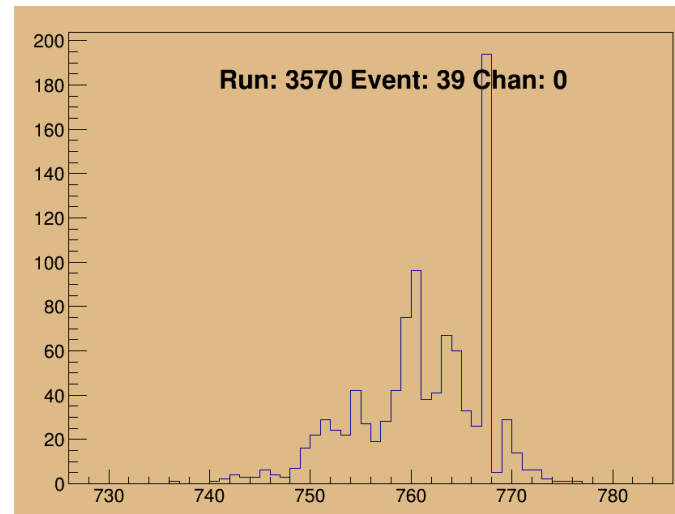
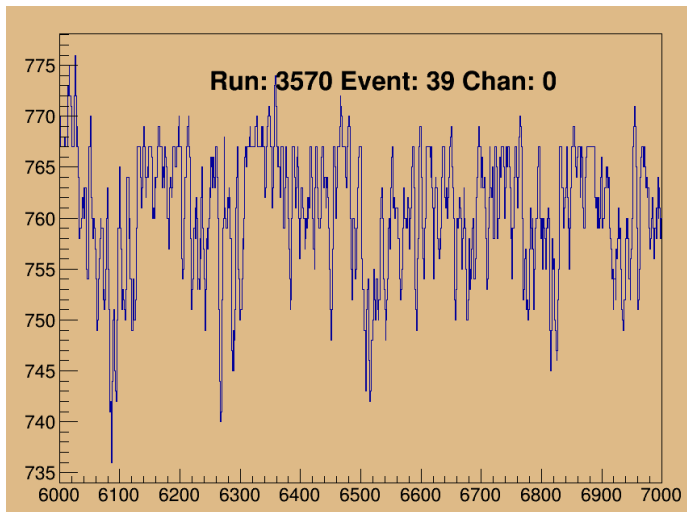
From B. Kirby: Pulse height analysis of all runs

## Runs 3564 to 3568: RCEs 0-2, 4-15, All APAs



# Stuck Codes

- Known feature of cold electronics ADC
- Shows up as “truncated” waveforms
- Doesn’t obviously appear on induced signals
- Does frequency of “stuckness” depend on  $dV/dt$ ?



# Dropped Samples

- Shows up as zeros in waveform
- Intermittent and run-dependent
- Seems to go by groups of 32 channels
- Shows up in monitoring plots as “high RMS”
- Possibly related to link errors between FEMBs and RCEs
- Under current investigation

# Missing and/or non-consecutive events

- Tingjun/Karl observed in Tickler data
- Believed due to back-pressure issues
- Should go away once these are resolved



# Conclusions

- First noise and tickler data shows some issues
  - Some known
  - Some unanticipated
- Exciting time as we work through these and get ready for real data!