

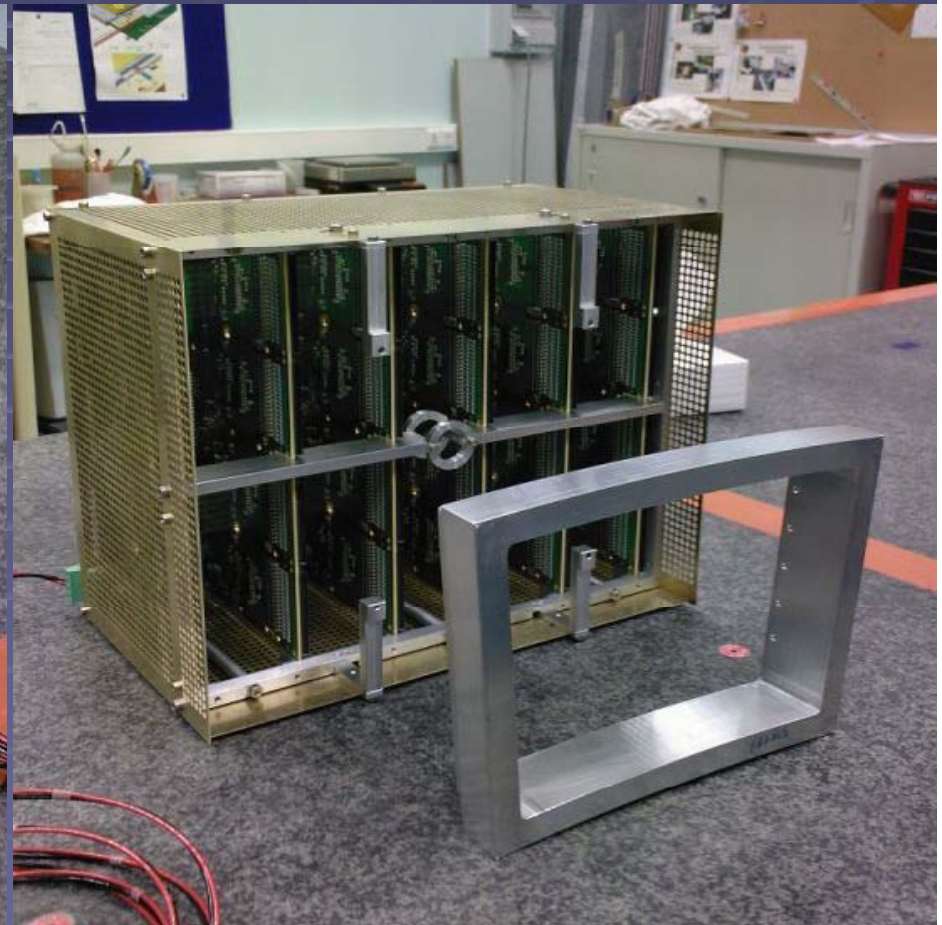
# DAQ: From impulses to one's and Zero's

Stephen Turnbull CEA IRFU Saclay

# Overview

- Step one; Avalanche -> Digital signal
  - State of electronics
- Step two; Signal -> Disk Data
  - The DAQ
  - The Human Interface, raw data event display
- Step three; Disk Data -> LCIO events

Electronics with mechanical support, before addition of copper shielding between cards.



# DAQ:

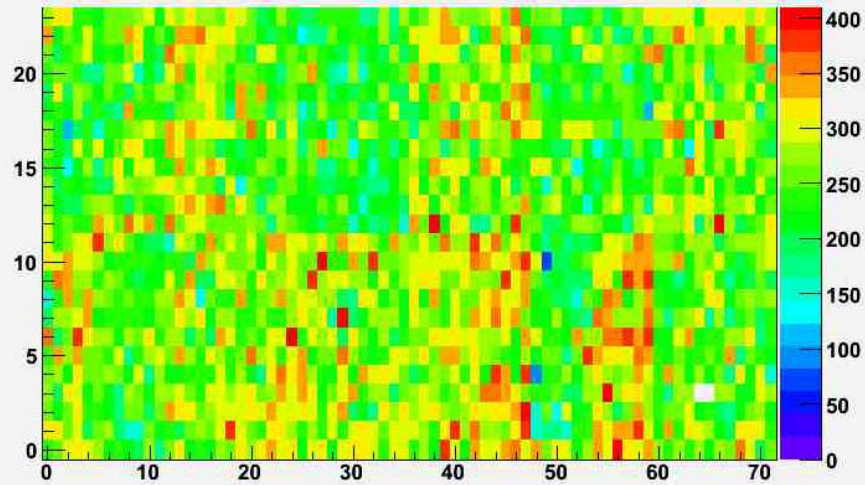
- A home grown acquisition software
  - Can be run in both windows and Linux
    - Currently running in windows
  - Currently outputs “.acq” run files which are binary files of event objects, but not LCIO event objects.
    - It - may - be possible to edit acquisition soft to output LCIO. But in this case the monitoring software would also have to be changed to compensate.
    - A ‘run’ is a series of events taken over a period of time

# Raw event display, and diagnostic monitoring tools

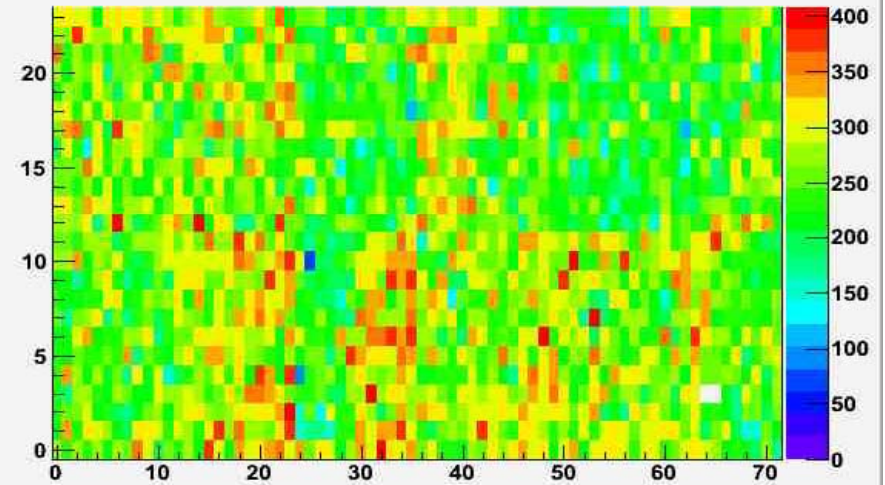
- Two diagnostic tools are being prepared for the tests in DESY.
  - Pedmon – a pedestal monitoring/measuring program, which reads in completed '.acq' files and using root produces the pictures on the following slides
  - JTPC – an raw event by raw event display, not yet tuned to read '.acq' files. Will be able to open .acq files which are currently being written, will be able to display each event as it occurs for real time monitoring and trouble shooting.

# Comparisons pre-post shielding

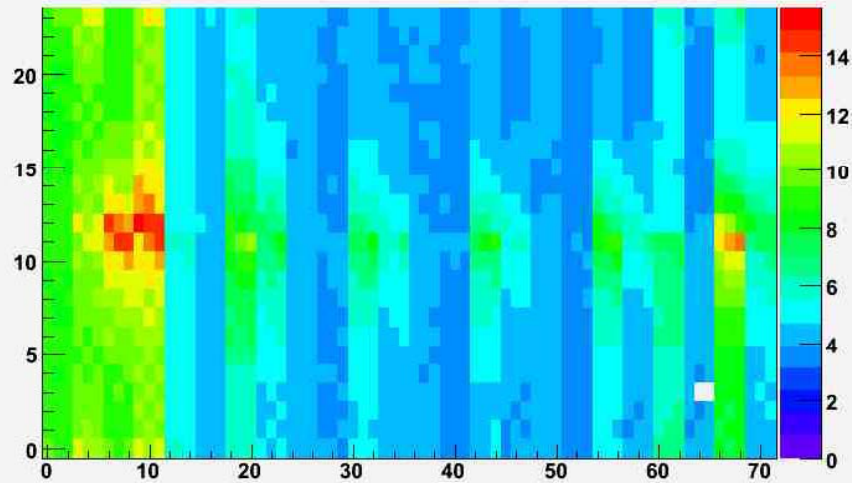
PhysPedMeanDisplay



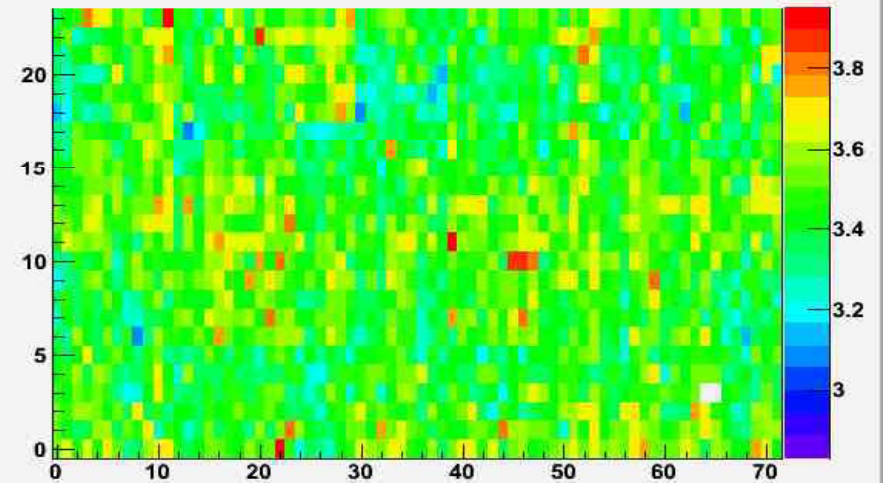
PhysPedMeanDisplay



PhysPedRMSDisplay

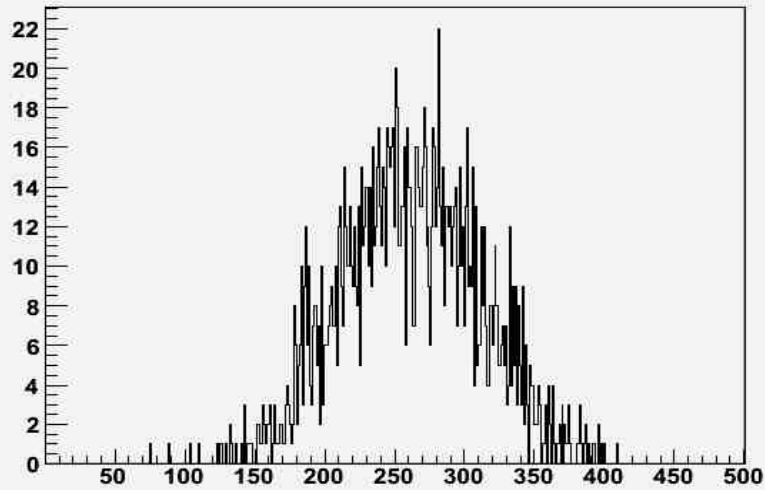


PhysPedRMSDisplay

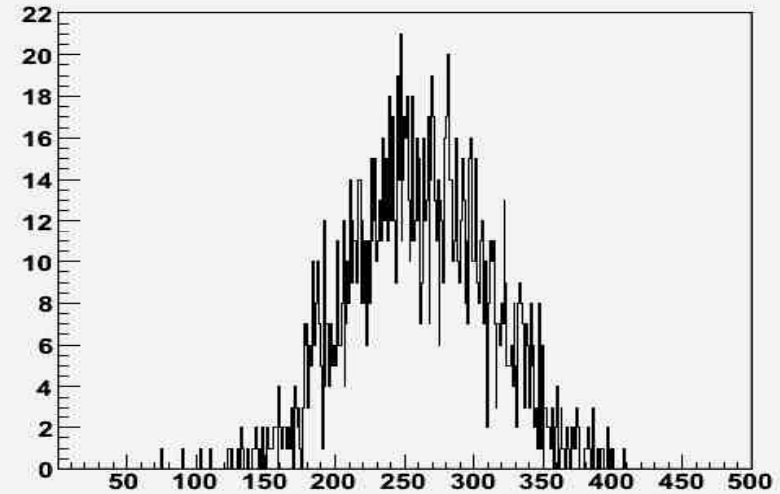


# More: Pre vrs Post: histograms

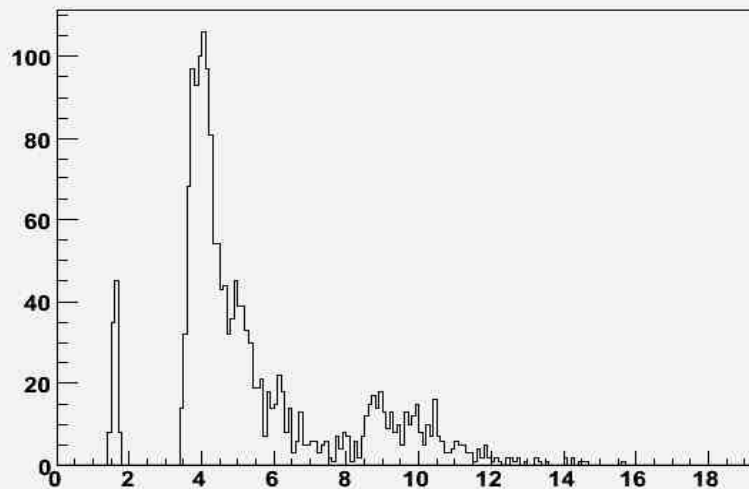
PedMeanGlobal



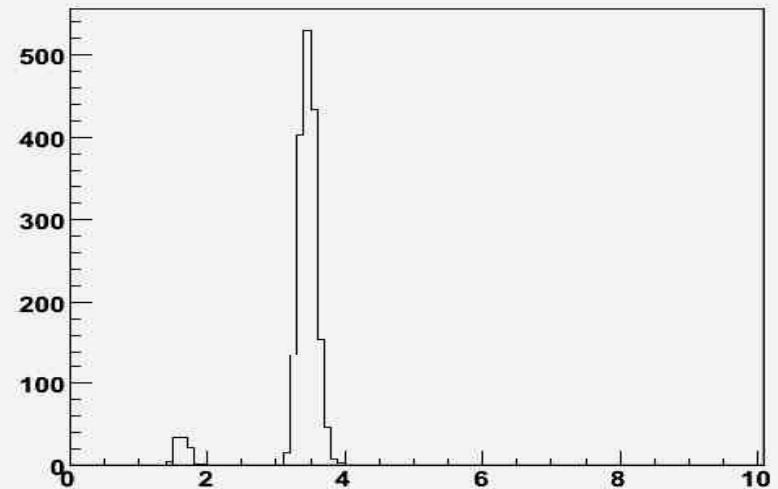
PedMeanGlobal



PedRMSGlobal

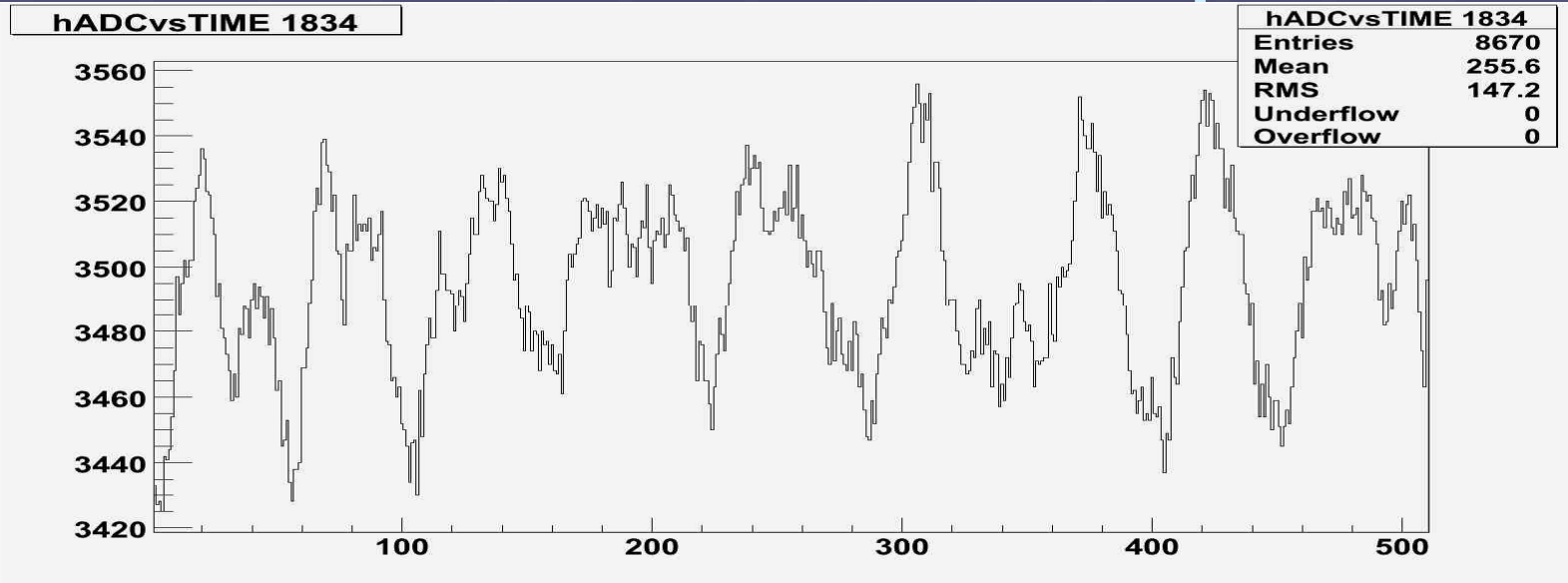


PedRMSGlobal

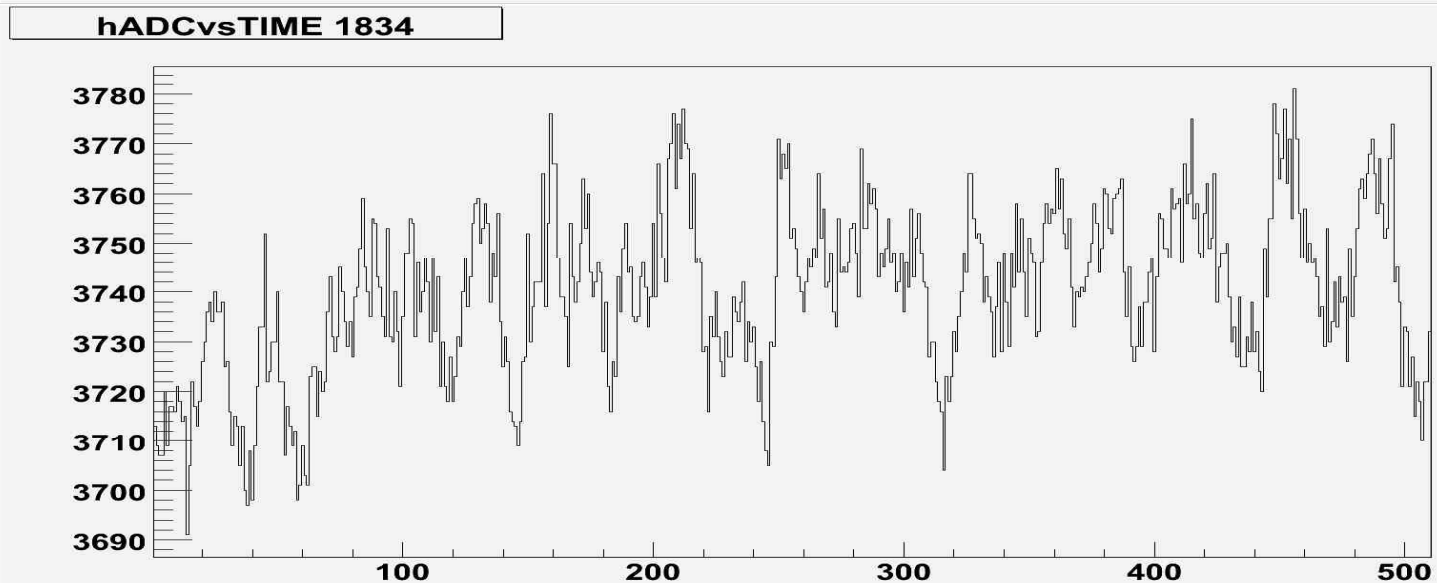


# One Chanel Noise example

Before  
shielding:  
Typical Tip to  
Tip ~100 bins  
(sum over 20  
events)



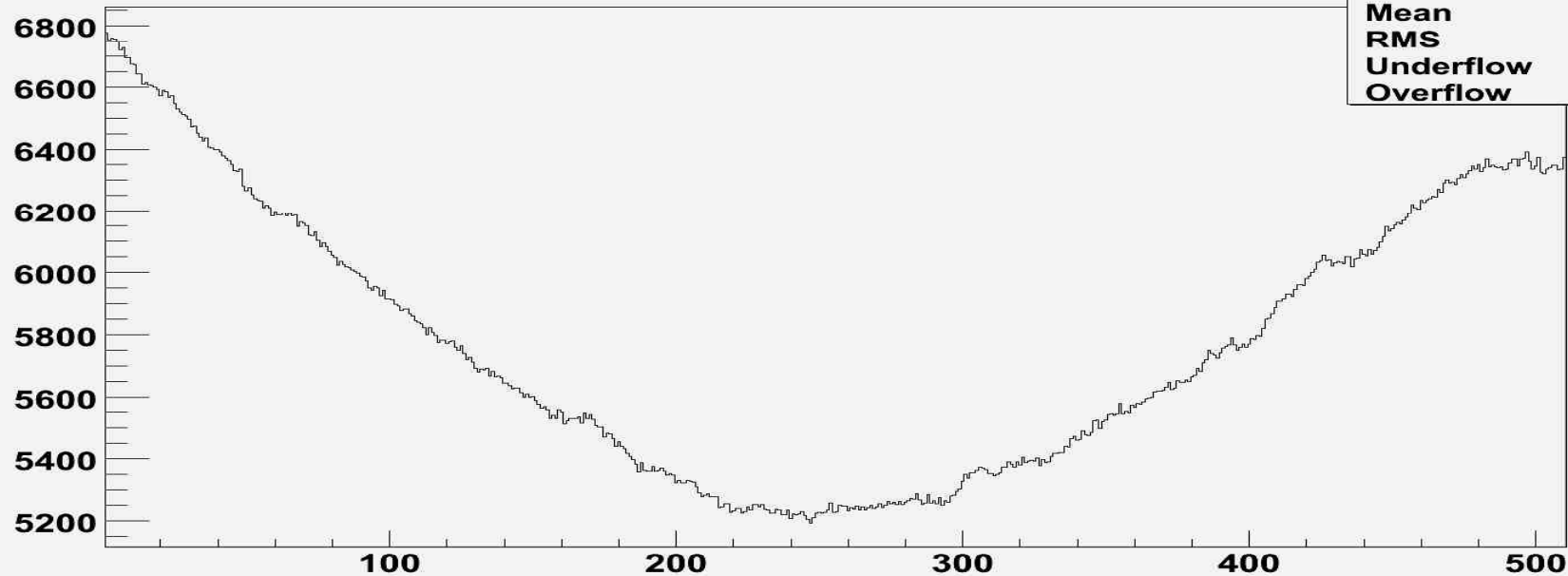
After  
shielding:  
Typical Tip to  
Tip ~ 50 bins  
(sum over 20  
events)





# An interesting anomalous Signal

hADCvsTIME 1



hADCvsTIME 1	
Entries	8670
Mean	254.5
RMS	152
Underflow	0
Overflow	0

- Still a sum over 20 events
- Very long oscillation
- Not changed vary much by shielding, only changed start and end points

# Local -> LCIO

- Current thinking was to have an offline processor, or marlins first processor, which would translate from local format to LCIO format.
- Would have to take completed '.acq' files and merge them with other LCIO data as a pre-processing step.
- Isn't pretty; other options are welcome.  
:- )