

FOOT meeting

TOF-wall: test with cosmic rays

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TOF-wall detector

- TW used to **measure the energy loss ΔE** of the passing particles and to provide their arrival time.
- Made of **40 bars** of EJ-200 plastic scintillator arranged in two orthogonal layers of 20 each.
- At each end of each bar, the two series of two **SiPMs** were connected in parallel.

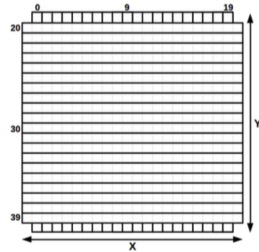


Figure: Scheme of TOF-Wall bar numbering

Experimental setup

- The light produced in the bars is collected at each end.
- Each group of four SiPMs provides a single summed analog signal.
- The output signal of each side of each bar was input to a waveform digitizer board, WaveDREAM, hosted in the WaveDAQ integrated trigger and data acquisition system.

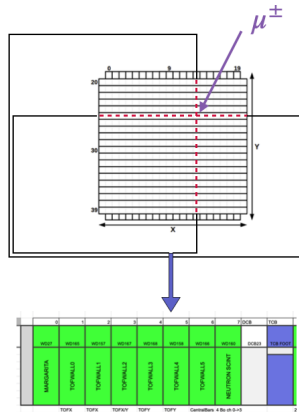


Figure: Thanks M. Morrocchi!

Experimental setup

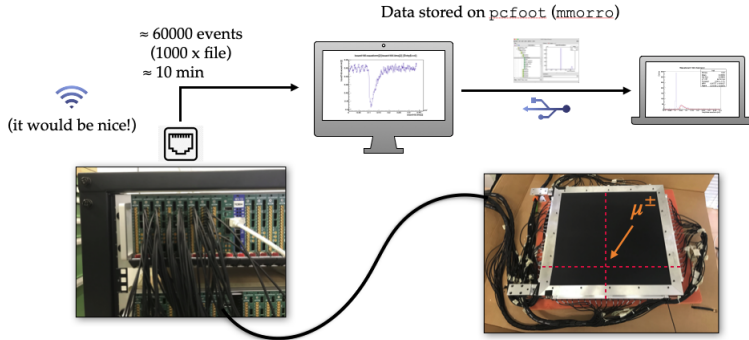
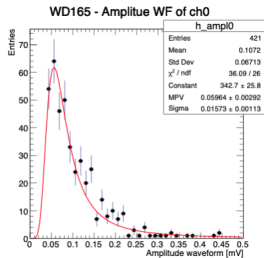
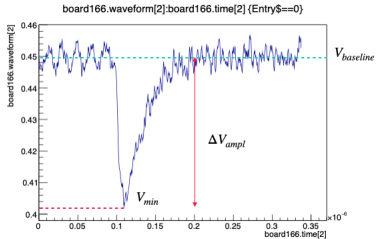
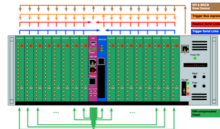
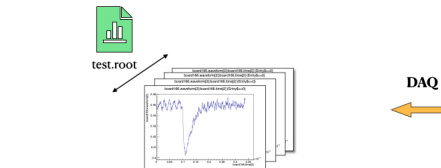
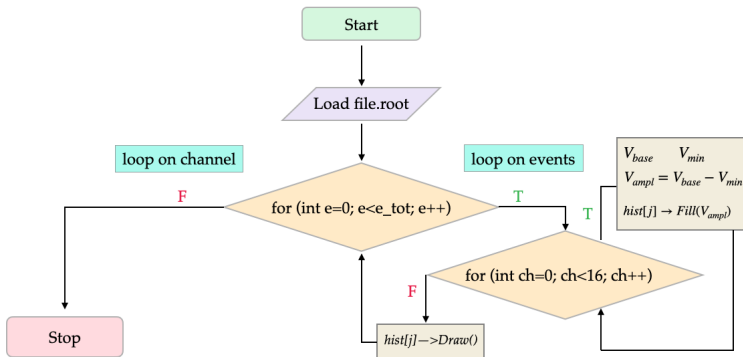


Figure: Schematic representation of the setup

Data acquisition



Flowchart



Algorithm applied on all the waveDREAMs of the TOF wall.

WaveDREAM board 165 - Amplitude histograms

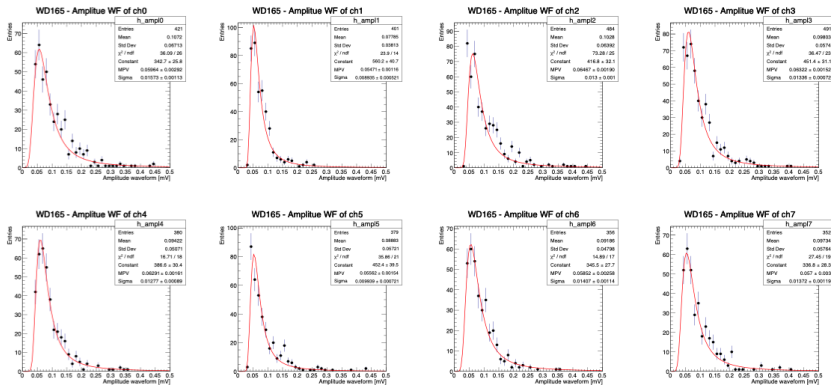


Figure: Channels from 0 to 7.

1

WaveDREAM board 165 - Amplitude histograms

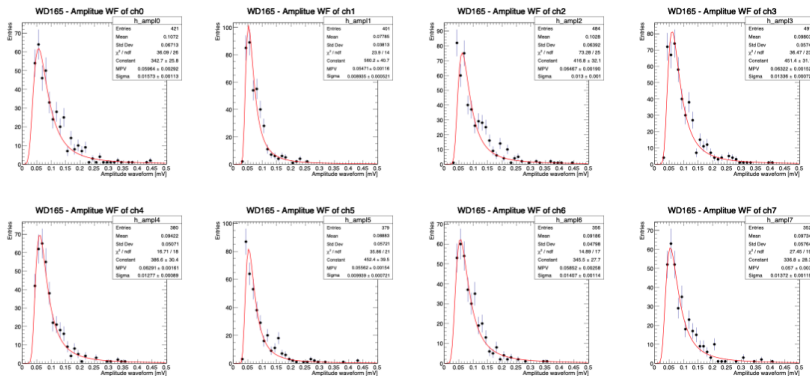
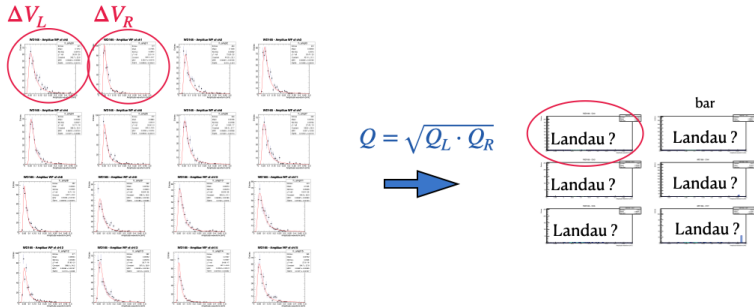


Figure: Channels from 8 to 15.

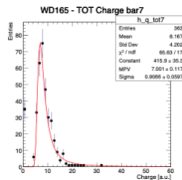
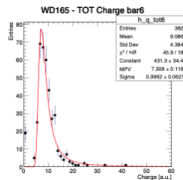
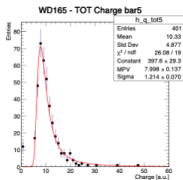
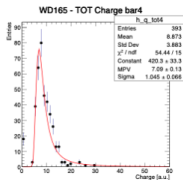
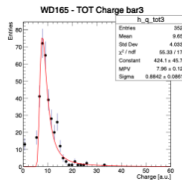
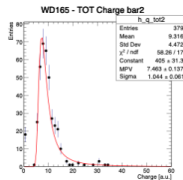
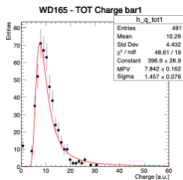
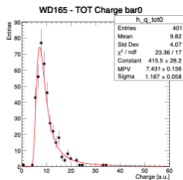
2

Charge



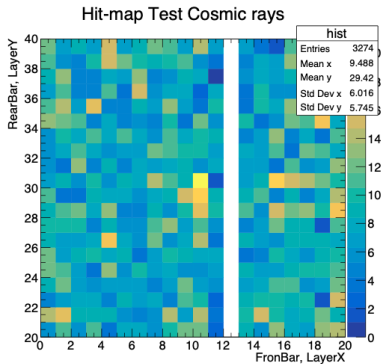
- Compute charge Q through the integral of the waveform (for each individual event).
- For each event, Q_{tot} evaluated from the collected charge on each side of the bar .

Charge

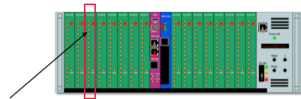


Good agreement with the expected Landau distribution .

Hit-Map TOFwall



Board 157, channel 2 and 3 disabled



Maybe a problem with the connector?

BAR 12 X-View

