Quick MSD Software update
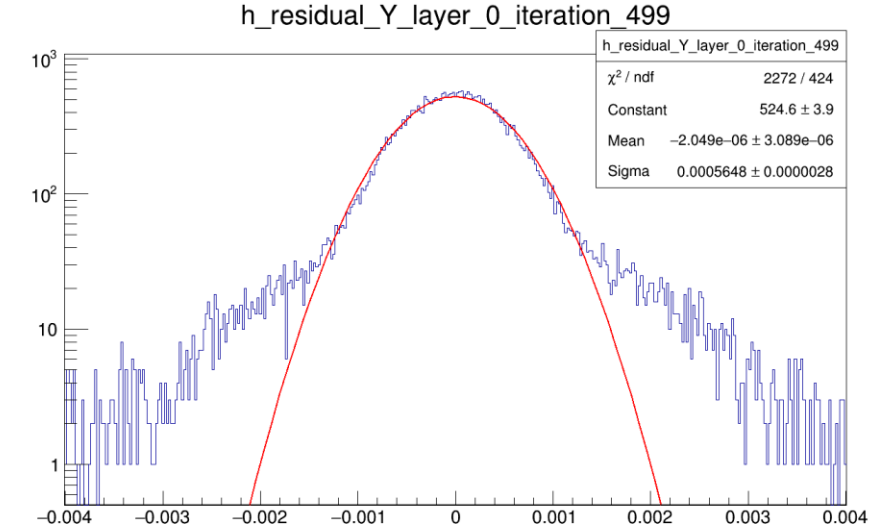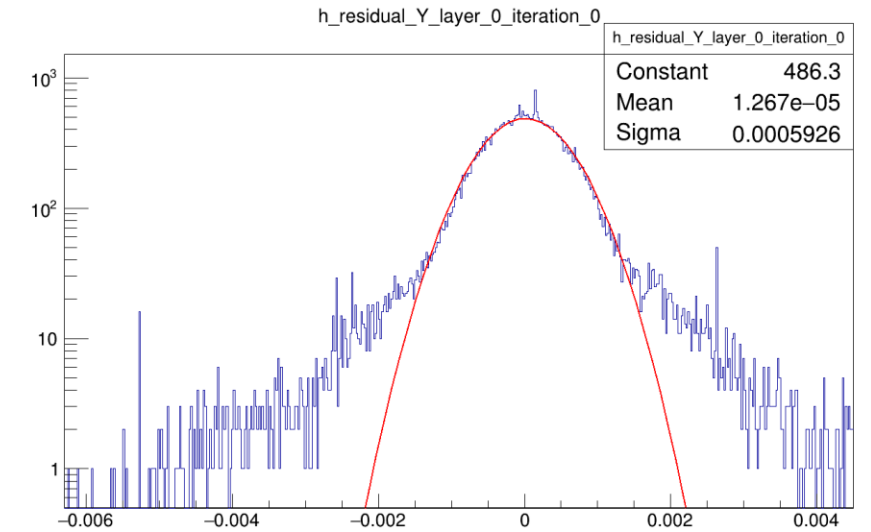
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GSI 2021 Alignment

- Working on alignment with standalone code
  - Rigid shifts in the plane perpendicular to beam axis
  - Rotations around the beam axis

- Working on data selection: increase events with only 1 hit in each detector (reduce noise, use non aligned runs maybe …)

- Values obtained from data with no corrections look reasonable

- Slight improvement of residuals distributions after alignment

- Fixed some errors in the geometry (distances along the beam axis)

- Will need to then align MSD system with the rest of the detectors

h_residual_Y_layer_0_iteration_0

h_residual_Y_layer_0_iteration_0	
Constant	486.3
Mean	1.267e−05
Sigma	0.0005926

h_residual_Y_layer_0_iteration_499

| h_residual_Y_layer_0_iteration_499	
χ^2 / ndf	2272 / 424
Constant	524.6 ± 3.9
Mean	−2.049e−06 ± 3.089e−06
Sigma	0.0005648 ± 0.0000028

Noisy strips

- First strip of each readout ASIC is noisy
  - Effect probably due to noise on the ASIC control signals
  - Signal is comparable to 5 MIPs, so much less than Oxygen primary
  - Calibration run is less noisy than data: effect of the beam needs to be studied

- One of the detectors has several noisy strips

- No big difference in cluster reconstruction with the dead strip map due to high cut threshold used (40 "sigmas", about 80-100 ADC depending on the channel)

- A new cluster algorithm might help

Event number 0 Detector: 0
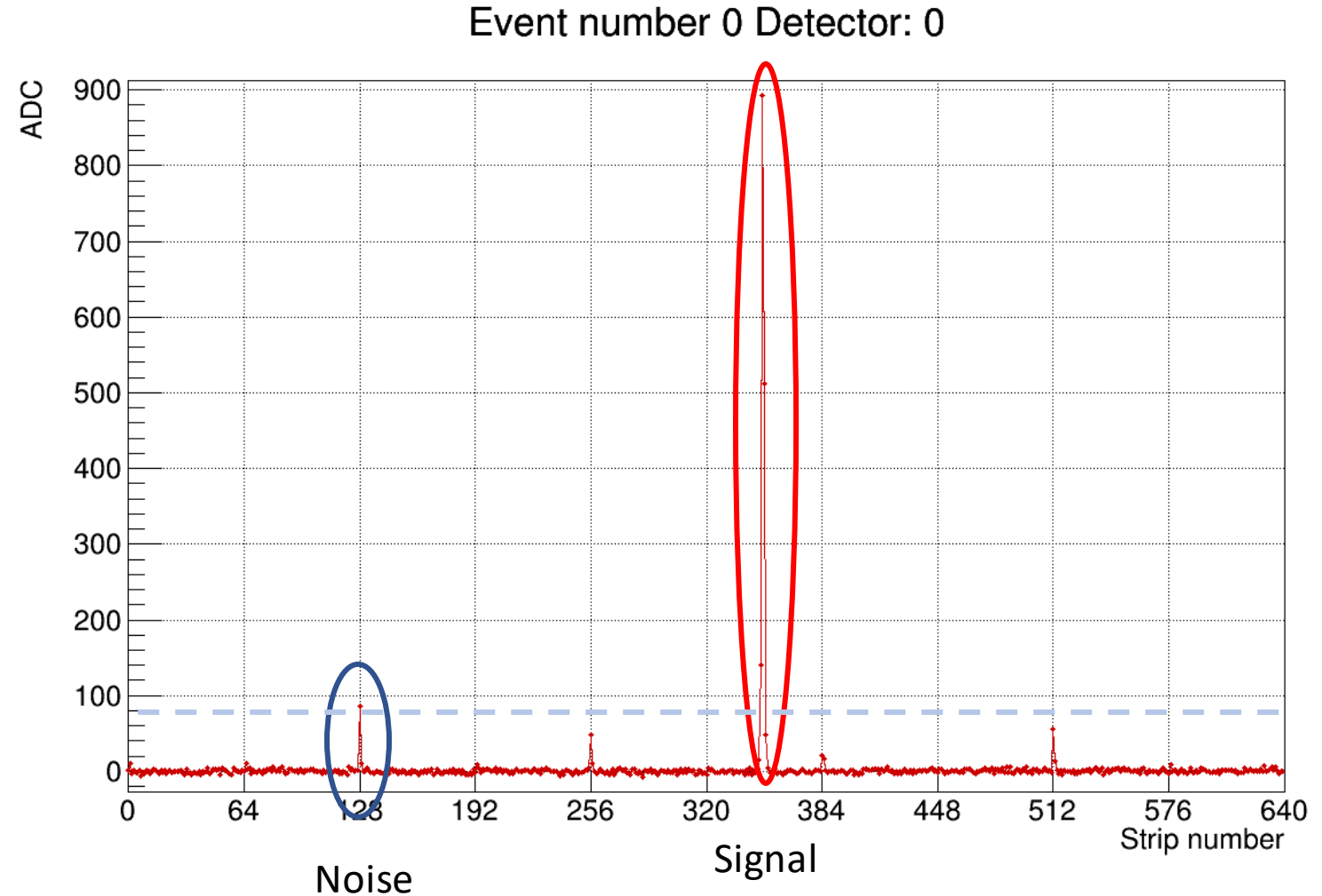
New cluster reconstruction?

- Single threshold cluster reconstruction needs high cuts to avoid noise

- Could it be possible to implement a double threshold algorithm?
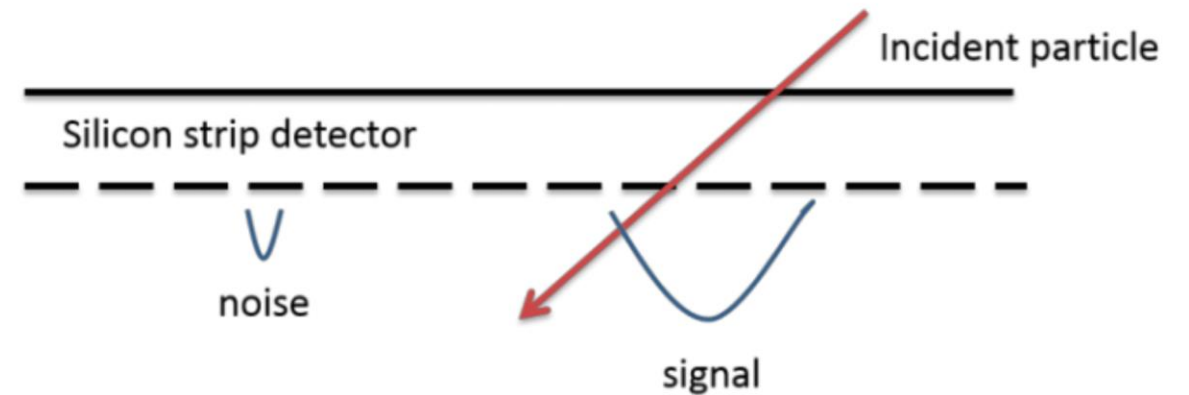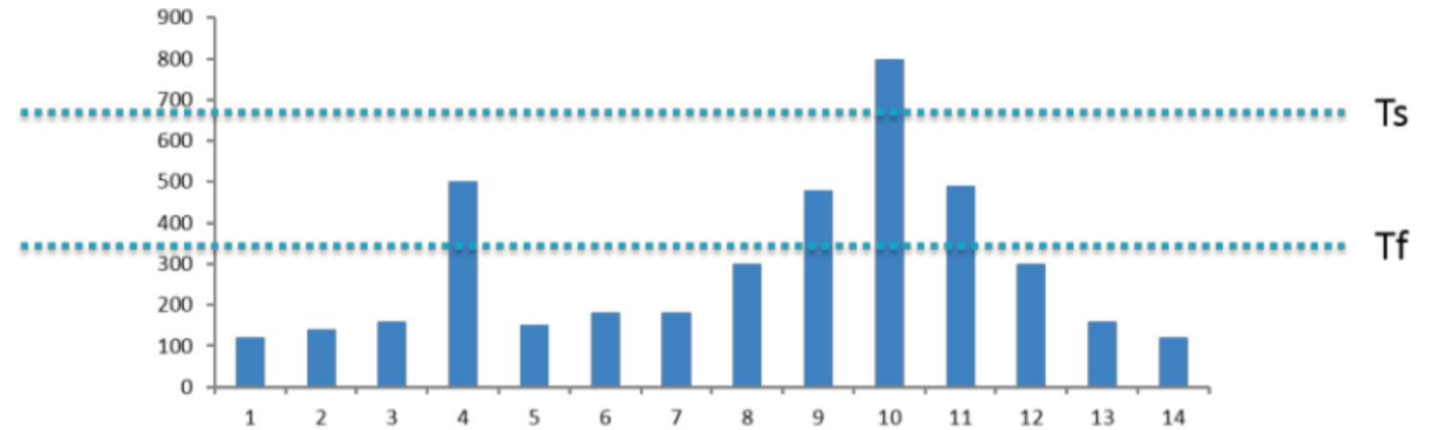
New MSD methods

- Implemented new definition for "eta" of the cluster
  - No difference for most clusters with old version, but it's formally correct now
  - Old version might be computationally faster

- Implemented a method to correct the cluster ADC wrt the eta of the cluster
  - First model tested with 400MeV/u (will probably show some results in next Physics meeting)

- Implemented a method to get the starting address of a cluster

- Implementing a method to get the highest ADC cluster in a sensor for each event

- All changes still to be commited to newgeom branch