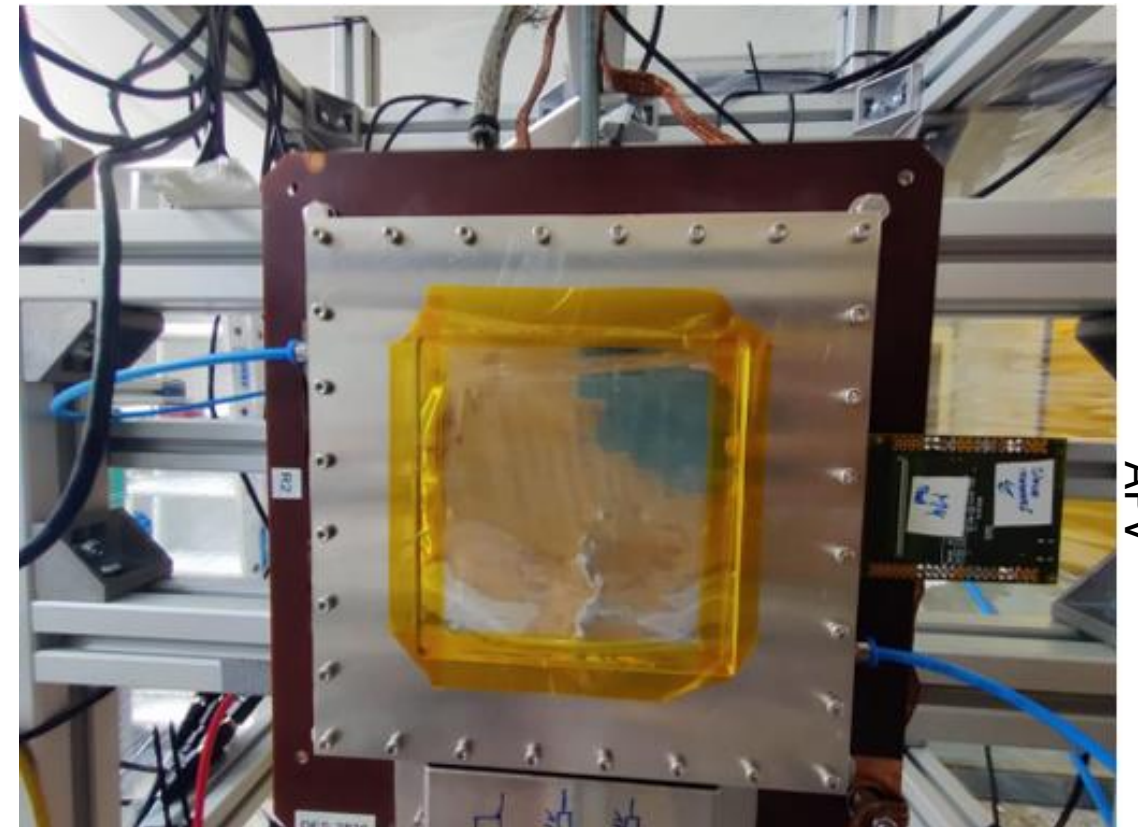
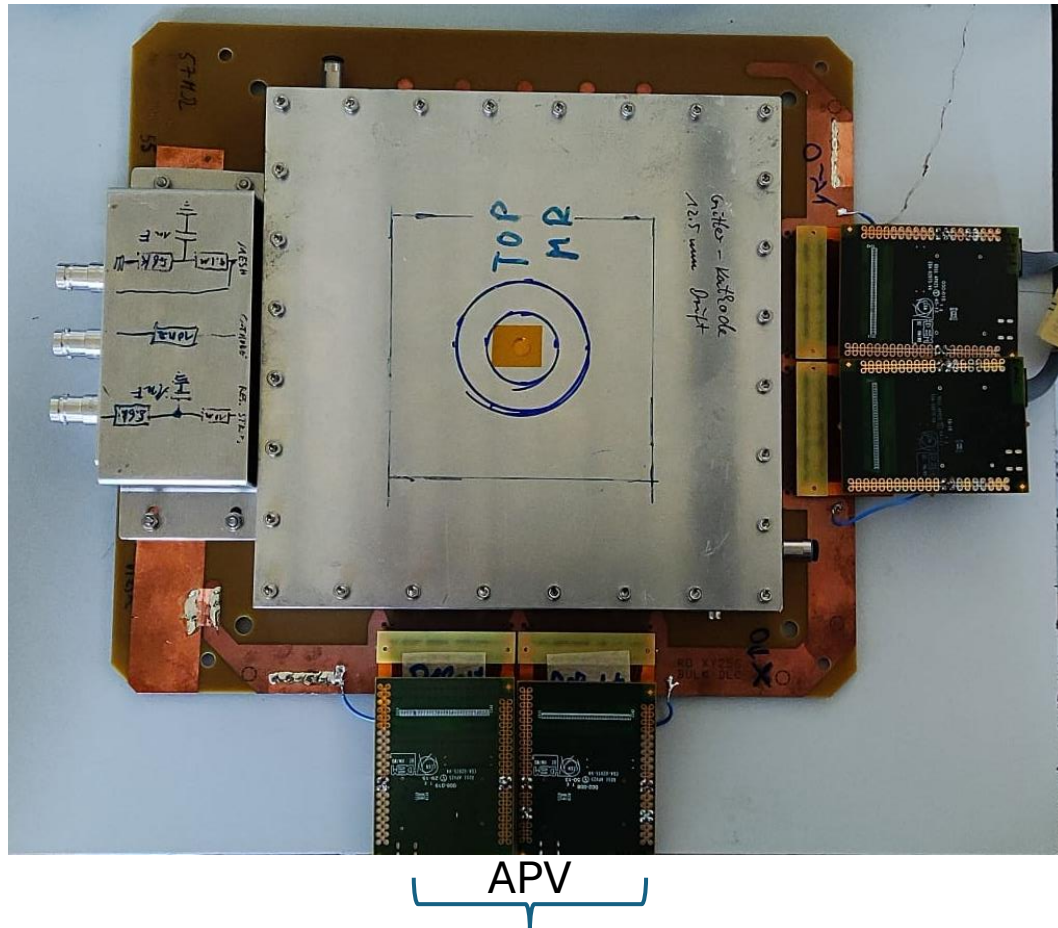


Hardware Meeting 19.09.2024

Motivation:

- Investigation of PAD Detectors.
 - Reduced read out channels and consequently lower number of electronics compared to conventional MicroMeGas.



Progress

- Tested the 4 TMM's to select which ones to use for the new telescope
- Tested with the Fe55 Source

Source

Detector 1

Detector 2

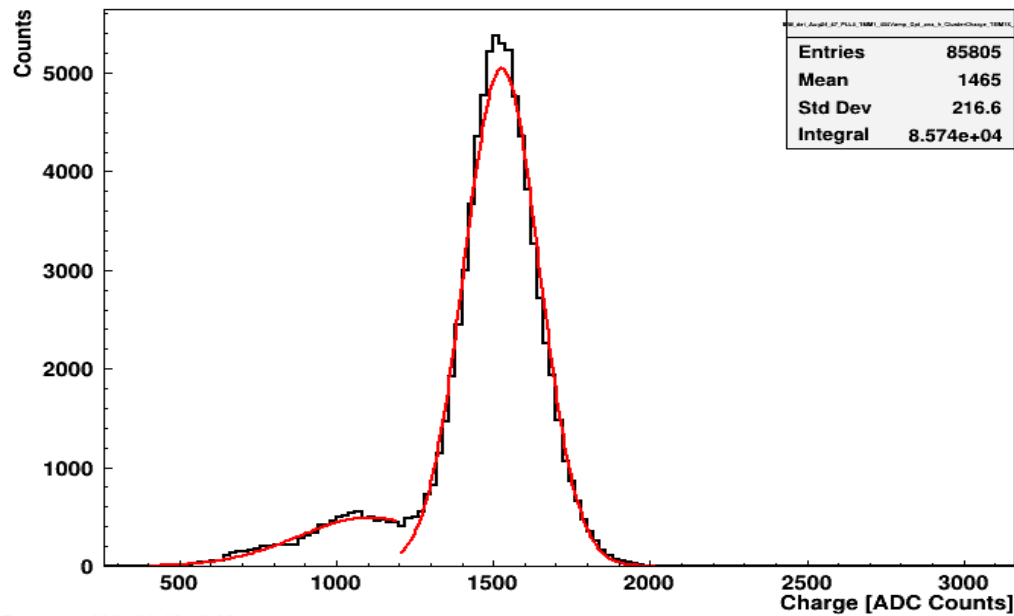
APV's for readout

Detector 3

Detector 4

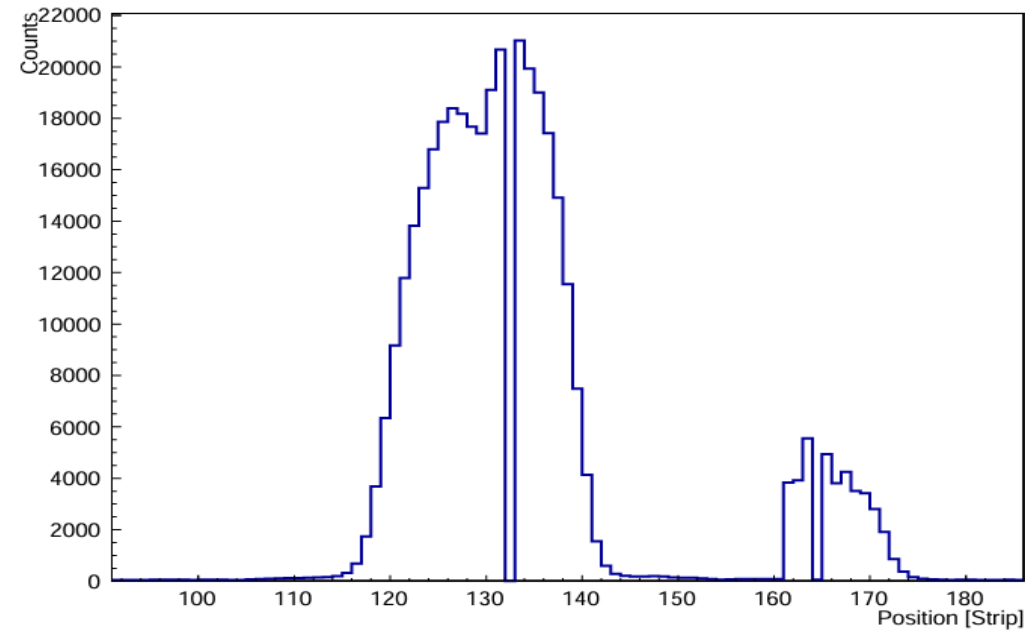


h_ClusterCharge_TMM1X

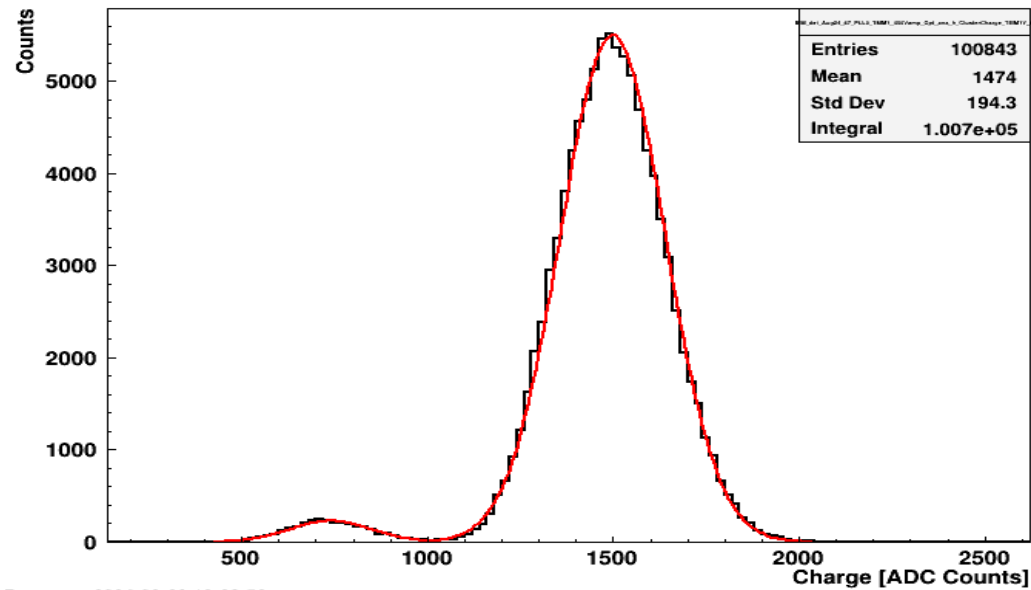


Drawn at: 2024-08-09 18:08:41

h_StripNumber_TMM1X

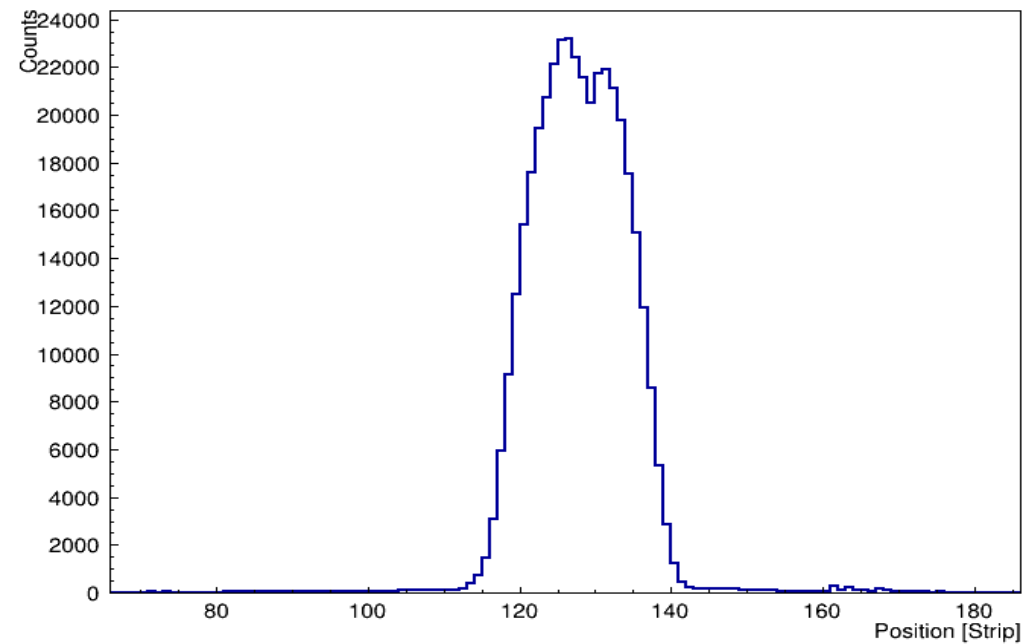


h_ClusterCharge_TMM1Y



Drawn at: 2024-08-09 18:08:50

h_StripNumber_TMM1Y



• PAD 2 Test:

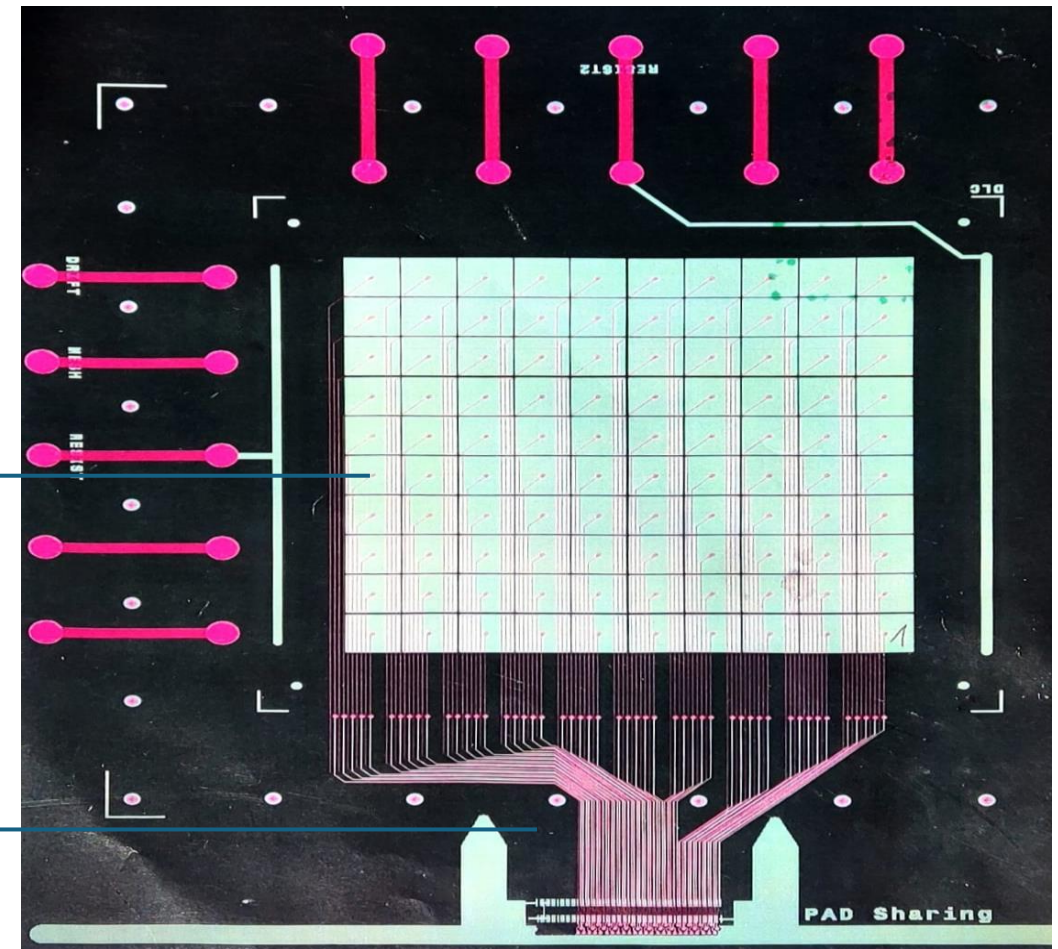
PAD2: Old pad detector with 5 layers

- 10*10 Pixels, 1 APV and 100 readout channels.
- Tested using Fe55 source.
- Position Reconstruction tested with 3D printed Scream portrait and Cu-block.
- Pitch = 10mm

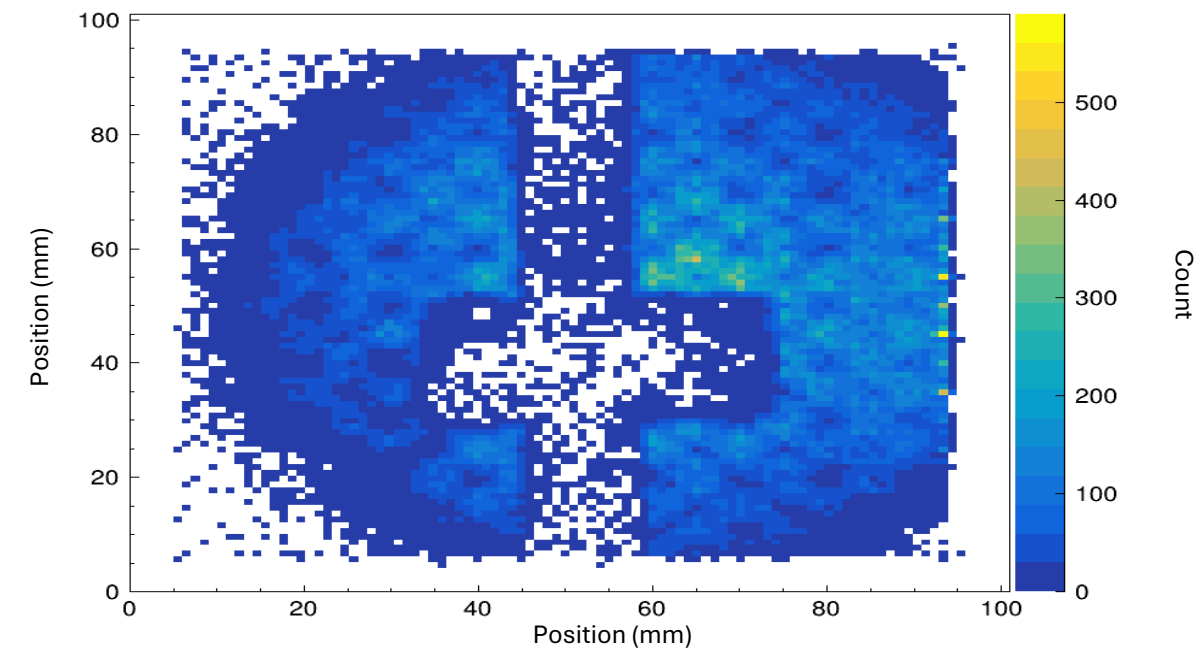
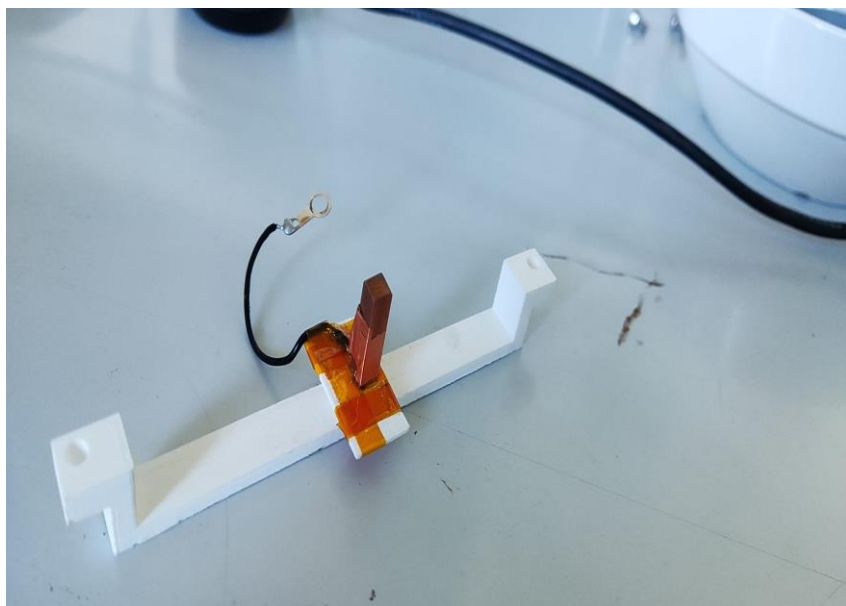
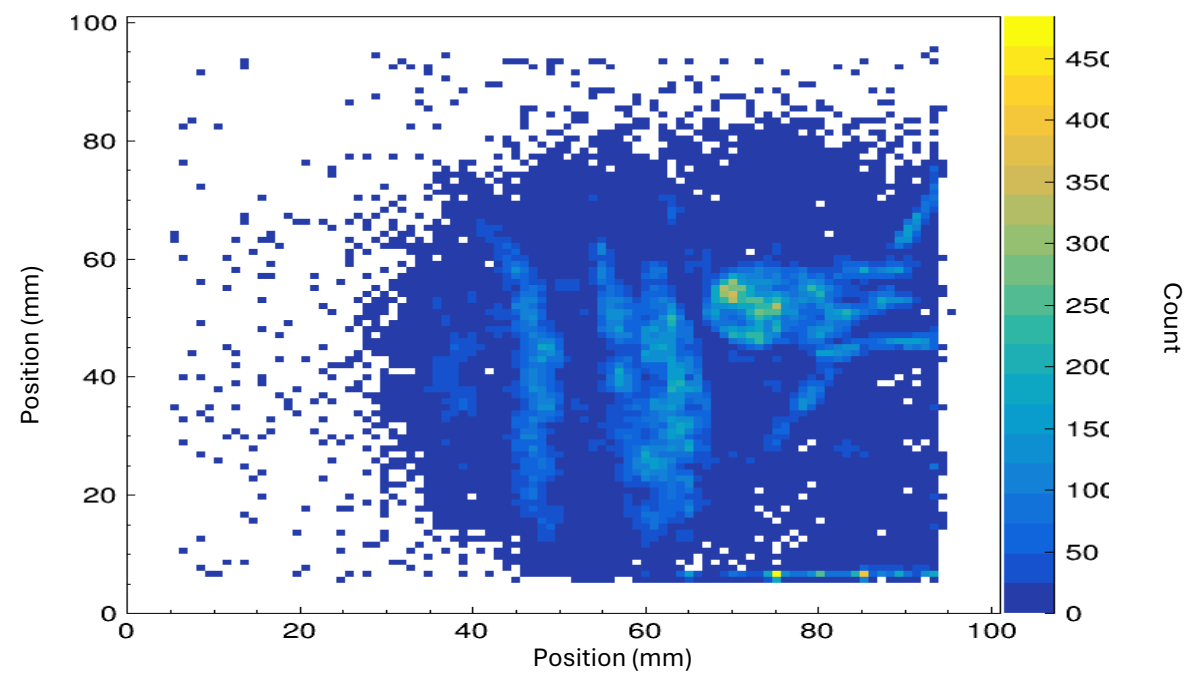
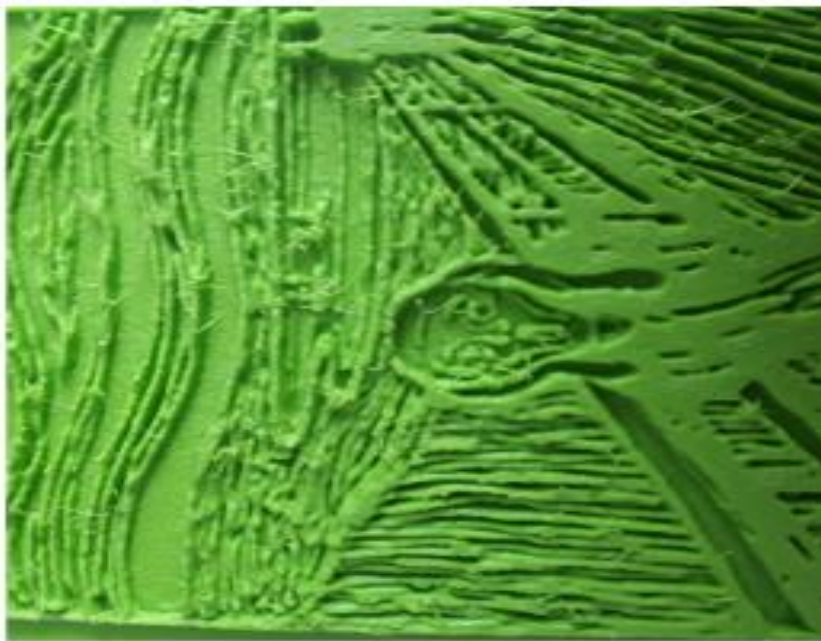
Faced relatively no issues throughout testing.

10*10 Pixels

100 channels connected to 1 APV



h_pixelCluster2DPosition_Scream_PAD2



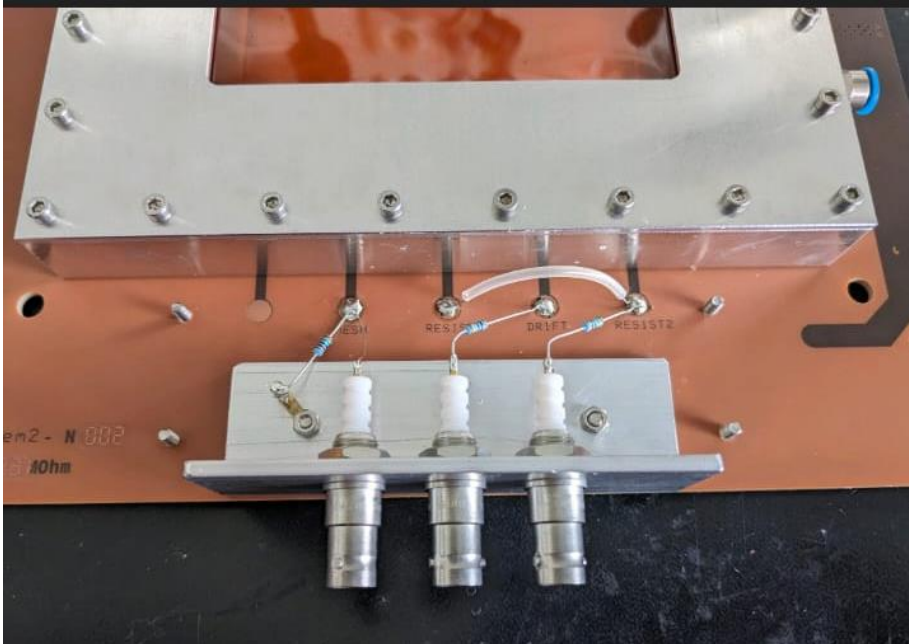
- PAD 1 Test:

- New Unknown Pad Det.

- Issues Faced and current solutions:

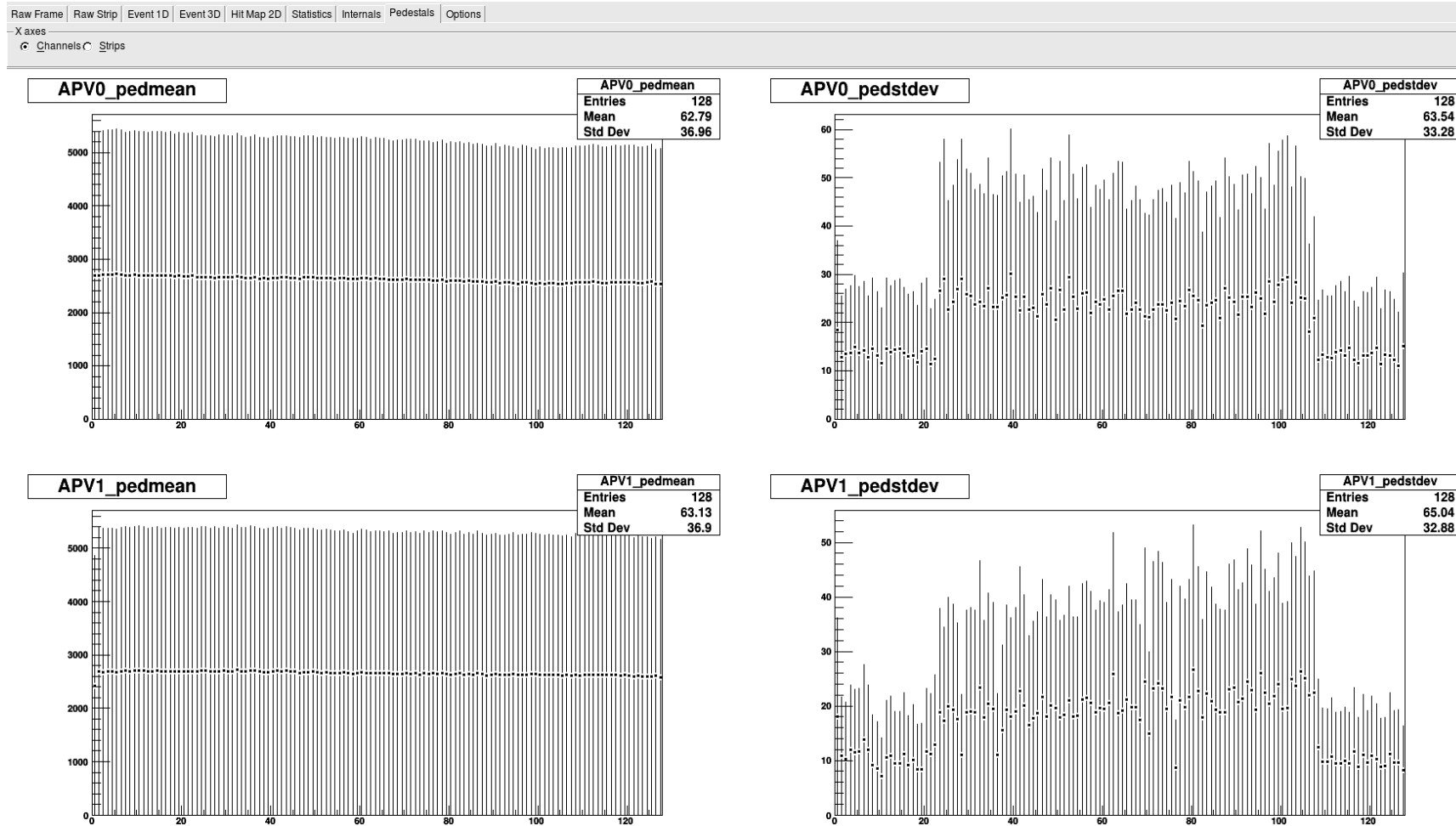
- Noise and grounding issues – Oscilloscope signals were too noisy, and we could not identify the peaks.
 1. Initially the entire edges of the detector was covered using Cu tape.
 2. The detector was placed on an Aluminum plate. Helped a bit.
 3. Additional RC filter was installed before the timing filter amplifier. This reduced the noise by a huge amount.

- PAD1: New pad detector with 3 layers
- 2 APV's

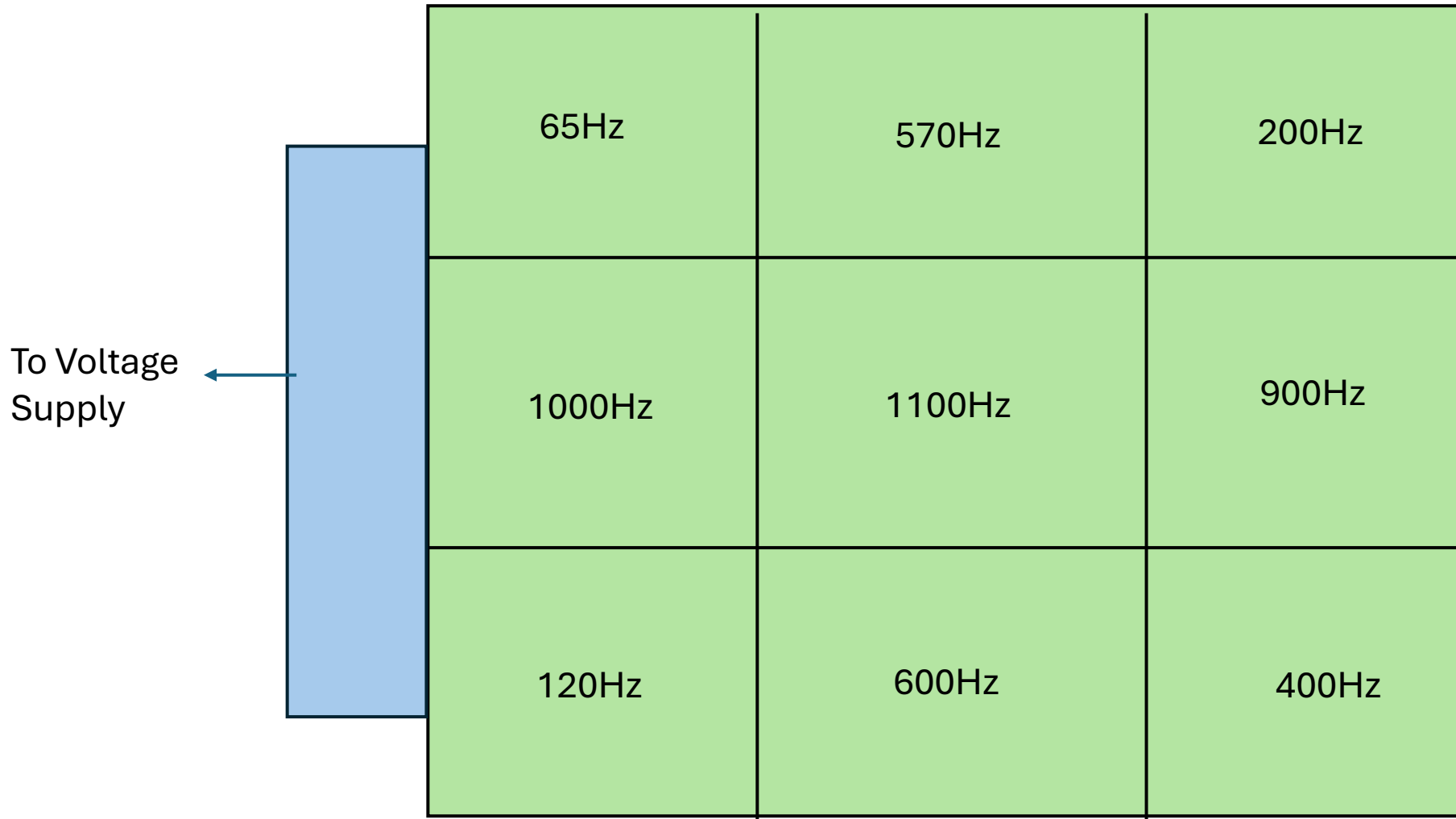


- Strip-detector like behavior.

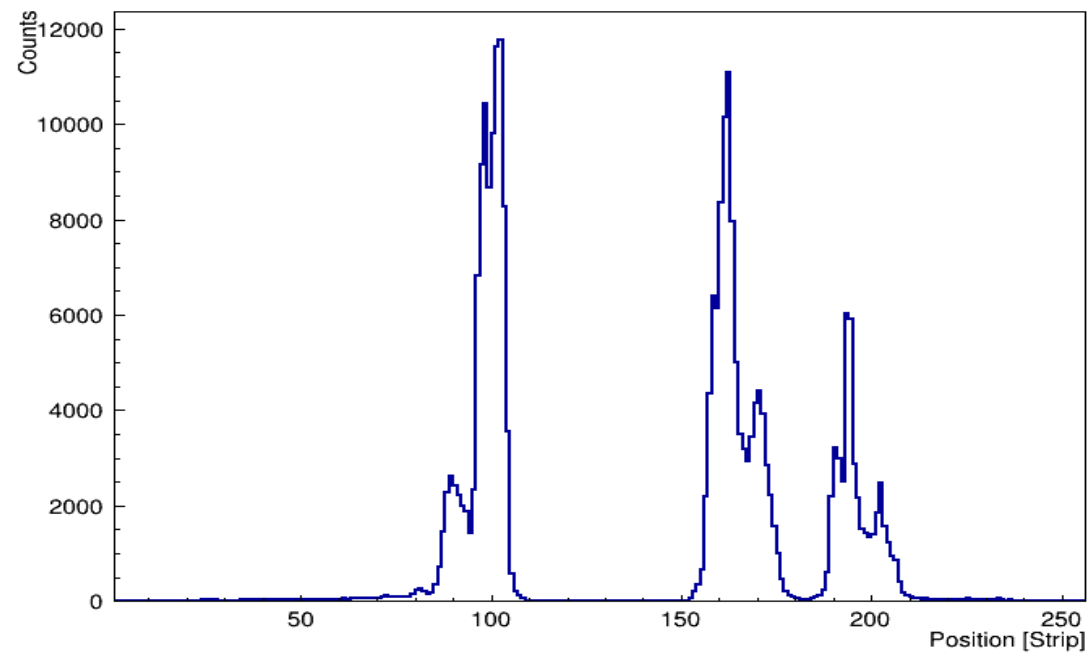
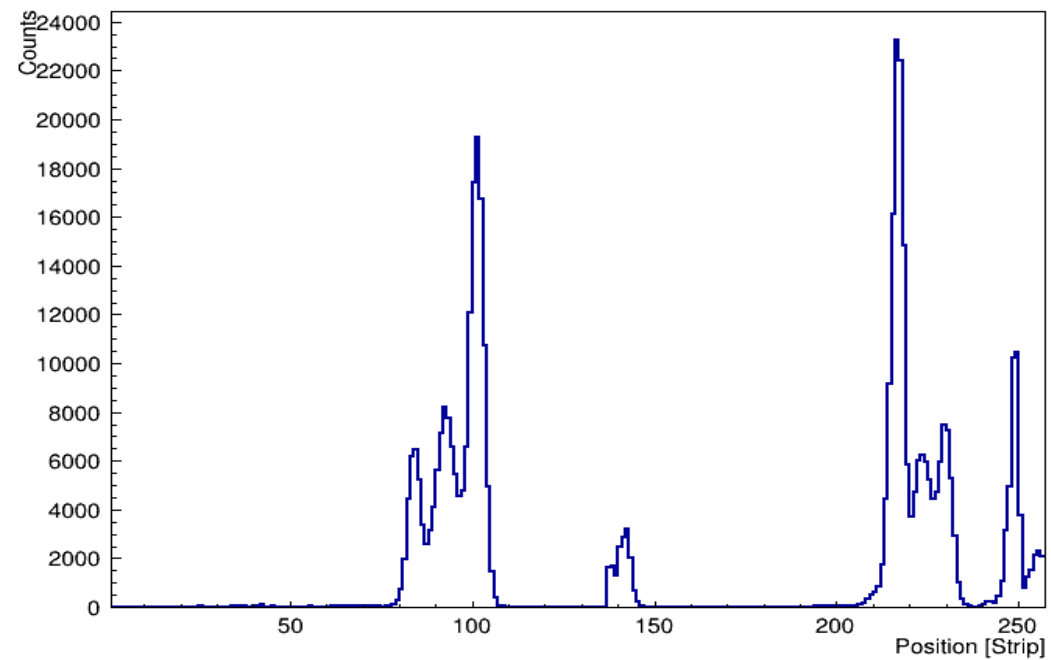
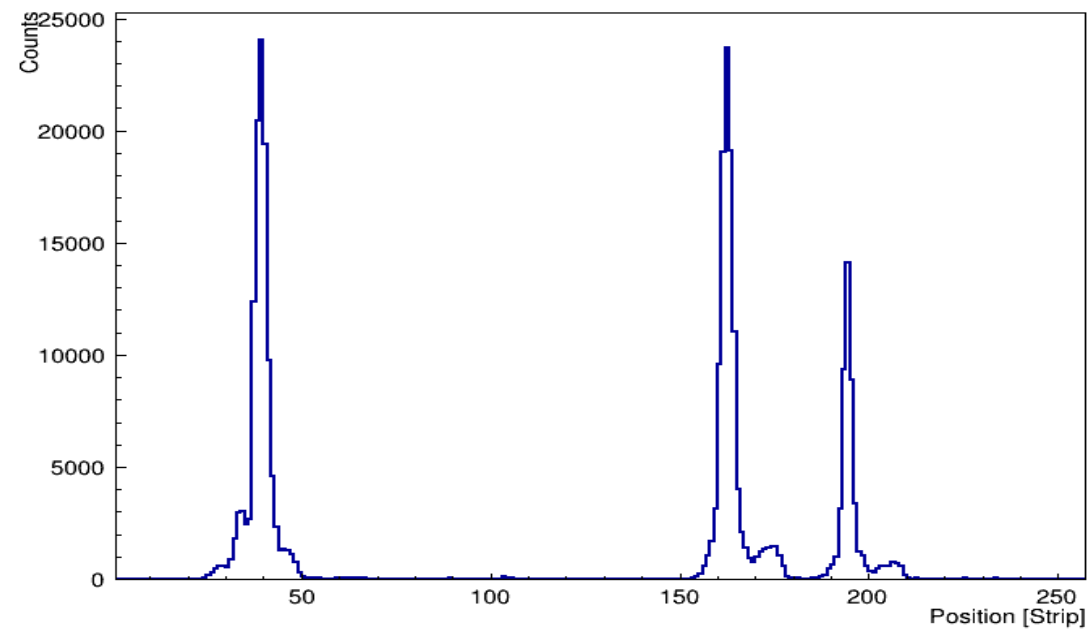
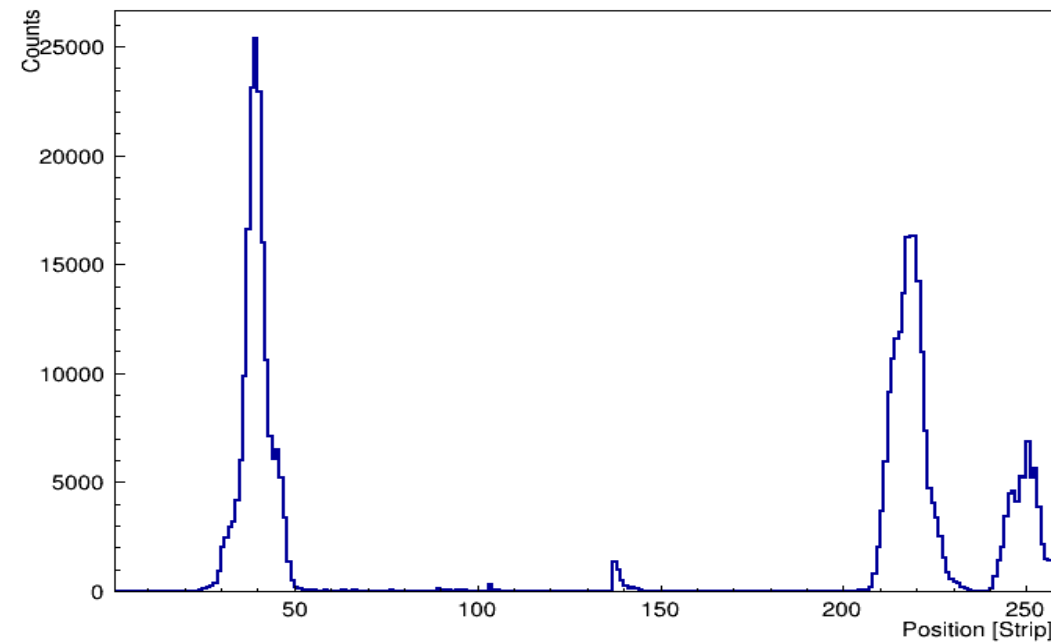
1. Looked at mmdaq on etp10 to see the connected channels.



- Different rates were observed across the detector surface at the same voltage under the same conditions with the Fe55 source.

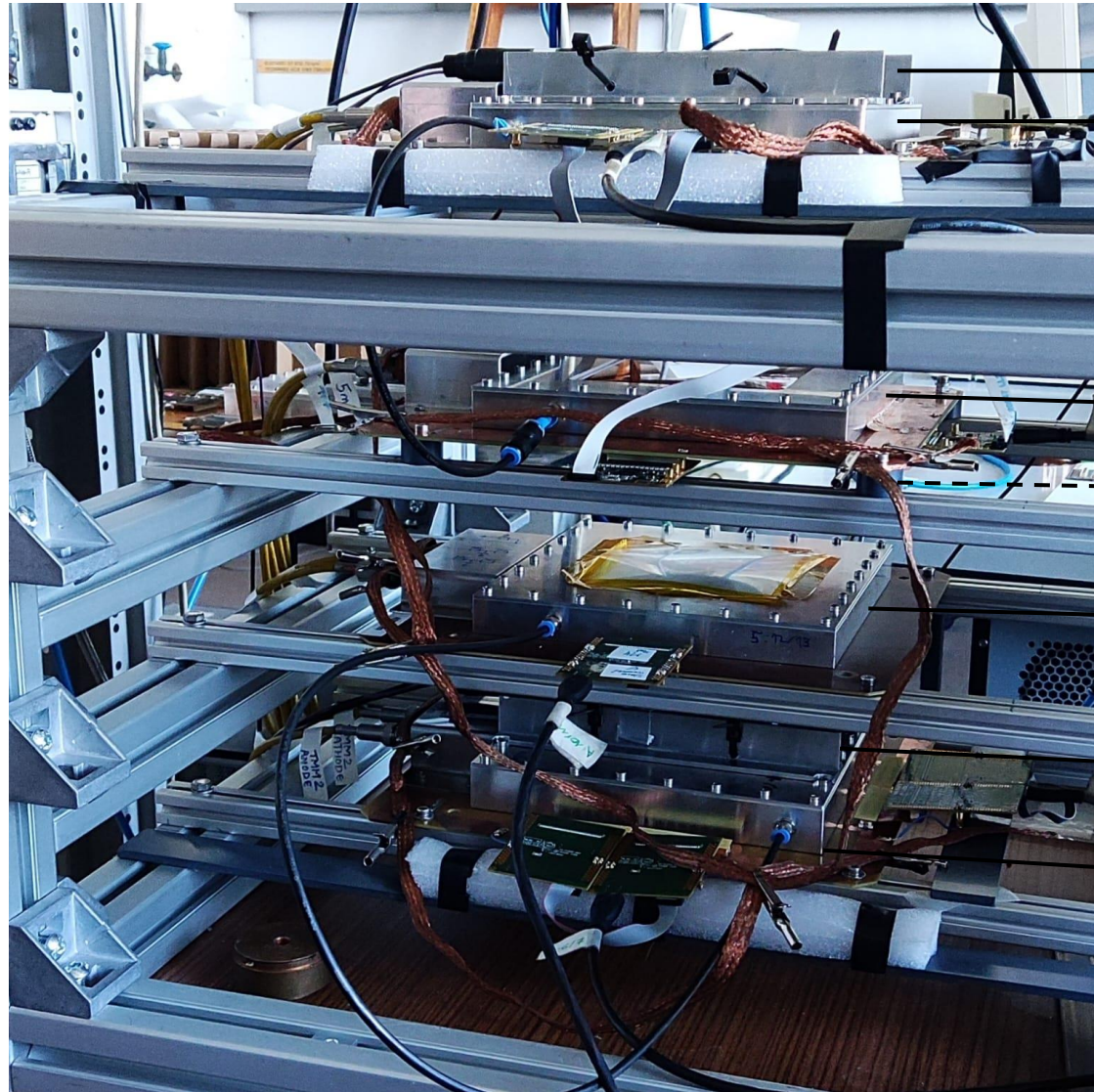


- Still don't have a solution to this problem.

StripNumber_UL_PAD1**StripNumber_UR_PAD1****StripNumber_LL_PAD1****StripNumber_LR_PAD1**

APV Connections below the detector which lead to problems with building the telescope setup.

1. Rectified with a plastic bush.



Scintillator 1

TMM 1

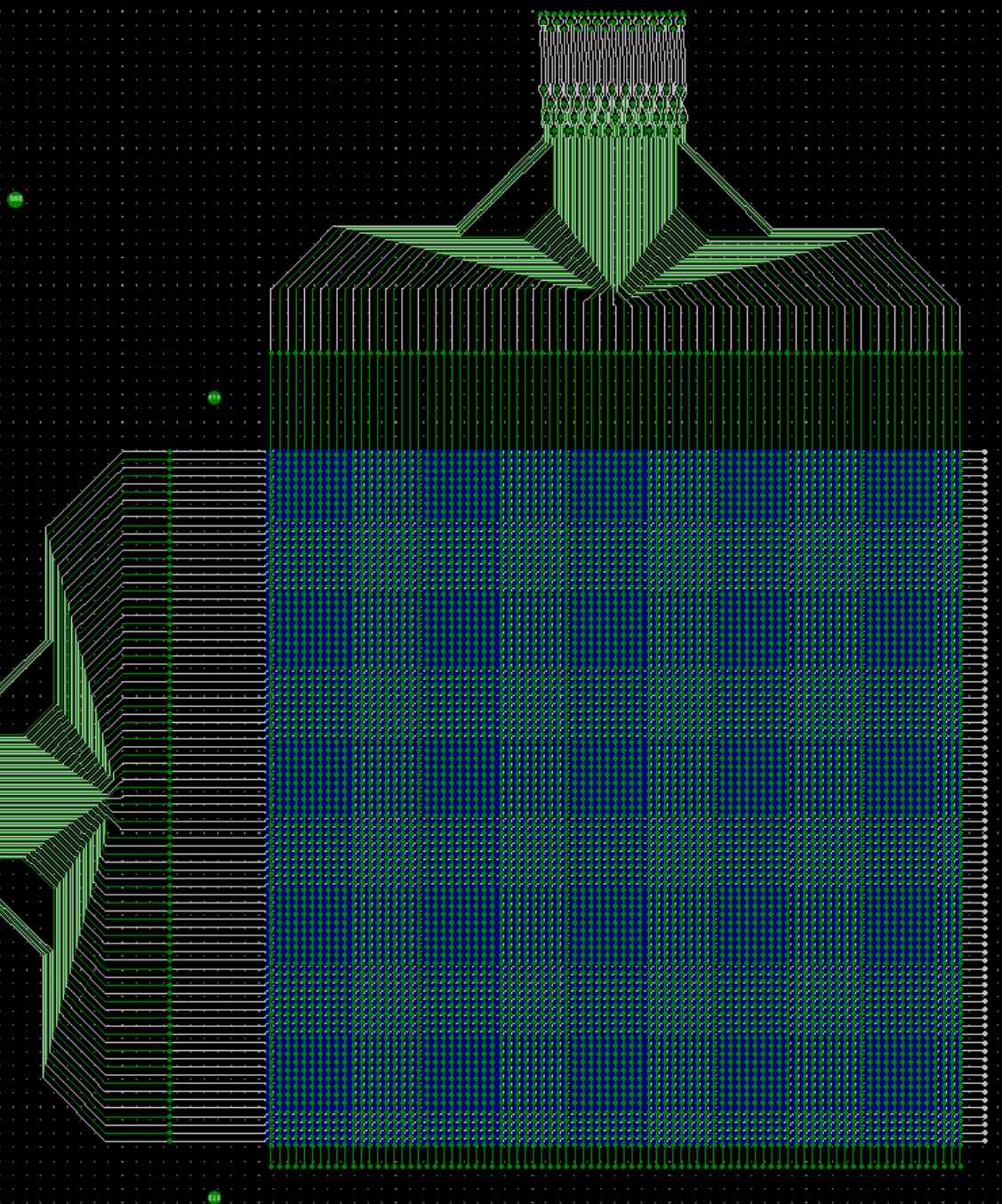
PAD 1

Bush

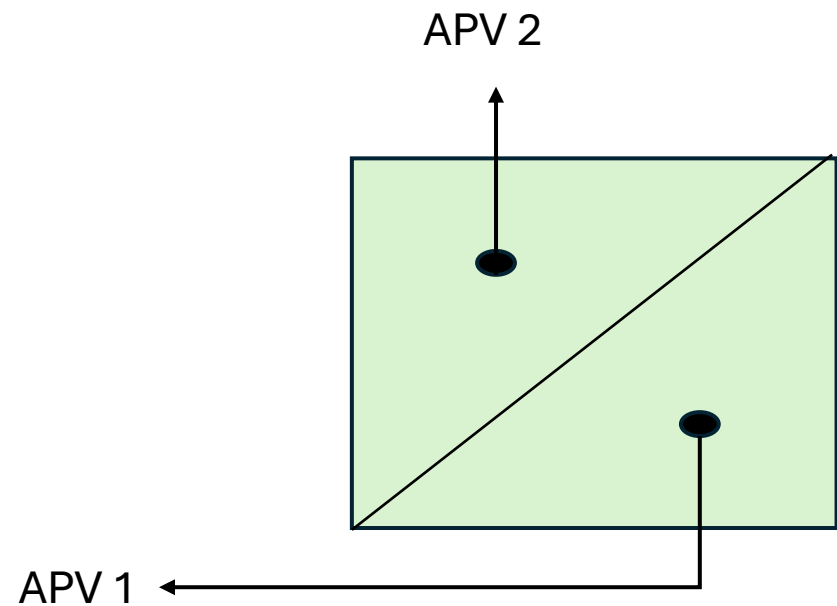
PAD 2

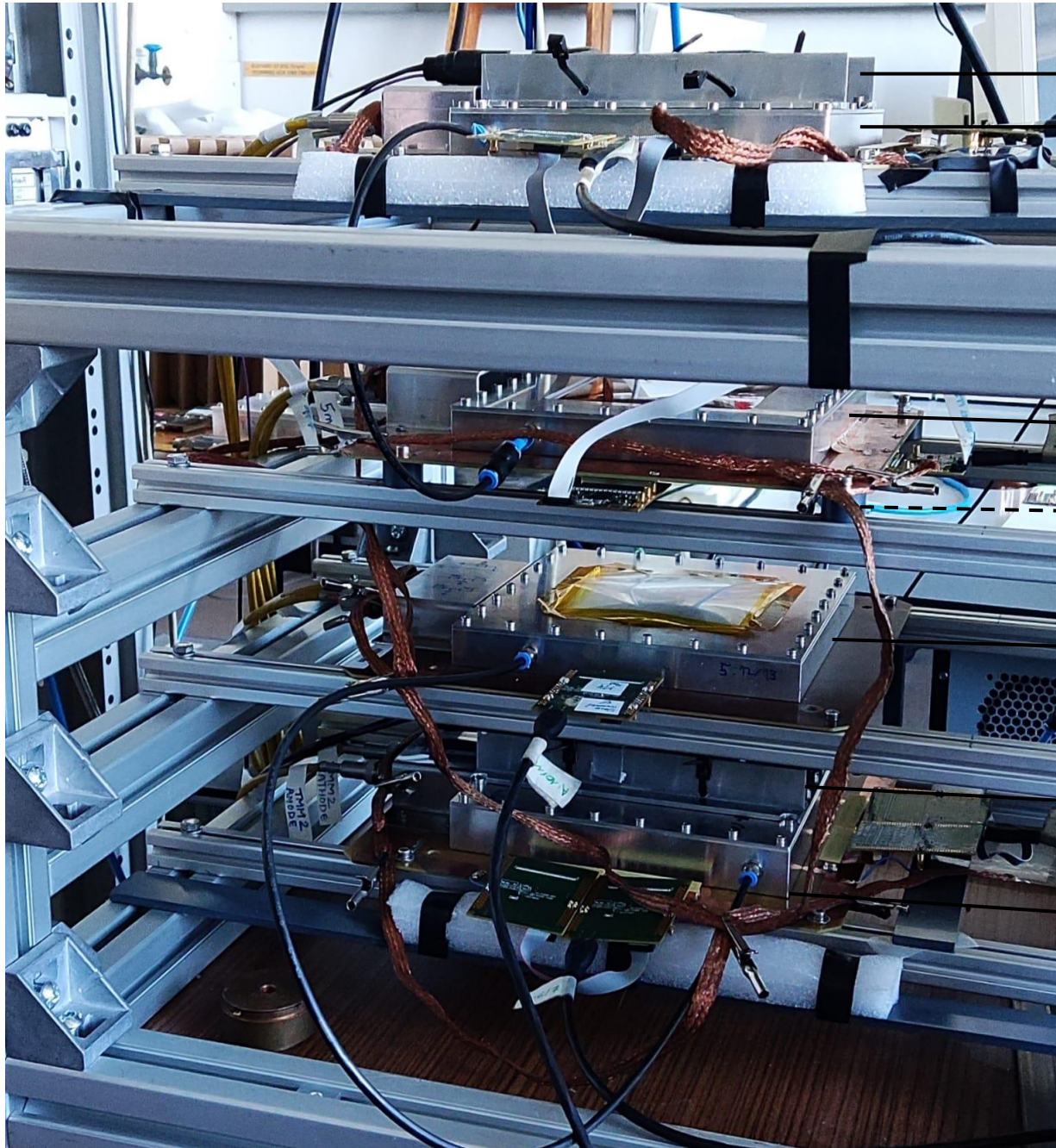
Scintillator 2

TMM 2



- Investigation of PAD 1:
 - The strip like behavior of PAD led us to pixel shape and connections to APV.
 - 3 layers
 - 85*85 pixels (3rd layer)
 - 2 APV's
 - Pitch 1.2mm (Outermost pixel layer)
 - 170 channels





Scintillator 1

TMM 1

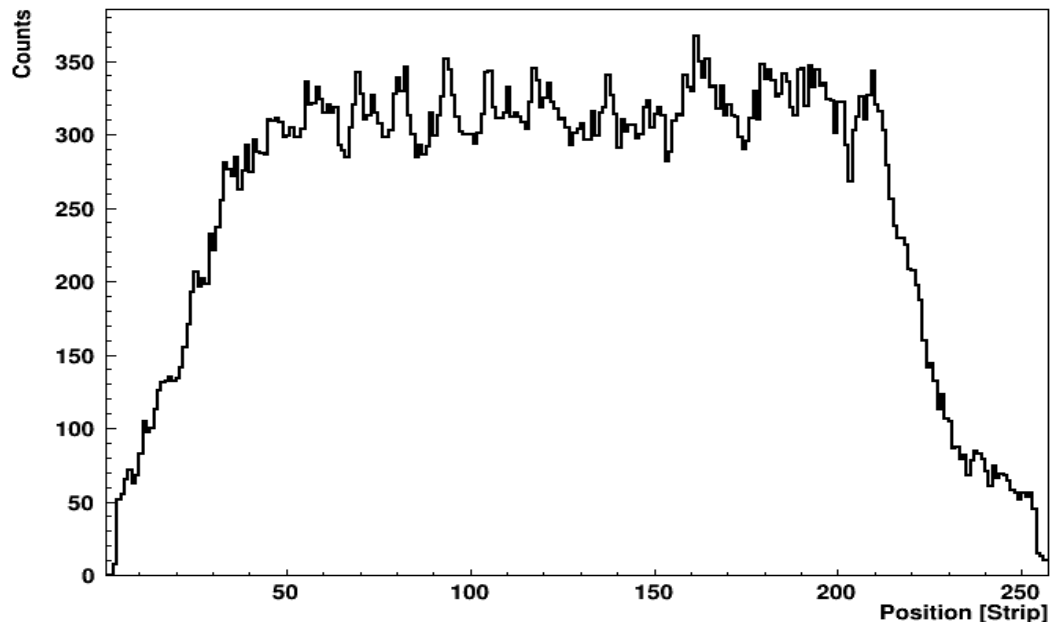
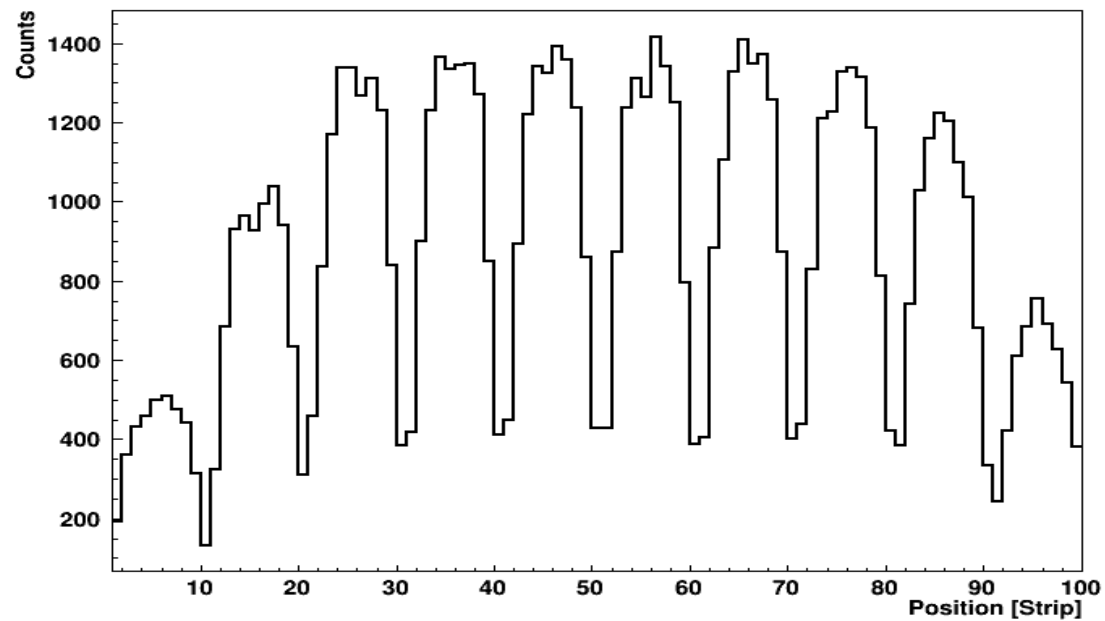
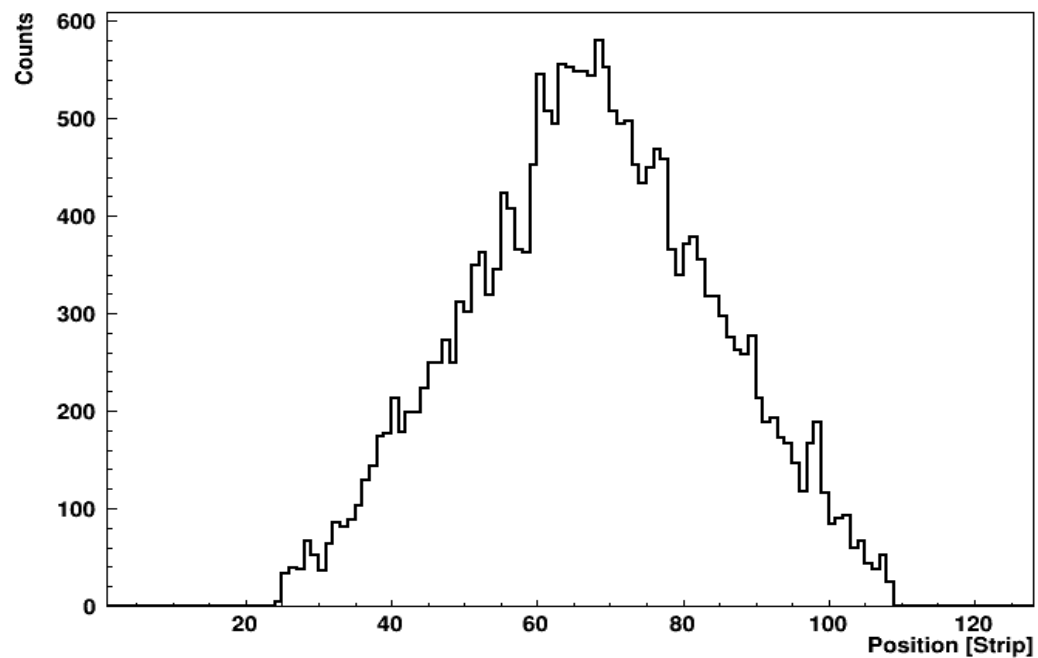
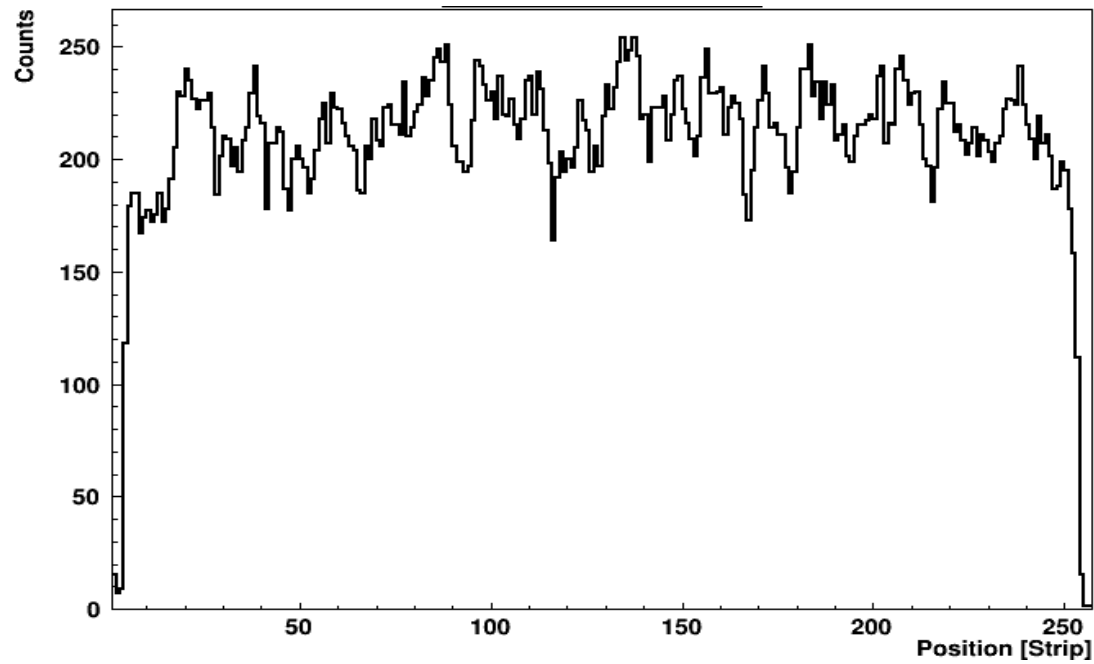
PAD 1

Bush

PAD 2

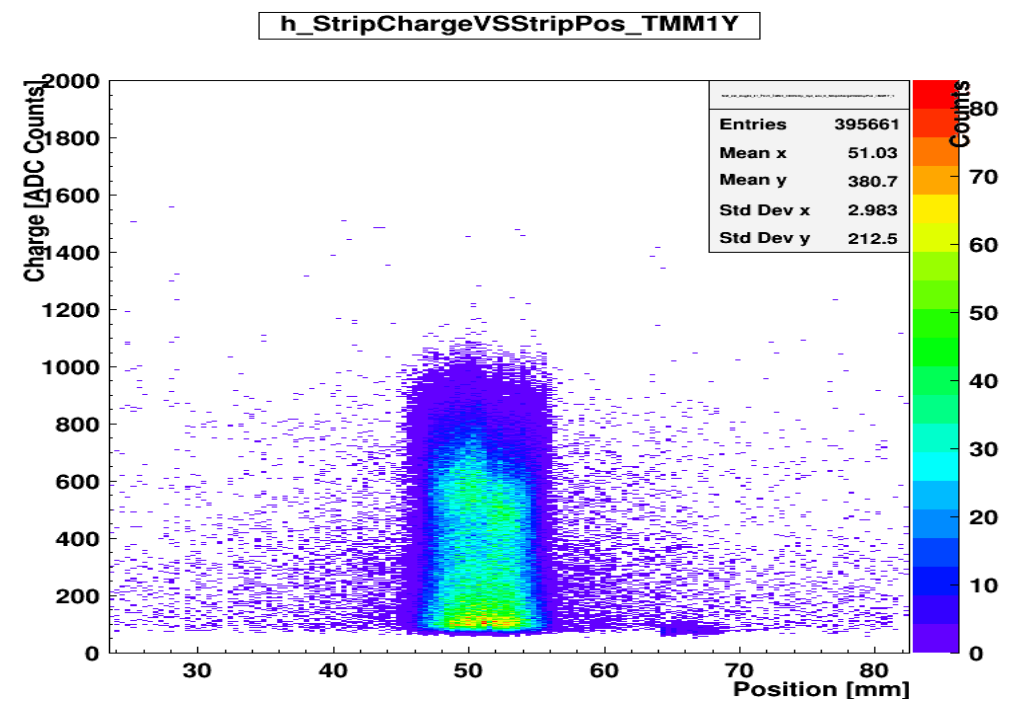
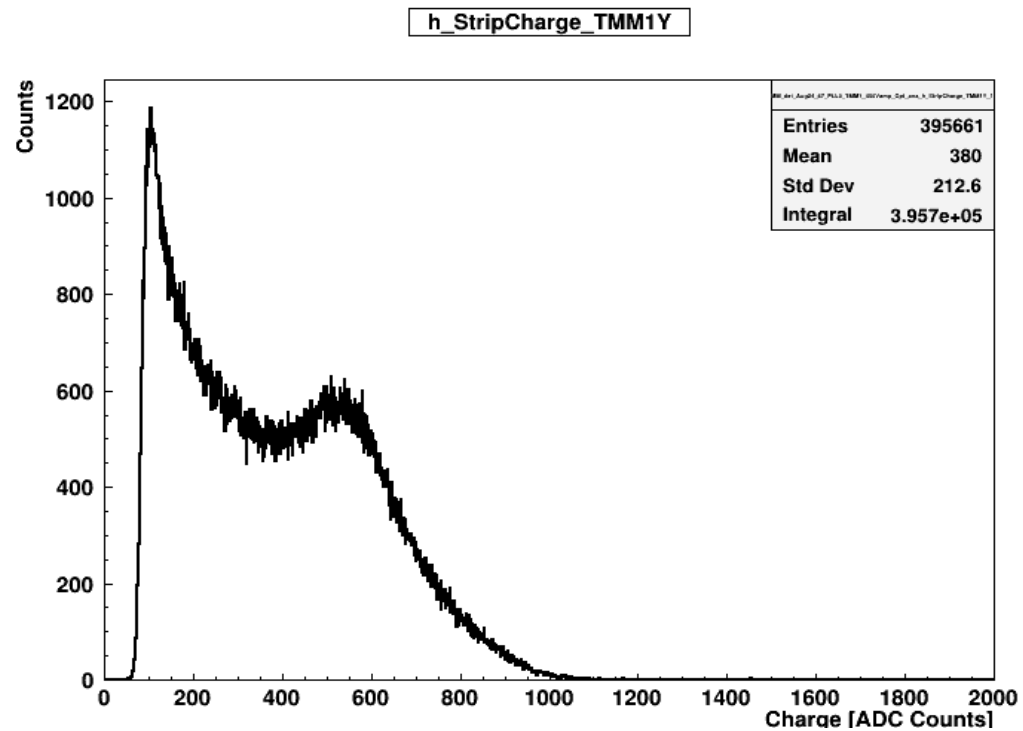
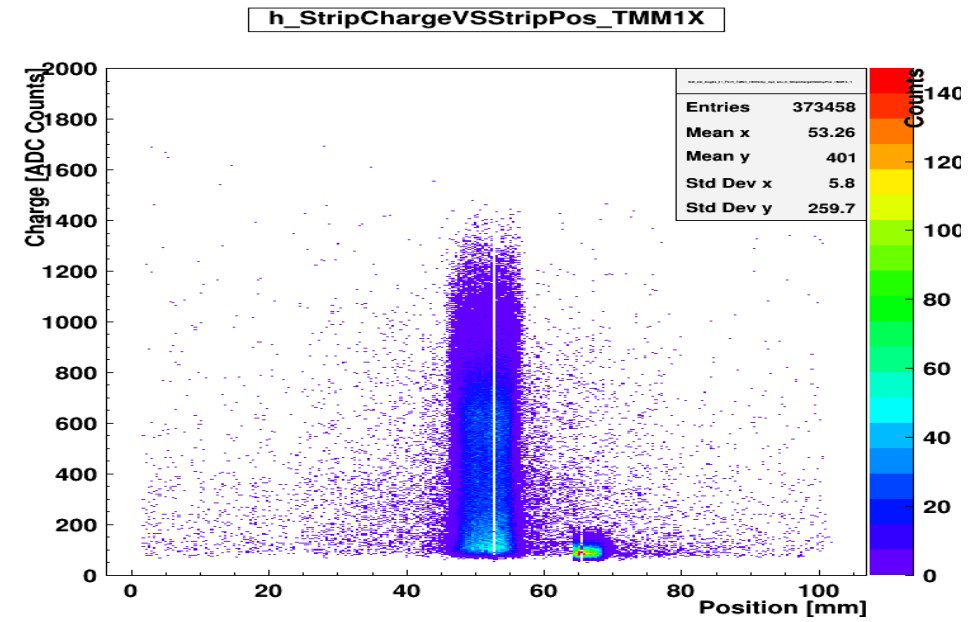
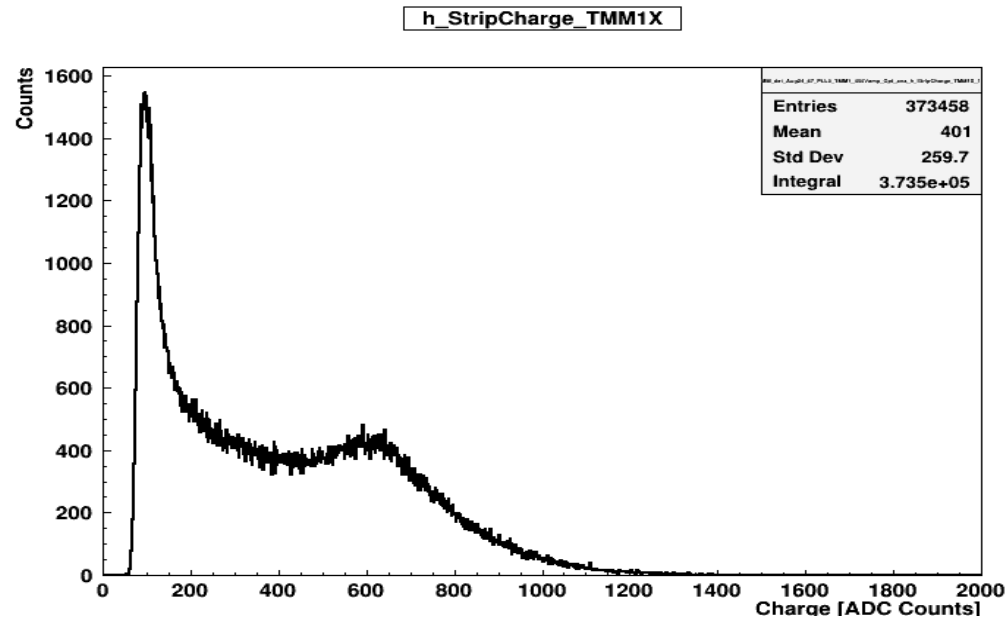
Scintillator 2

TMM 2

TMM1**PAD2****PAD1****TMM2**

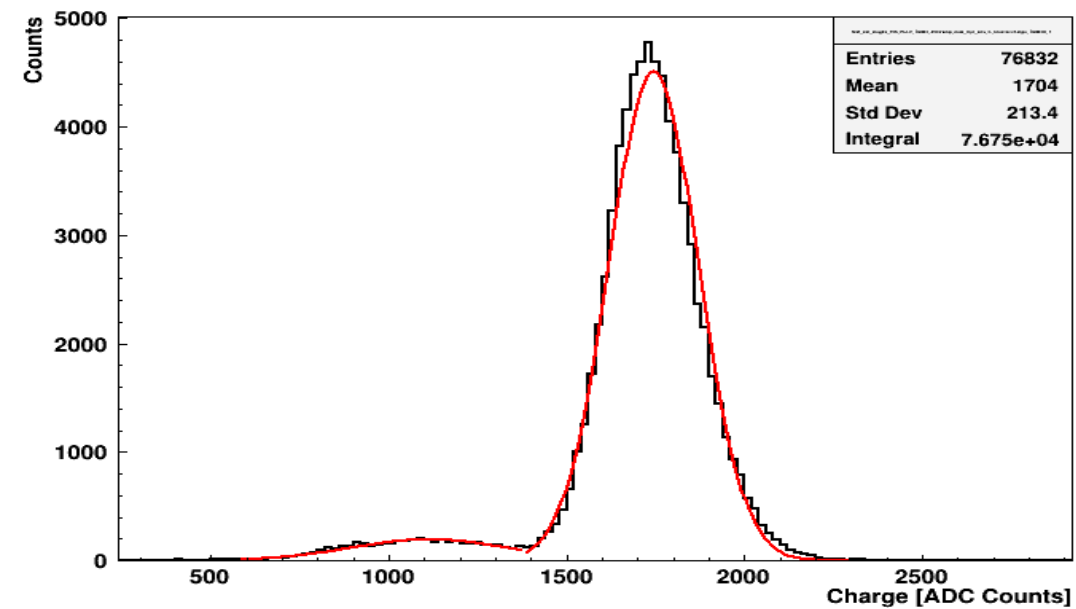
- What next?
 - Charge reconstruction for PAD1.
 - Alignment of the detectors in the script.
 - Tracking to find the Residuals for the telescope.
 - Work to be done with Clustering for the pixel detectors.

- TMM 1 additional Plots

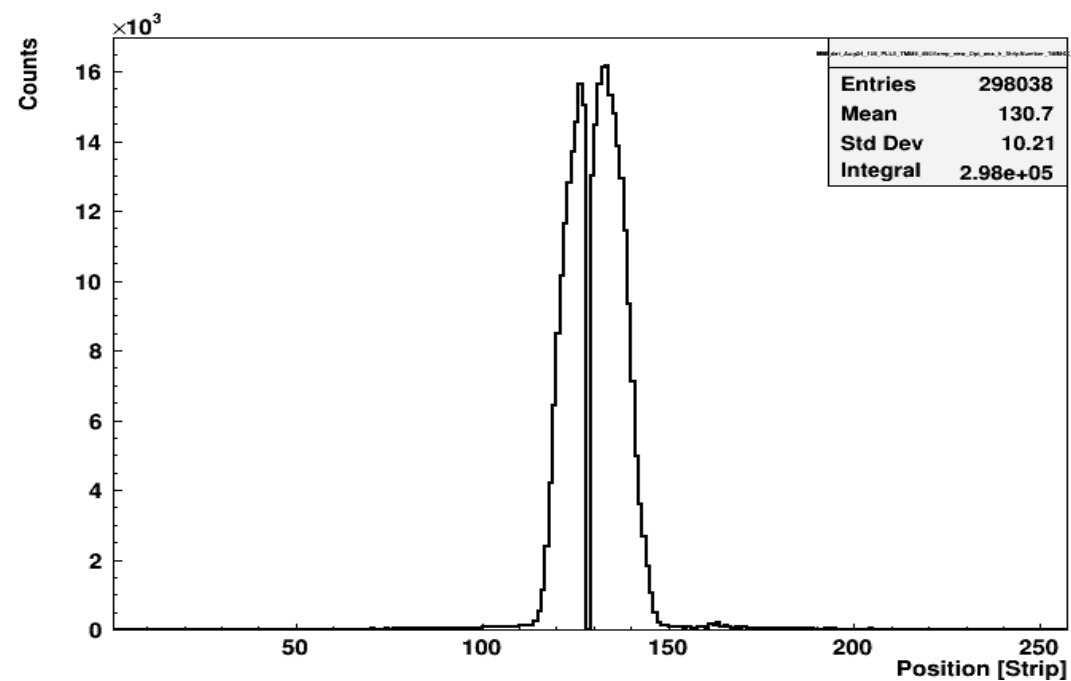


- TMM 4 Plots

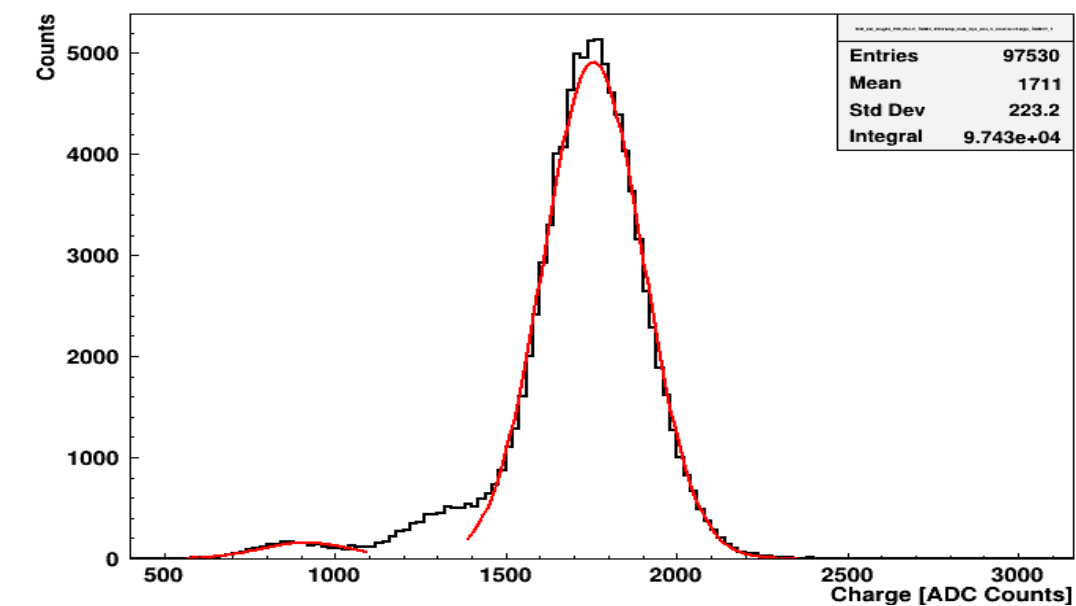
h_ClusterCharge_TMM4X



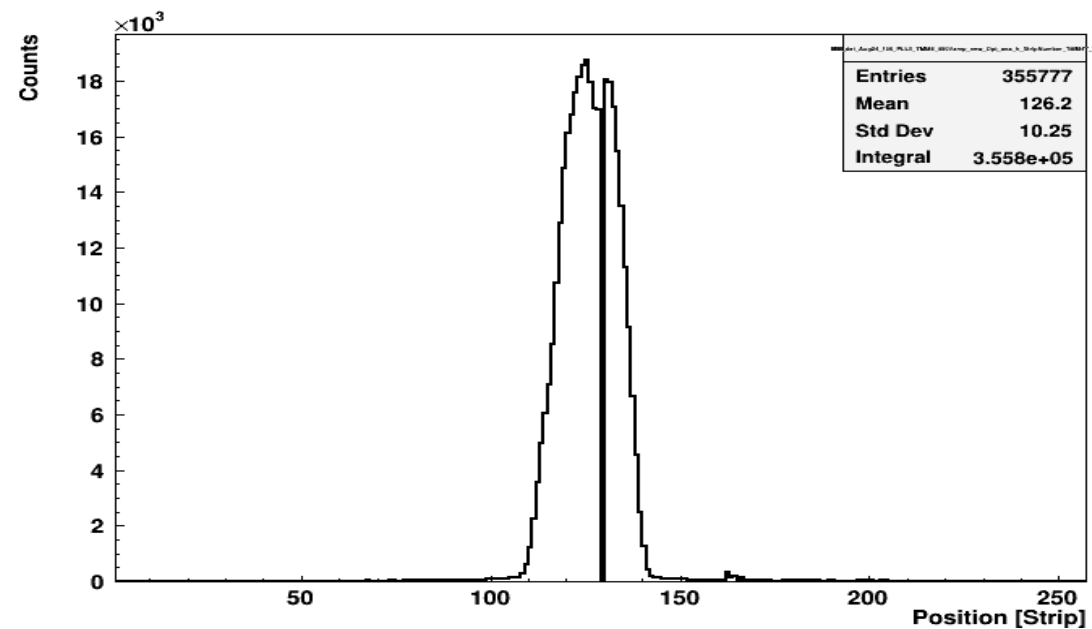
h_StripNumber_TMM4X



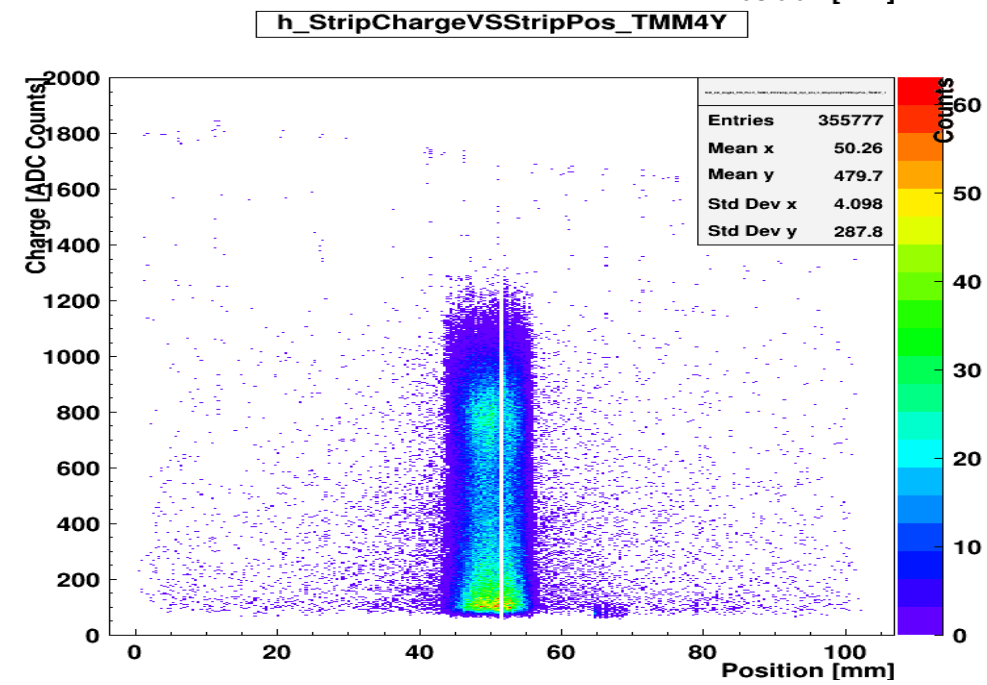
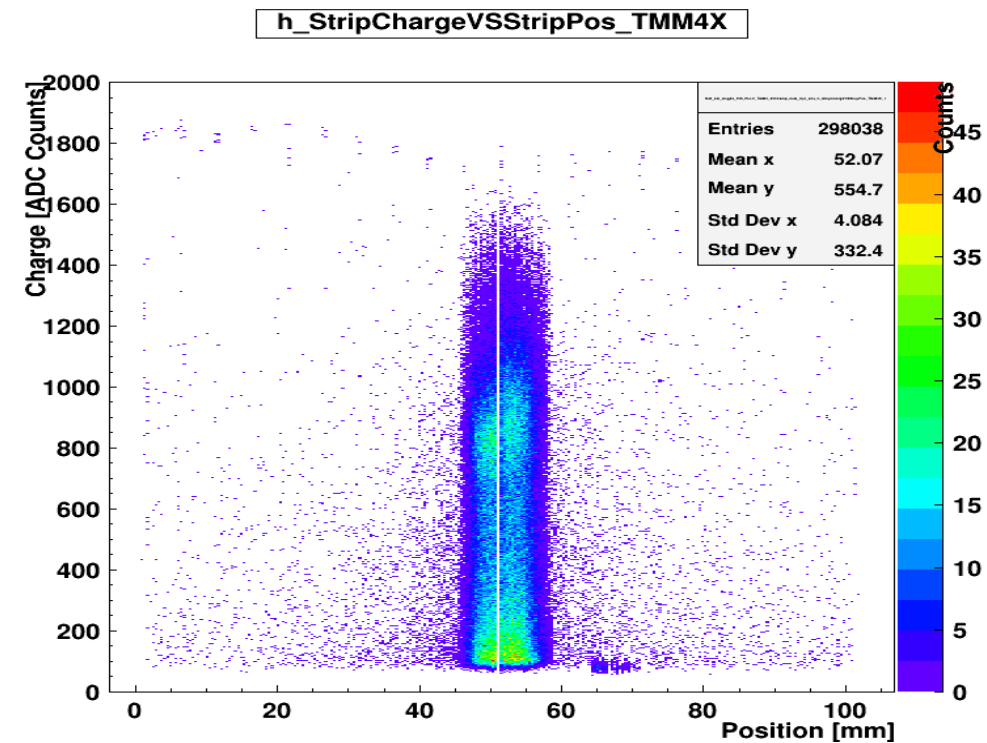
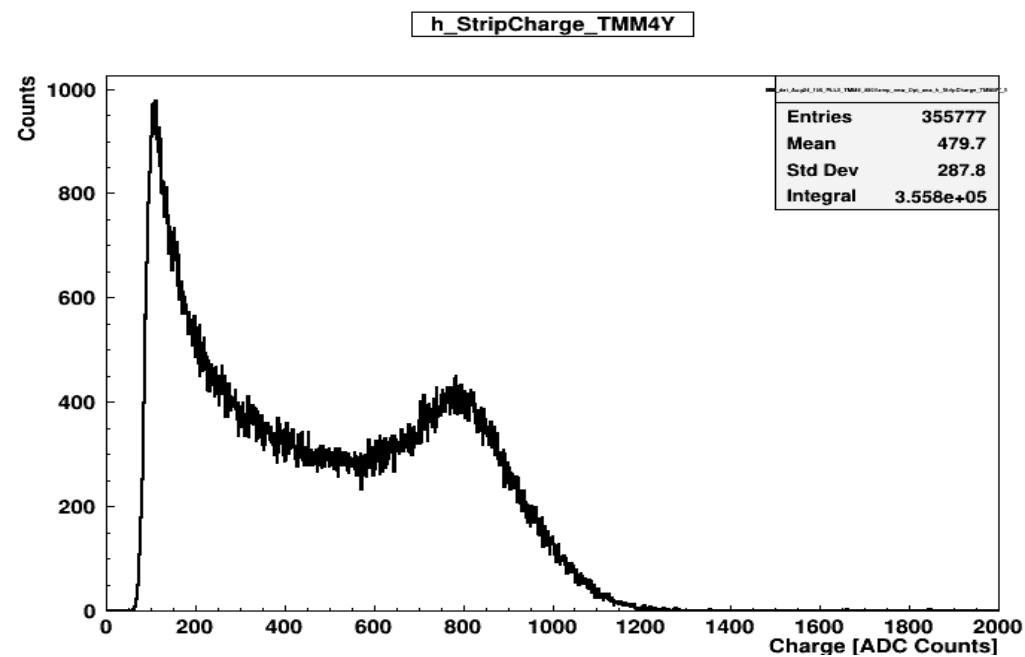
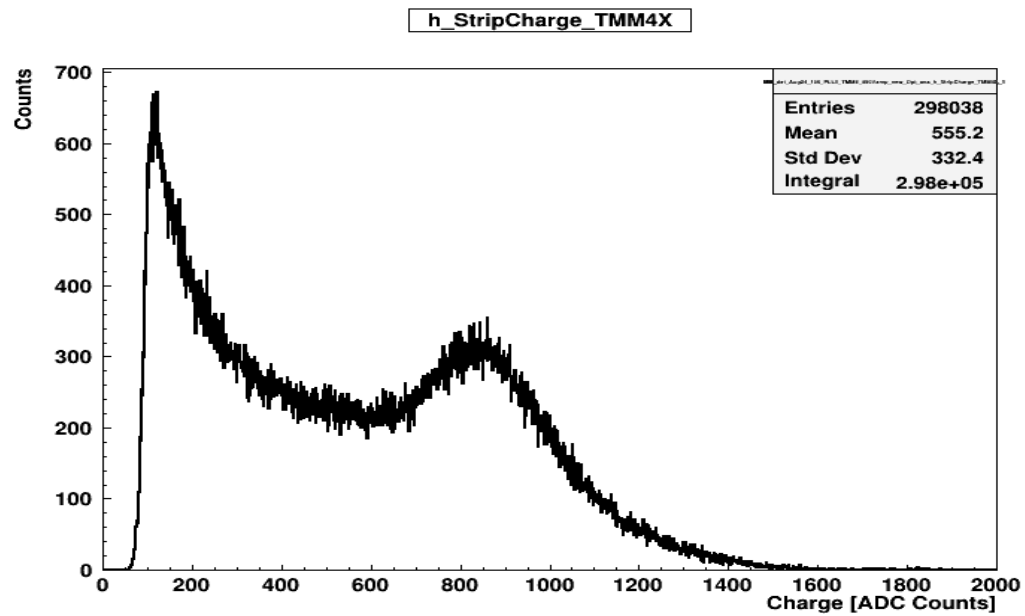
h_ClusterCharge_TMM4Y



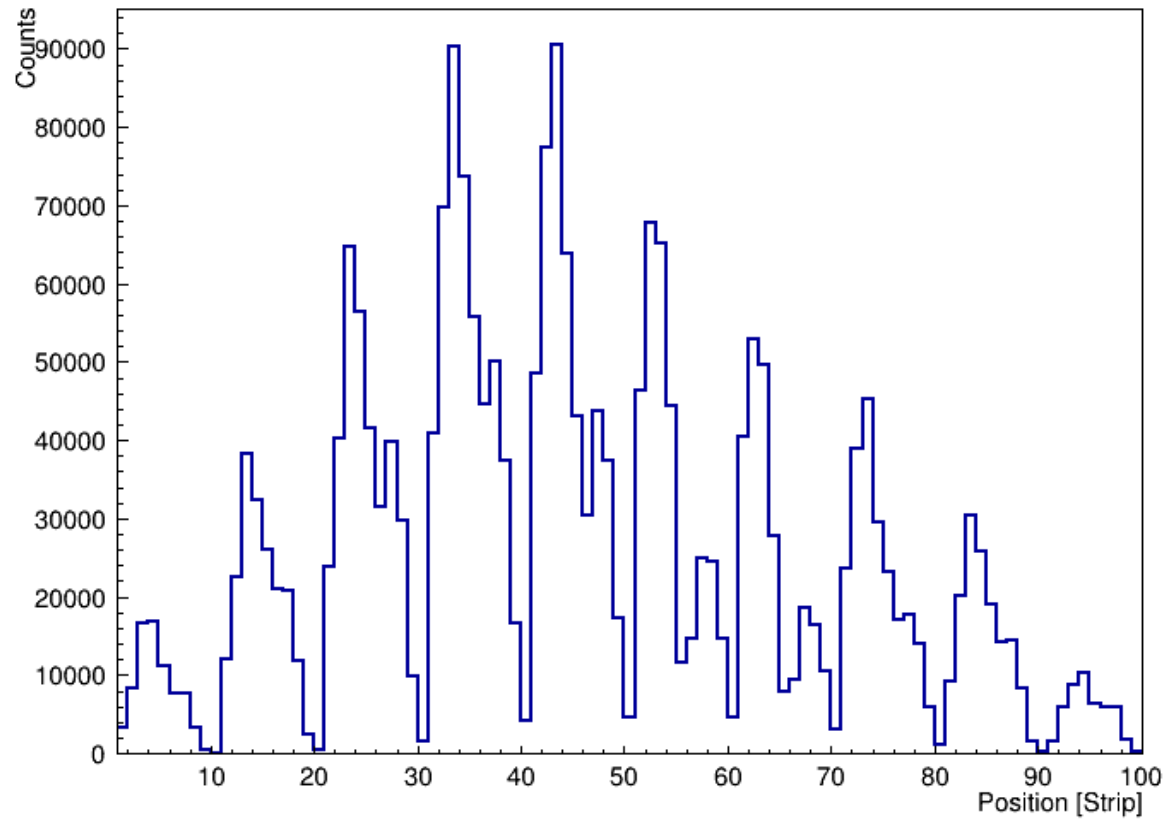
h_StripNumber_TMM4Y



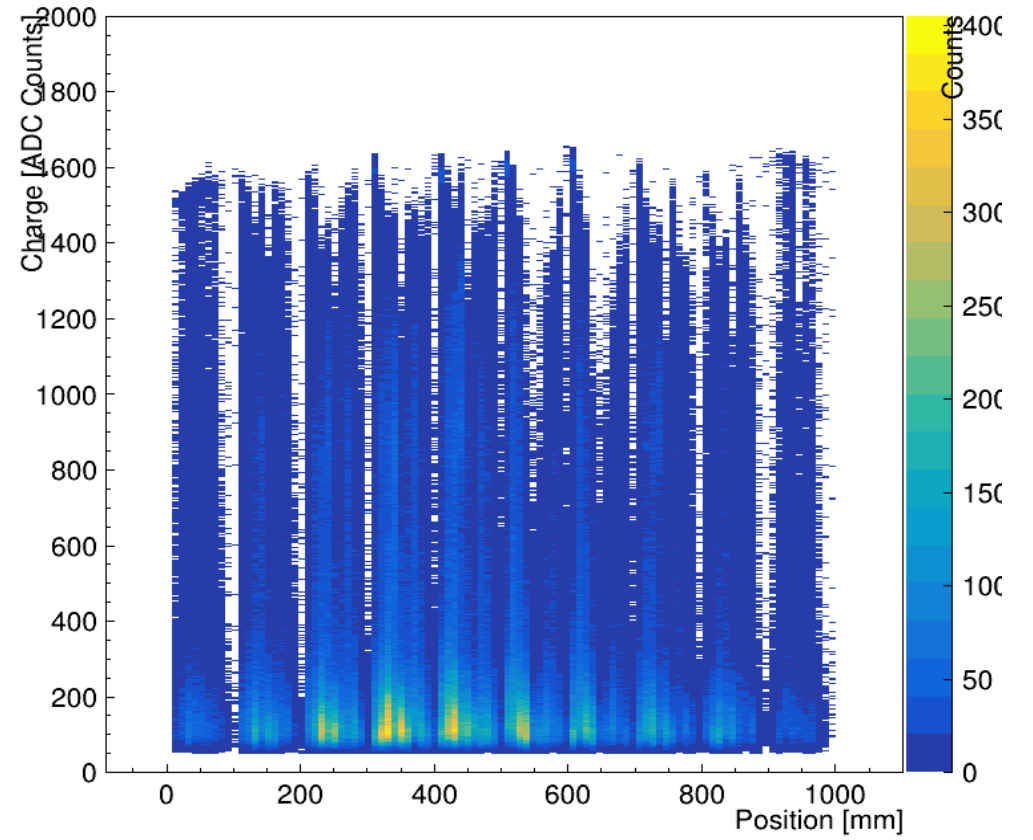
- TMM 4 additional Plots



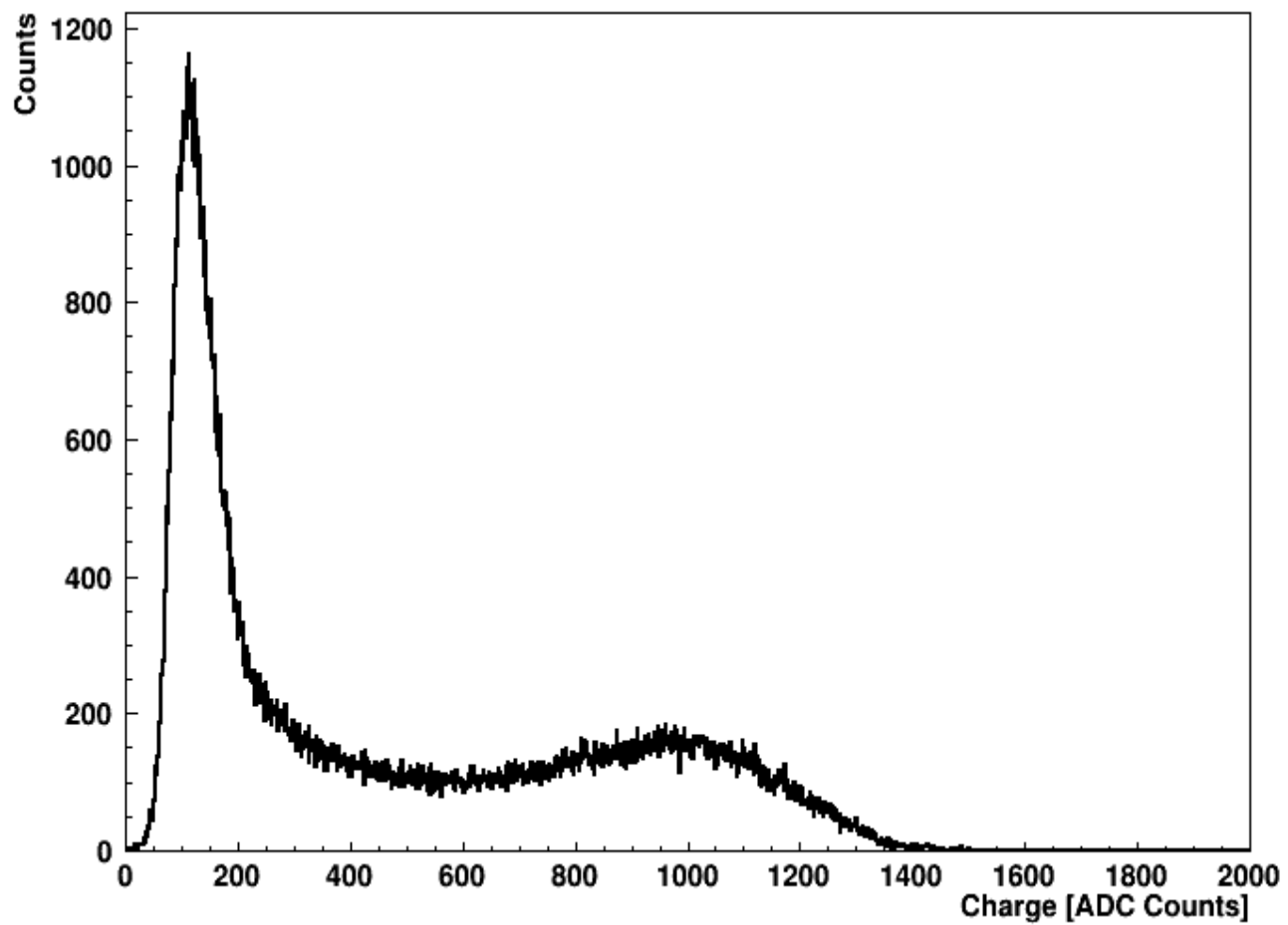
h_StripNumber_CuBlock_PAD2



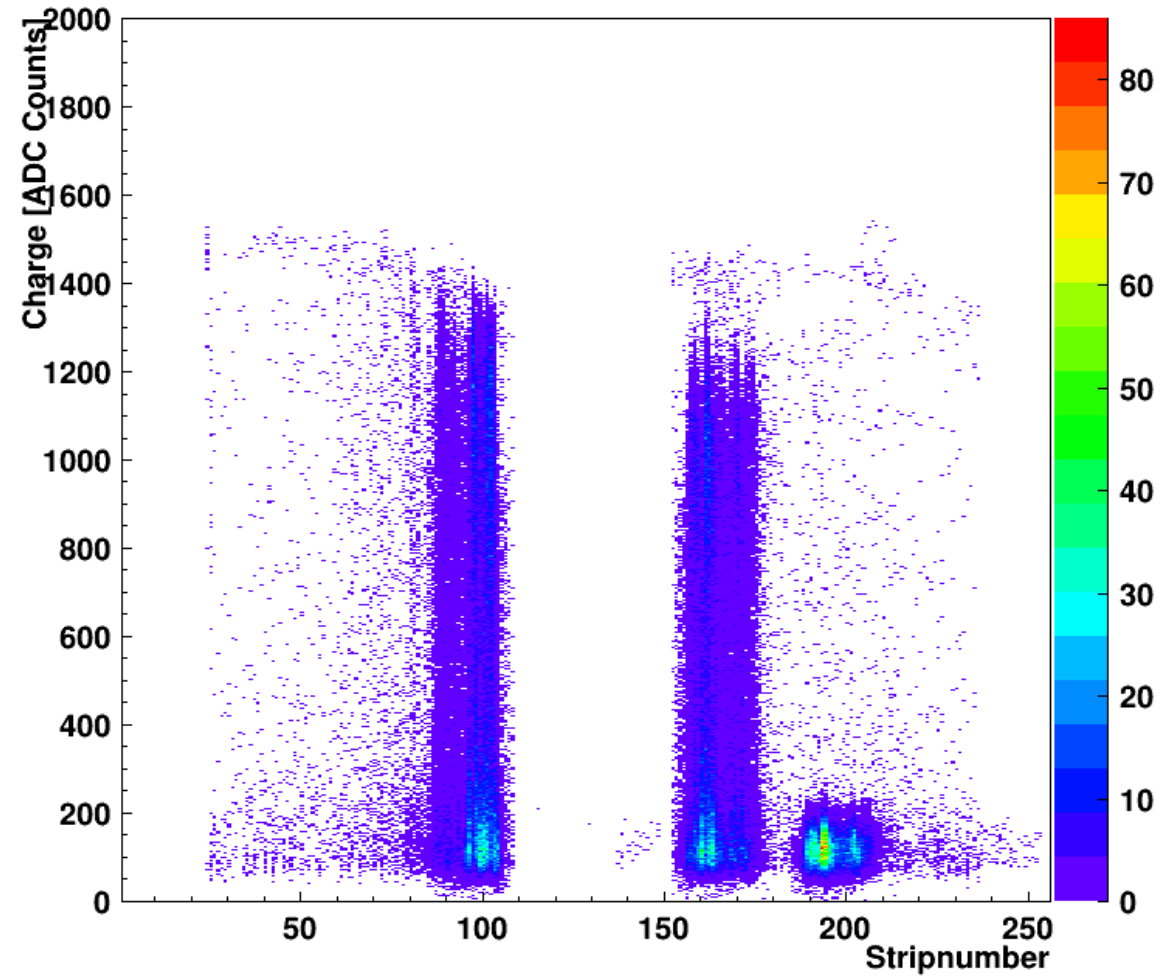
h_StripChargeVSStripPos_CuBlock_PAD2



- PAD1 additional Plots with Fe55 at Upper Left Corner

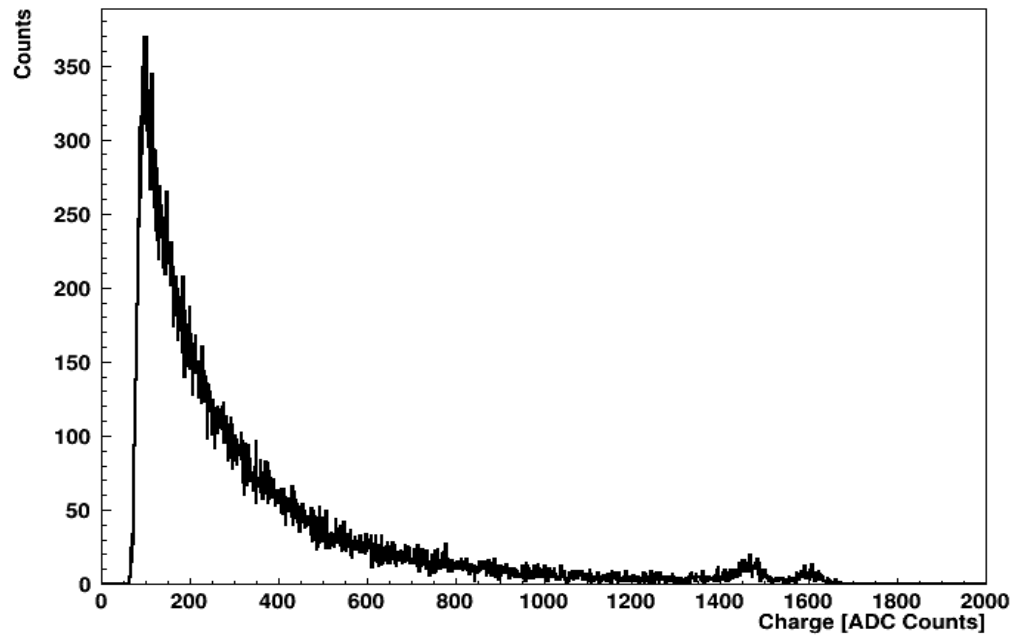


Strip Charge

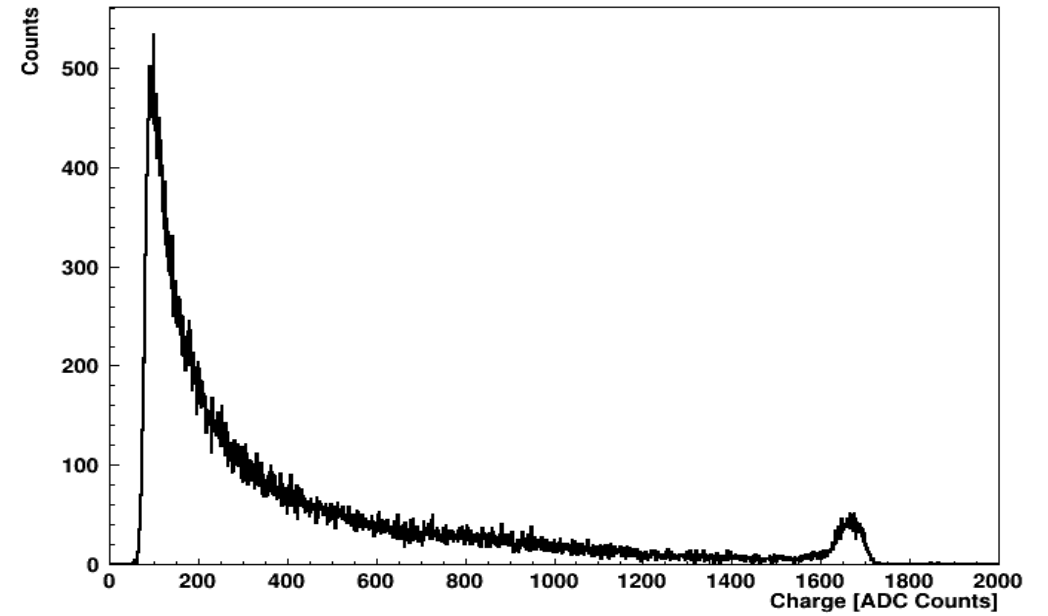


Strip Charge Vs Strip Position

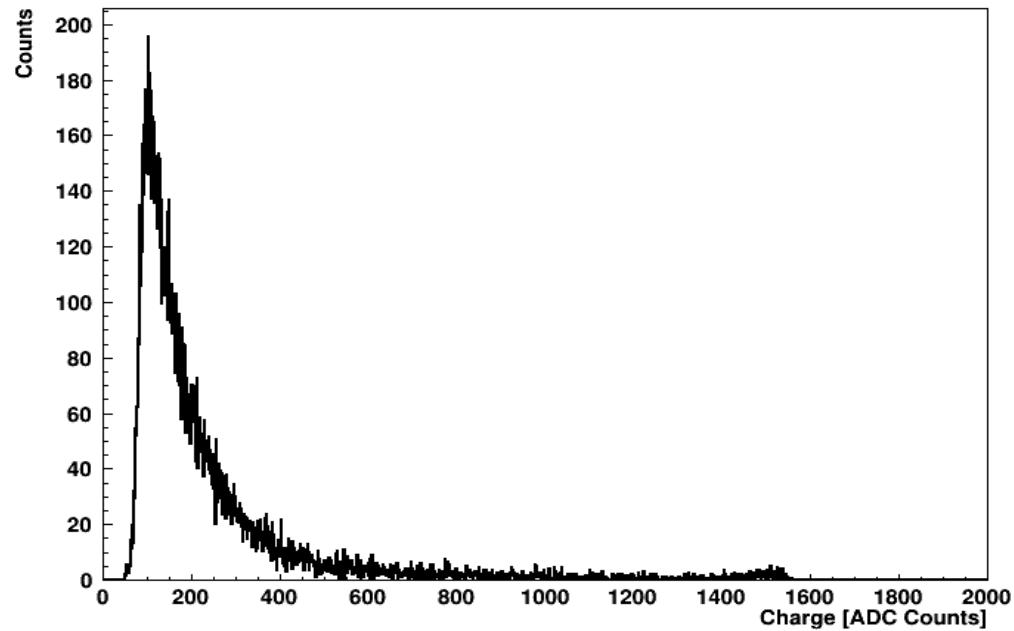
TMM 1X



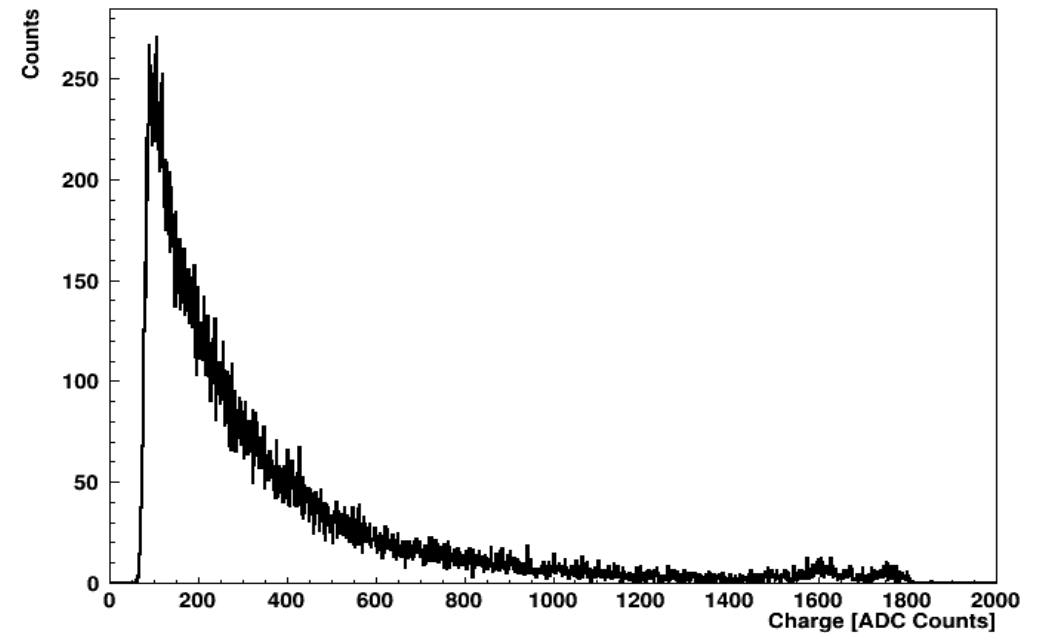
PAD 2



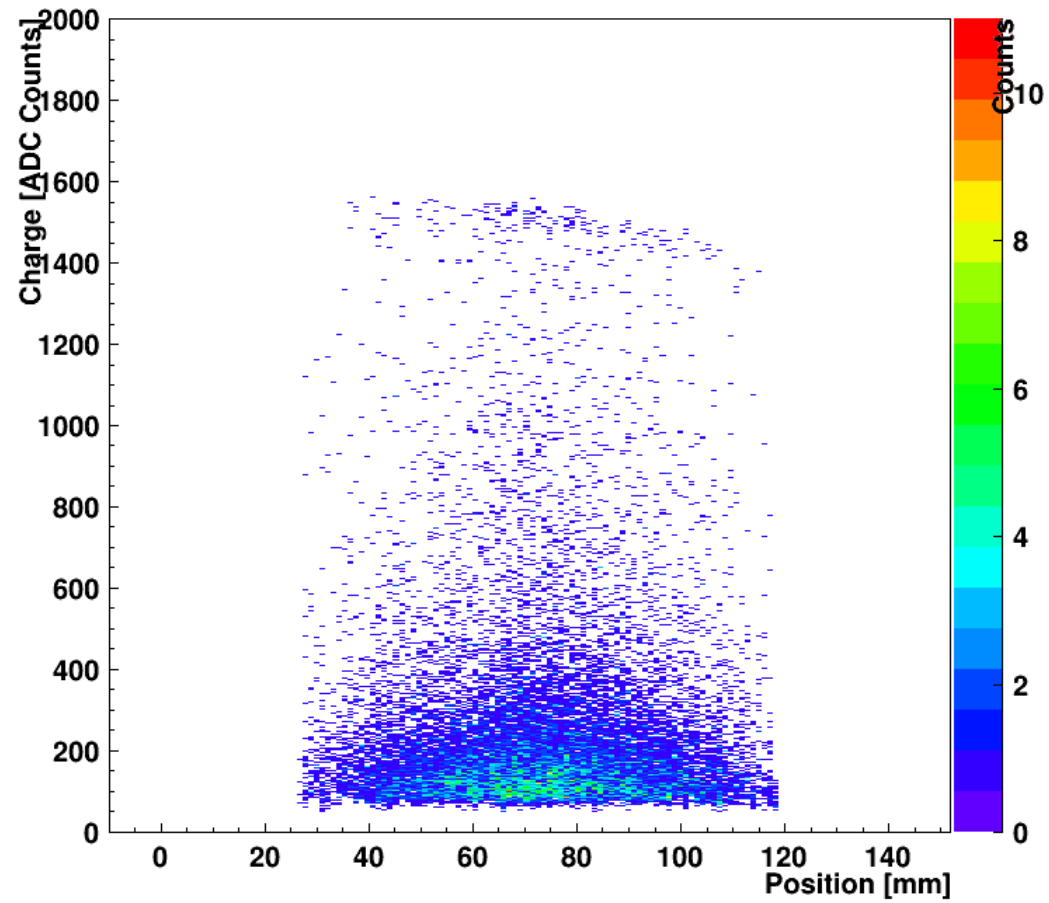
PAD 1X



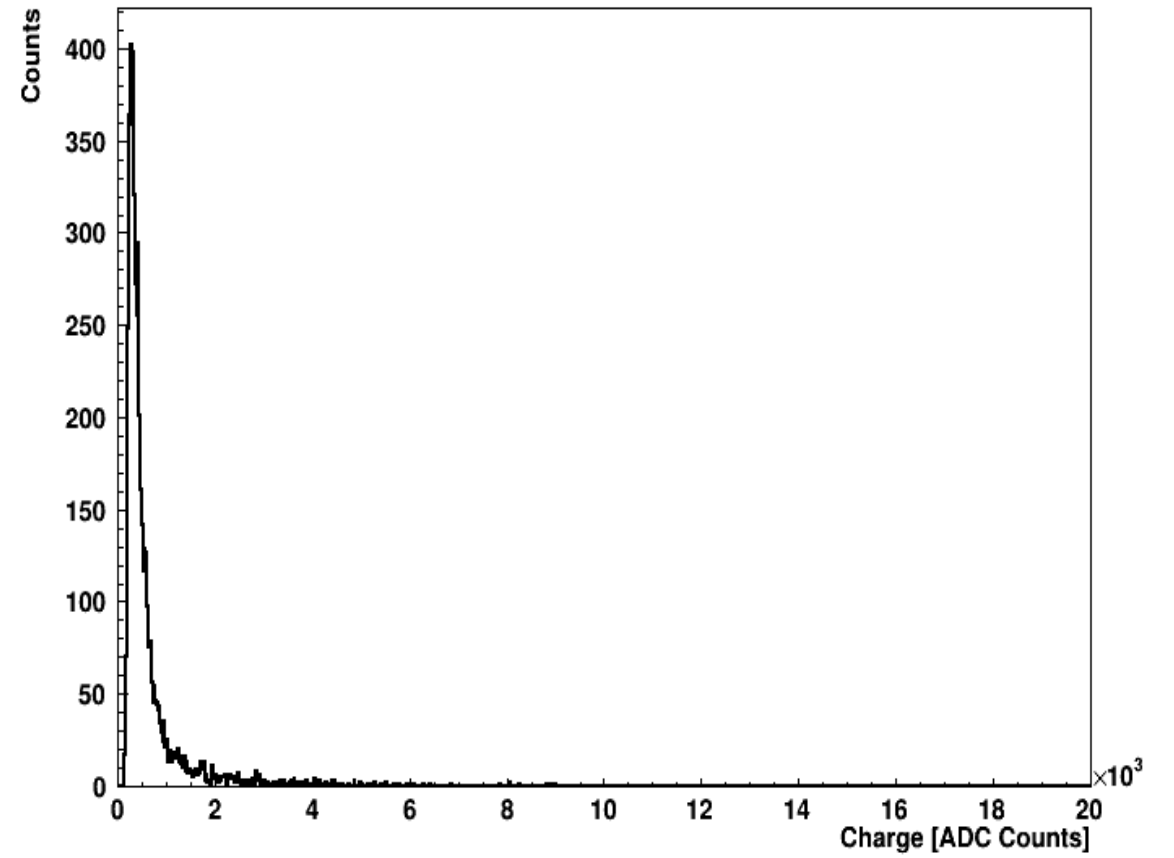
TMM 2X



- PAD1 additional Plots with Muon measurements



Strip Charge Vs Strip Position PAD 1X



Cluster Charge PAD 1X