



Istituto Nazionale di Fisica Nucleare
LABORATORI NAZIONALI DI LEGNARO



Laboratorio Gamma UniBo – INFN

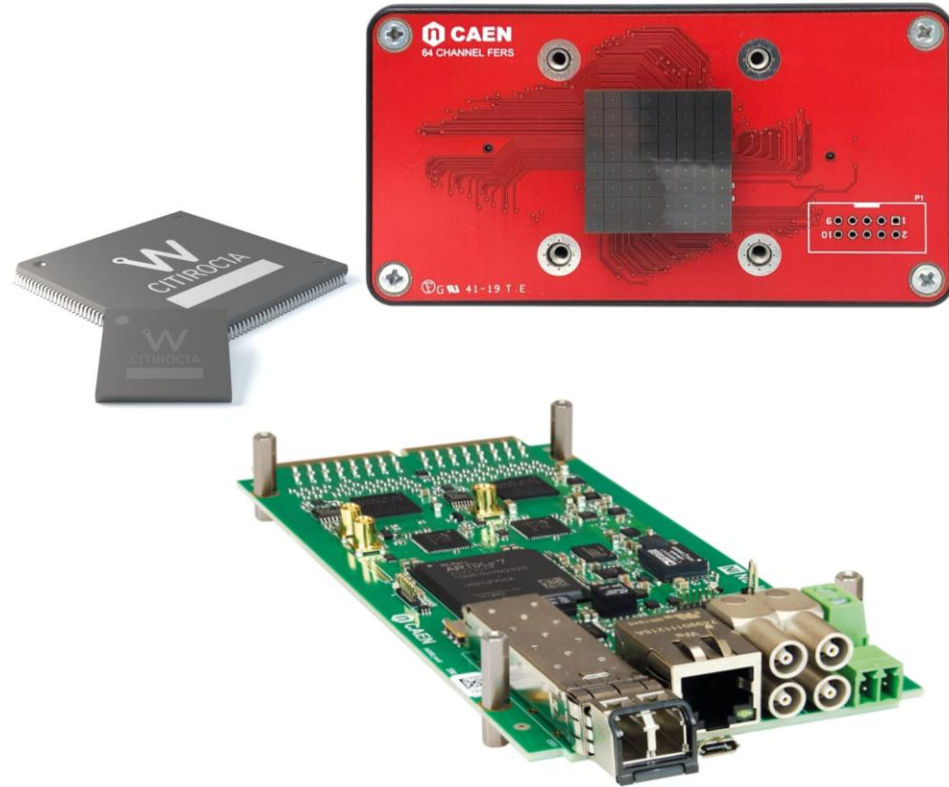
WP3 state of art on FERS + SiPM + GAGG(Ce)

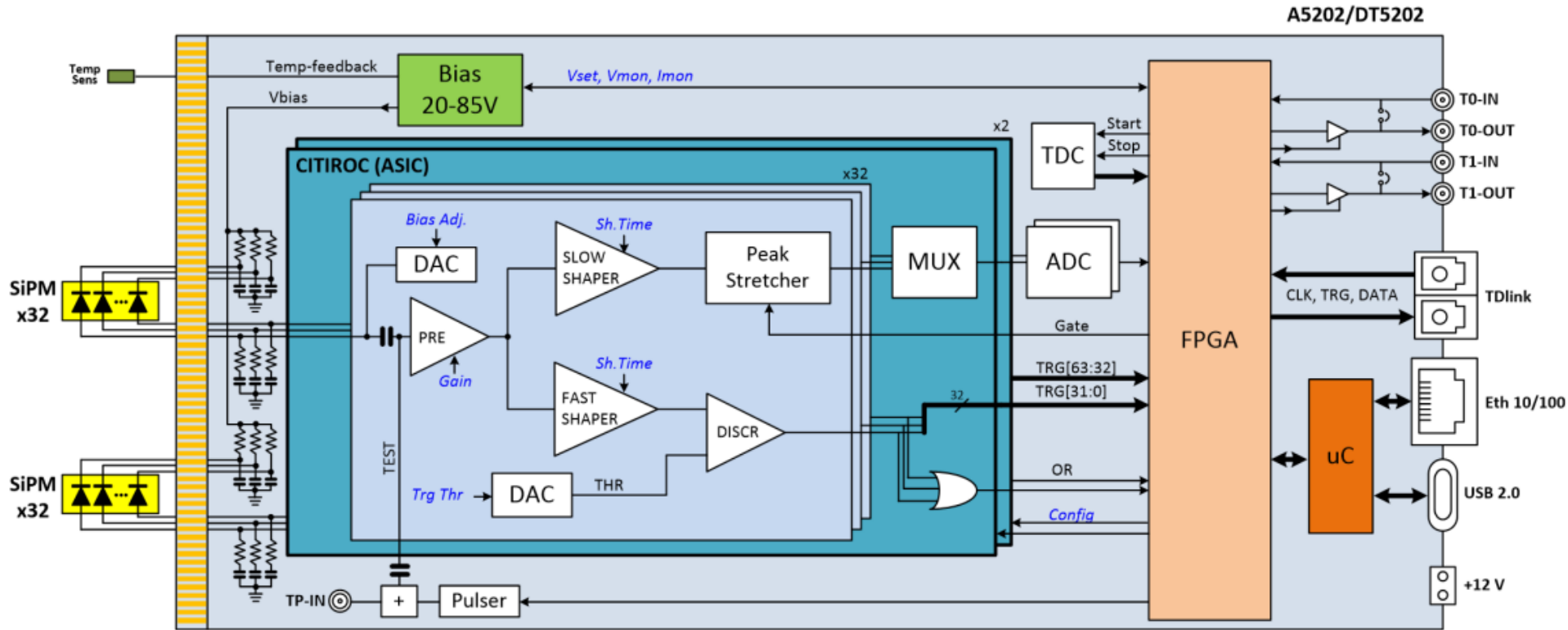
E. Borciani, S. Spadano

October 4th, 2024

The readout system we are using is the A5202/DT5202, belonging to the FERS-5200 family, it's based on Citiroc-1A ASICs and designed for the readout of Si-PMs. This board has 64 readout channels consisting of:

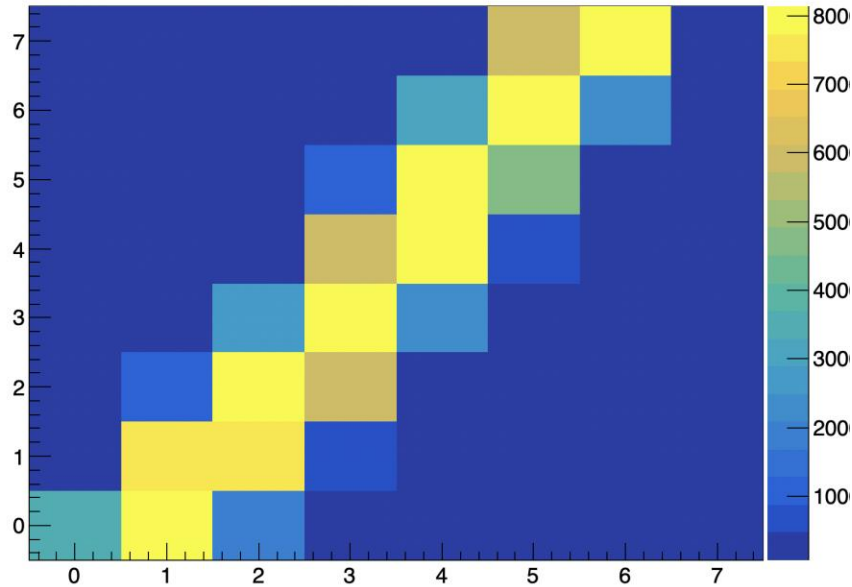
- pre-amplifier, shaper, peak sensing and discriminator;
- multiplexed ADC (analog to digital converter);
- FPGA for acquisition management and readout interfaces (USB, Ethernet).



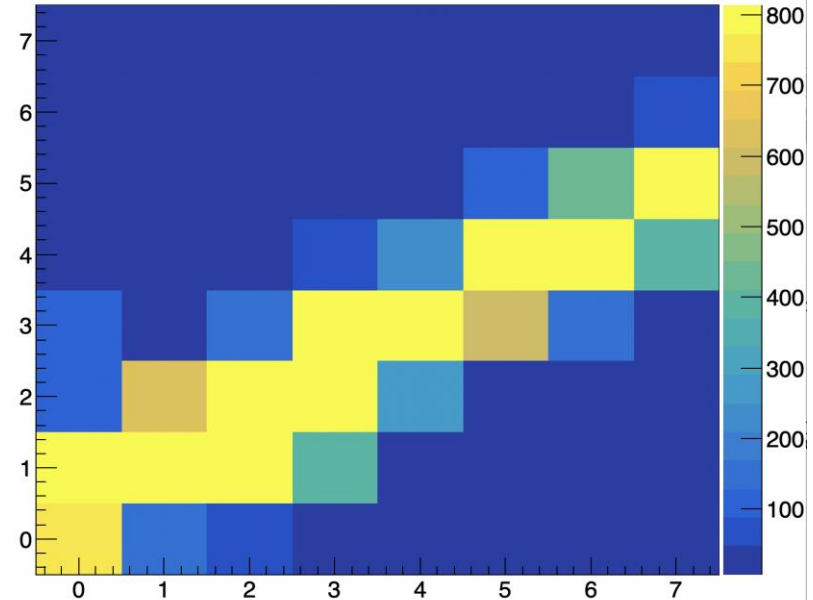


Muons Detections

MapLG



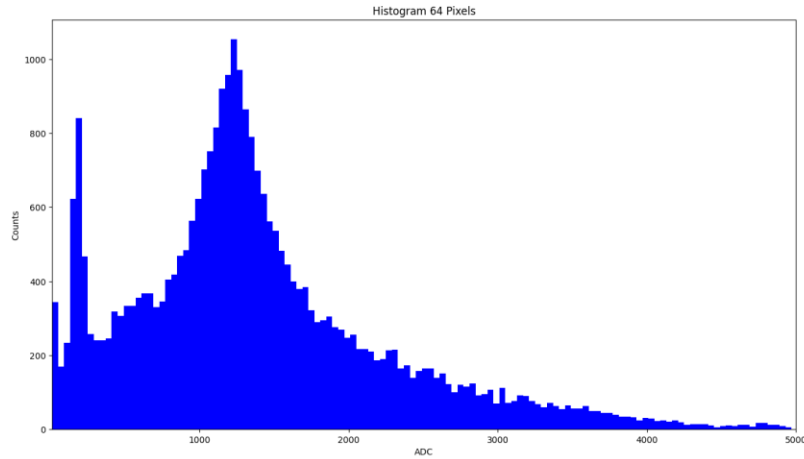
MapLG



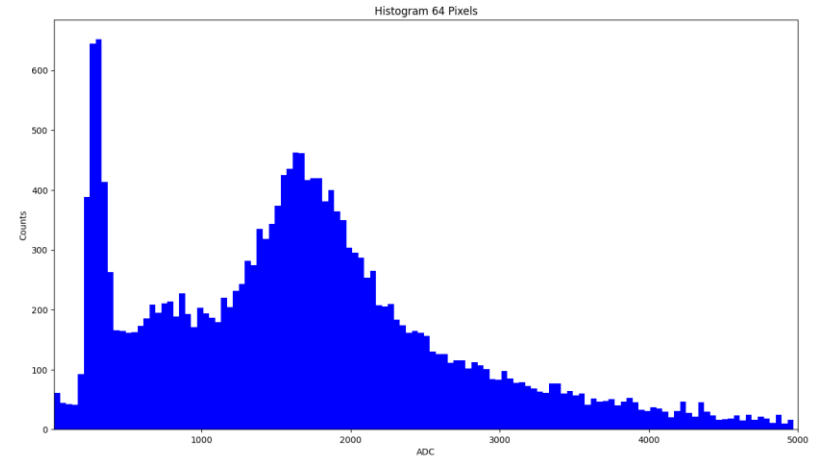
Plot obtained by Carla Sbarra

Ba-133

64 Channels – 1 Ch Trg



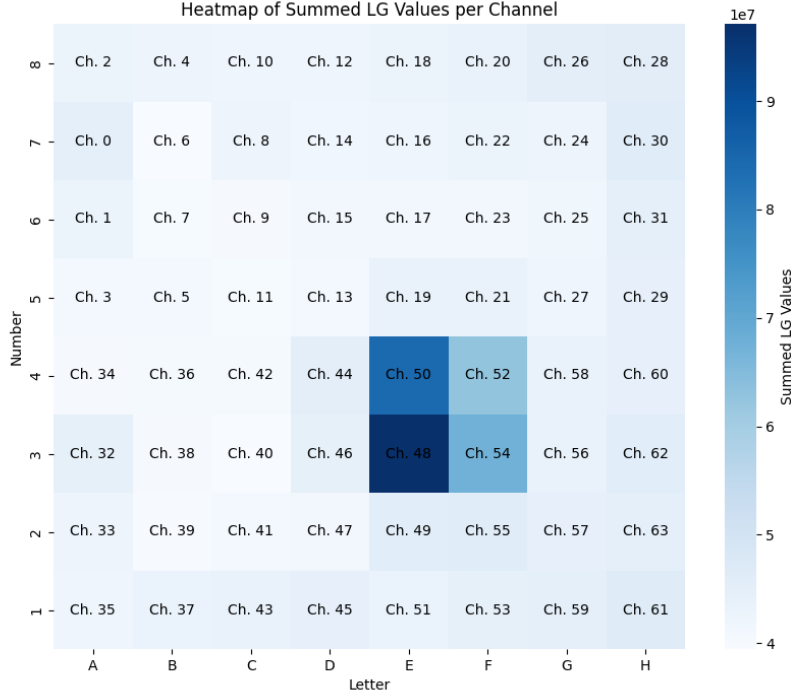
Gain 35 Thr 185



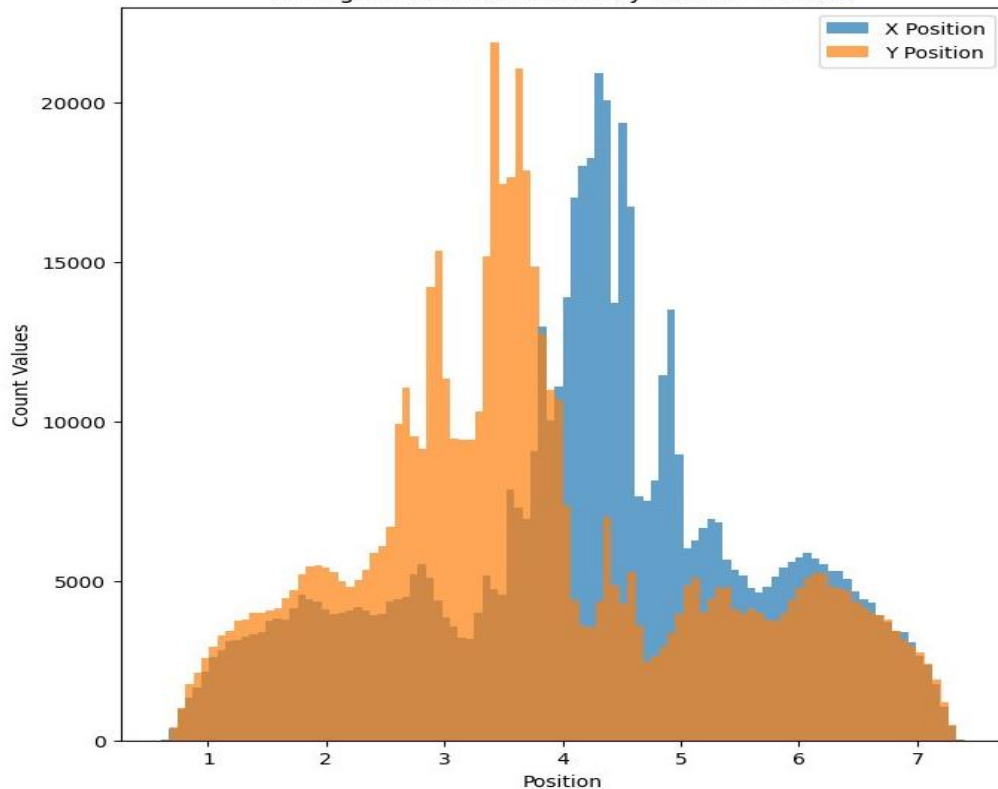
Gain 35 Thr 200

Imaging – Working on it

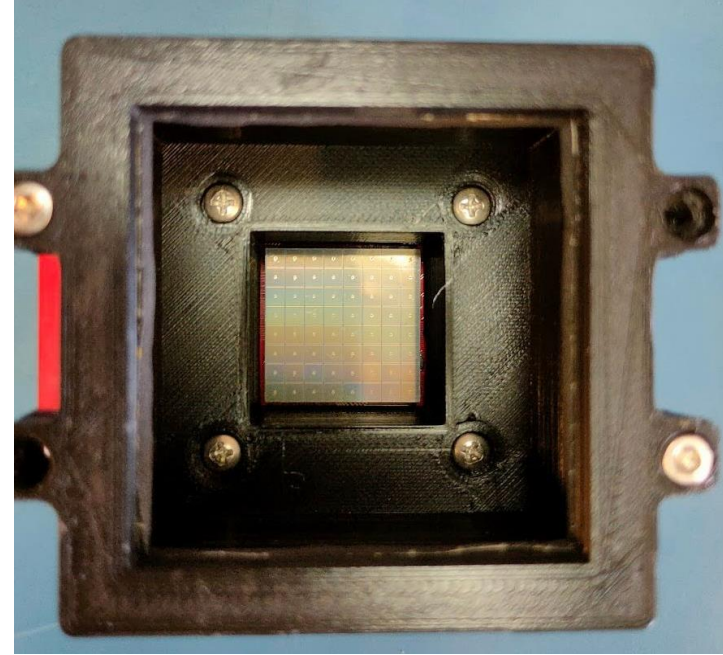
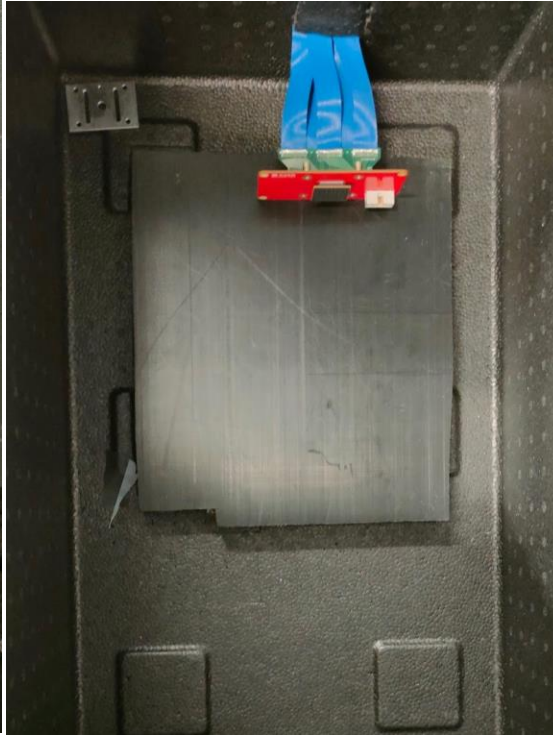
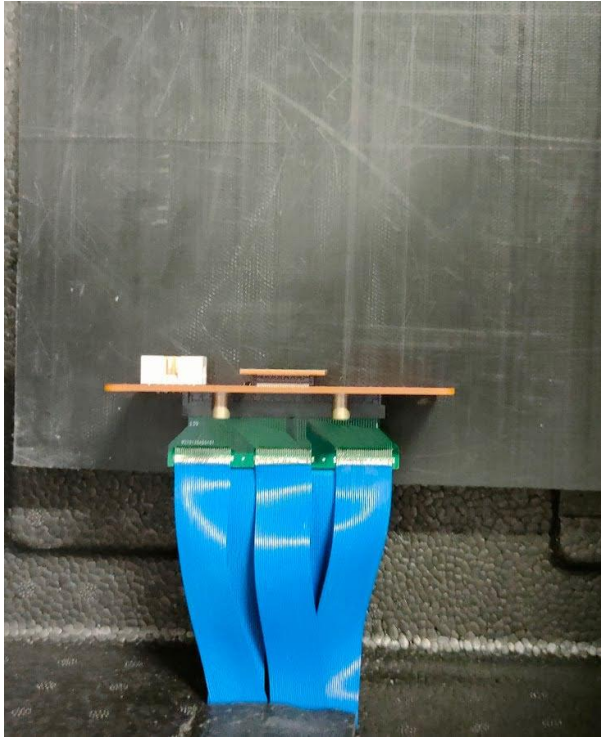
Heatmap of Summed LG Values per Channel



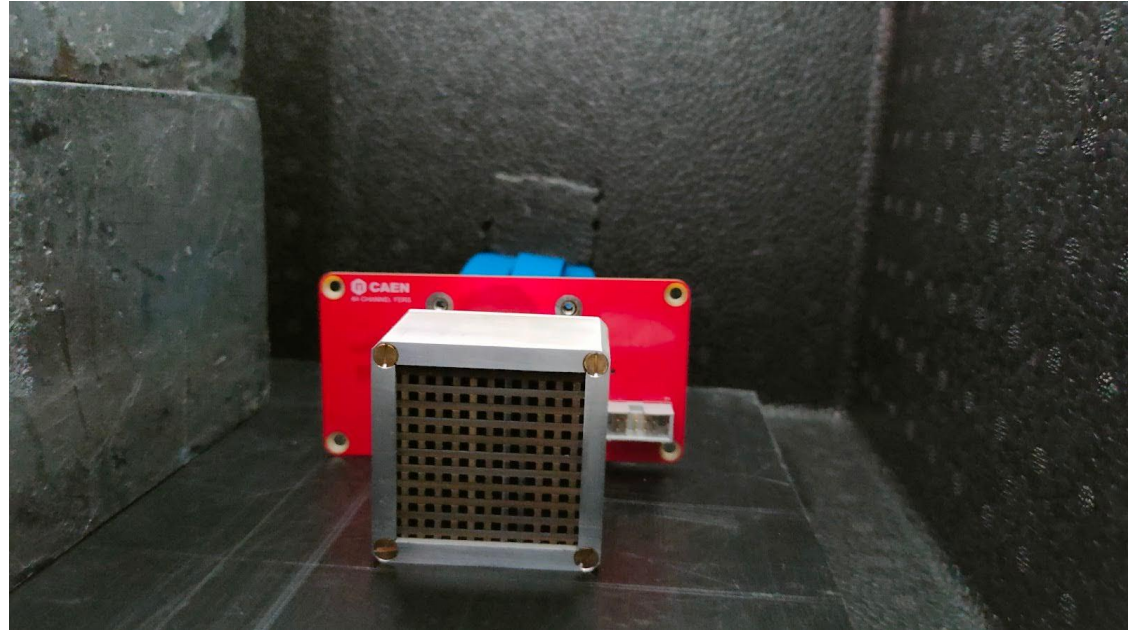
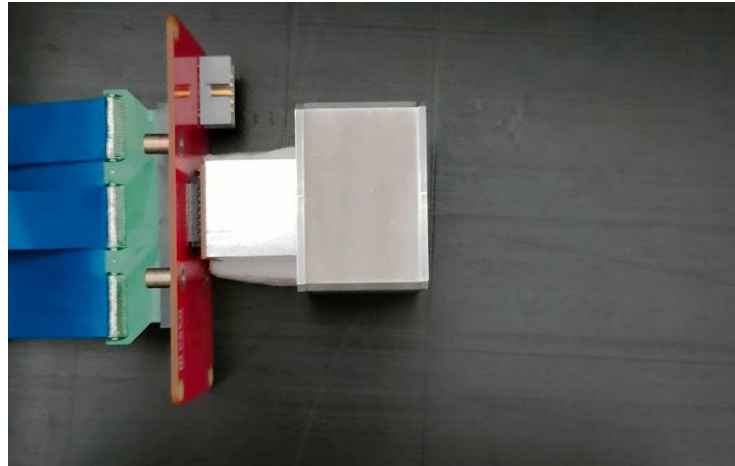
Histogram of Count Values by Position Y and X



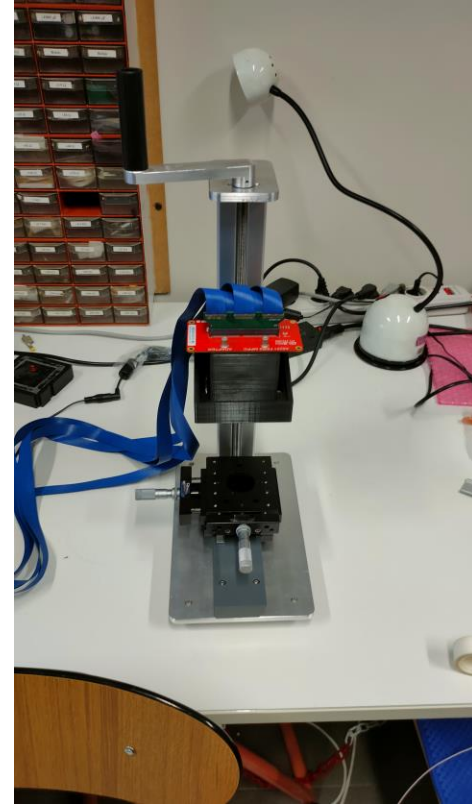
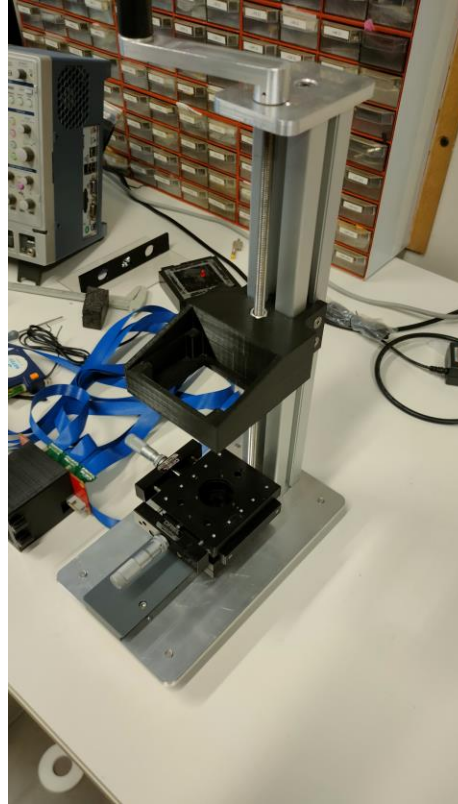
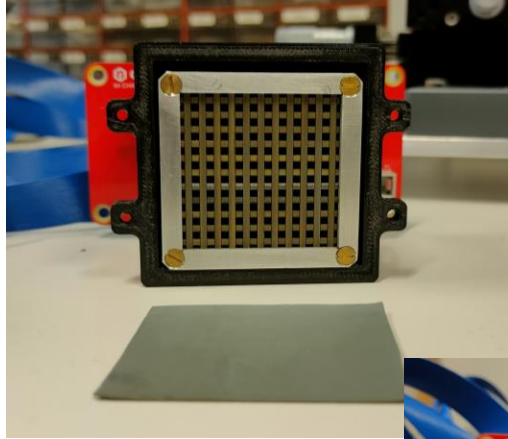
Setup Integration – SiPM + Margotti Support



Setup Integration - GAGG(Ce) + Tungsten Collimator

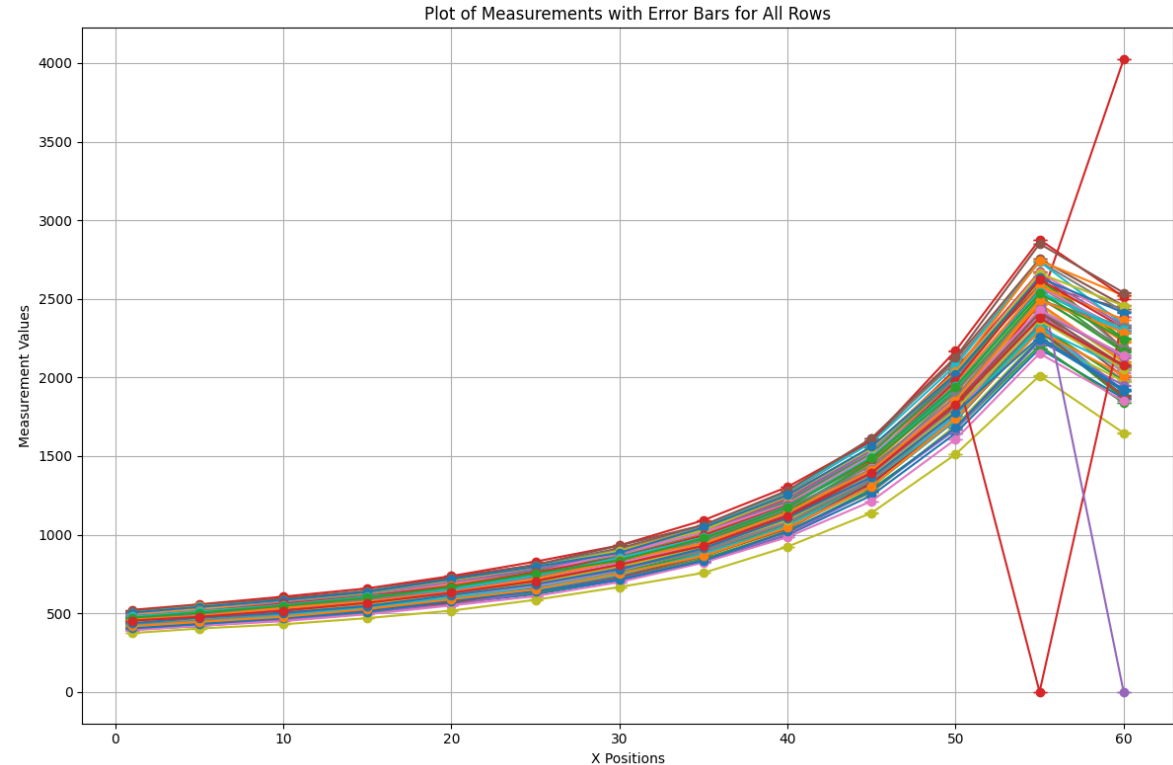


Setup Ready for Ag-111



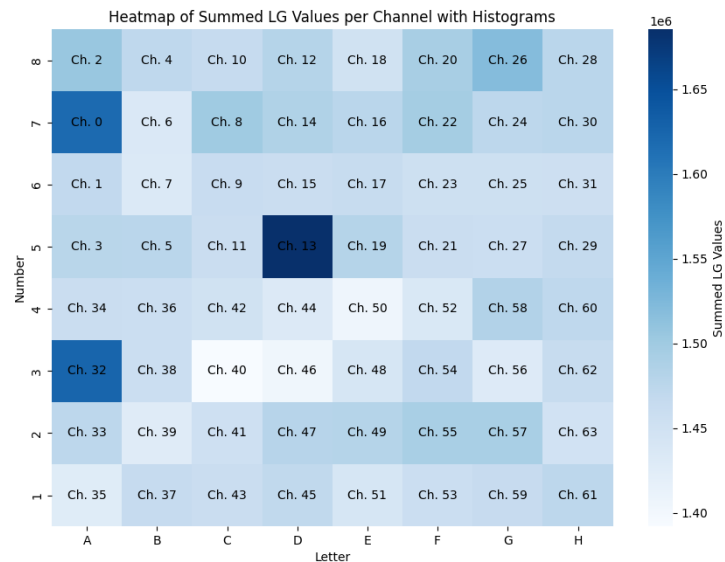
Answer of the Si-PM matrix to a laser pulse, without any correction.

Gain	Mean(ADC)	Variation(%)
20	642,1	16,6
25	717,7	16,9
30	815,5	16,3
35	946,8	17,7



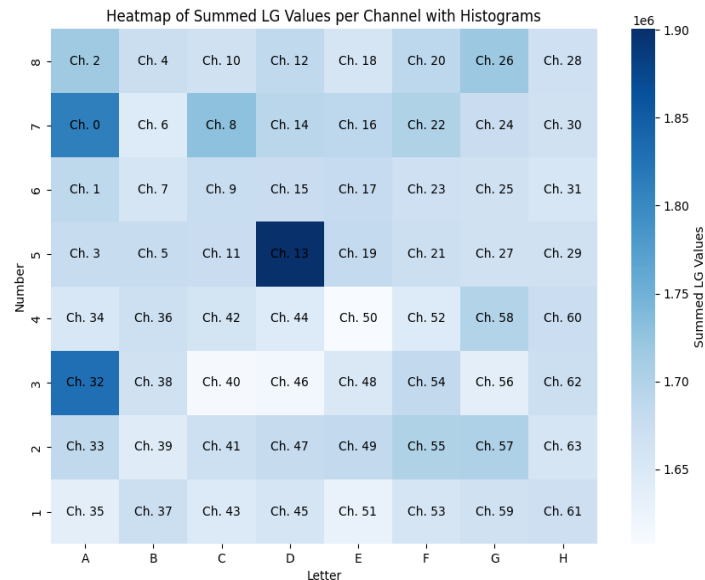
New FERS Noise

Inside Black Box



Mean FWHM (ADC)= $11,2 \pm 0,3$

Outside Black Box



Mean FWHM (ADC)= $9,9 \pm 0,2$

Setup Acquisition Ag-111



Future goals and conclusions

- Acquisition of Ba-133 with the new working setup;
- Detailed study of spatial resolution (and comparison with simulation);
- LENA acquisition of Ag-111

