# Results on Target5
# (current status and future developments)

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# Setup for SiPM measurements

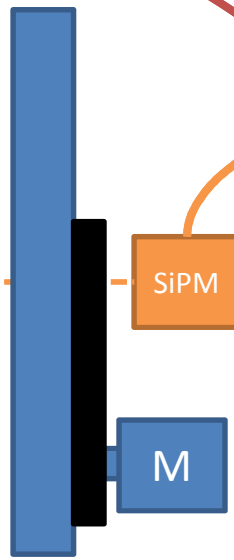
Power supply

Generatore
di impulsi

Pico-ammeter

Driver Led





Led

380 nm

SiPM

Pre-
amp

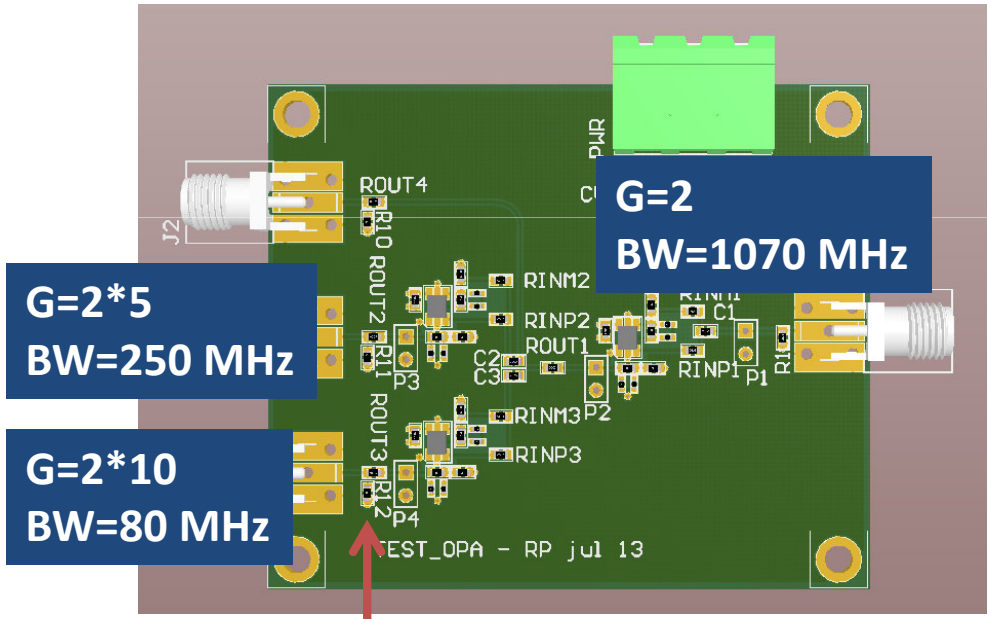
M

ND filter wheel

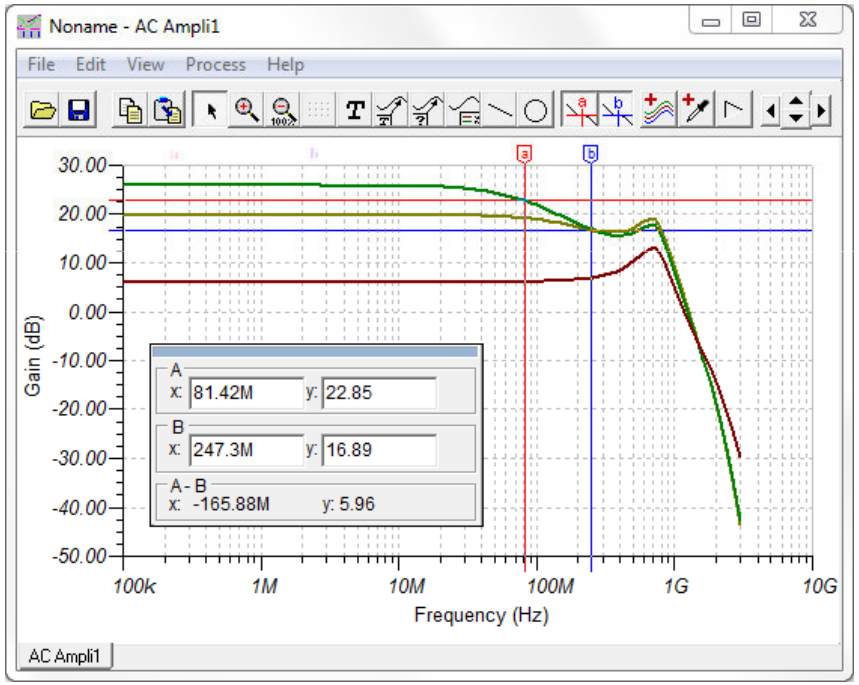
LeCroy SDA3010

Online histograms
Area/max charge measurement

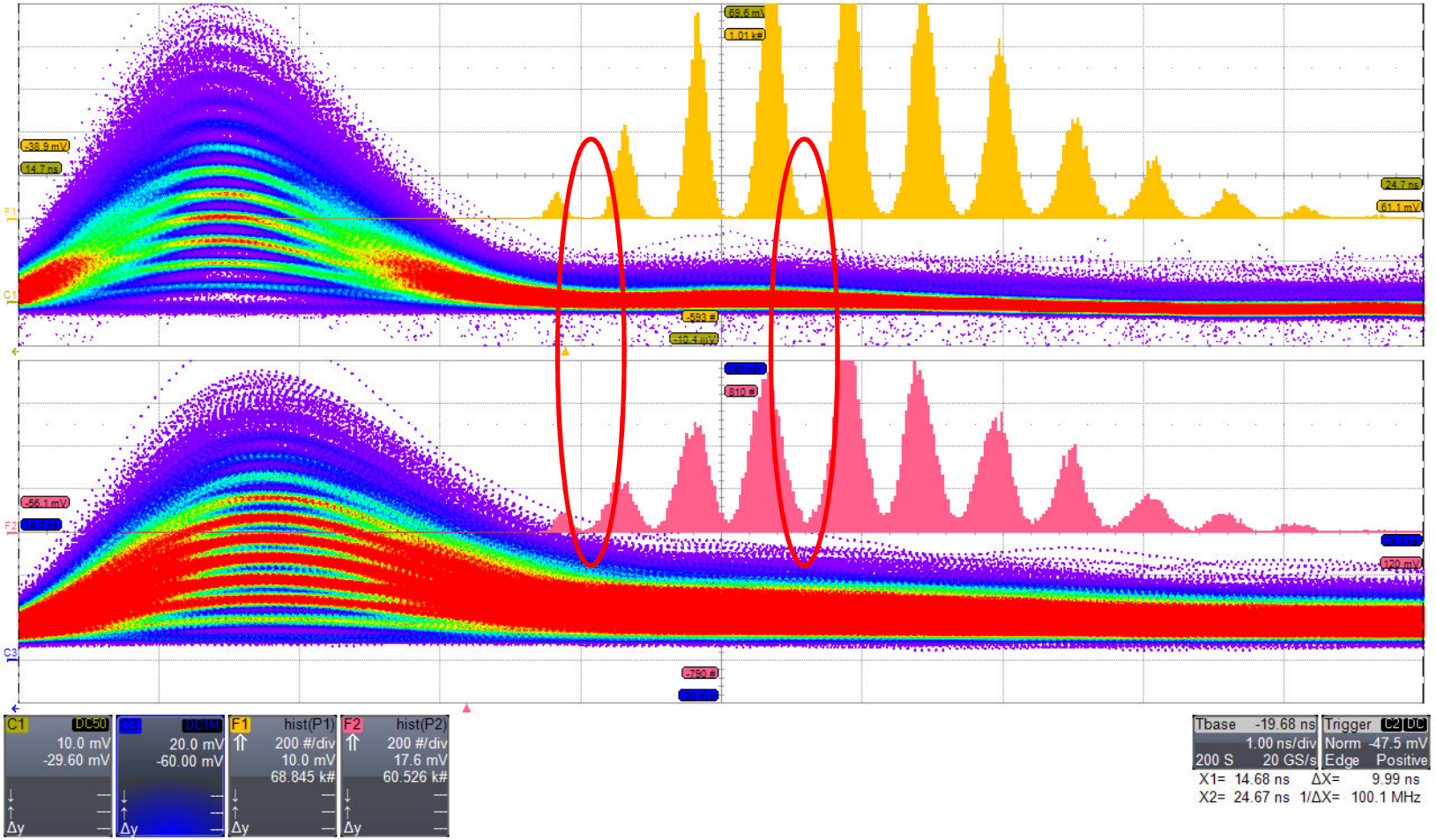
# Preamplifier




High Pass filter
$f_c$~90 MHz



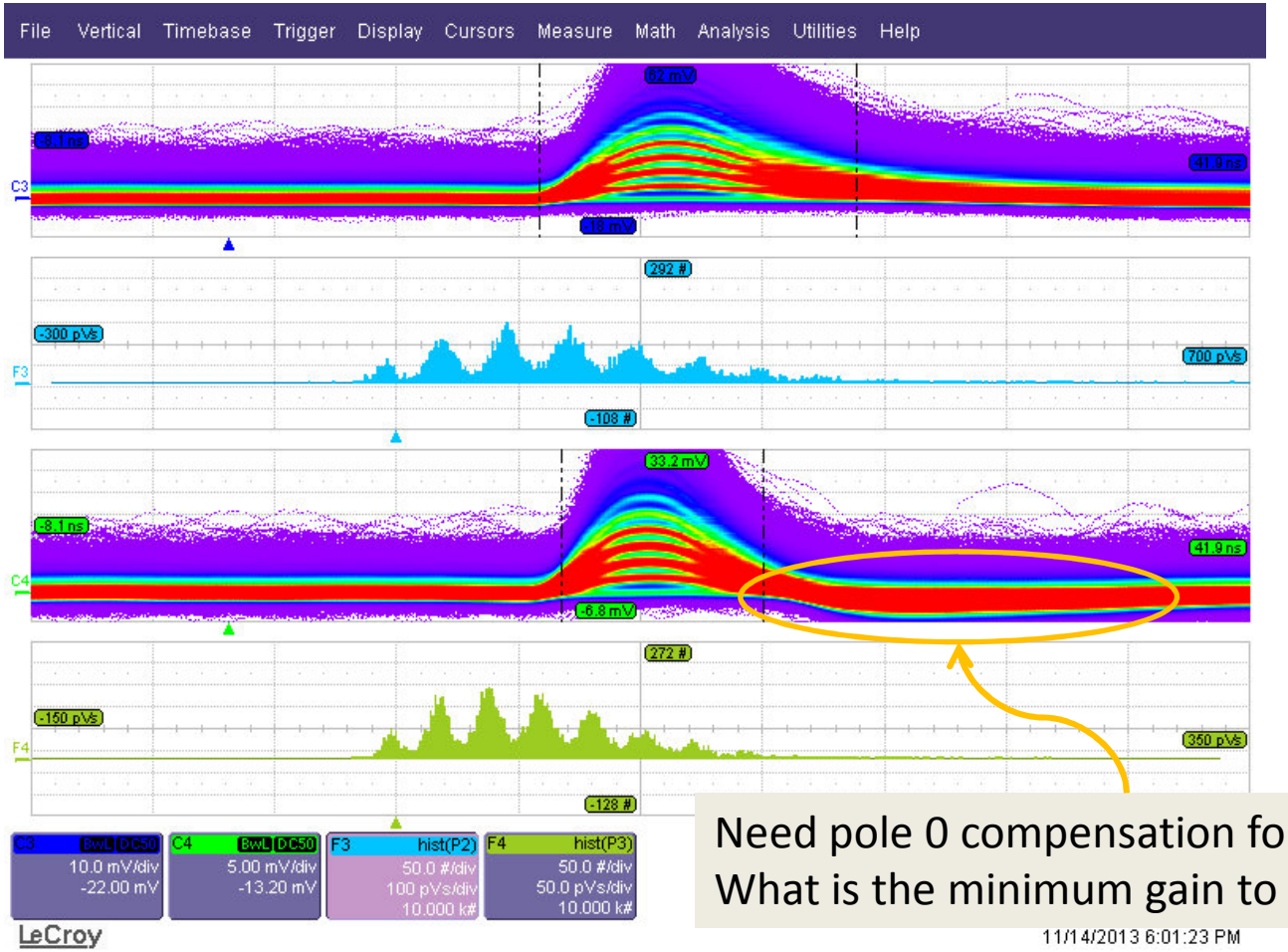
# Comparison SiPM 1x1mm$^2$ NUV4
# HP filter-no HP filter



# NUV 3x3 mm$^2$
# Test on pre-amp gain

G=+25

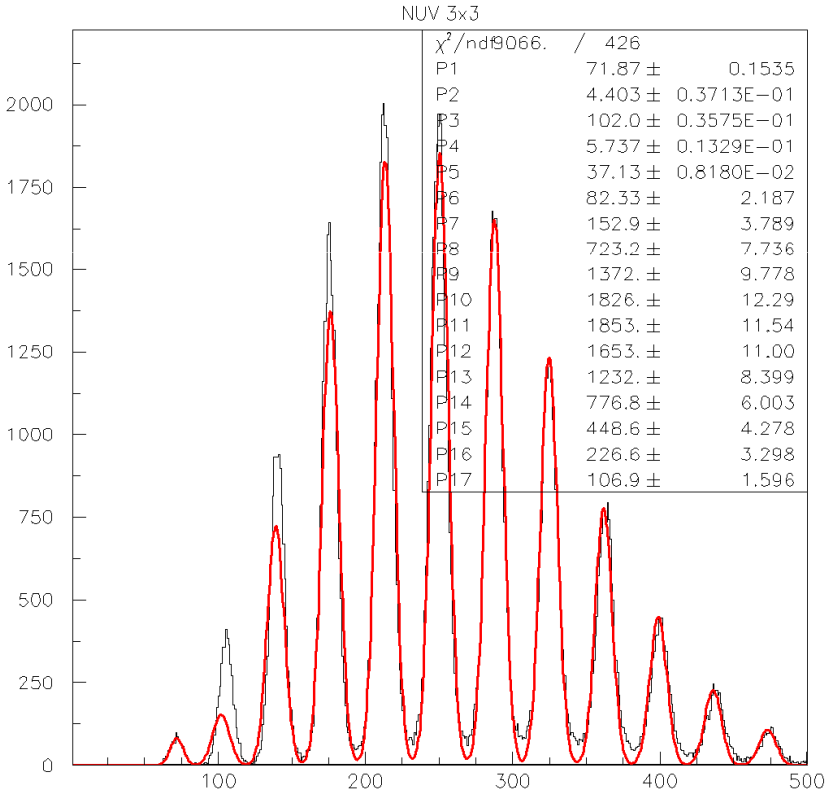
G=+50



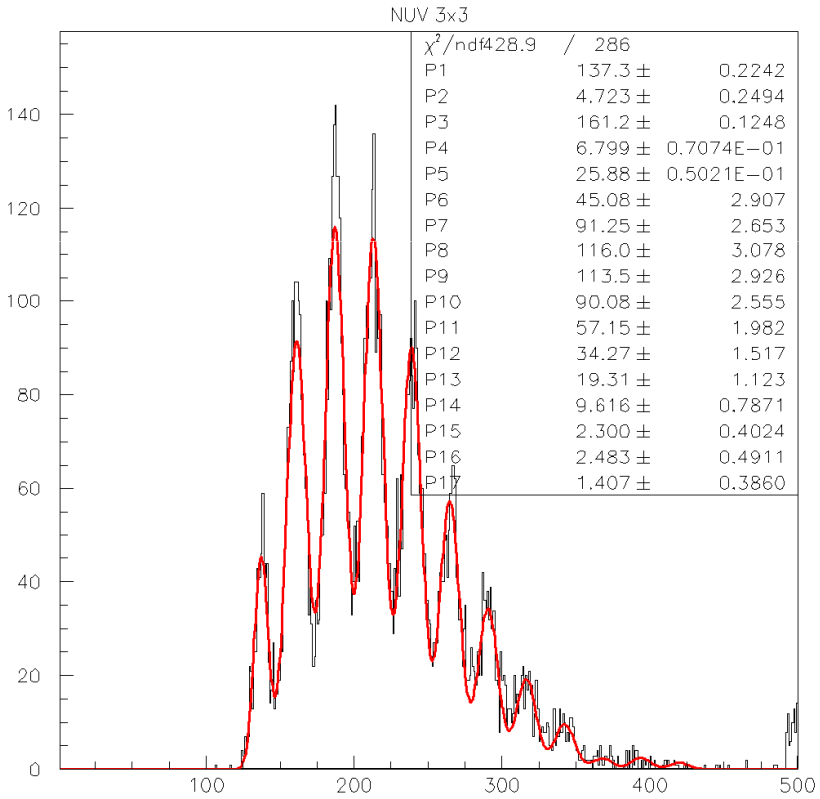

Need pole 0 compensation for high gains?
What is the minimum gain to use? 10?

# Confronto spettro

## NUV4 1x1 mm²

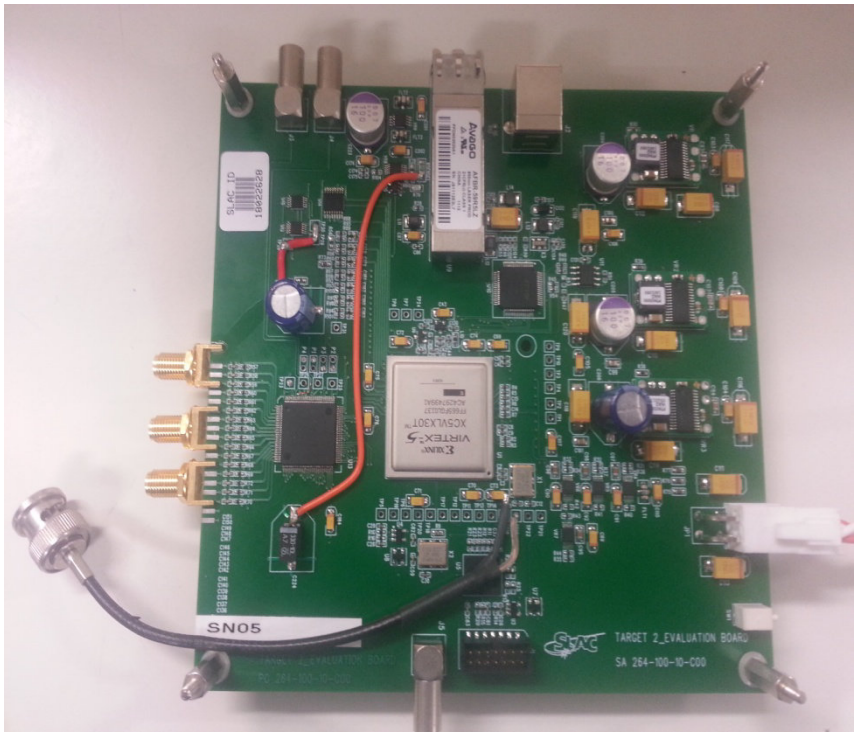



## NUV #8 3X3 mm²

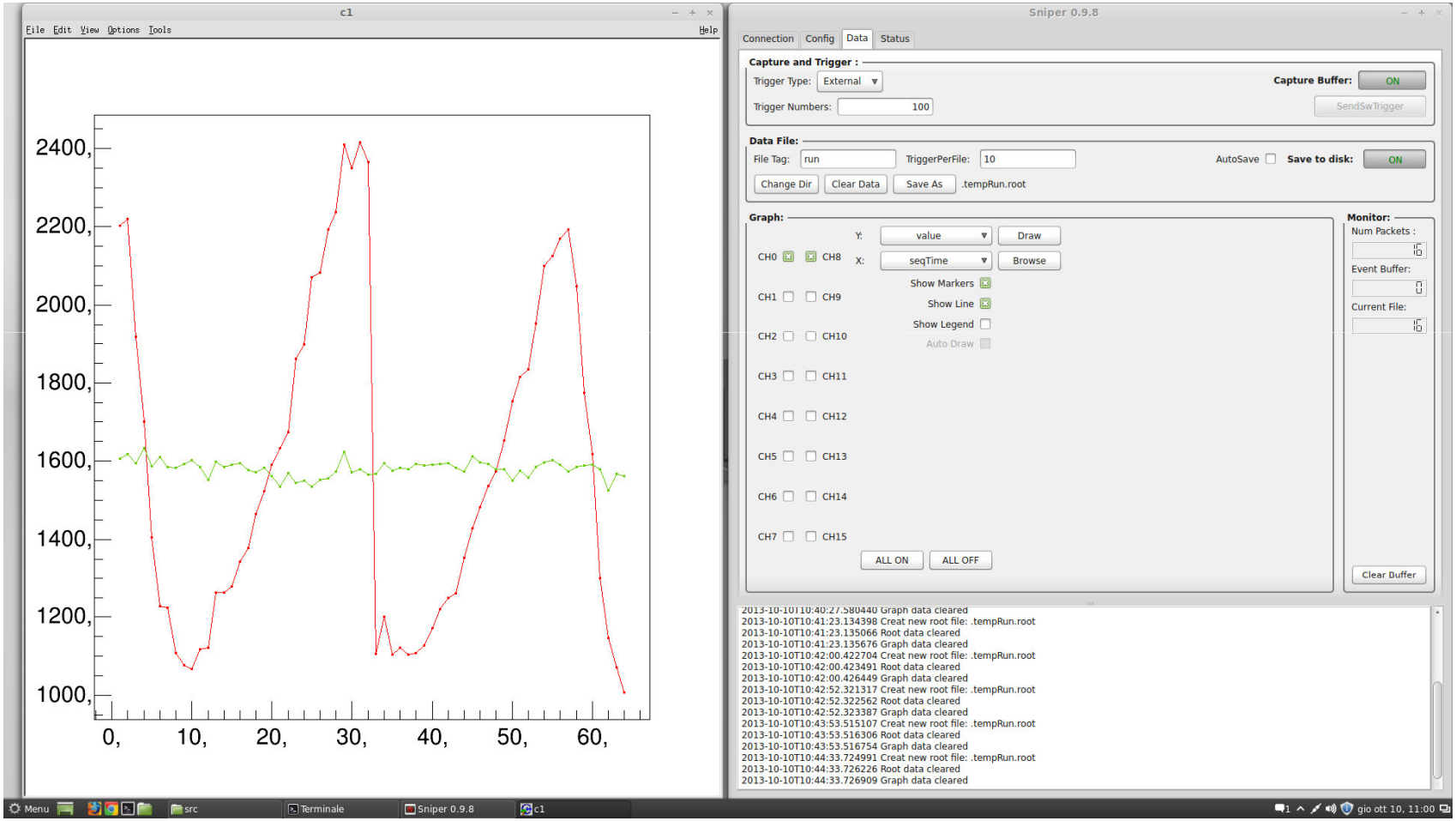


# Target5 Evaluation Board

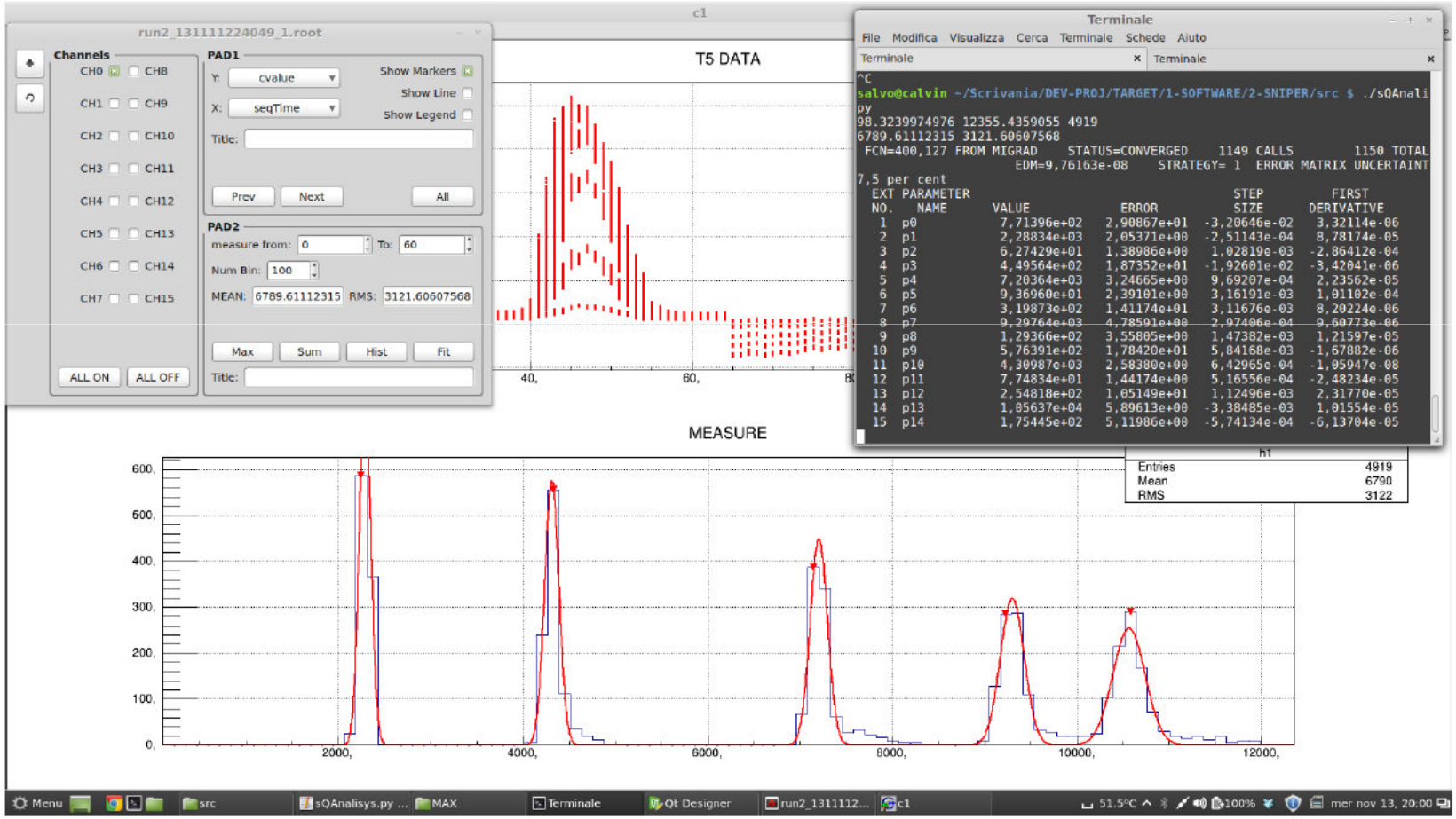
- Board built by SLAC
- 3 inputs on SMA connectors
- 1 external trigger
- Gb Ethernet interface
- Work done by Salvatore Zaza, thesis UniSi
- GUI based on python
- Analysis interfaced to Root and PyRoot



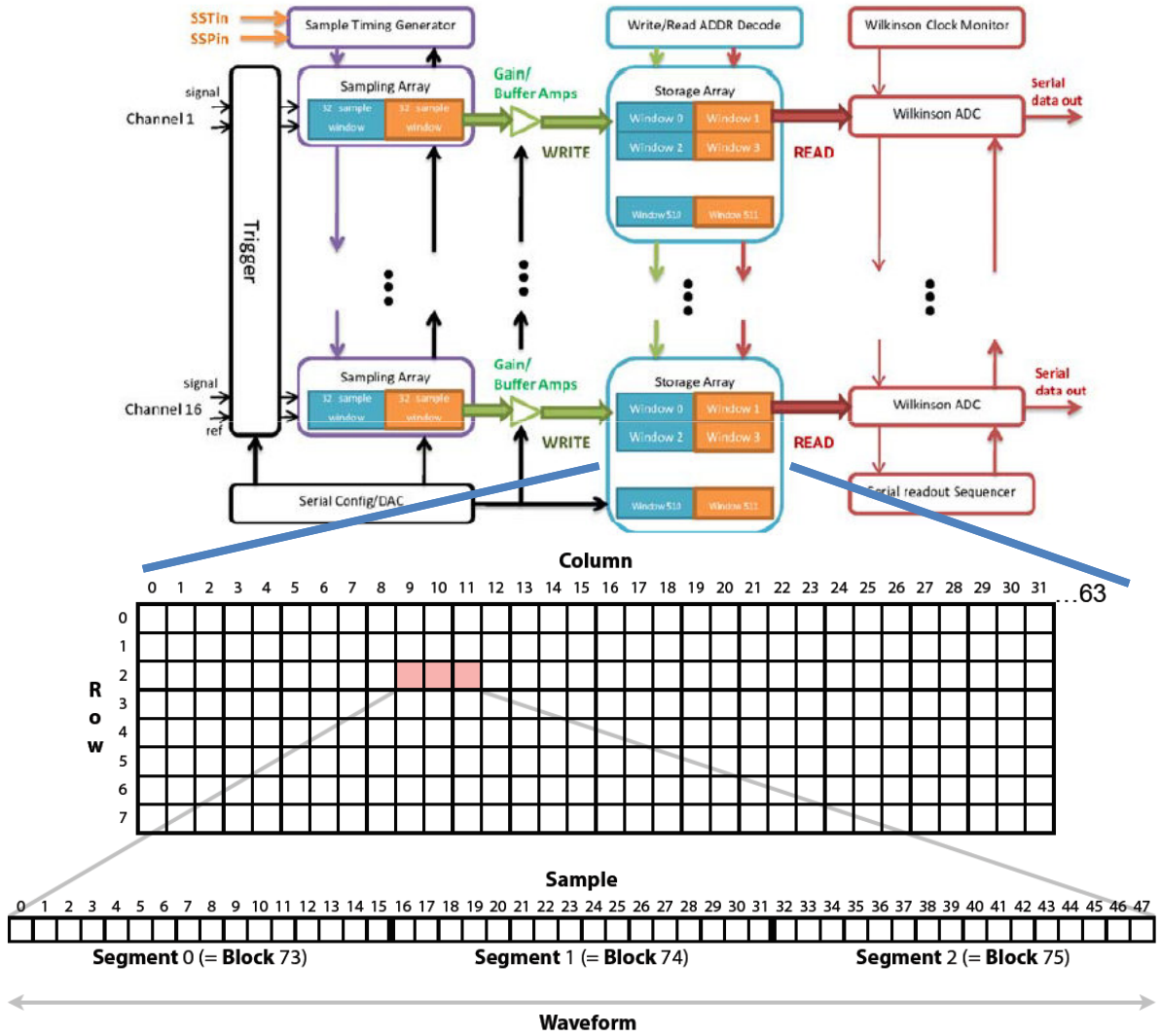
# GUI Interface to T5 eval board



# Analysis interface

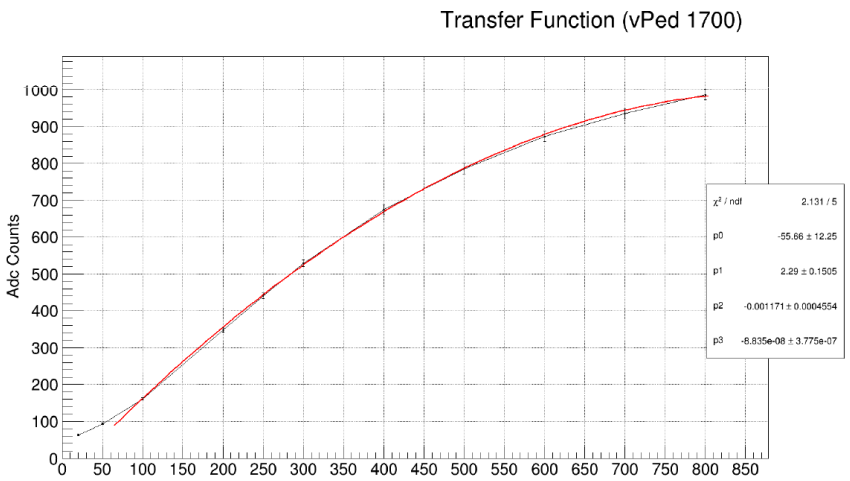


# T5 Storage Cells

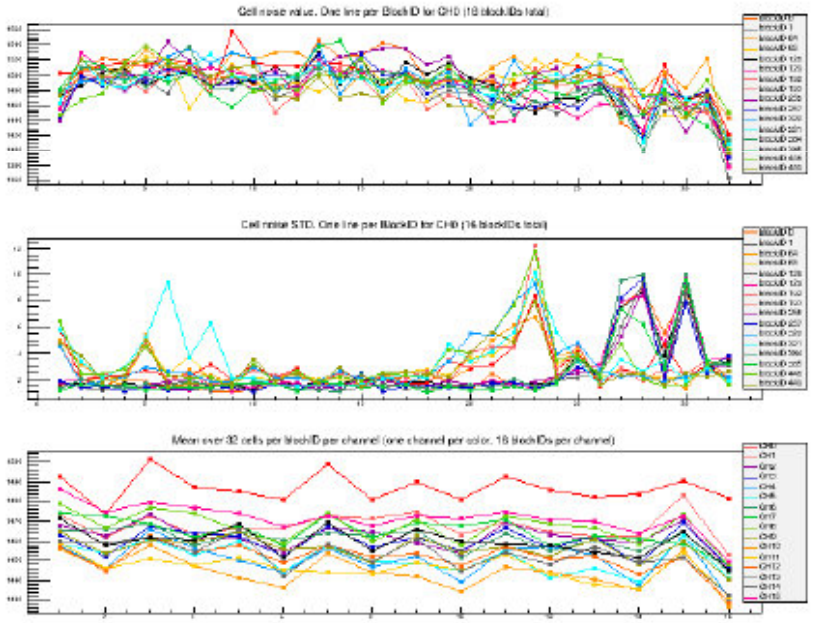


# Calibration

## Vped calibration

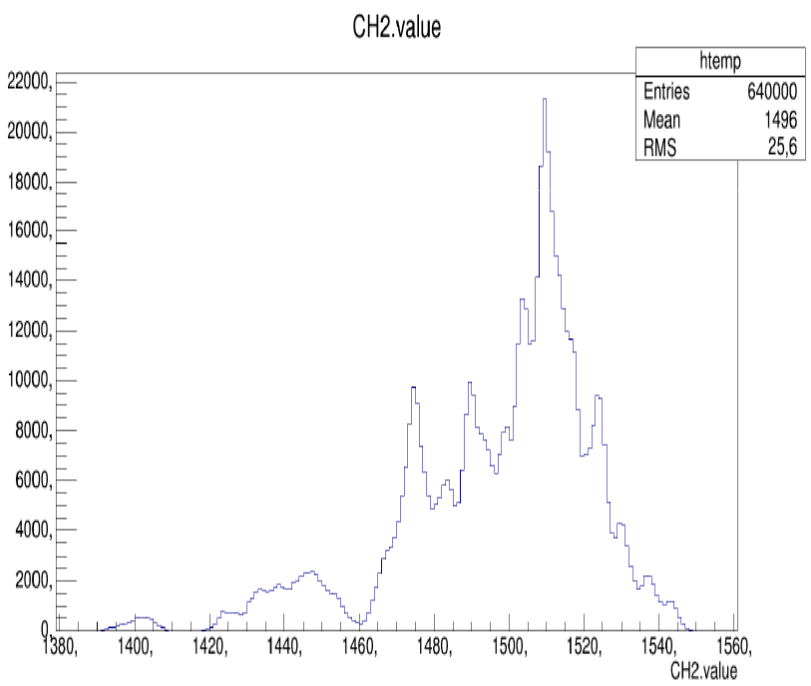



## Storage cell calibration

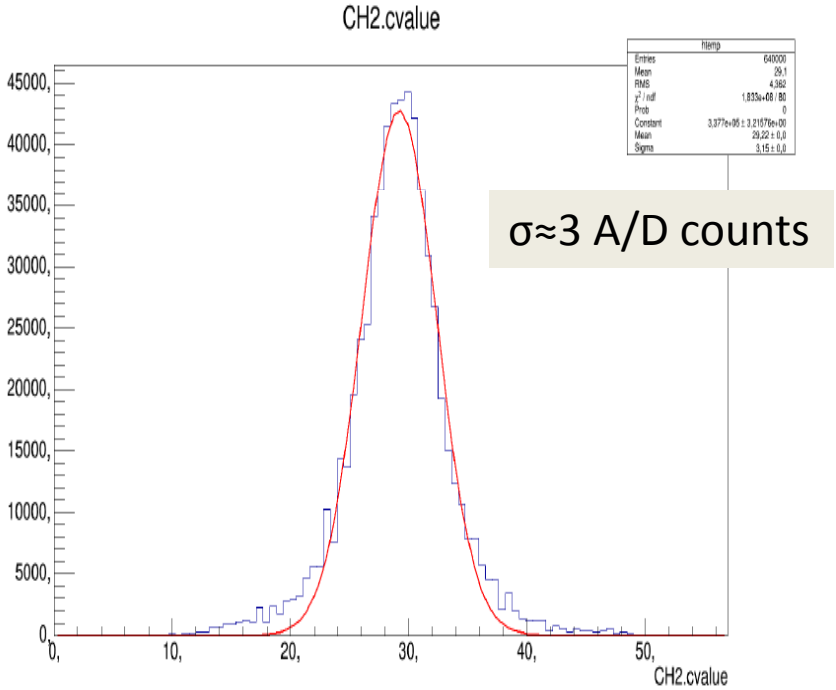


# Effect of (simple) calibration

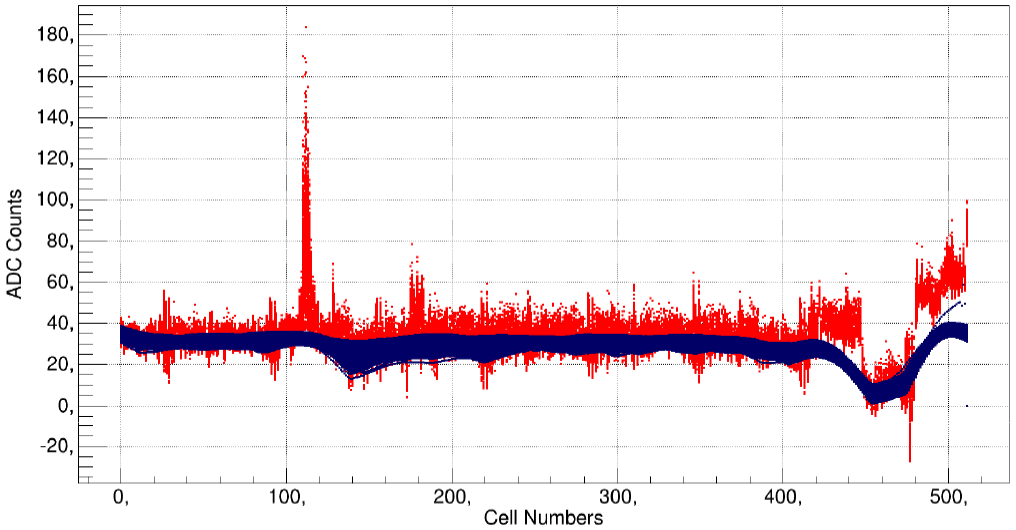
**Before calibration**

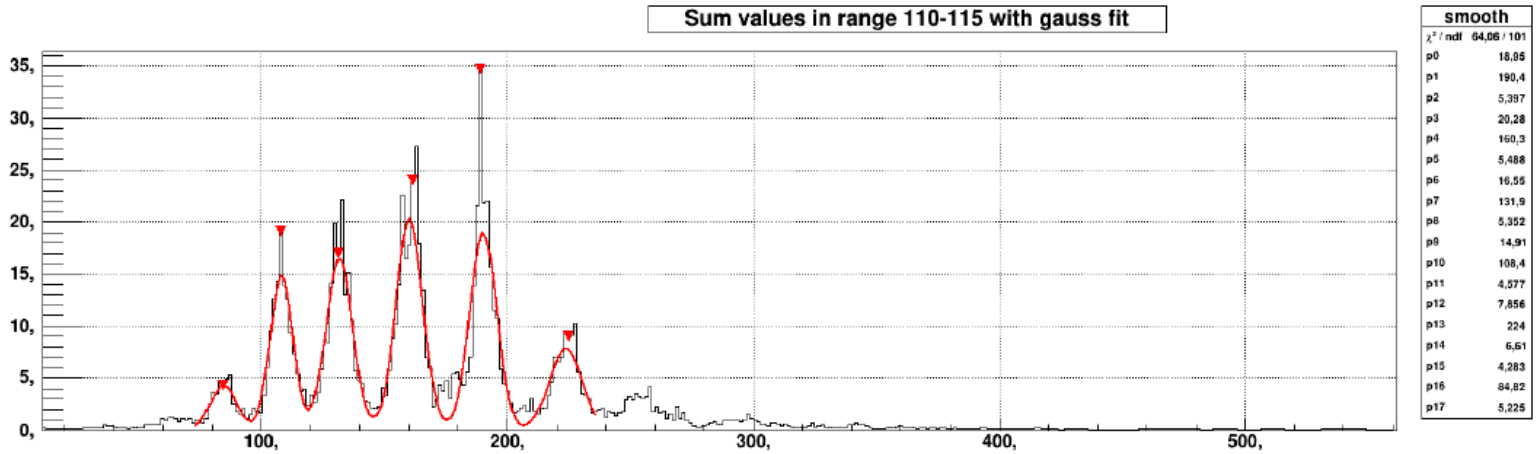



**After calibration**



# Sampling of SiPM signal with T5



# Conclusions

- Several activities ongoing in Pisa
  - SiPM fast “online” characterization
    - Single SiPM
    - Array 4x4 of SiPM 3x3 $mm^2$
  - Front-end performance
    - Preamp “discrete” simulation+prototyping+comparison
    - High pass filter effect+check on signal quality
  - Sampling electronics
    - Target 5 evaluation board
    - DAQ+GUI for laboratory measurement
    - Calibration studies, performance studies
- Future activities (short term)
  - Integration of discrete front-end components
  - Design of sampling board with Target7
  - Data communication with Gb interface (SFP 3.125Gbps →PCIe x4)