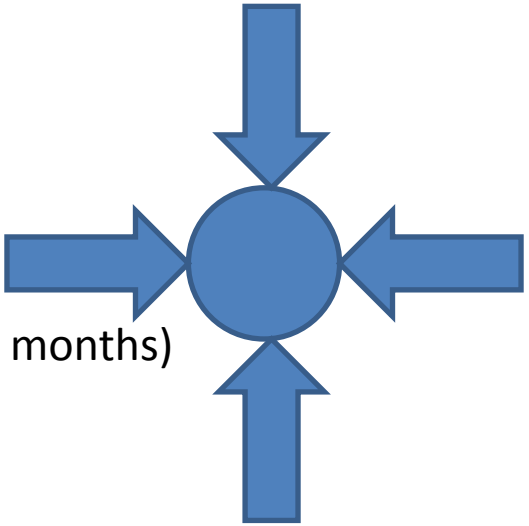
APV and AMORE, test beam and laboratory data analysis

on behalf of
Lari KOPONEN
HIP and Aalto University

FIT (Kondo Gnavo, Michael Staib *) : AMORE-SRS
(*) Mike help us during all the June beam period in H4

HIP(Francisco Garcia):
-FEC-ADC APVs
-Lari (Summer Student for three months)

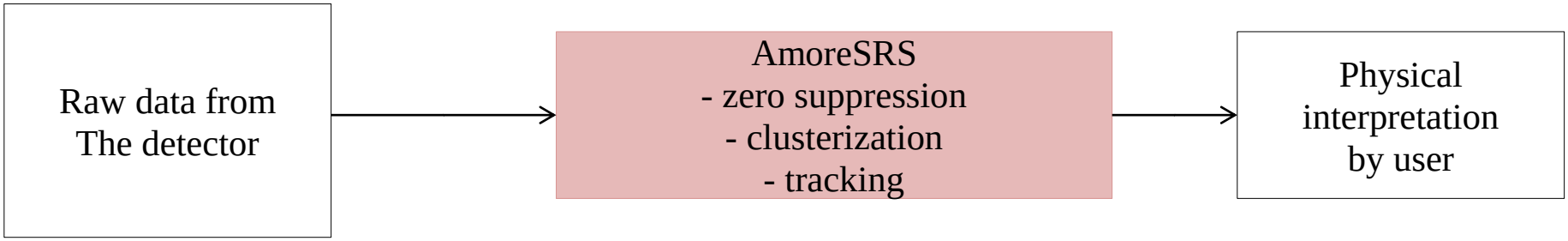


RD51 lab:
Detector and Services
PCs, lab, beam,…

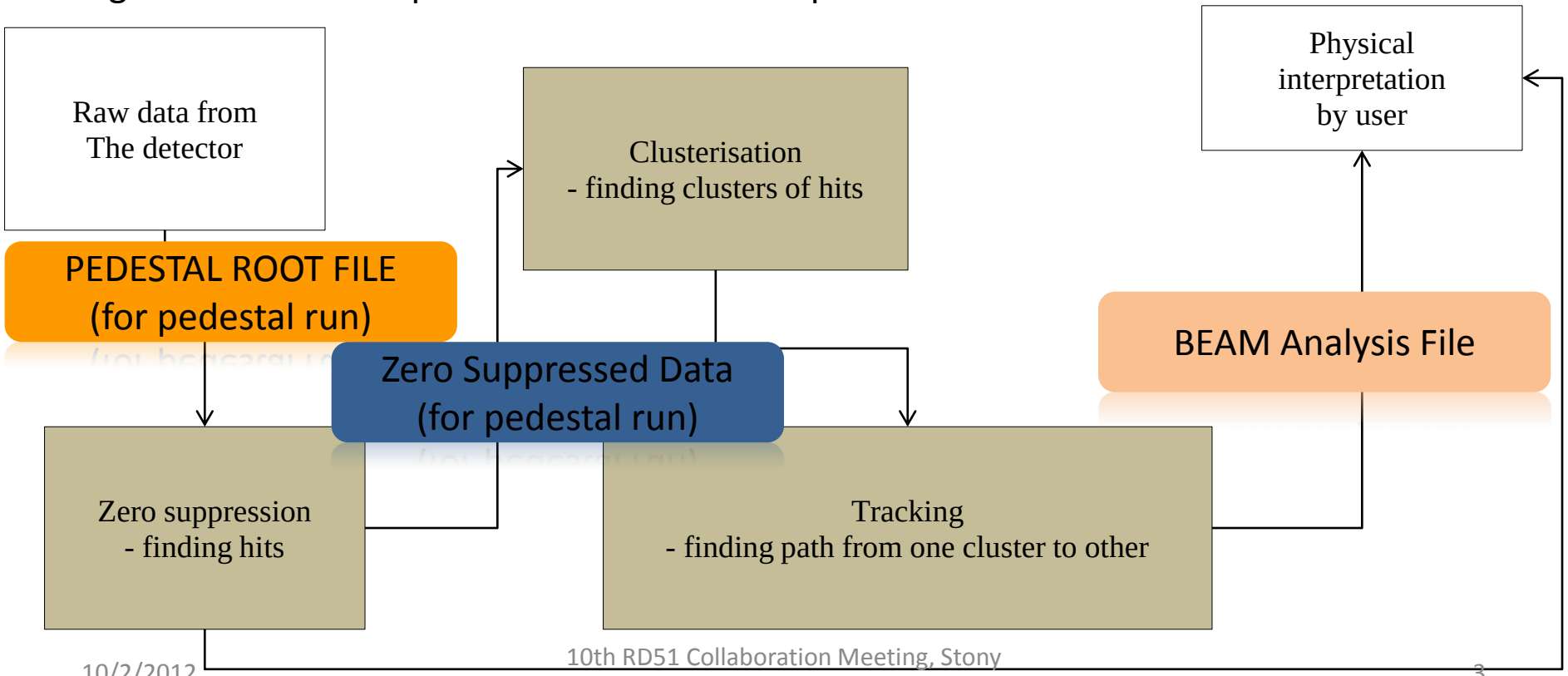
Hans Muller:
- FEC-ADC APVs

All the contributes have been fundamental.

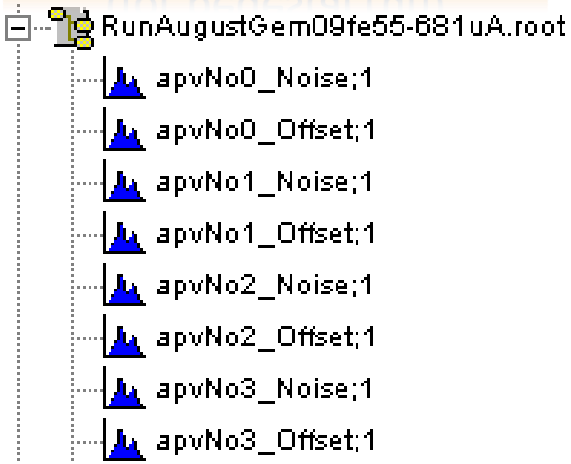
Starting point



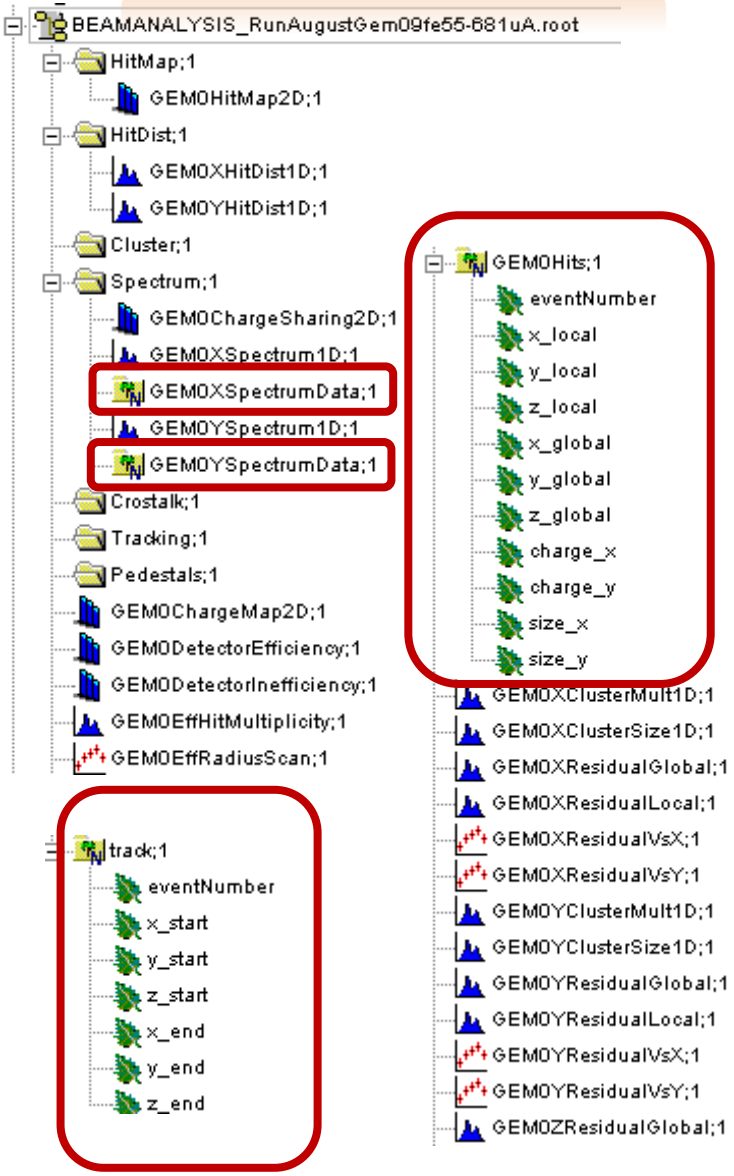
Fragmentation of the process with relative outputs



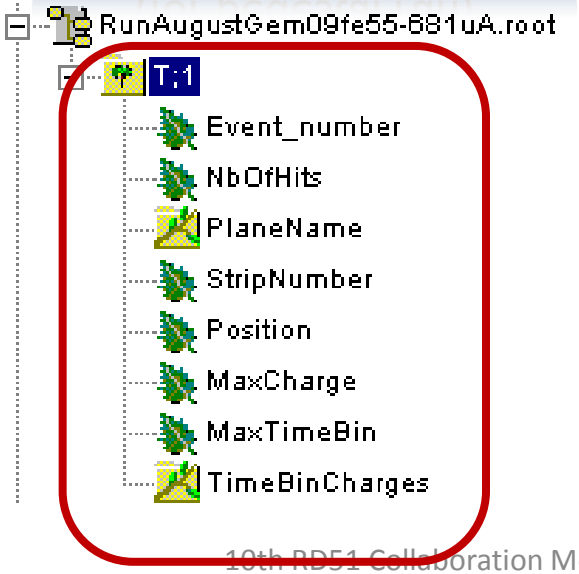
PEDESTAL ROOT FILE (for pedestal run)



BEAM Analysis File

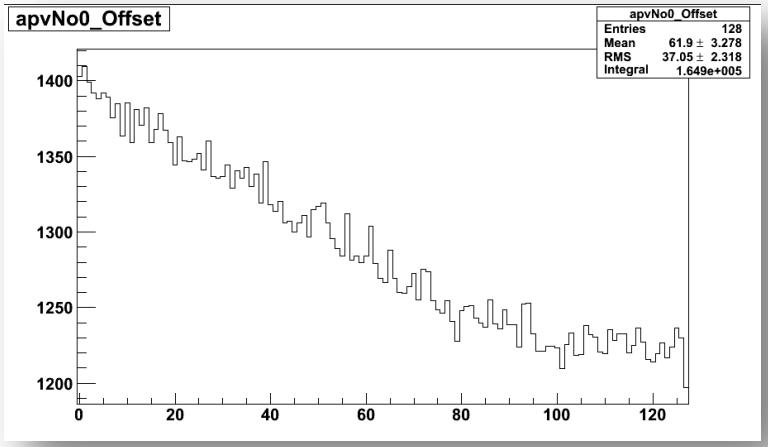


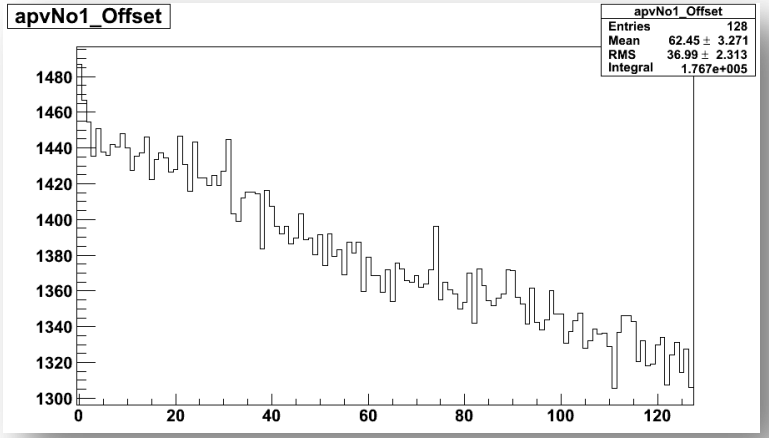
Zero Suppressed Data (for pedestal run)

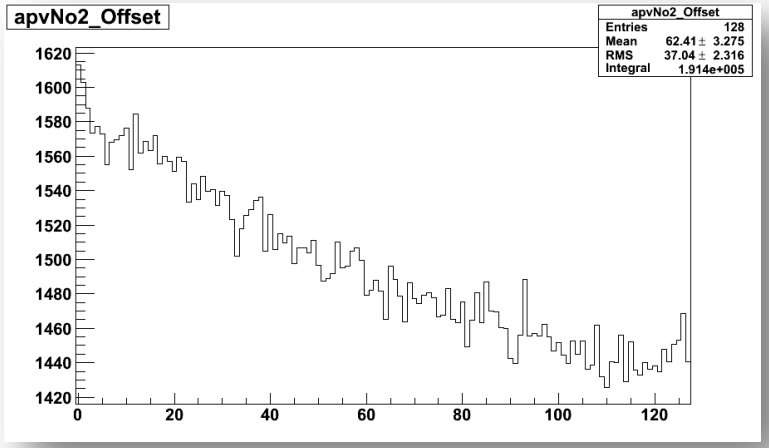


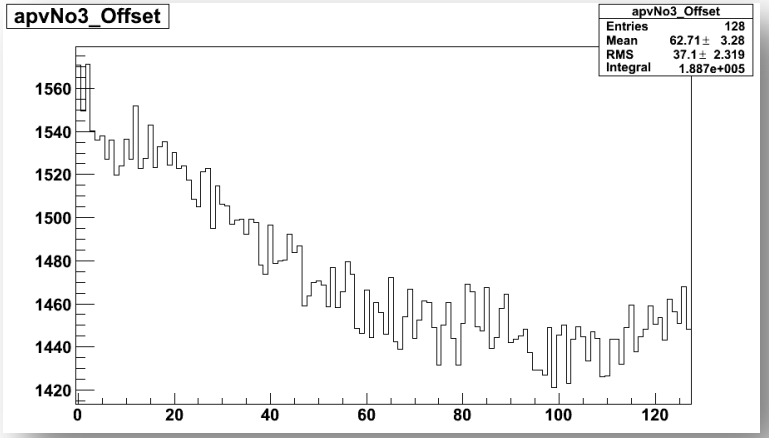
TTREE

PEDESTAL ROOT FILE (for pedestal run)

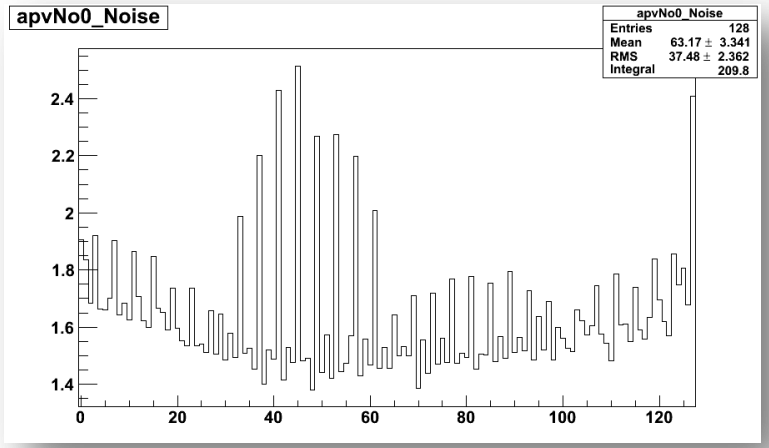


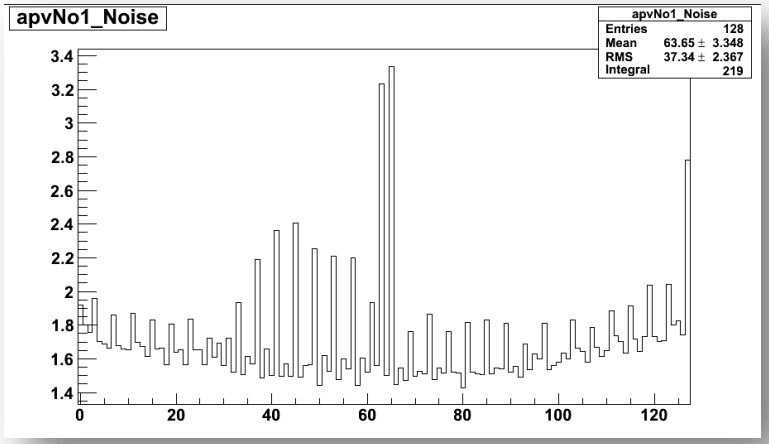


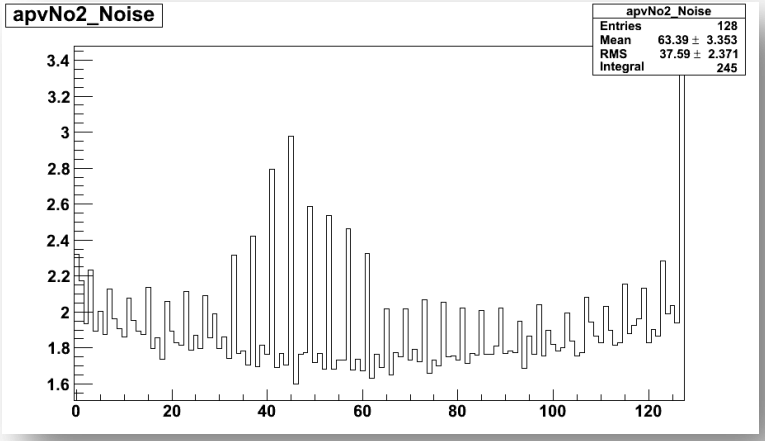


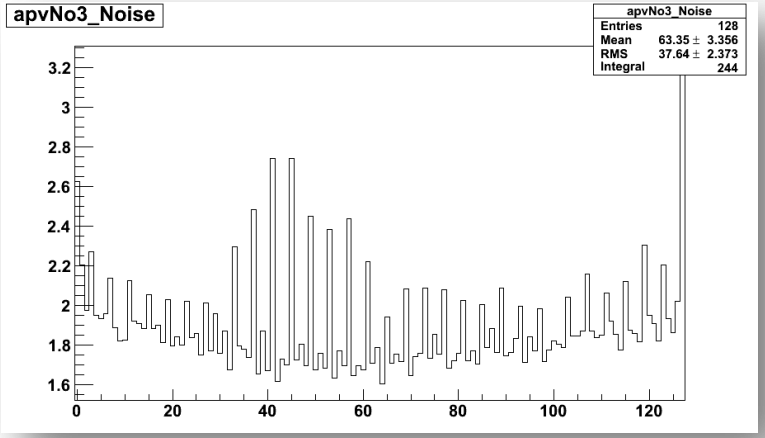


PEDESTAL ROOT FILE (for pedestal run)

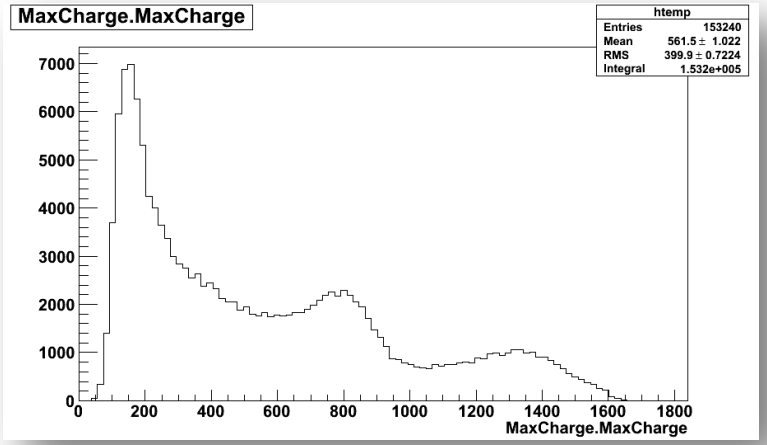


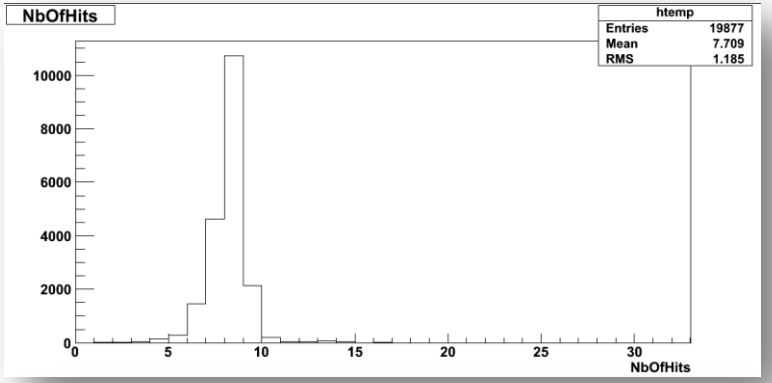


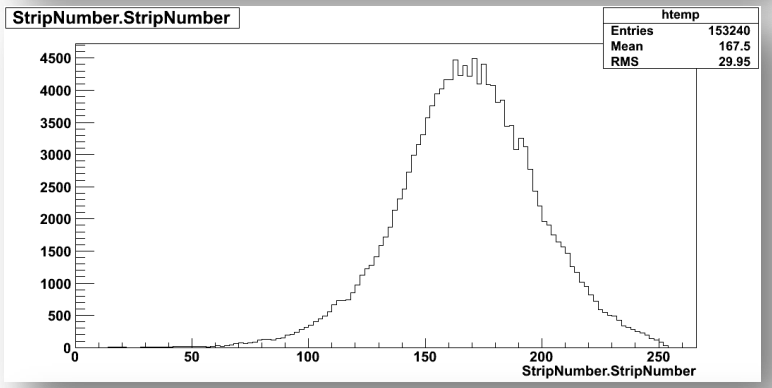


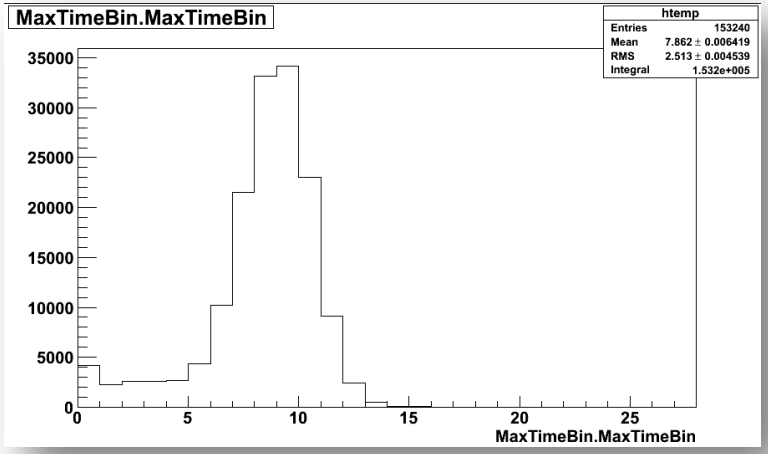


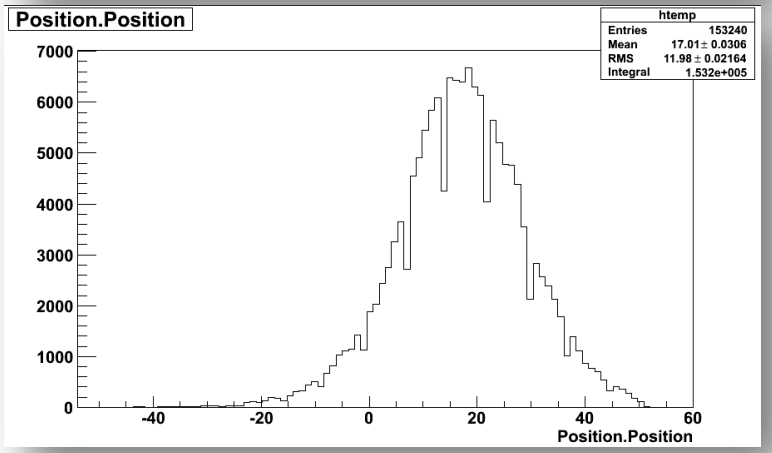
Zero Suppressed Data (for pedestal run)





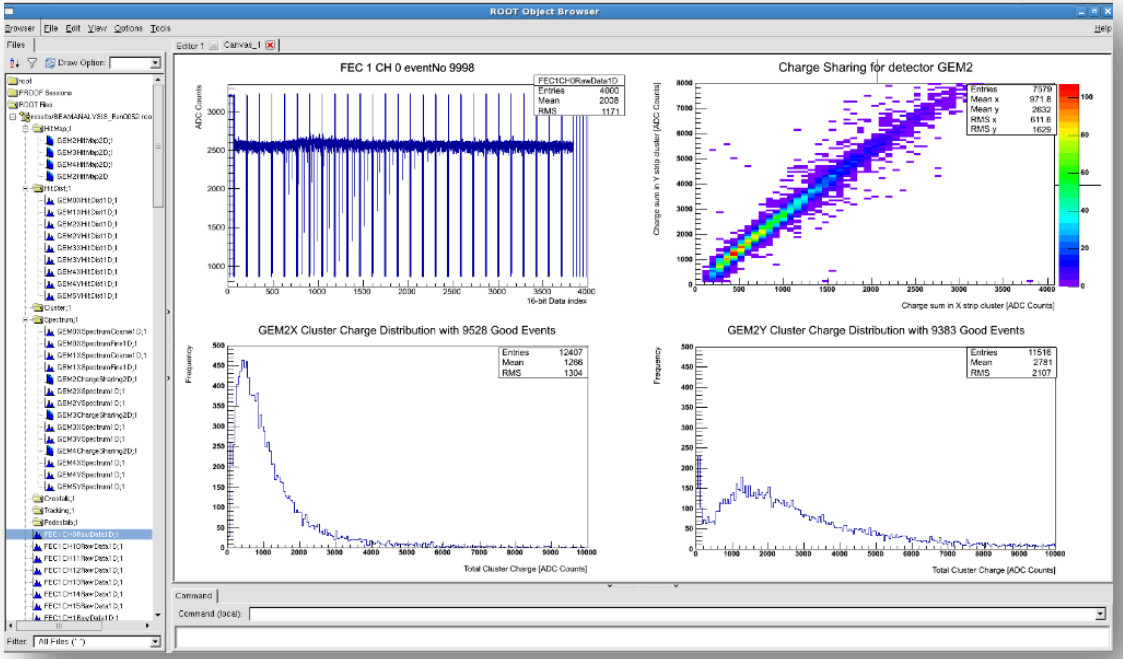


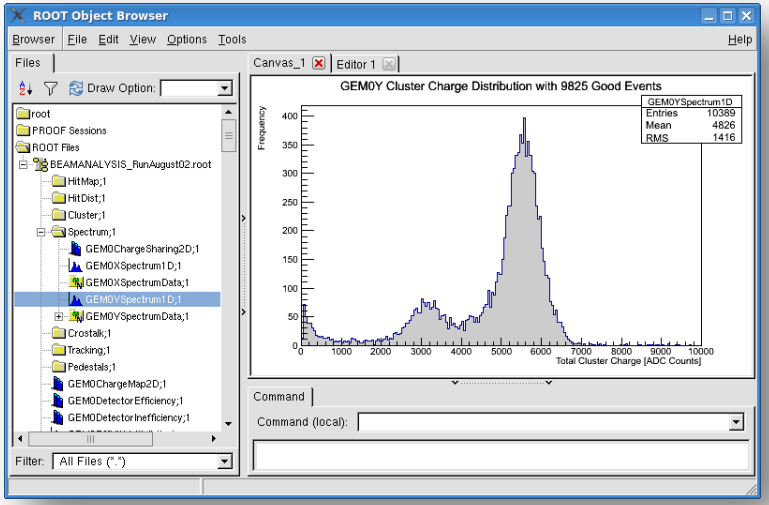


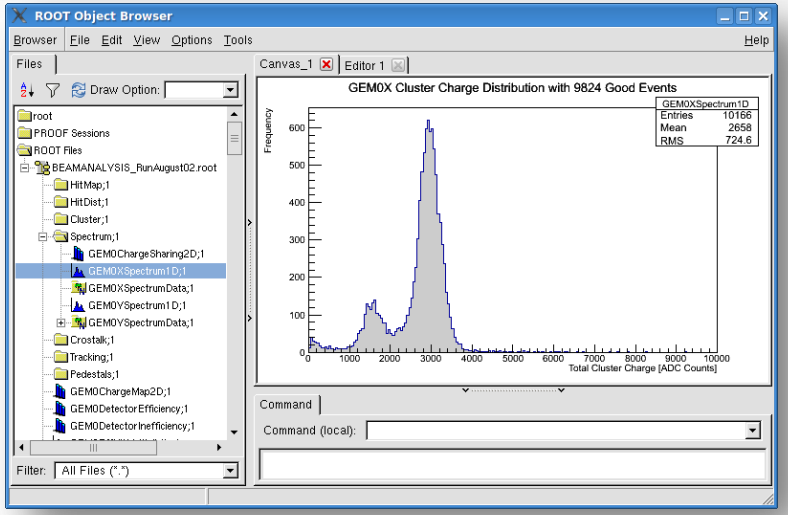


BEAM Analysis File

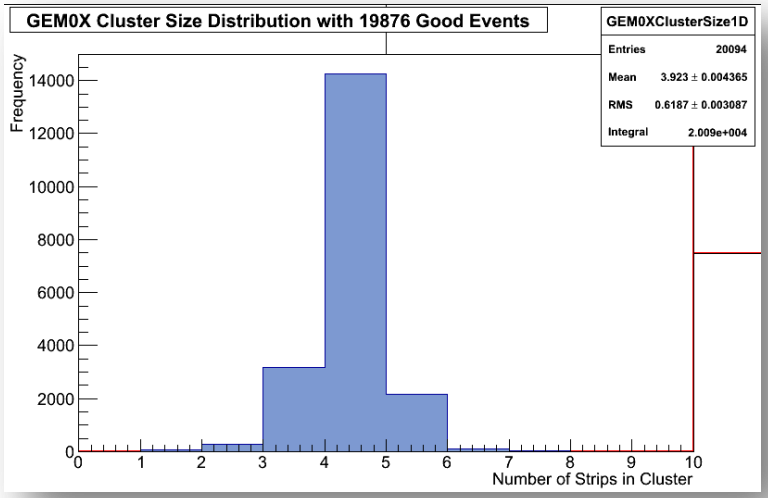
Default Plot and histograms

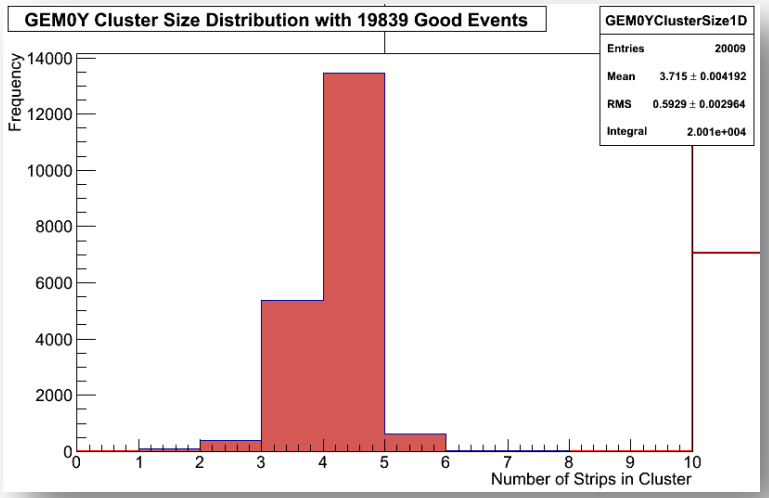


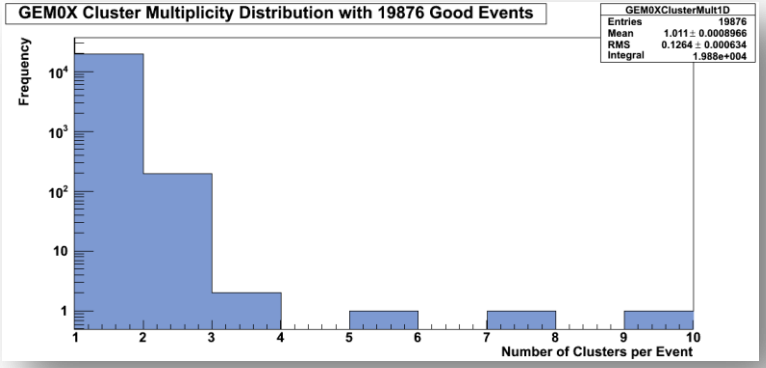


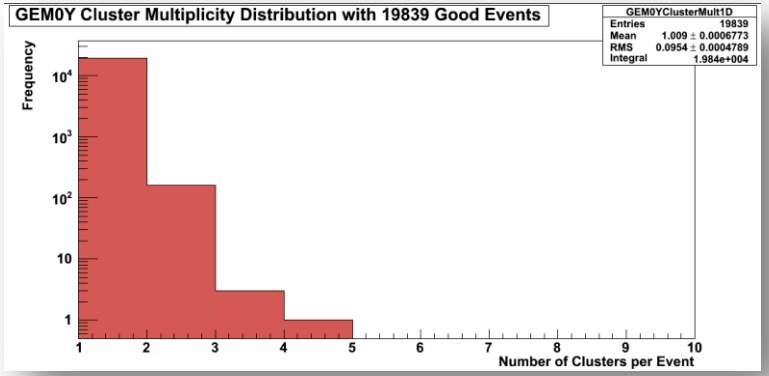


BEAM Analysis File









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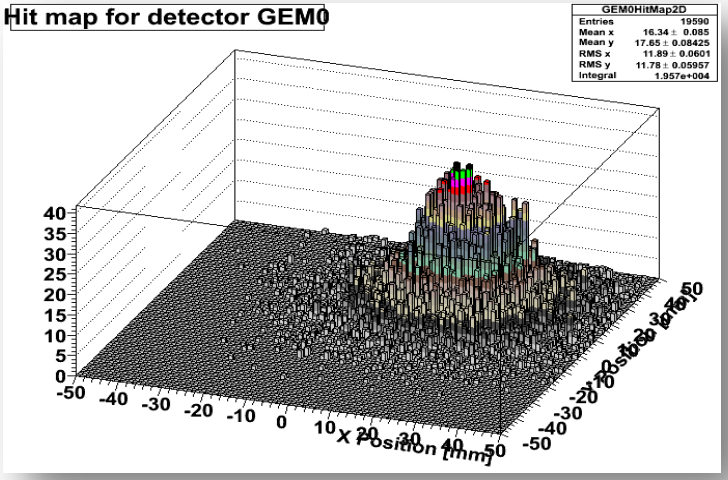
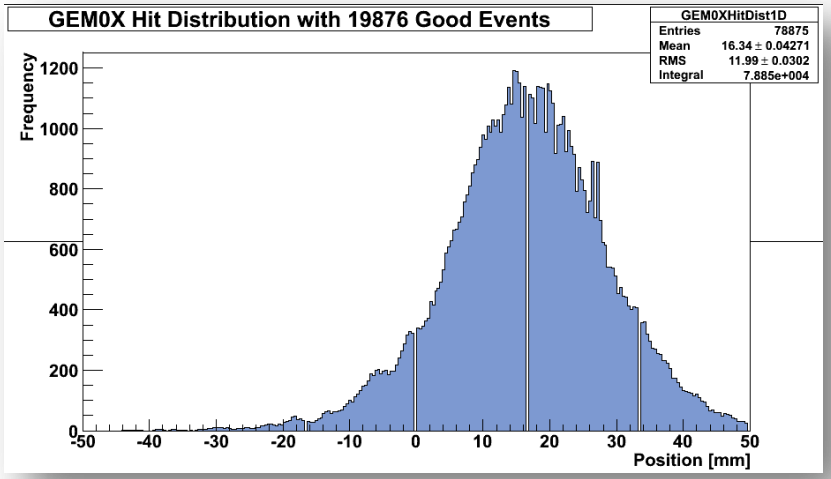
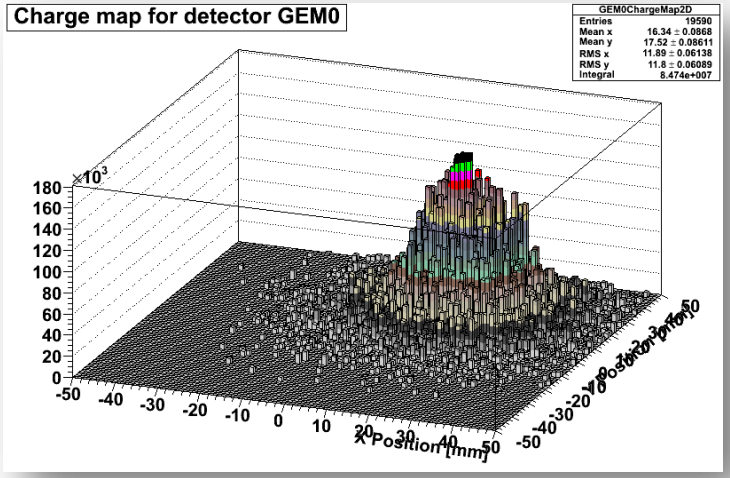
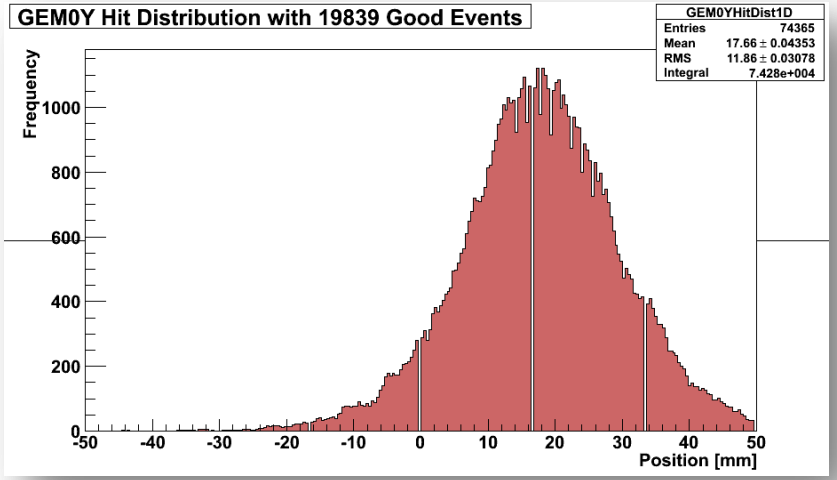


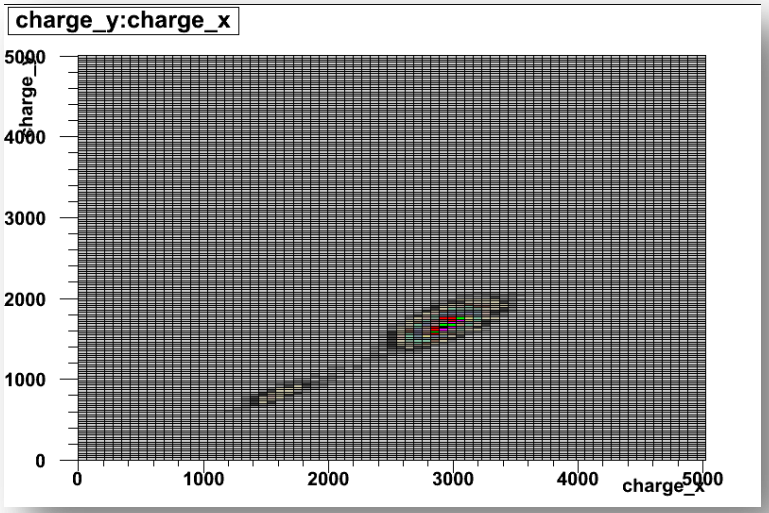


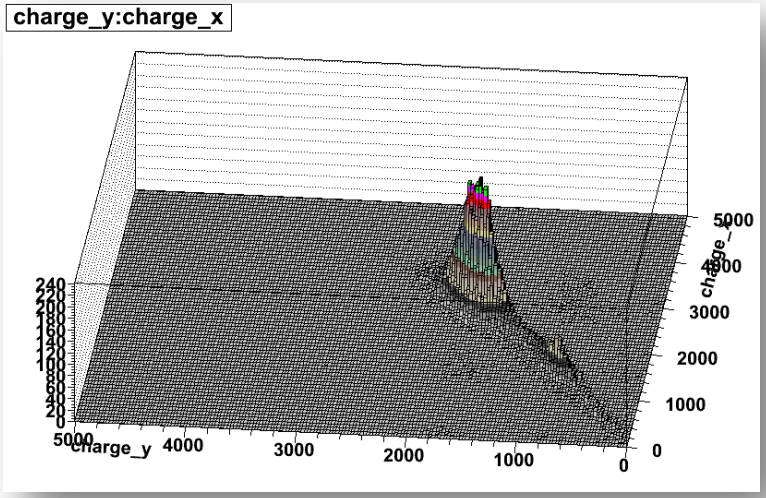


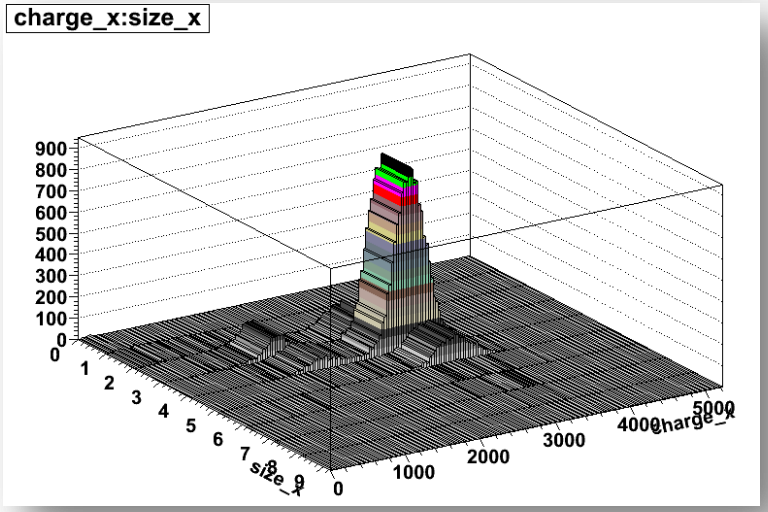


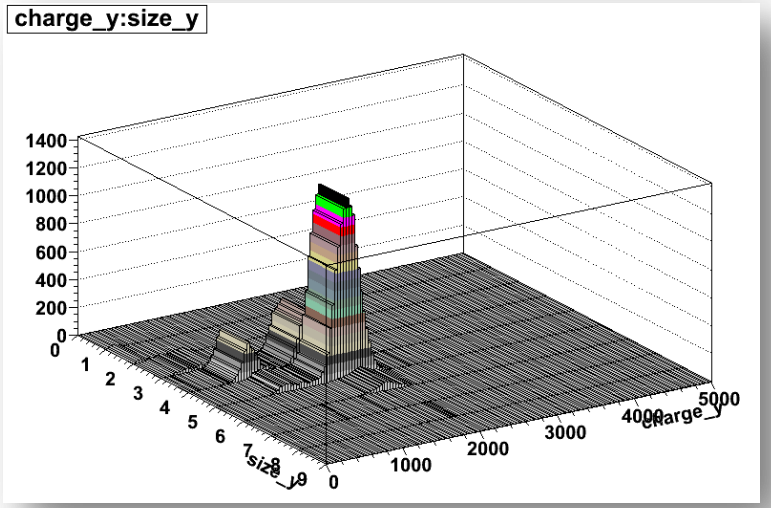
BEAM Analysis File

Having a TTree the data, event by event are available and additional analysis can be done



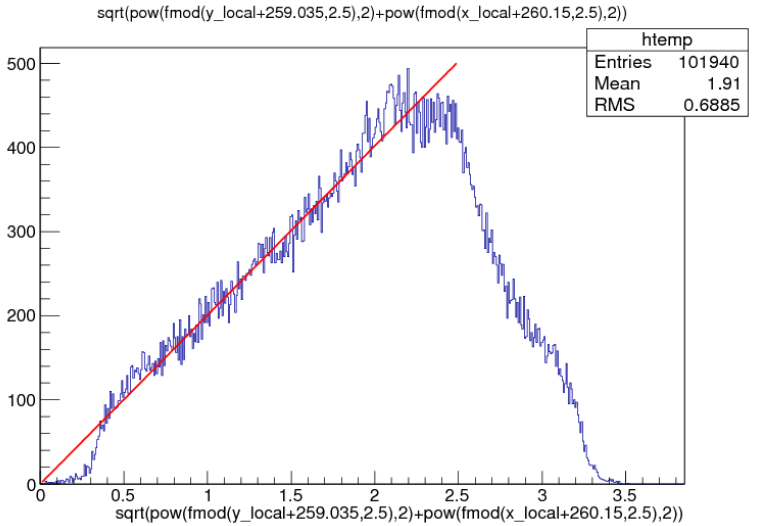


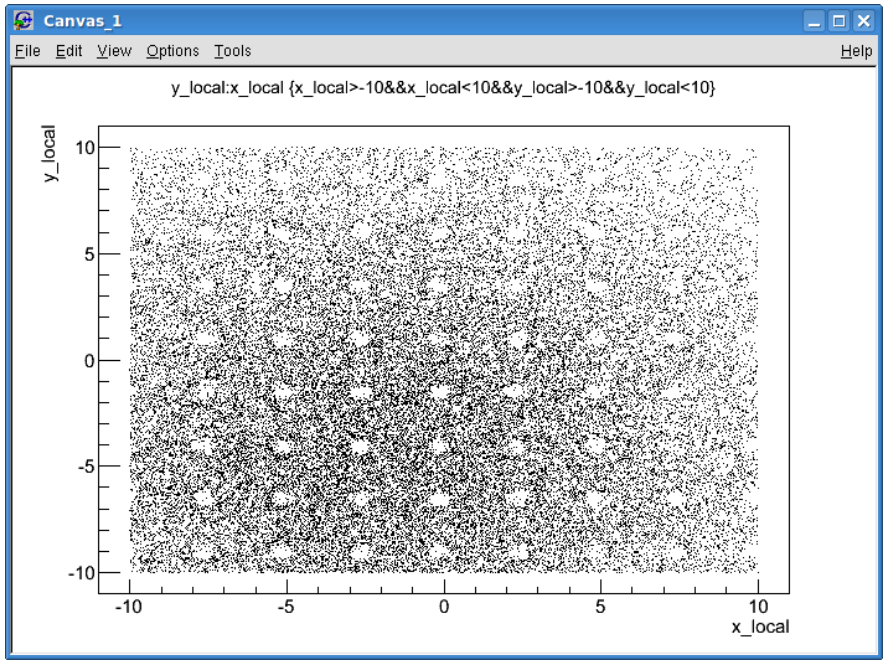


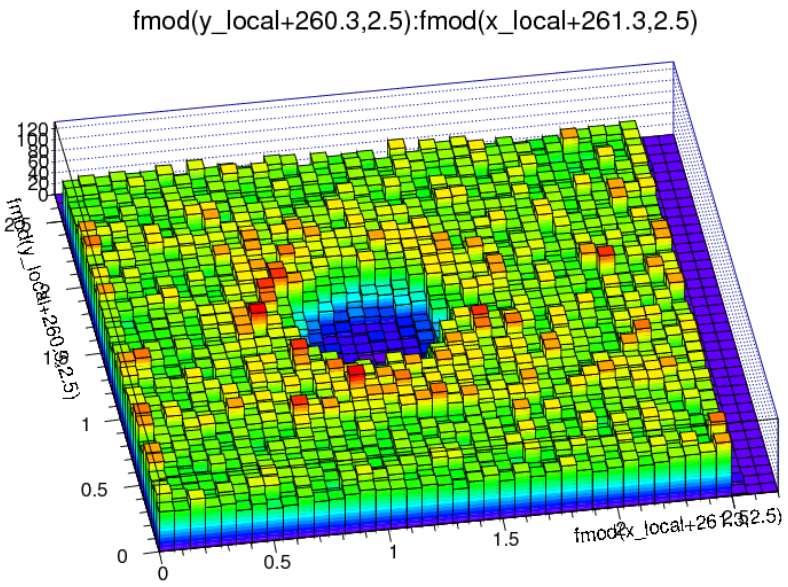


BEAM Analysis File

Example of post processing analysis: pillars in μmegas for a Fe55 run







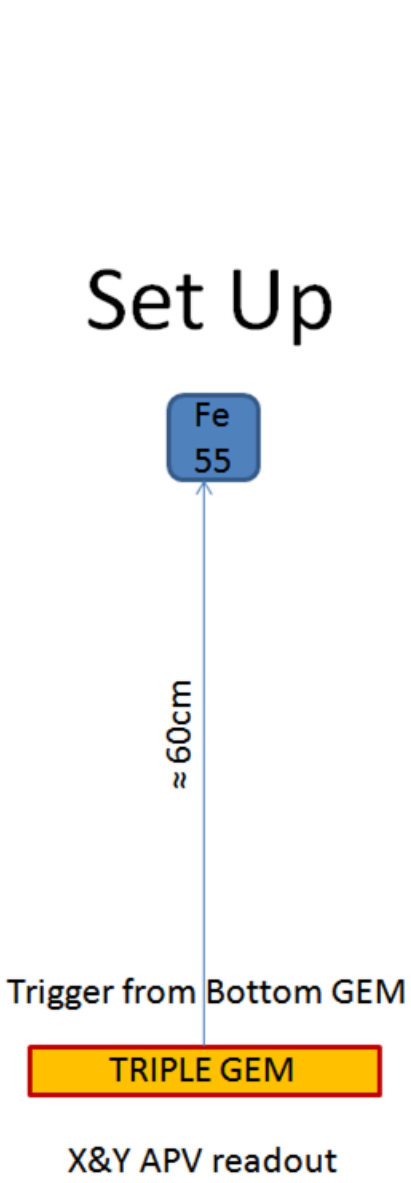
The donkey test

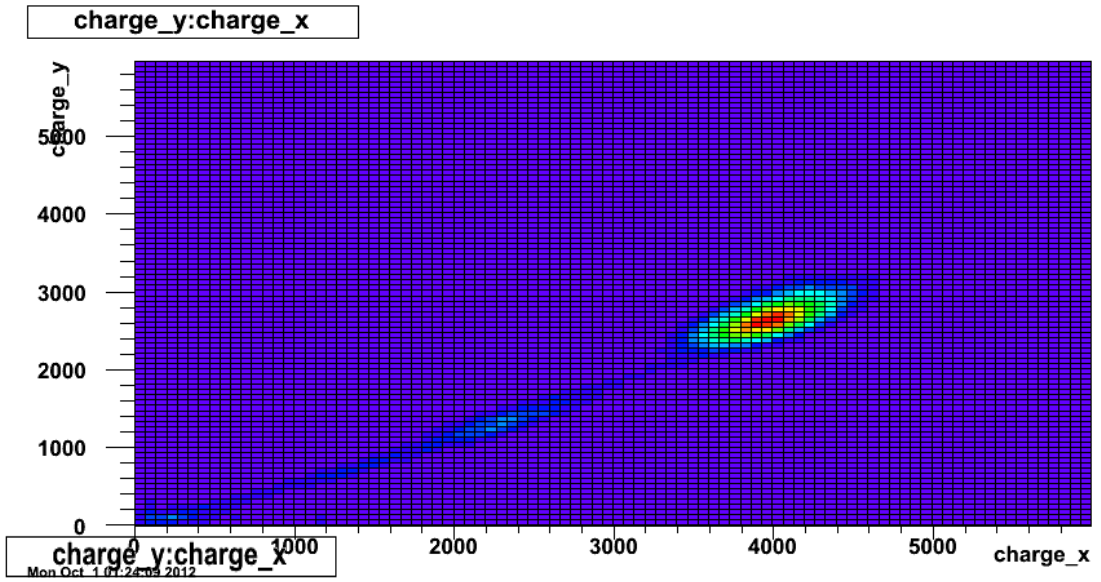
I (Eraldo) took data with DATE and I tried to do my specific analysis/plots using ROOT on the TTree of the root output files produced by AMORE.

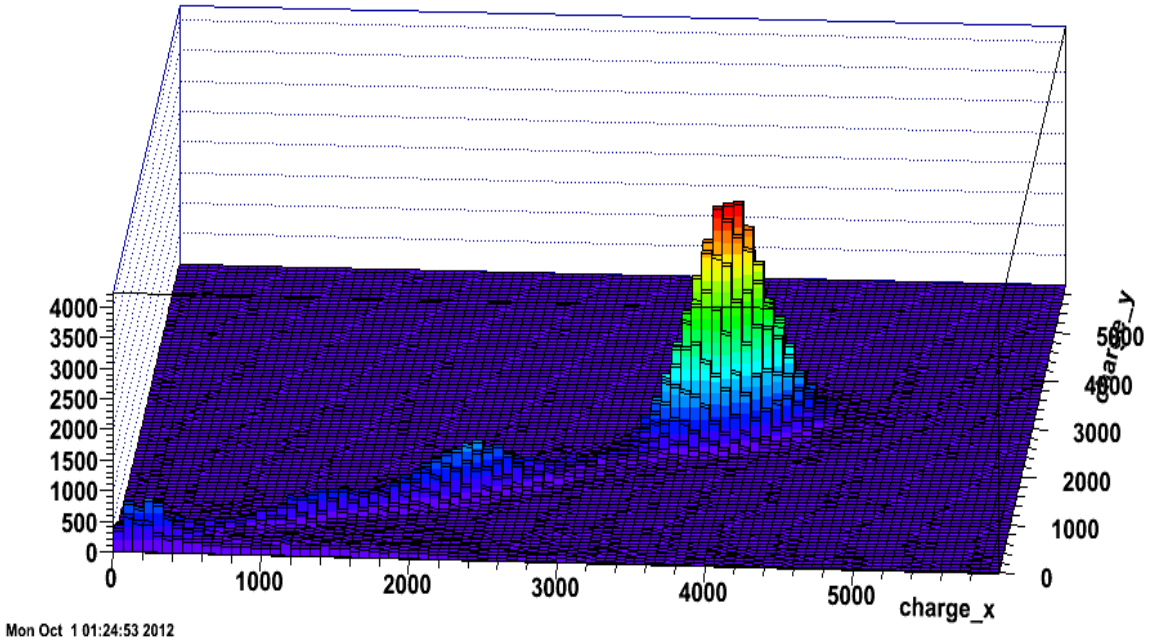
I don’t know absolutely nothing about the AMORE-SRS code. I wanted to check the feasibility of doing what I needed directly in ROOT.

I’m not an expert of ROOT but, MakeClass and MakeSelector provide me automatically the structure of the code that I need for looping the events…

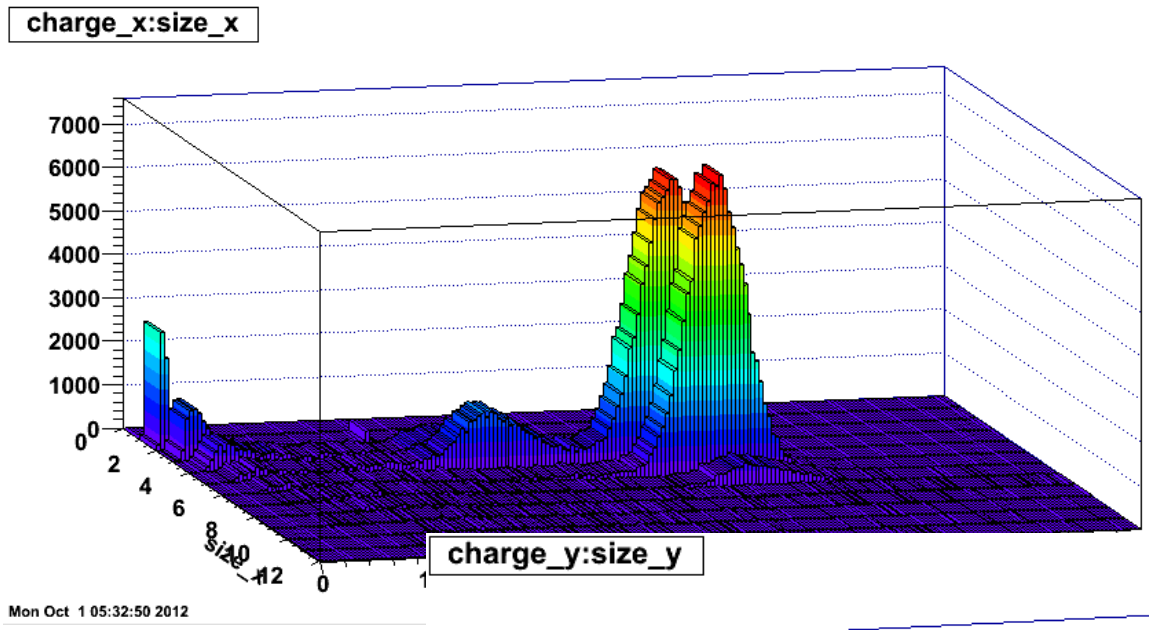
Spectrum and Correlation

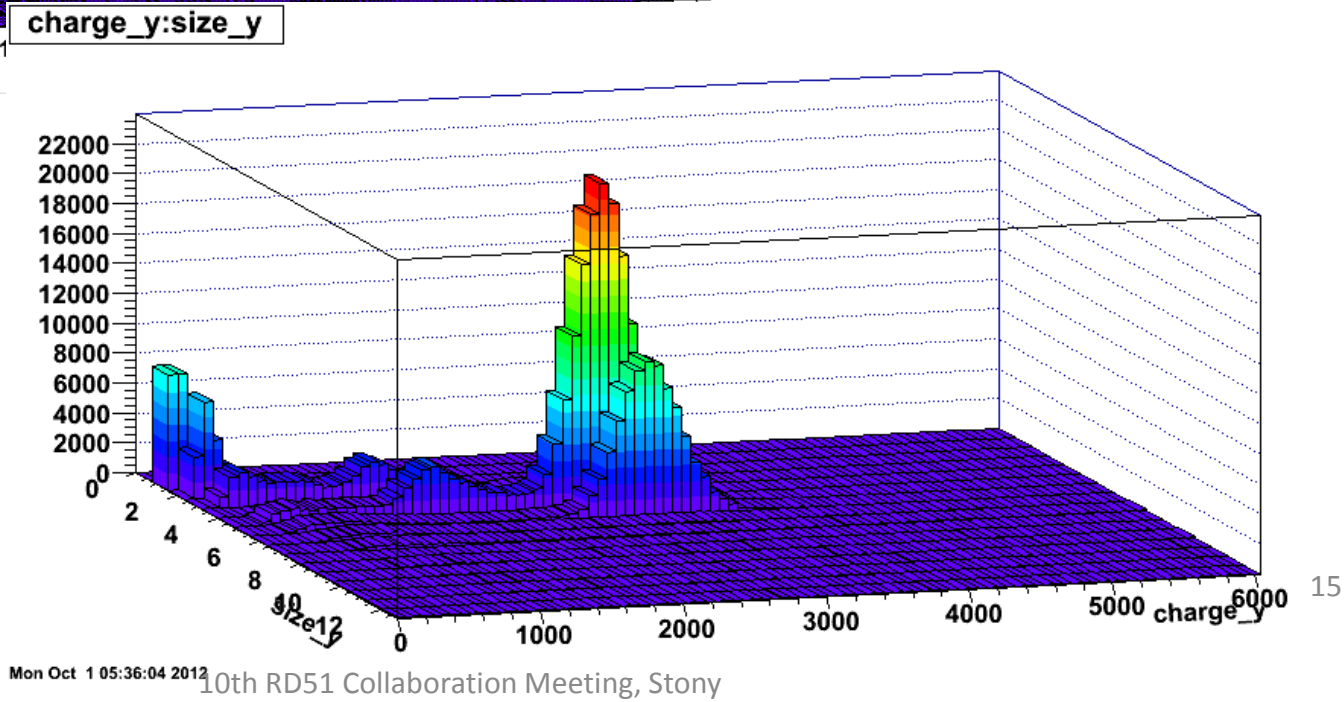


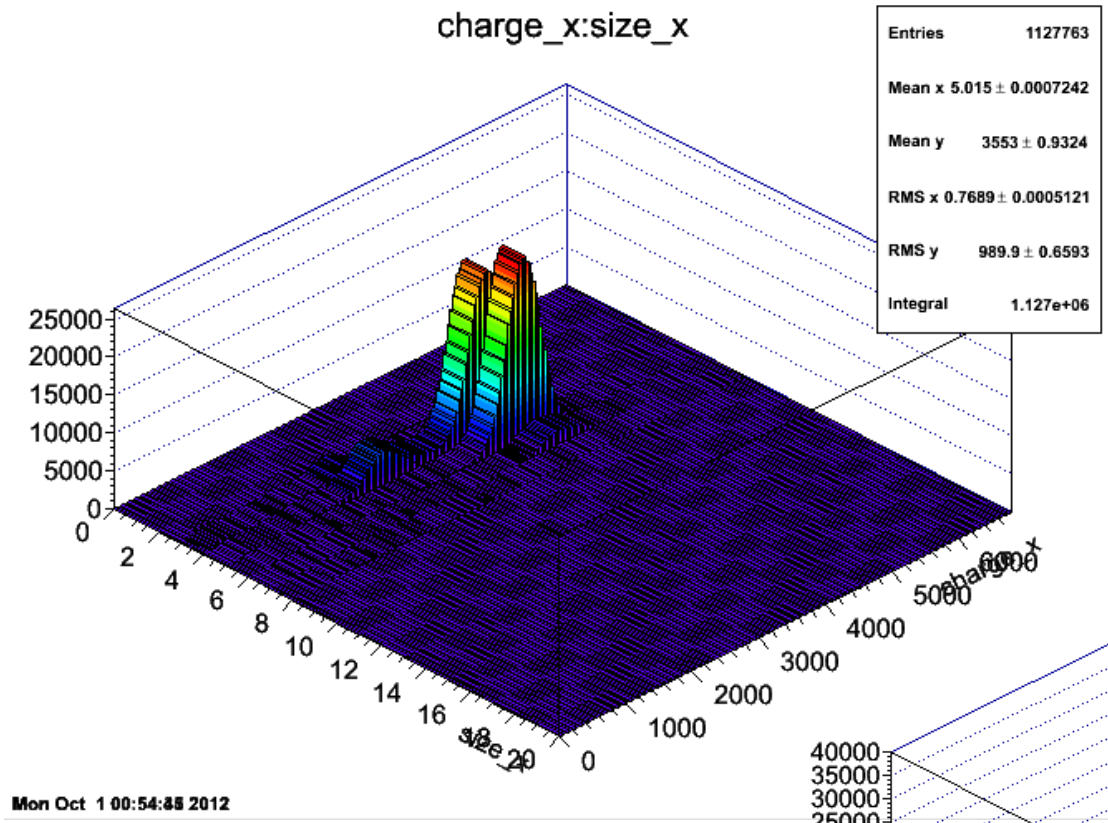




Spectrum vs Cluster Size



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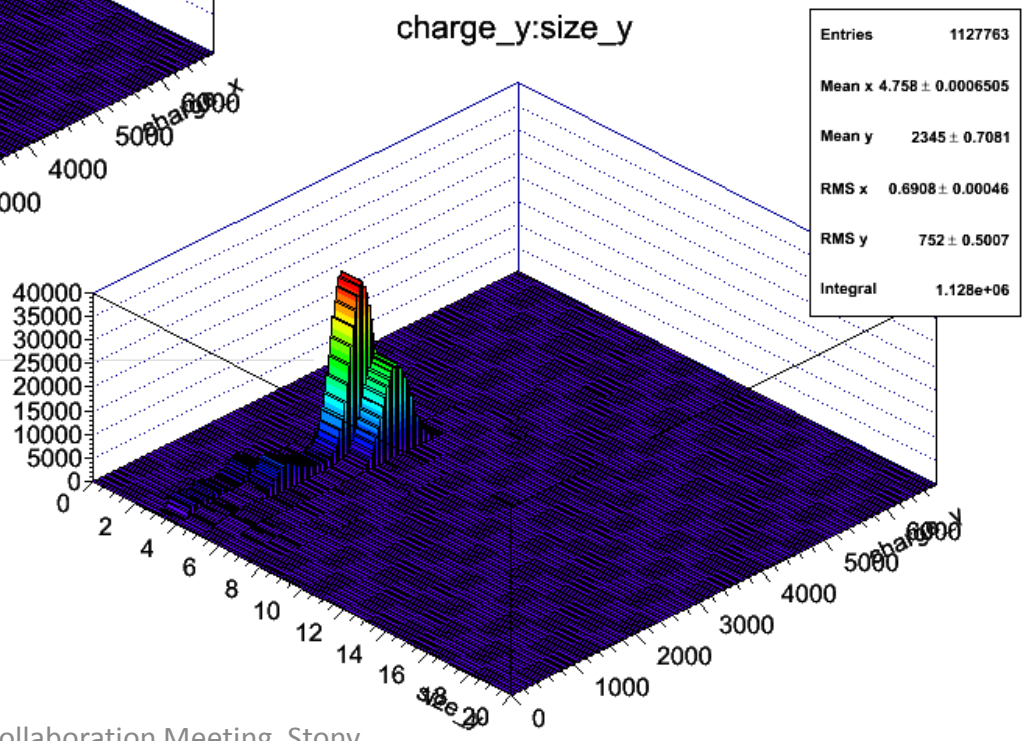
Entries 1127763
Mean x 5.015 ± 0.0007242
Mean y 3553 ± 0.9324
RMS x 0.7689 ± 0.0005121
RMS y 989.9 ± 0.6593
Integral 1.127e+06
25000
20000
15000
10000
5000
0
0
2
4
6
8
10
12
14
16
0
1000
2000
3000
4000
5000
Mon Oct 1 00:54:45 2012


charge_y:size_y
Entries 1127763
Mean x 4.758 ± 0.0006505
Mean y 2345 ± 0.7081
RMS x 0.6908 ± 0.00046
RMS y 752 ± 0.5007
Integral 1.128e+06
40000
35000
30000
25000
20000
15000
10000
5000
0
0
2
4
6
8
10
12
14
16
0
1000
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3000
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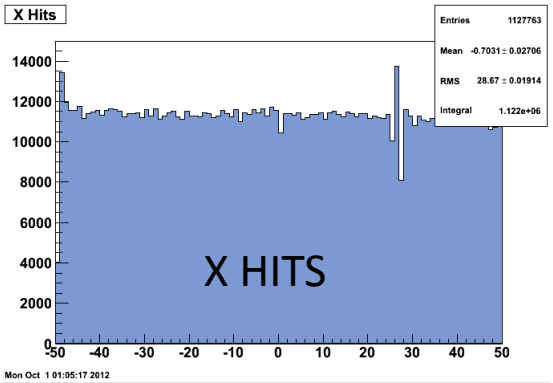
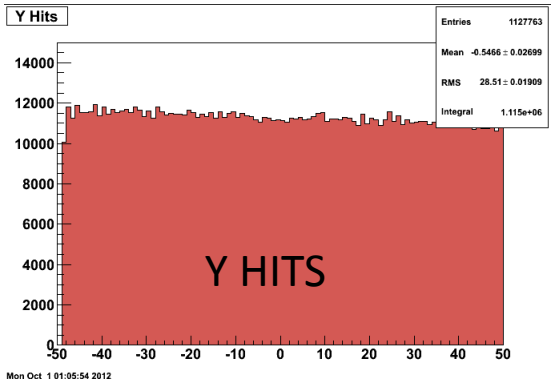
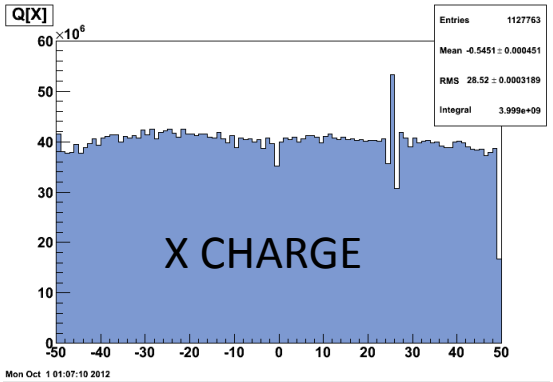
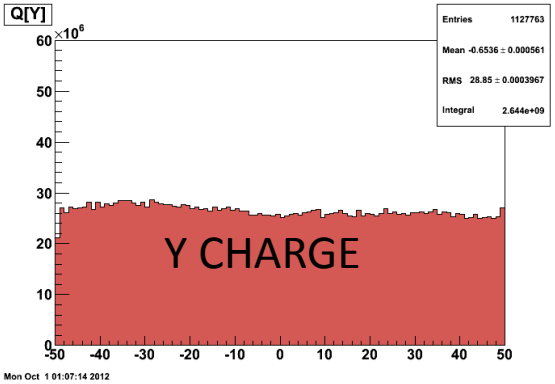
Mon Oct 1 00:54:45 2012

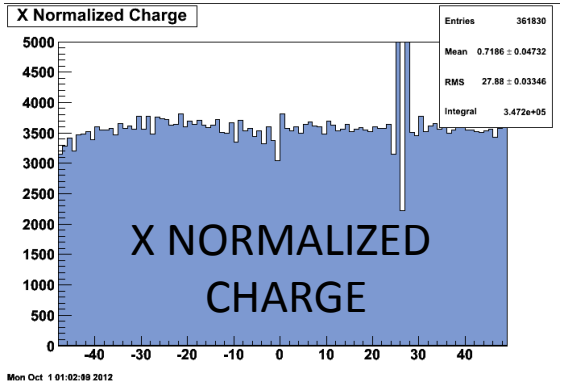
Uniformity Test

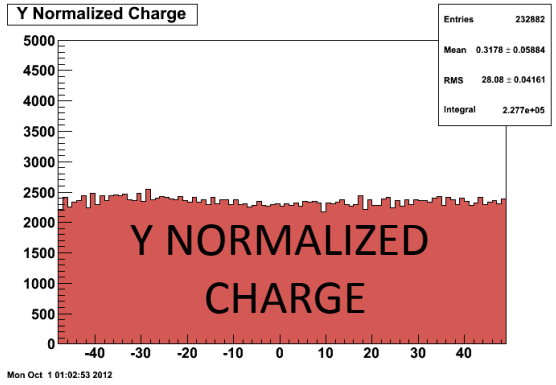




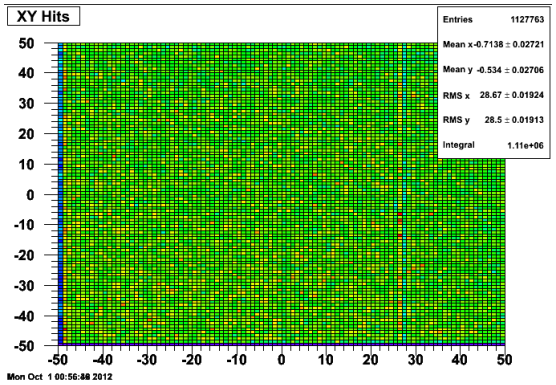


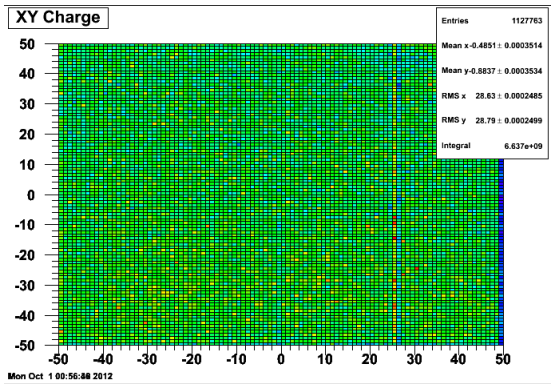


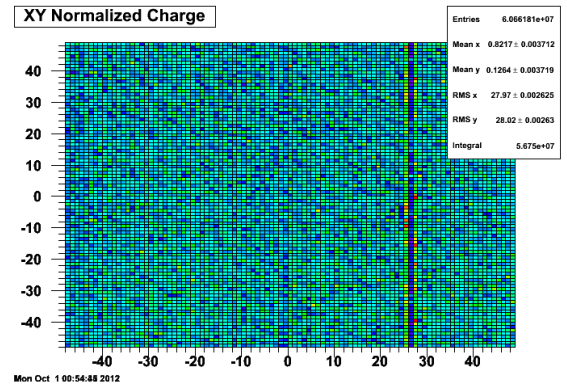


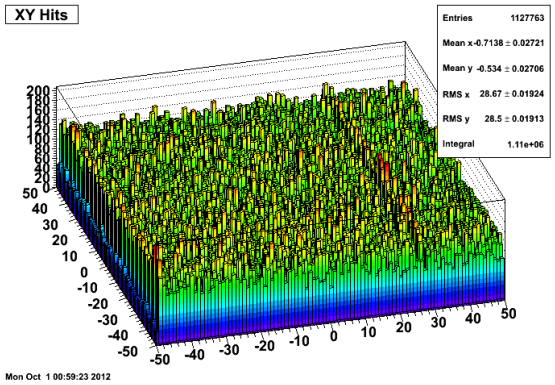


Uniformity Test

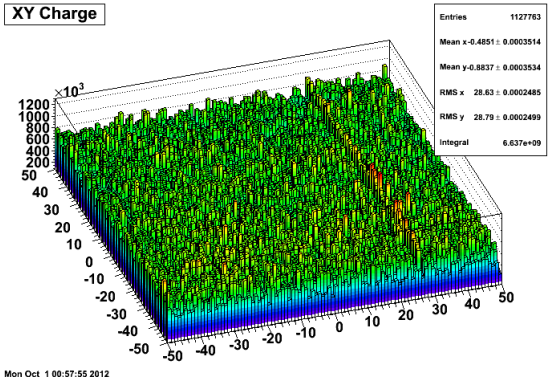




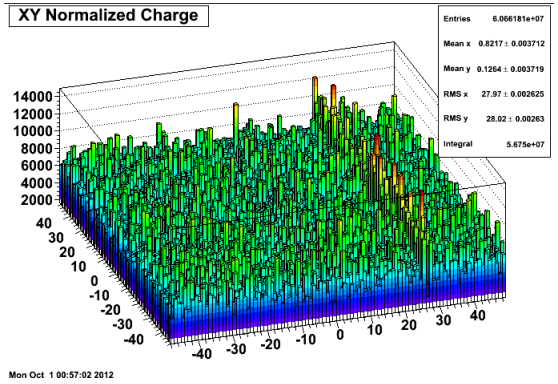




HITS

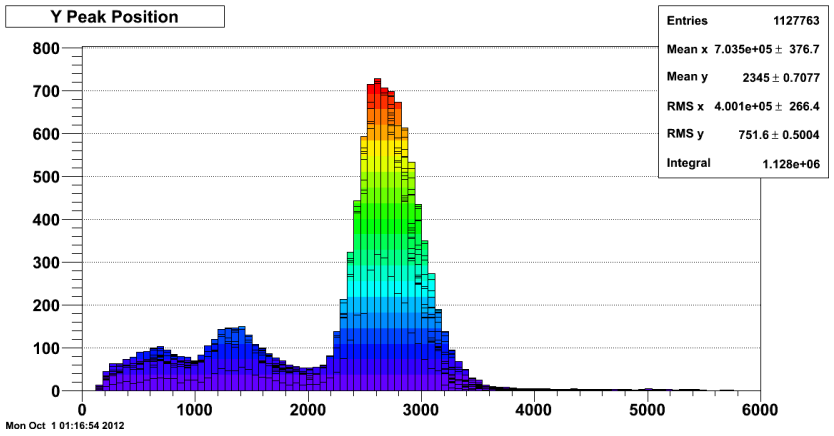


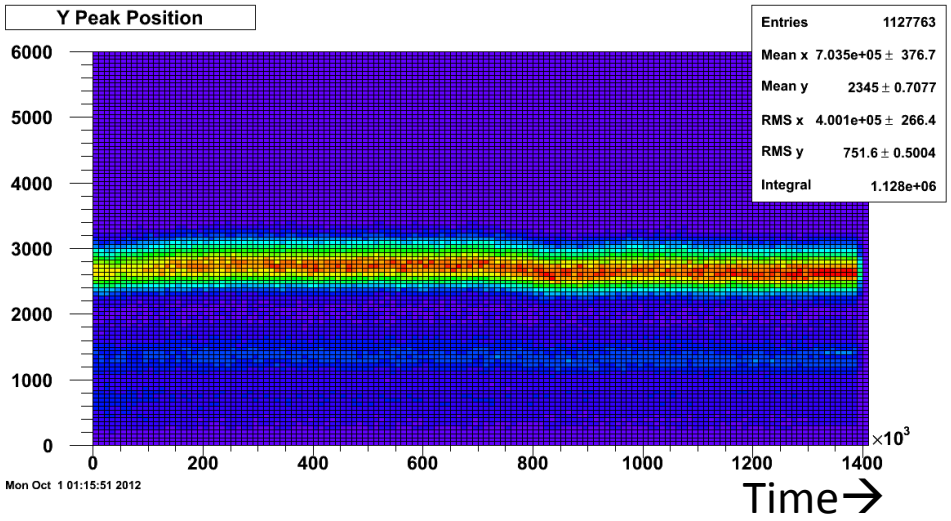
CHARGE

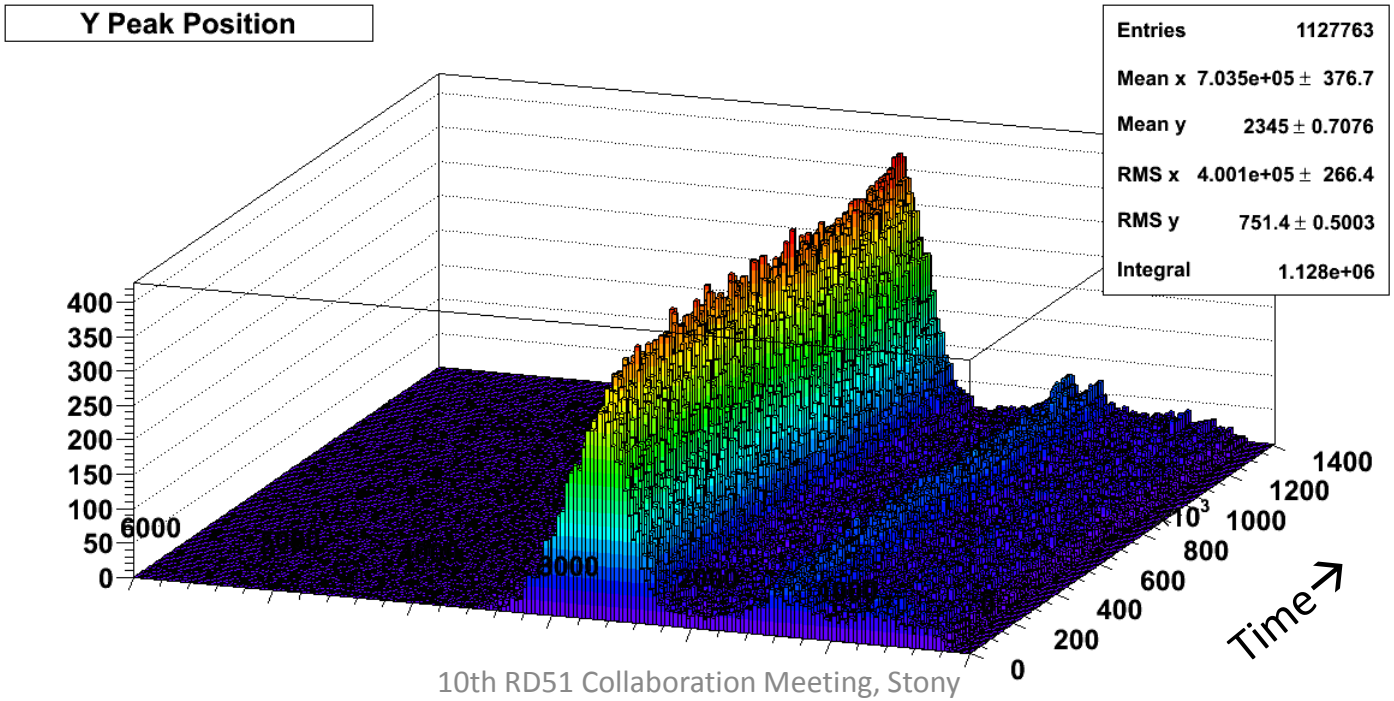


NORMALIZED CHARGE

Stability Test



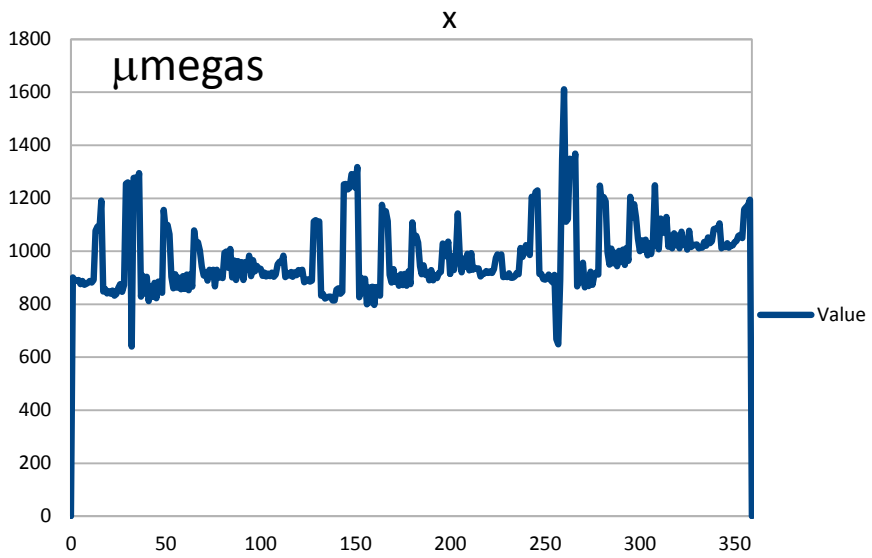


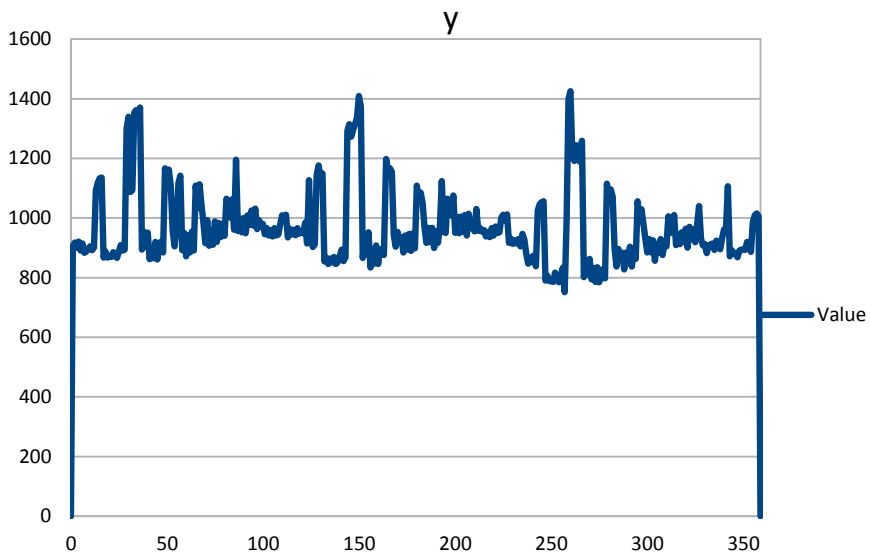


One open question…

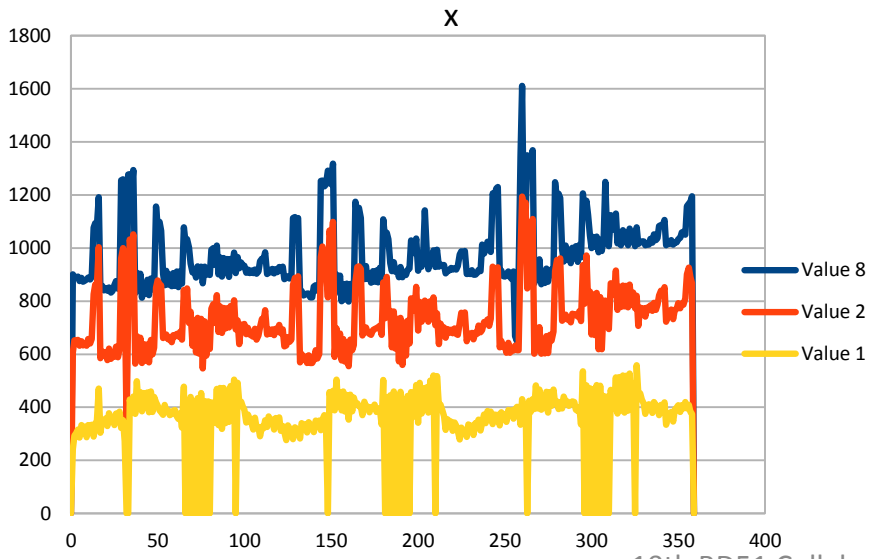
- Calibration pulse:
- We tried once but we had to retry because the output was completely non-sense

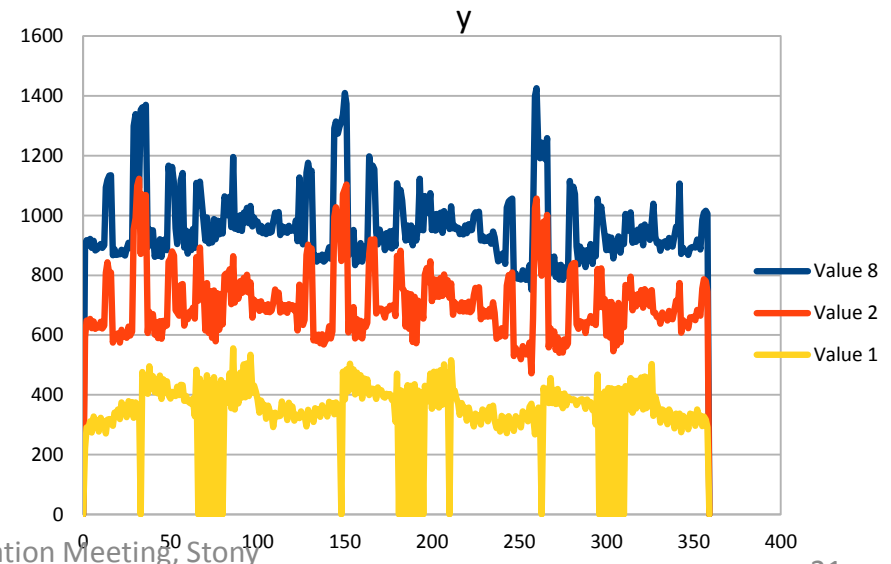
Calibration Pulse… something wrong on the data that we took



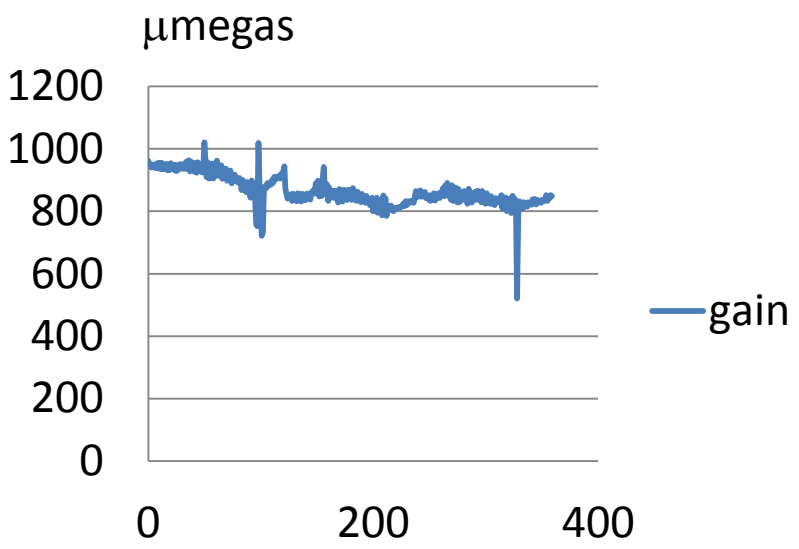


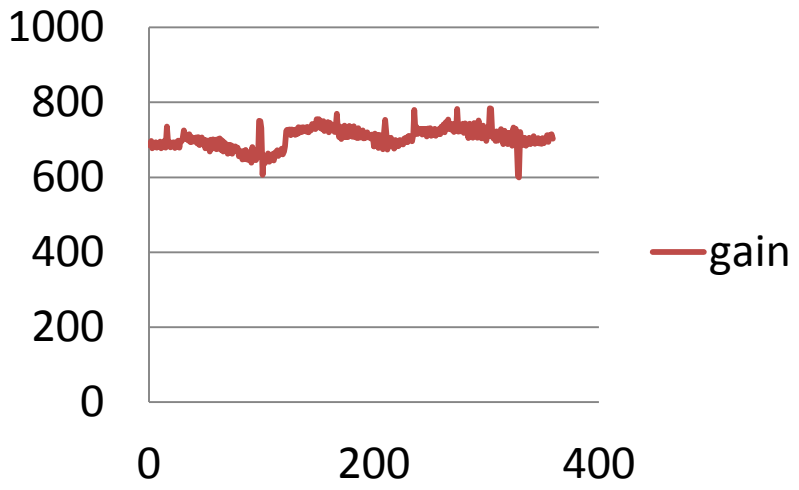
Pulsing different numbers of channels

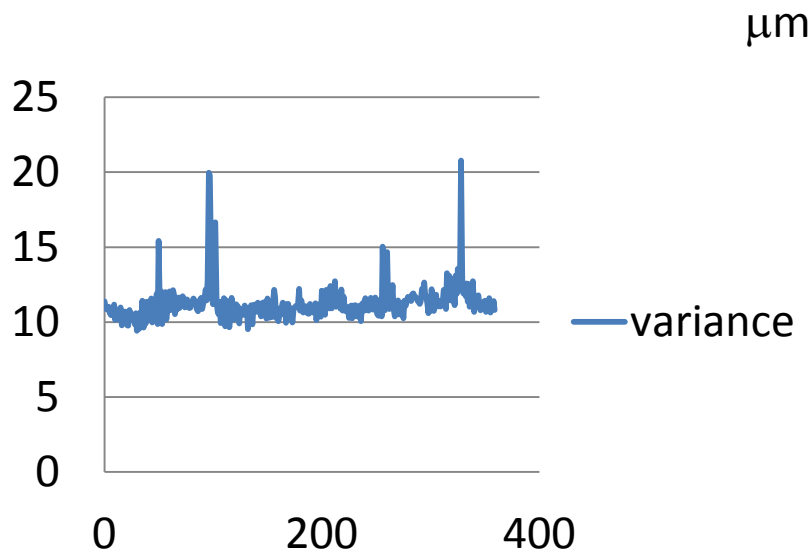


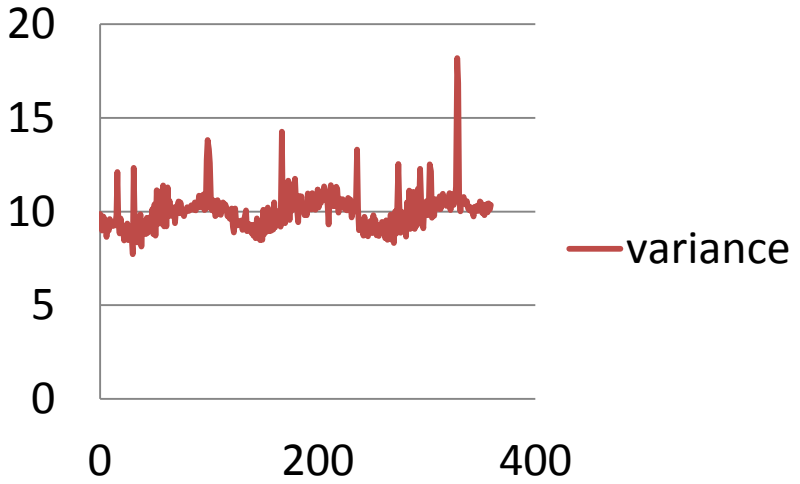


Calibration using the source signal (mistake by definition but…)









Documentation about the Lari activity available

- codebase_doc.pdf
- documentation.pdf
- installation_doc.pdf
- output_doc.pdf
- usage_doc.pdf
- zerosuppressionfile_doc.pdf

Example Code for analysis available

Projection of the signal versus time