DCH Test Beam
for Cluster Counting studies
Status and Very preliminary results

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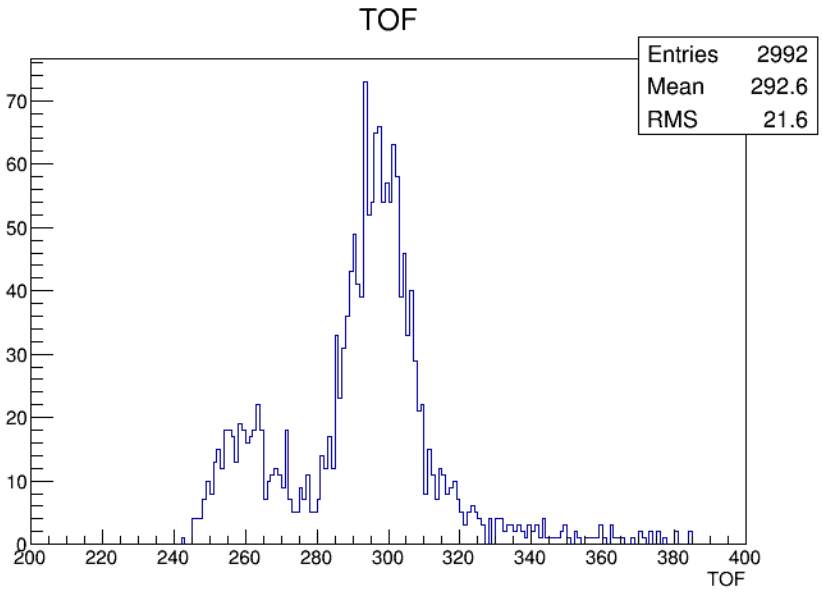
Test beam

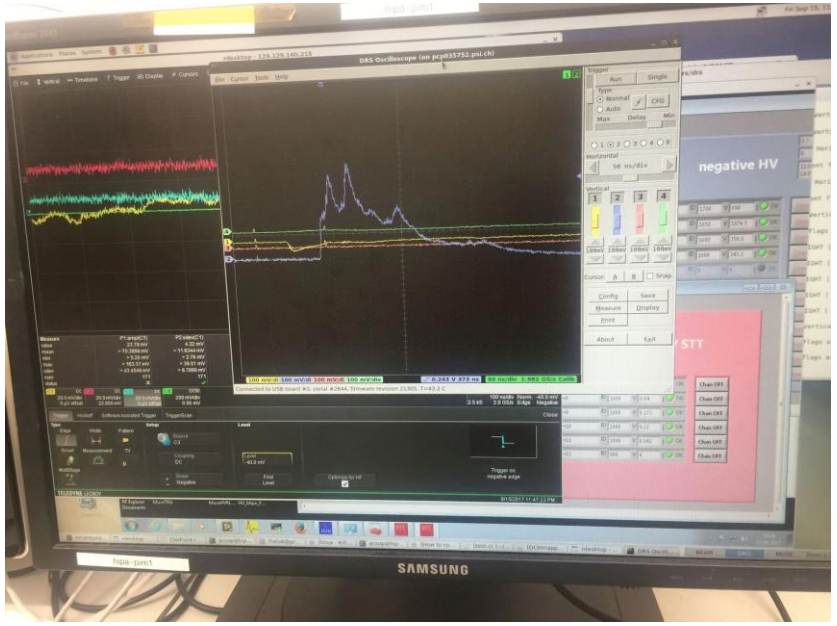
The test beam was performed at PSI in πM1 area on Sep. 13th-27th :with a

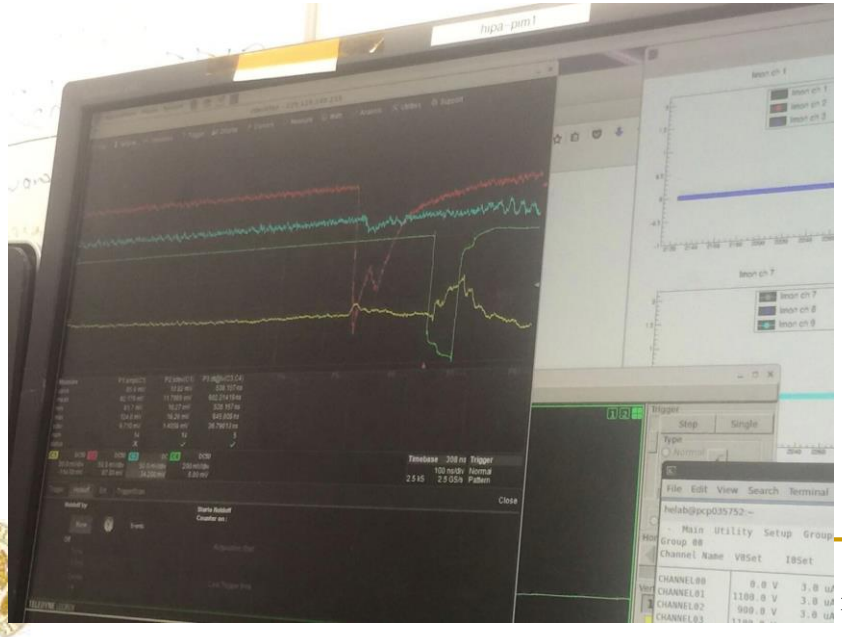
- drift chamber prototype to test the cluster counting/timing technique
- ~ 120 channel, wired with the same technique used for the construction of the MEG-II drift chamber and that could be used for the IDEA Drift Chamber;
- same FE electronics (different PCB layout) and same cables of MEG-II
  - It represents a test of the MEG-II DCH integration;

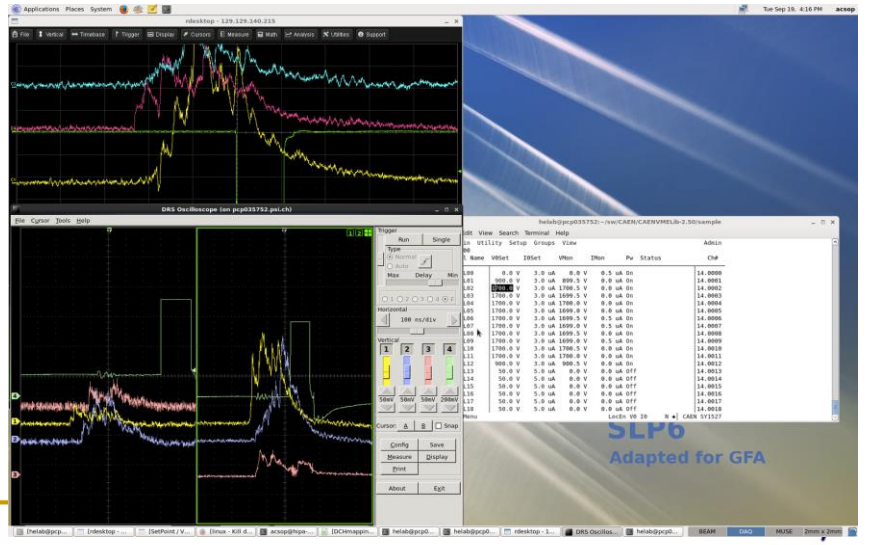
Test beam

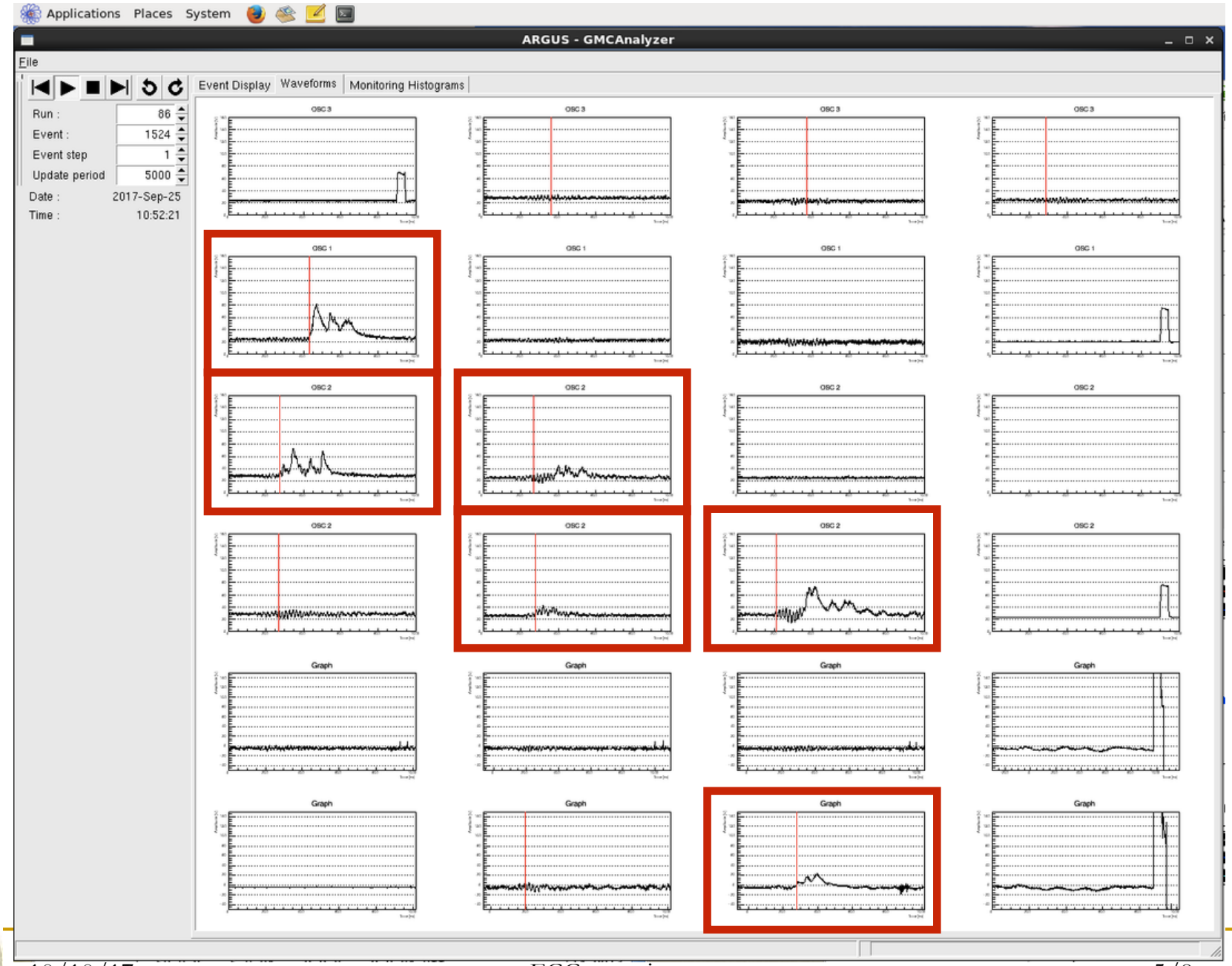
- We readout of 19 channels with 2 DRS4 evaluation board and 3 1GHz bandwidth oscilloscopes at 2.5 GSs.
- We have an external tracking system made of a pair of silicon detectors (Modupix).
- A set of two pairs of scintillators for PID with TOF -> clean π/μ samples to test PID with cluster counting




negative HV
SAMSUNG




SLP6
Adapted for GFA


Applications Places System
ARGUS - GMCAnalyzer
File
Event Display
Waveforms
Monitoring Histograms
Run : 86
Event : 1524
Event step 1
Update period 5000
Date : 2017-Sep-25
Time : 10:52:21
OSC 3
OSC 1
OSC 2
Graph

Data Samples

Data were taken in a few different conditions with 90:10 gas mixture:

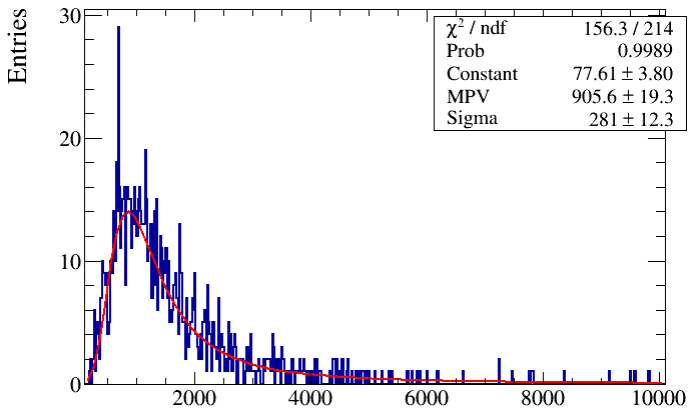
- HV scan (1425 to 1500 V)
- scan of wire angle w.r.t. the beam (40° to 90°)
- scan of particle momentum (115 to 400 MeV/c)

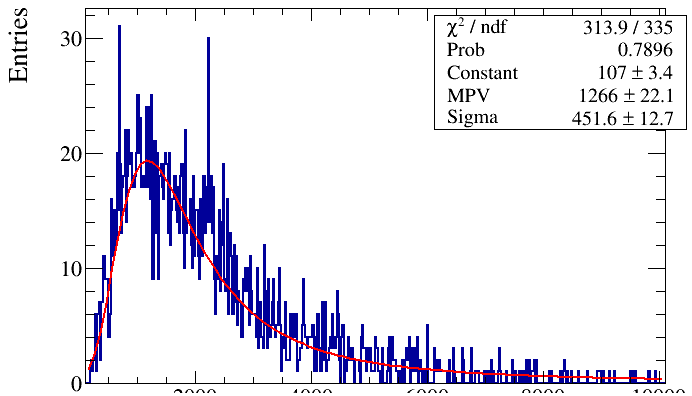
~ 5 - 10 Hz DAQ rate (limited by the communication with the devices)

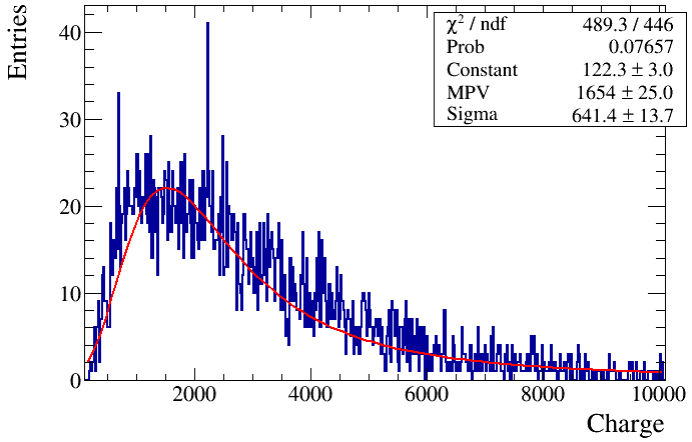
More than 150k events were collected

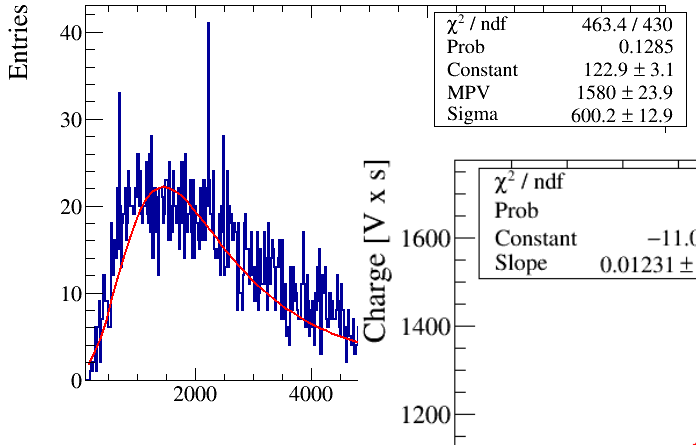
The data analysis is not yet started, we just start to look at some preliminary quantity just to check the consistency of the data, as an example with the help of Nilou, we performed some preliminary plots for the Cell gain:

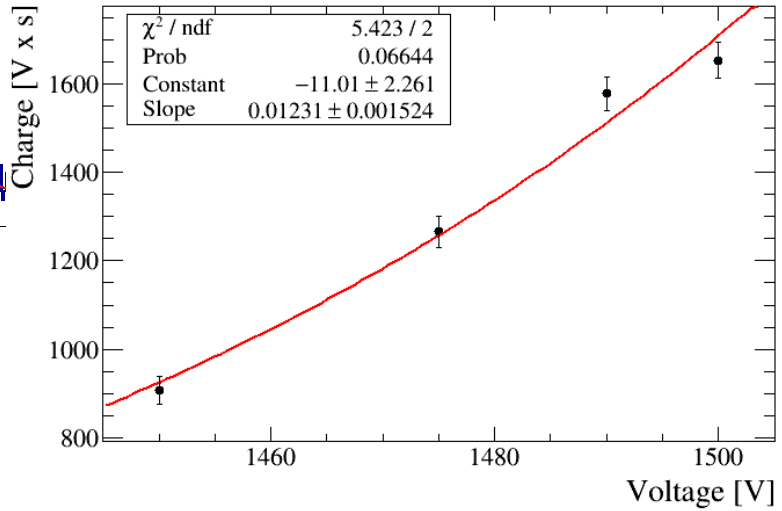
Data Samples (Gain trend for Cell 4 on Lay 4:)











Summary

- A large statistics of tracks was taken at πM1, under different conditions, to test the cluster timing and counting techniques
- Data quality seems to be good:
  - few mVRMS noise, no strange pick-up, no striking indication of ground loops, cluster structures clearly visible, etc.
- Data analysis will start soon