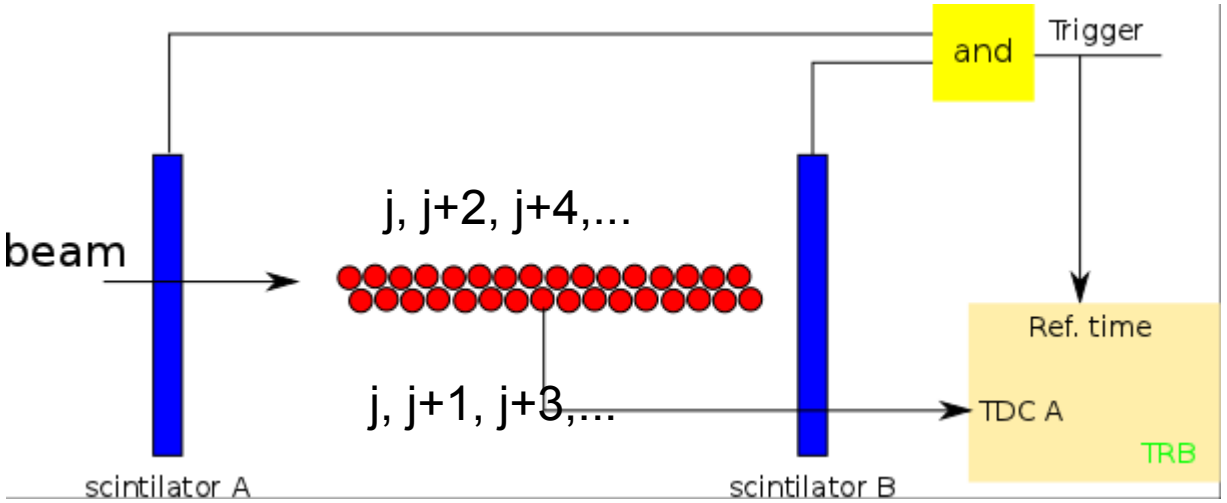
Juelich Test october 2012

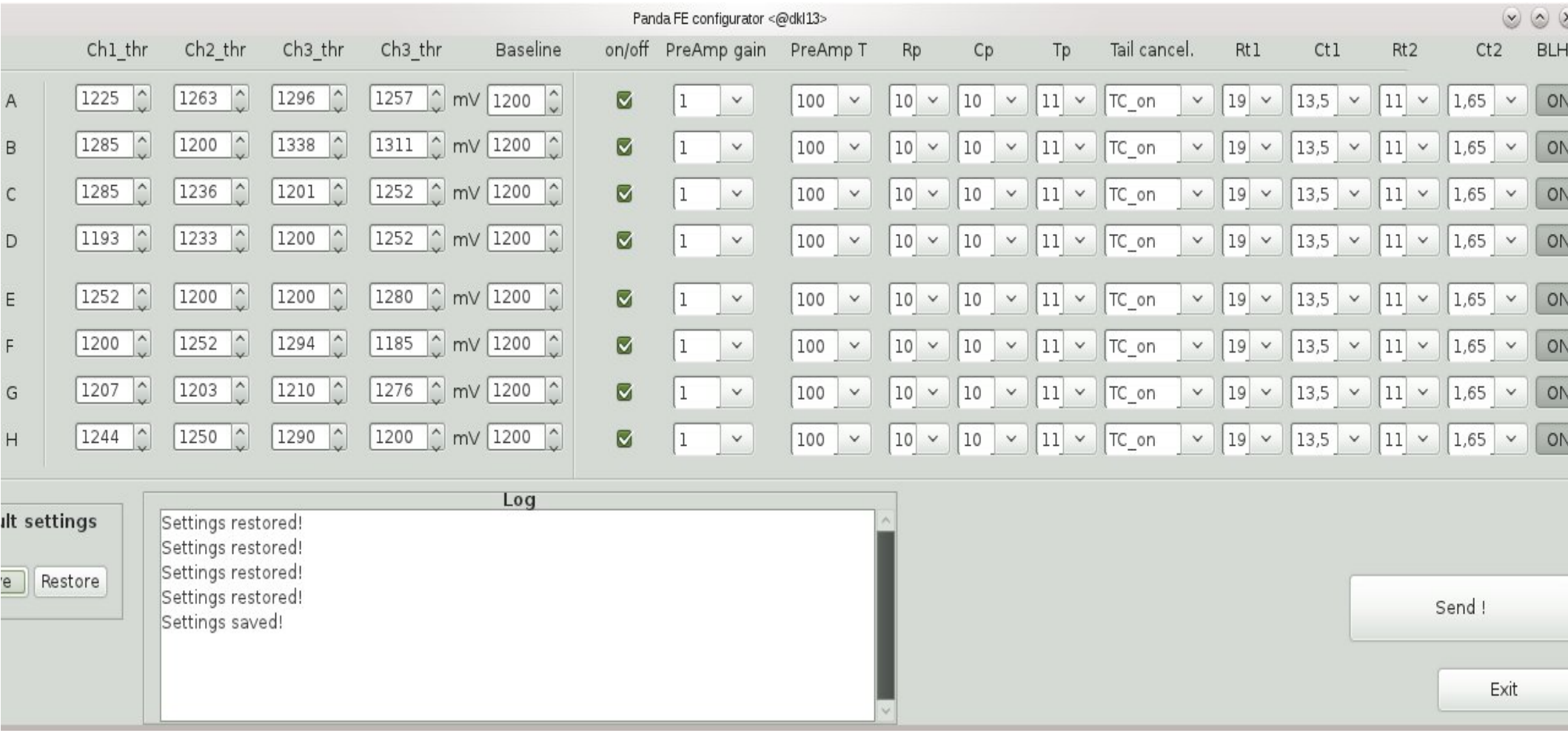
- Beam momentum p=0.9 GeV/c , beam intenisty ~10^5 / sec files:

```
te12266235528.hld.root    (day 266 23:55:28)   1800 V
te12267004949.hld.root         267 00:49:49    1750 V
te12267003239.hld.root         267 00:32:39    1900 V
te12267010614.hld.root         267 01:06:14    1700 V
```

- ASIC configuration (see next slide)
- Experiment set-up (& straw numbering)

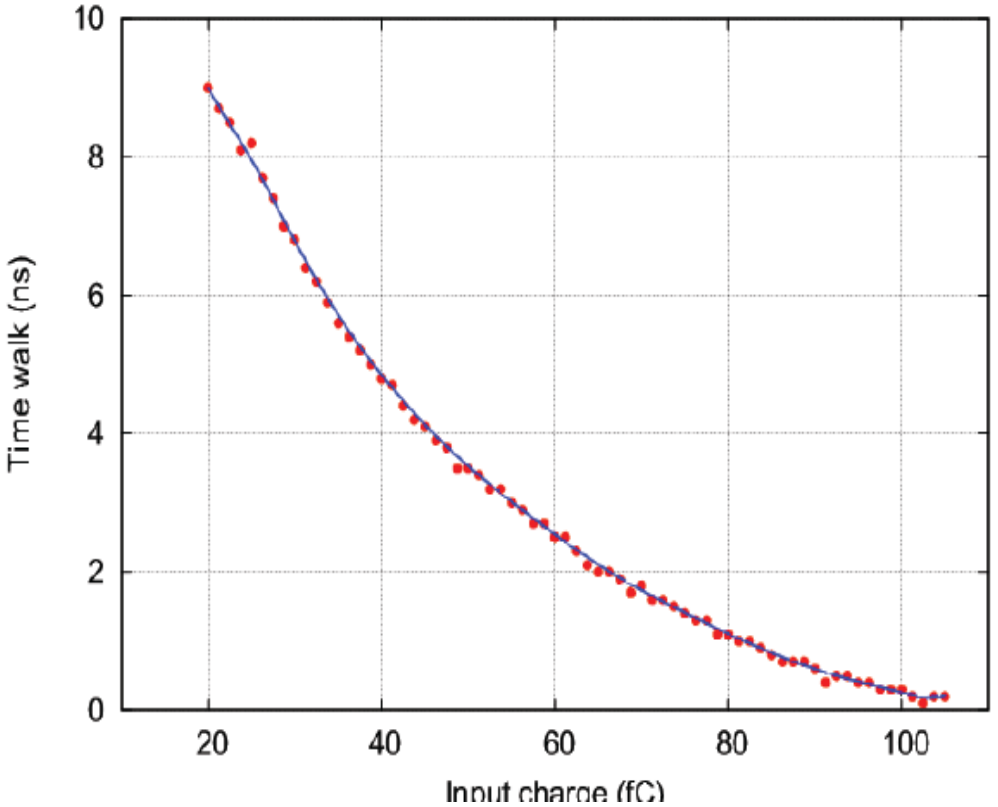


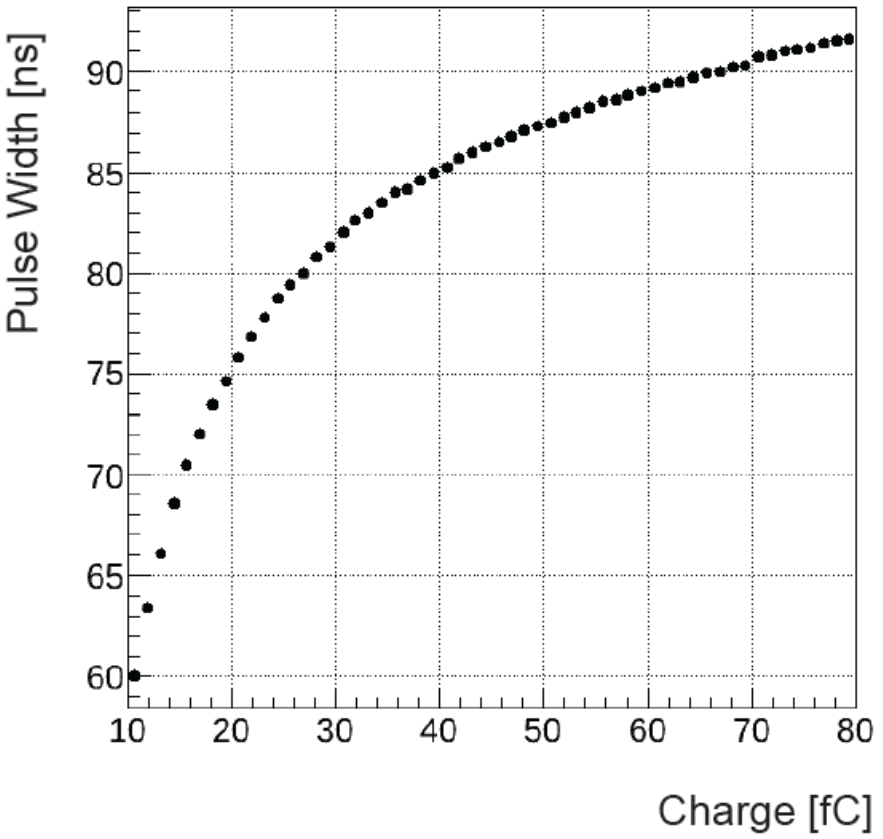
ASIC set-up



Most of data taken with this set-up : Preamp Gain 1, rising time ~40 ns,pulse duration ~ 100 ns
stable ASIC operation (no oscilation etc)

FEE characteristics : reminder I: operating curves



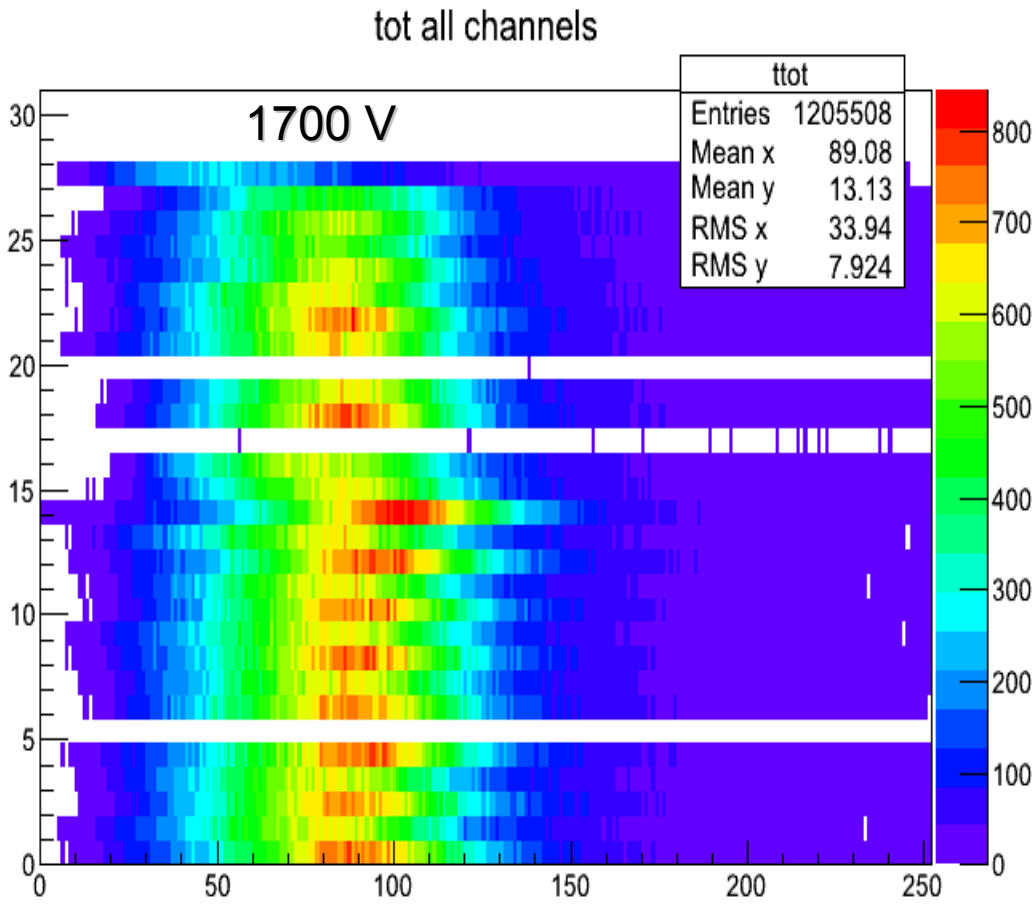


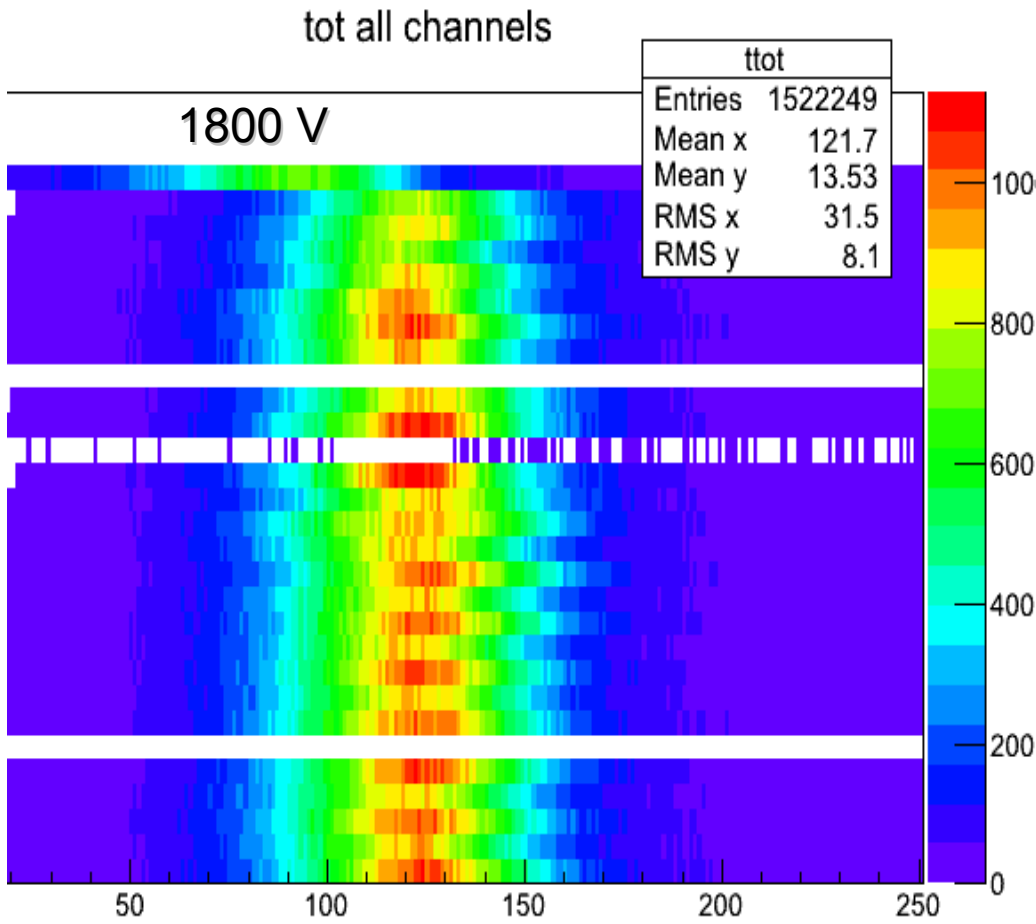
Max walk ~ 10 ns

flatting for Q > 100 fC

(Q for delta pulse (eq. to 6x larger detector pulse)

TOT -all channel



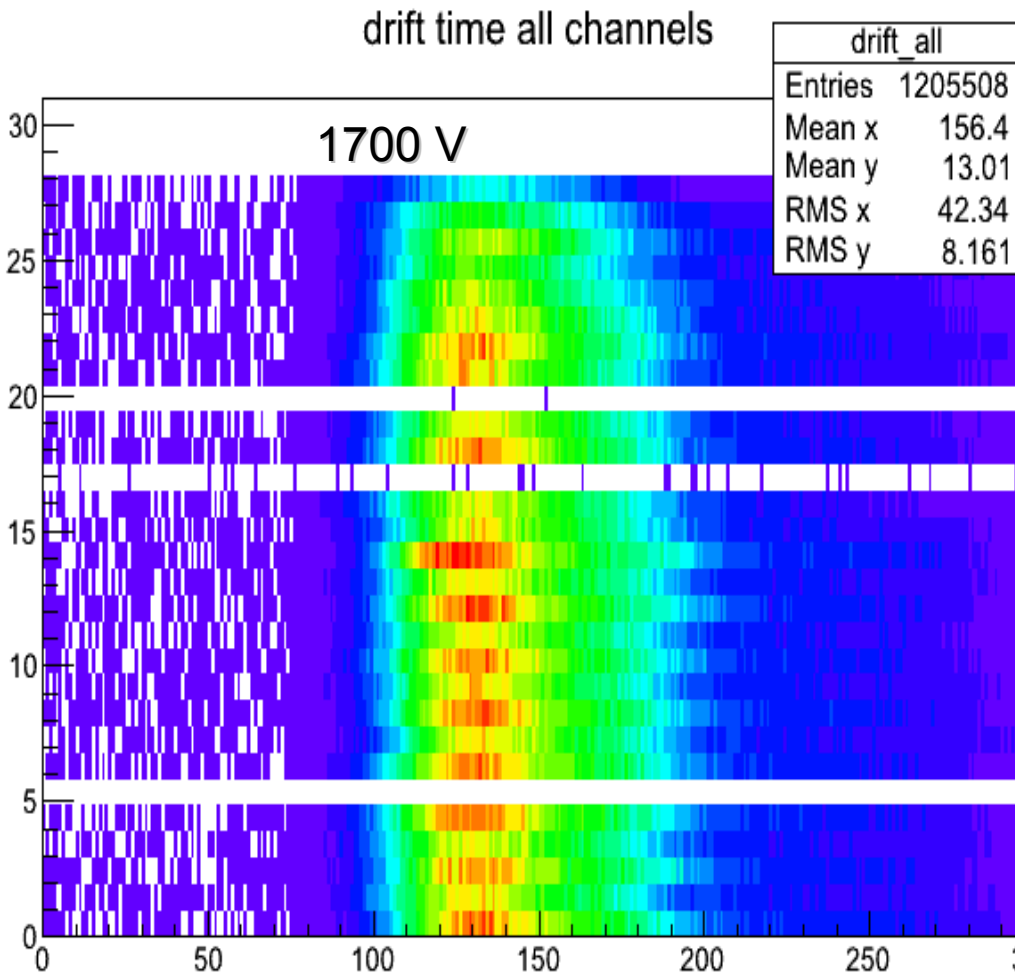


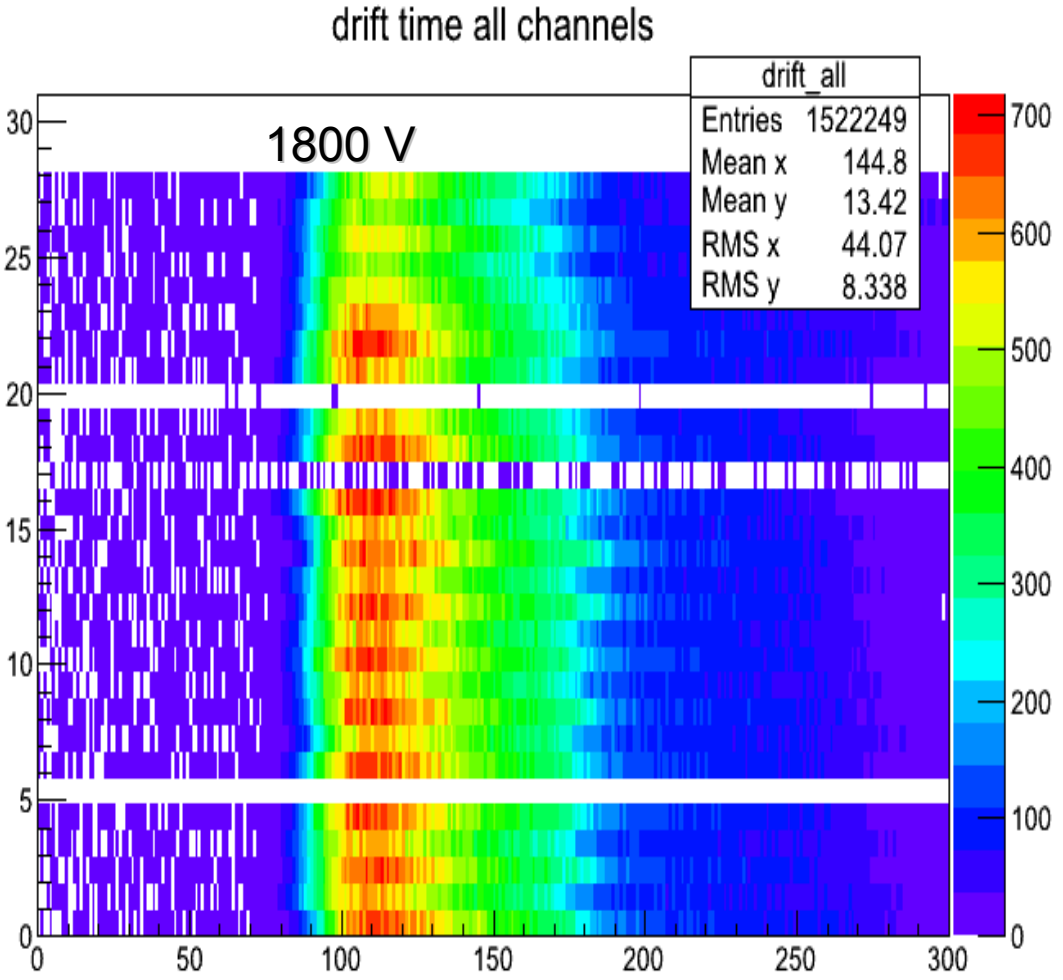
Threshold set-up above noise :

all channels shows similar TOT (small differences due to thresholds)

- TOT follows HV increase (as expected)

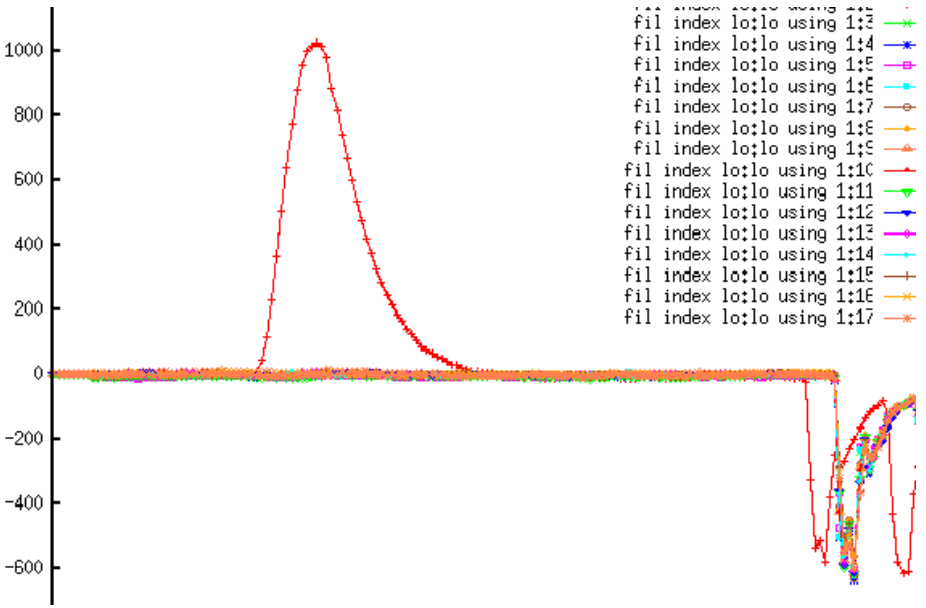
Drift time -all channels

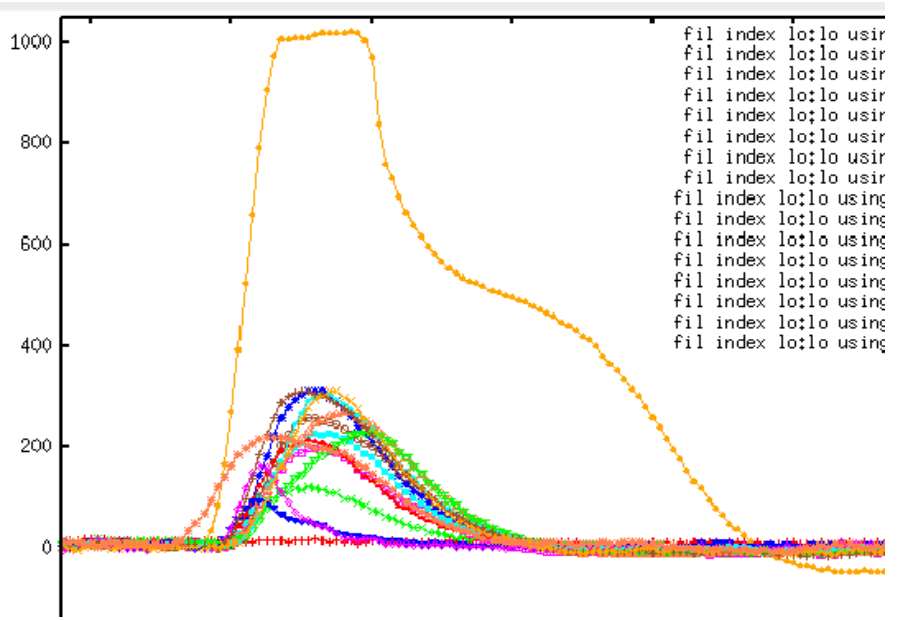




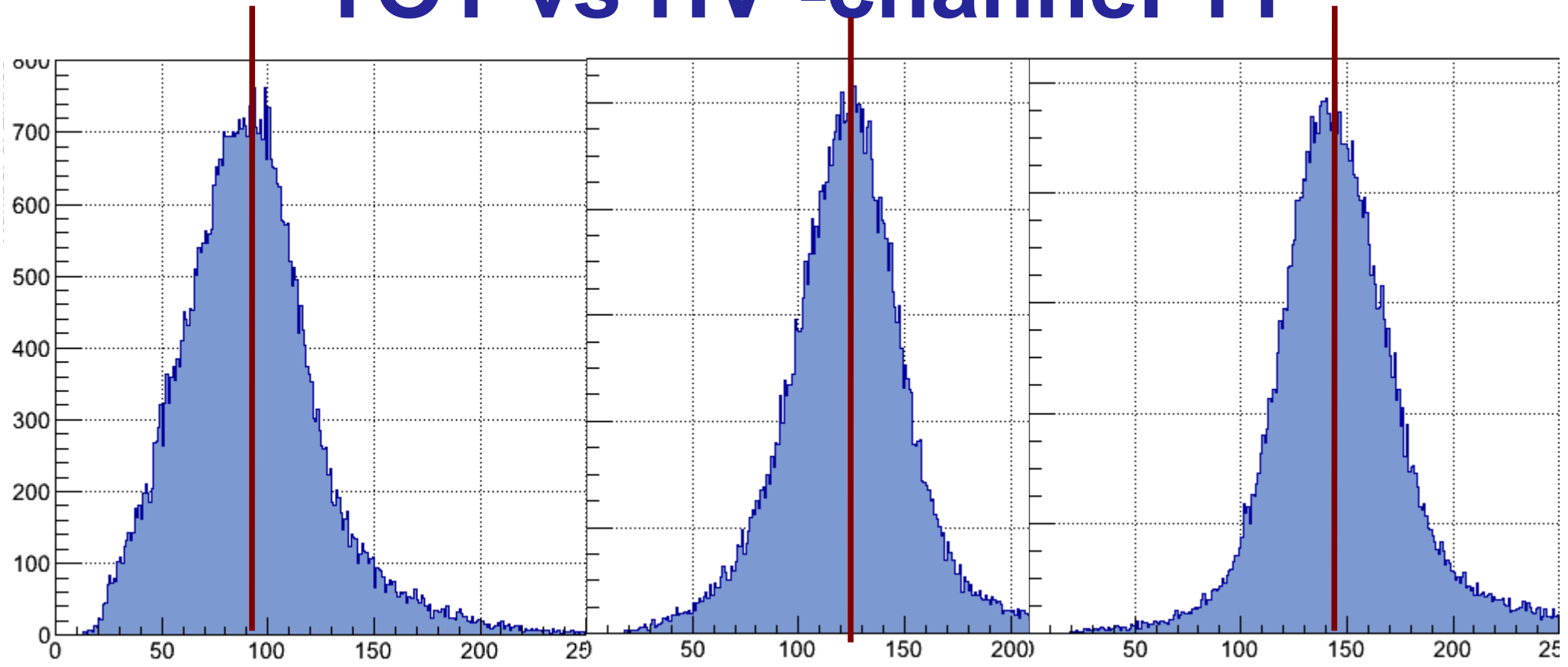
Signals from ASIC (vfQDC)

- beam momentum 900 MeV/c
- HV at 1750 V



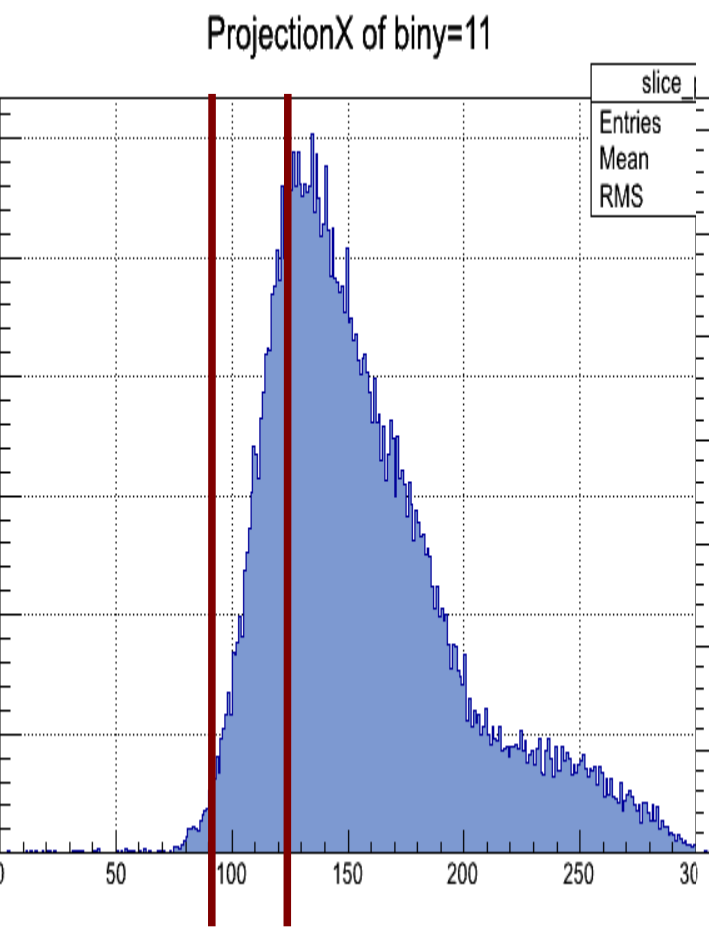


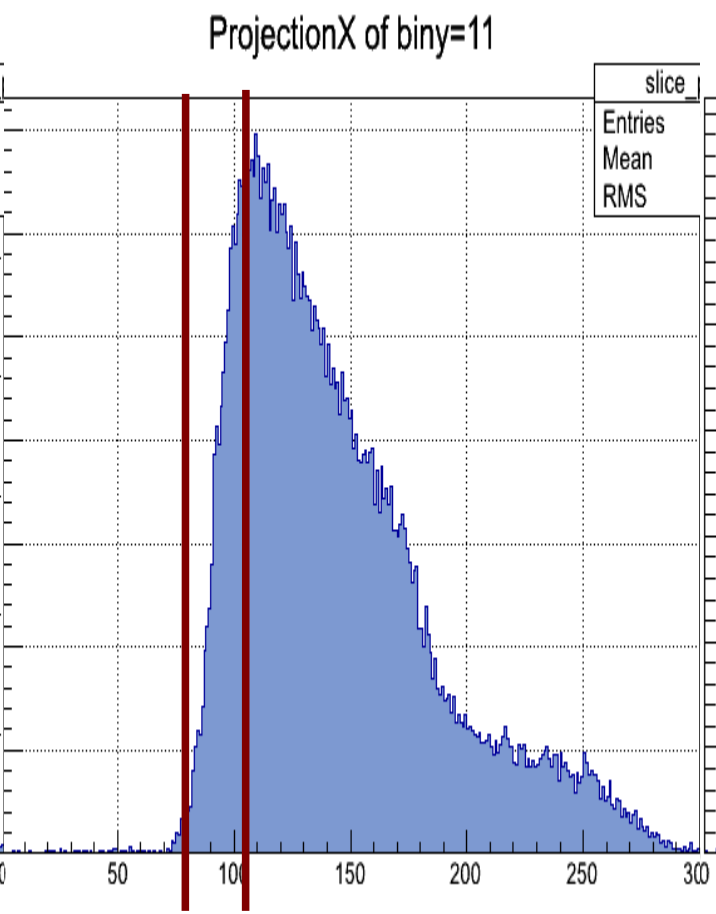
TOT vs HV -channel 11

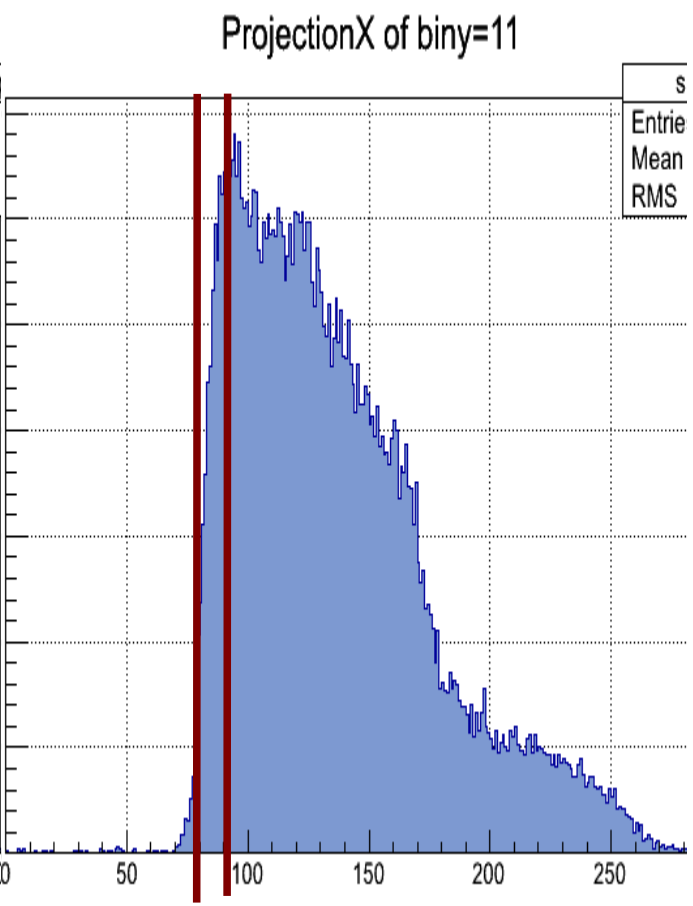


HV 1700 V	1800 V	1900 V
Mean 90	124	145

Drift times- channel 11 vs HV







HV =1700 V

Δ T = 30 ns

1800 V

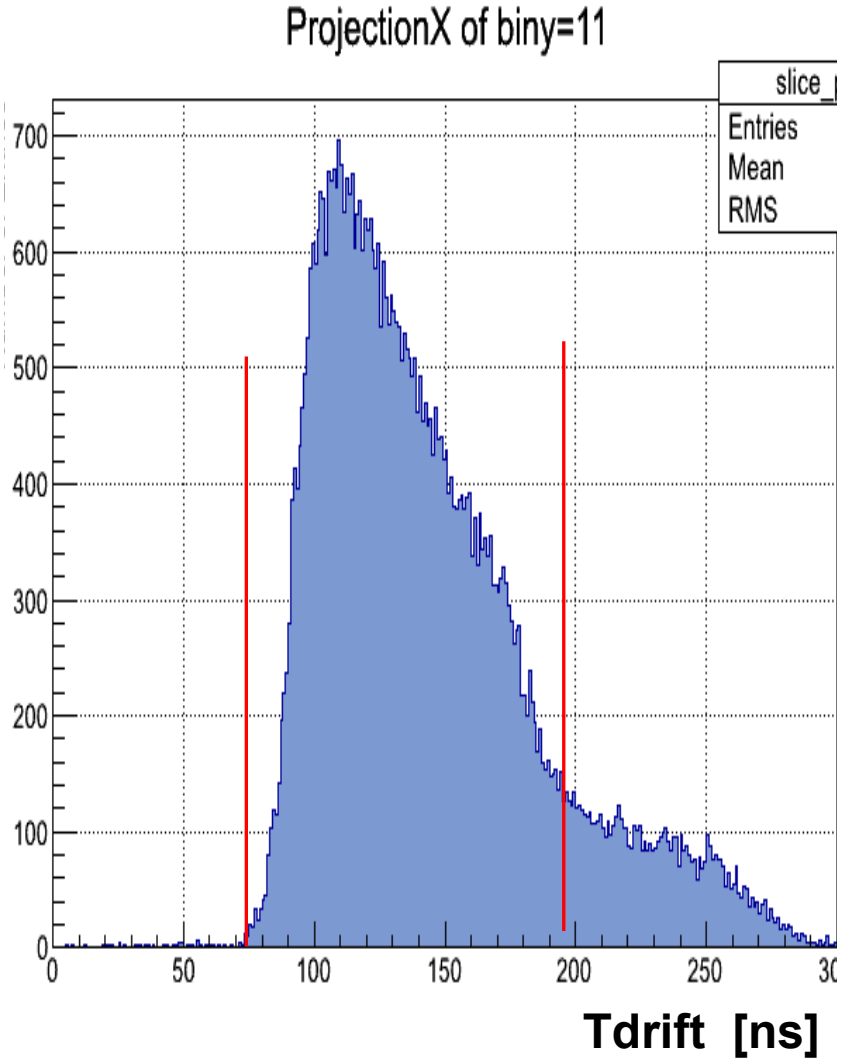
Δ T =20 ns

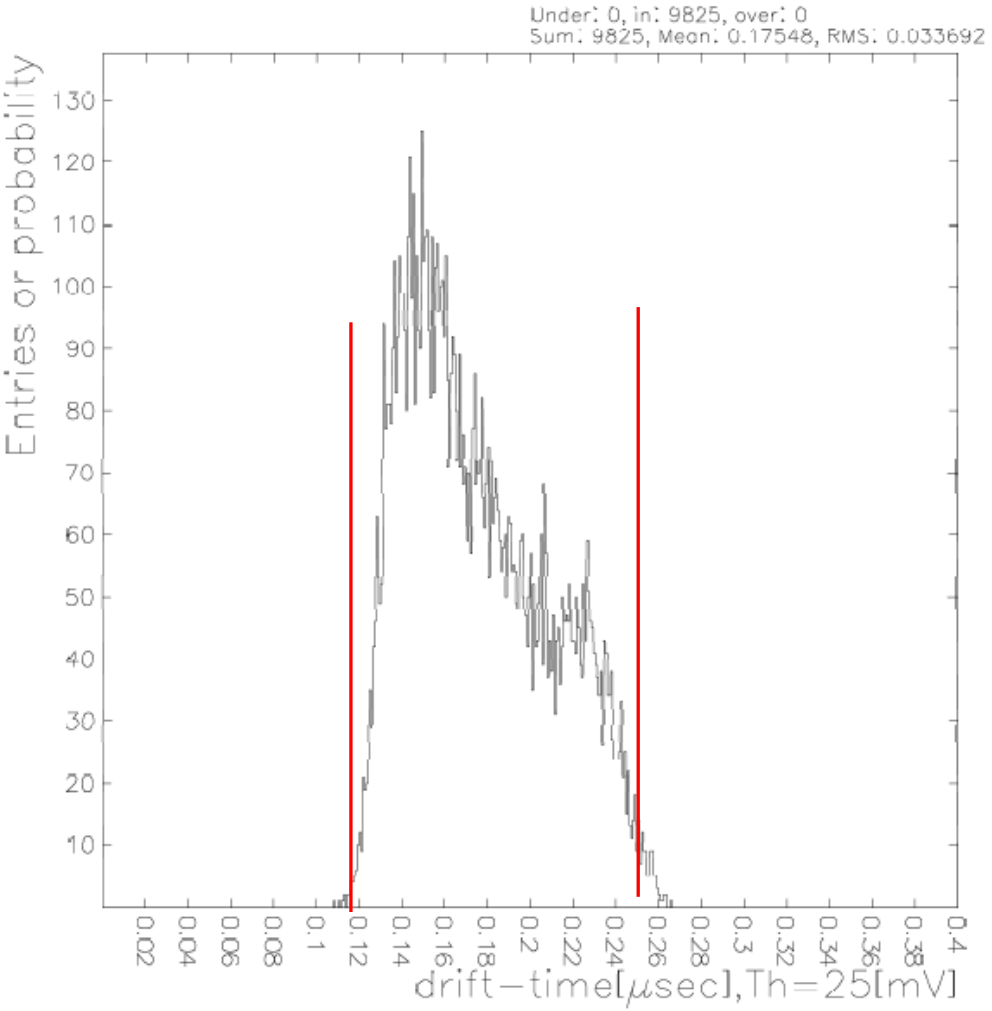
1900 V

Δ T =10 ns

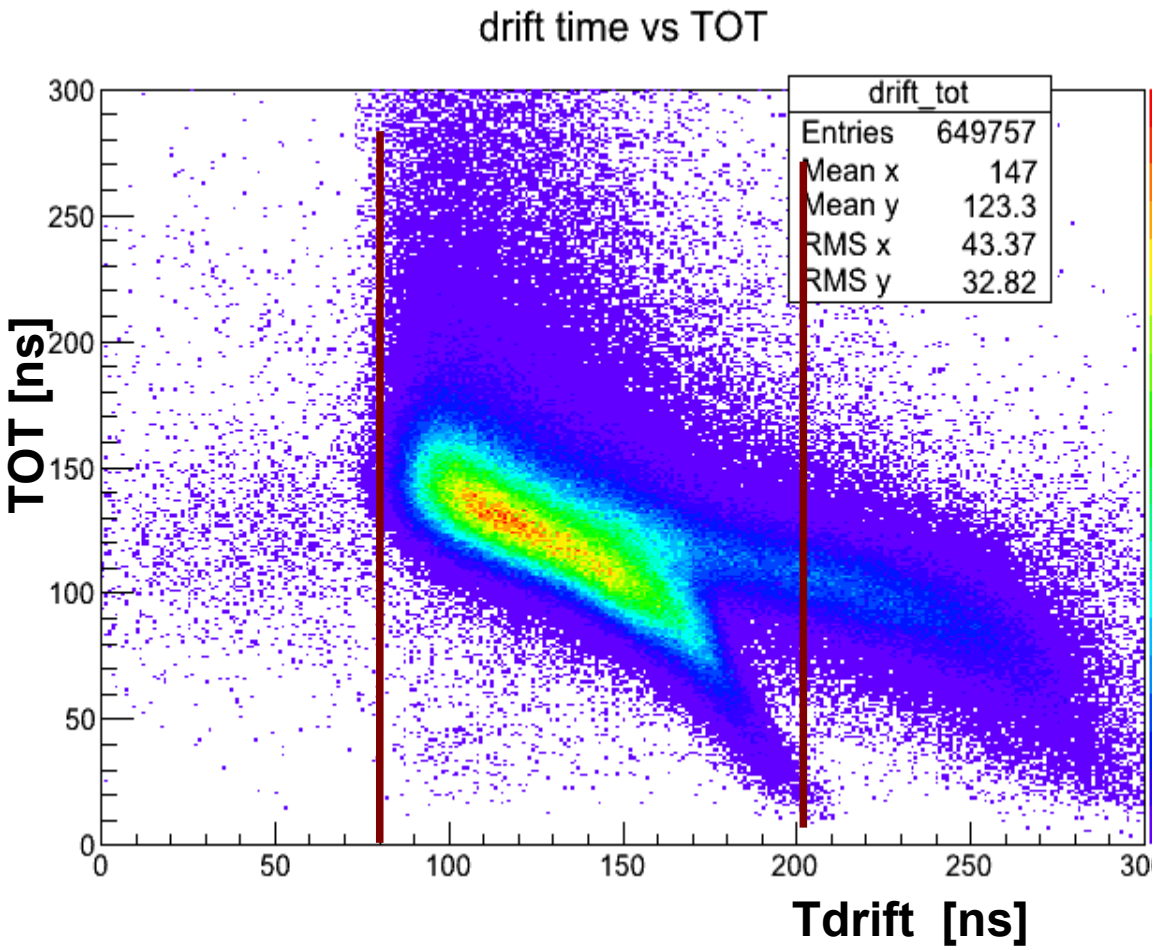
- Steeper rising for higher HV

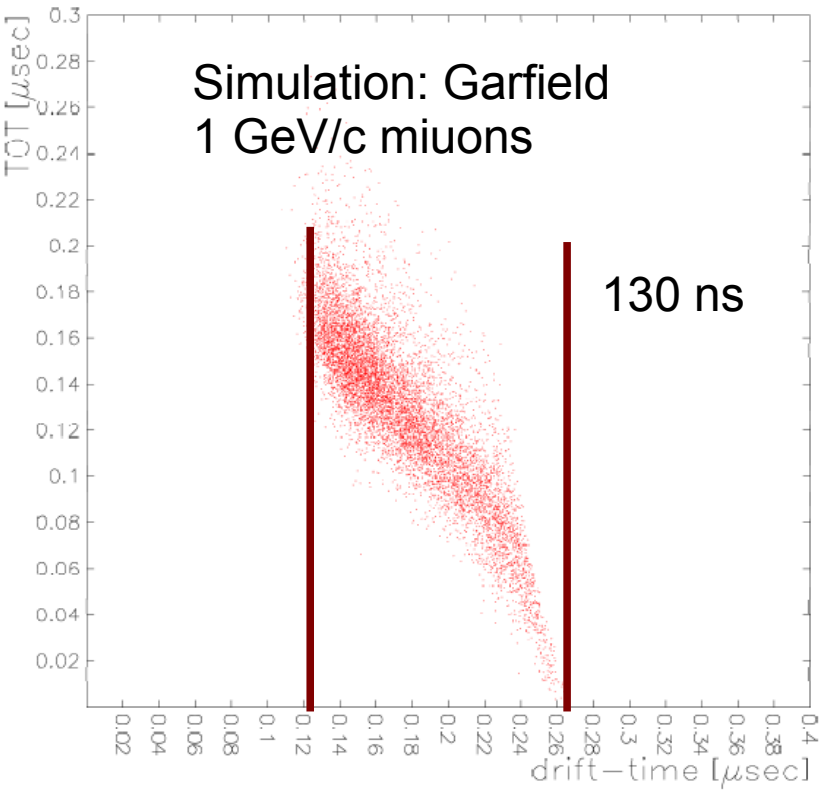
Comparioson to simulation (Garfield+FEE transfer function)





TOT vs Tdrift -all straws (NS>13)

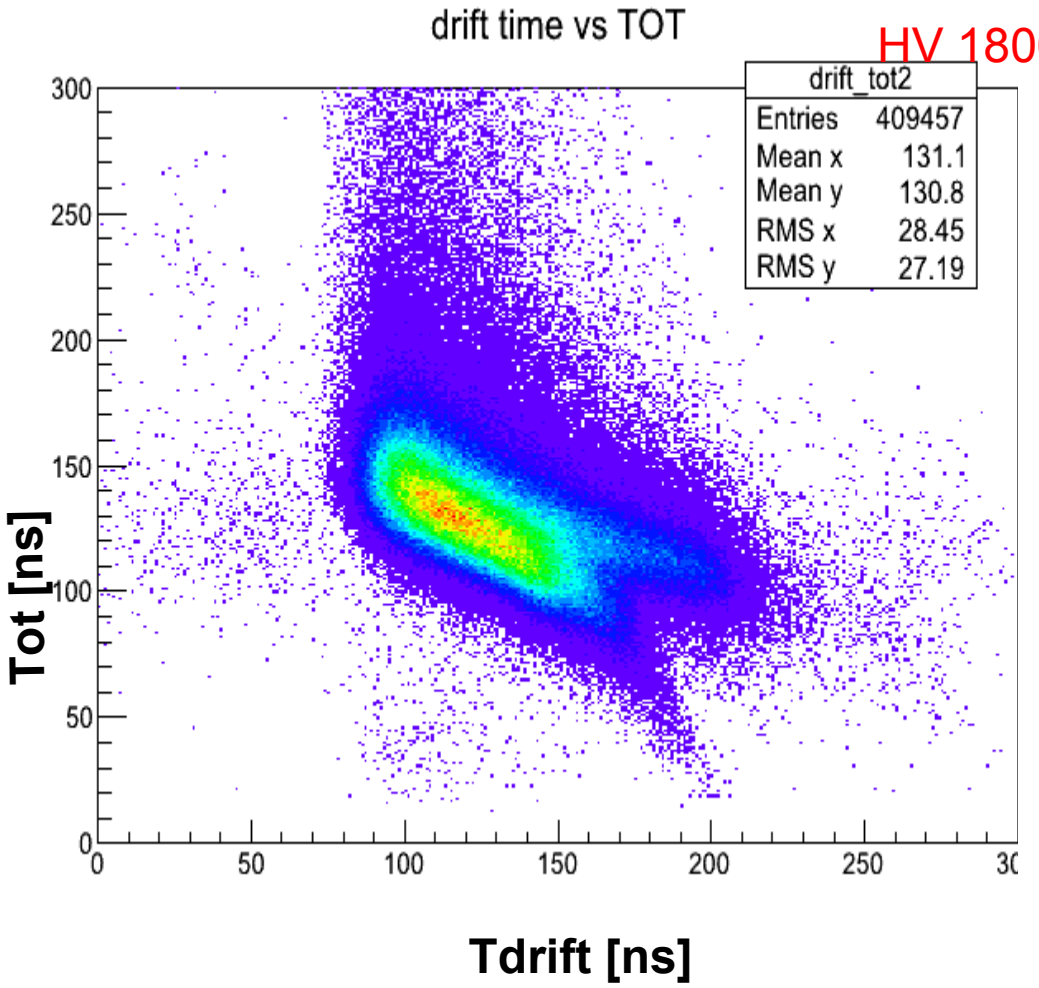


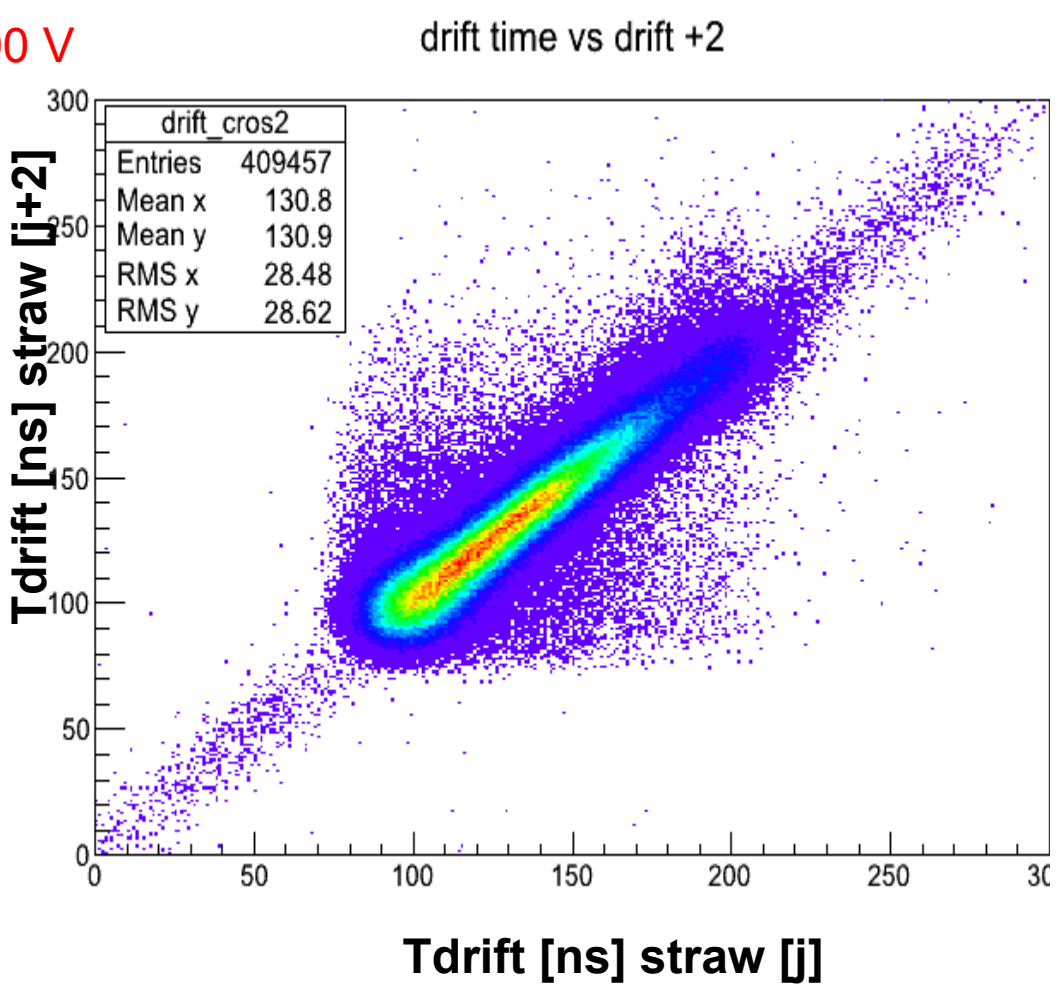


The problem: second leg structure in TDrift>130 ns !!

Possible explanation: pile-up due to micro bunch structure of beam: one beam particle makes trigger the second one (within 100 ns trigger widnow) crosses straws and makes delayed (by max 100 ns) distribution

TOT vs TDrift: straws in one layer (j,j+2,j+4)

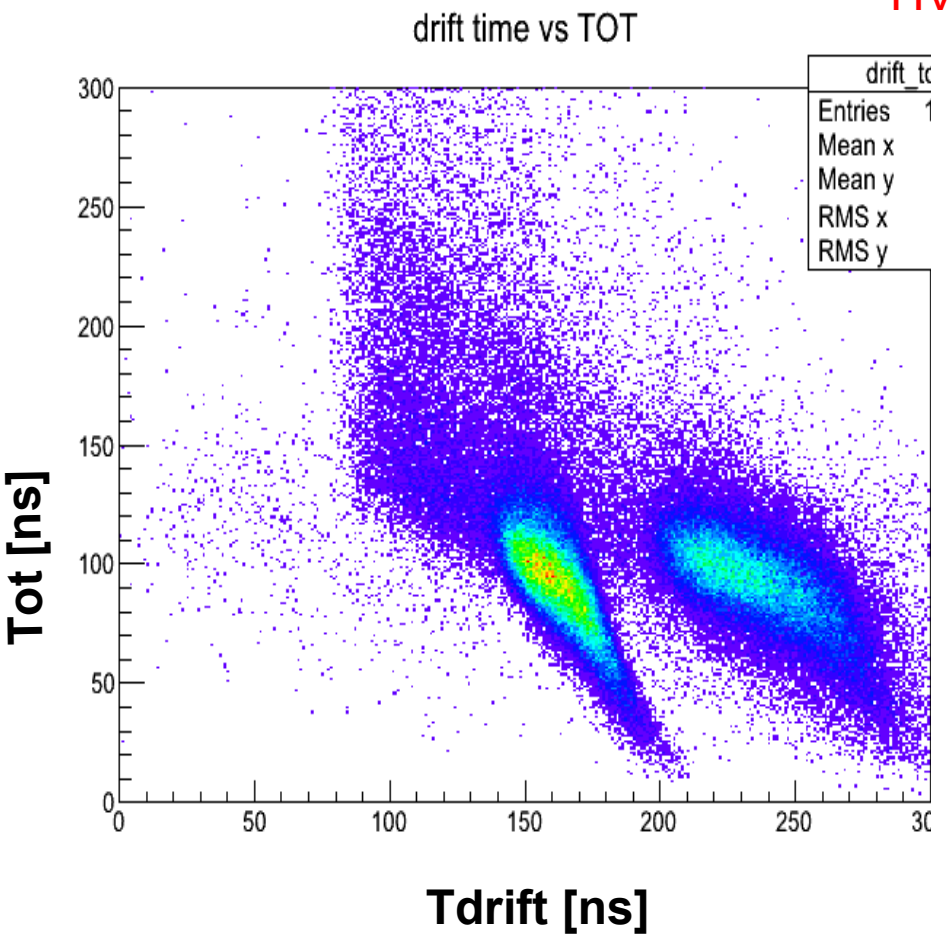


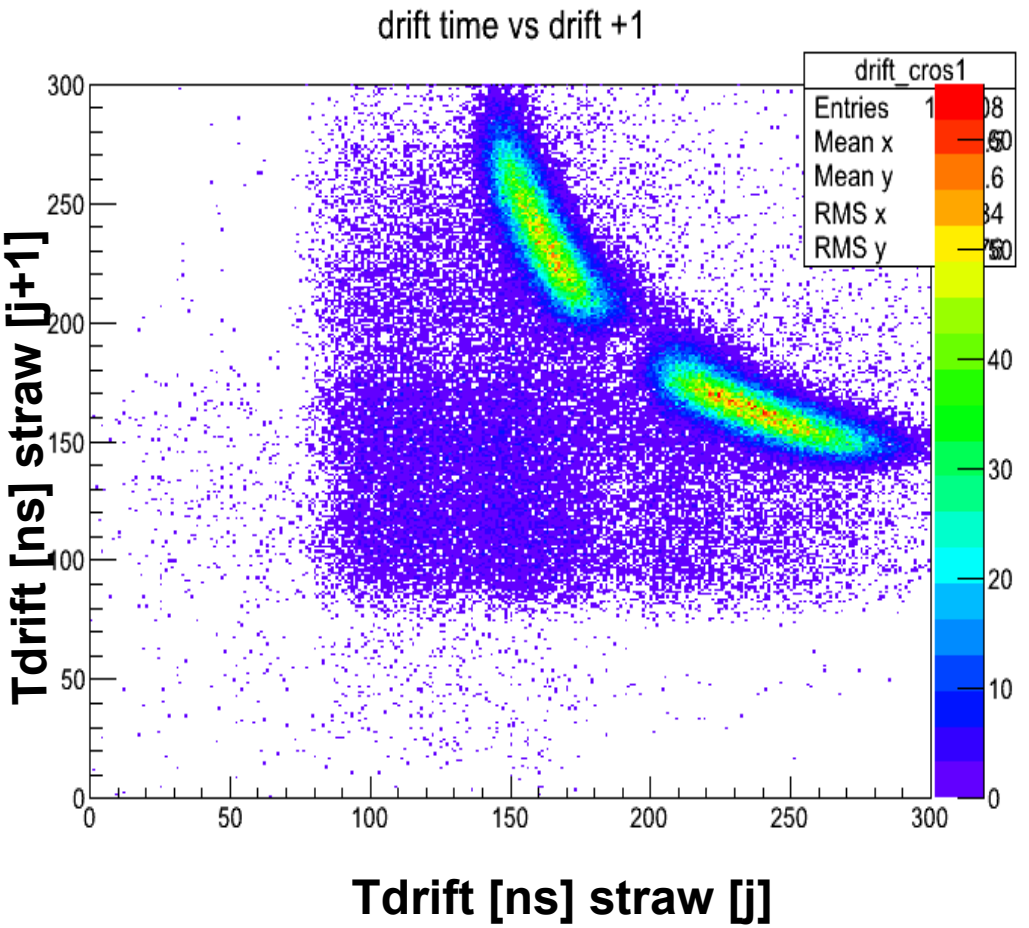


Tracks crossing ONLY one layer (upper one) : nice correlation visible

TOT vs Tdrif: straws in one layer (j,j+1,j-1),..)

HV 1800 V



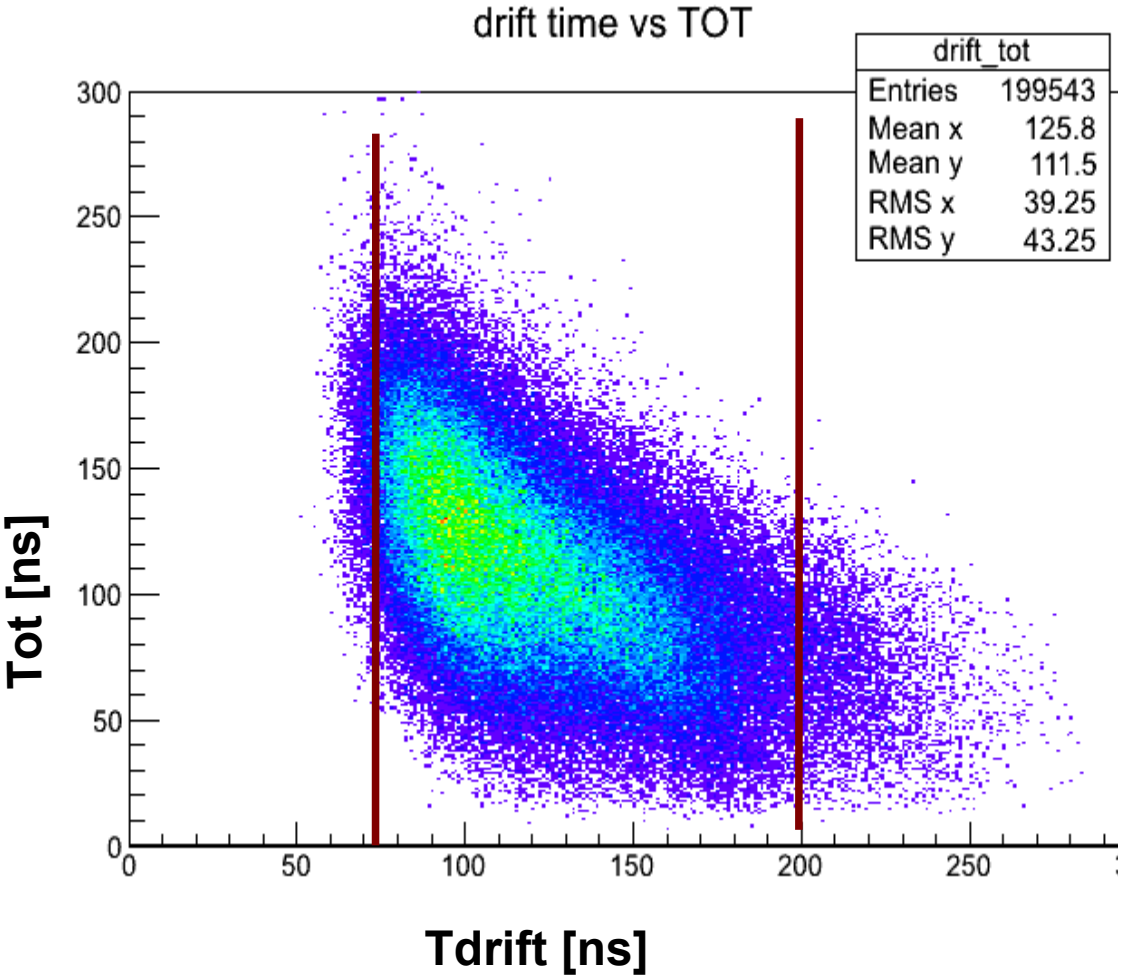


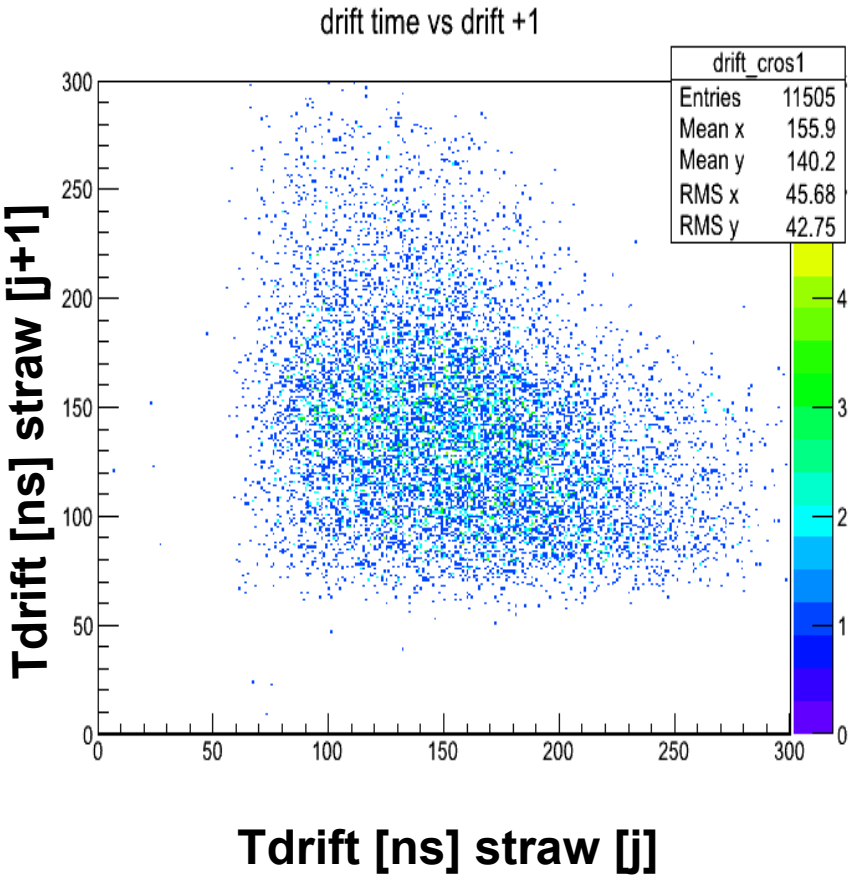
Tracks crossing TWO layers (upper and lower one)

35 % of one layer events (much more than expected from geometry ~15%)

Second structure more pronounced

Cross check with Sr90





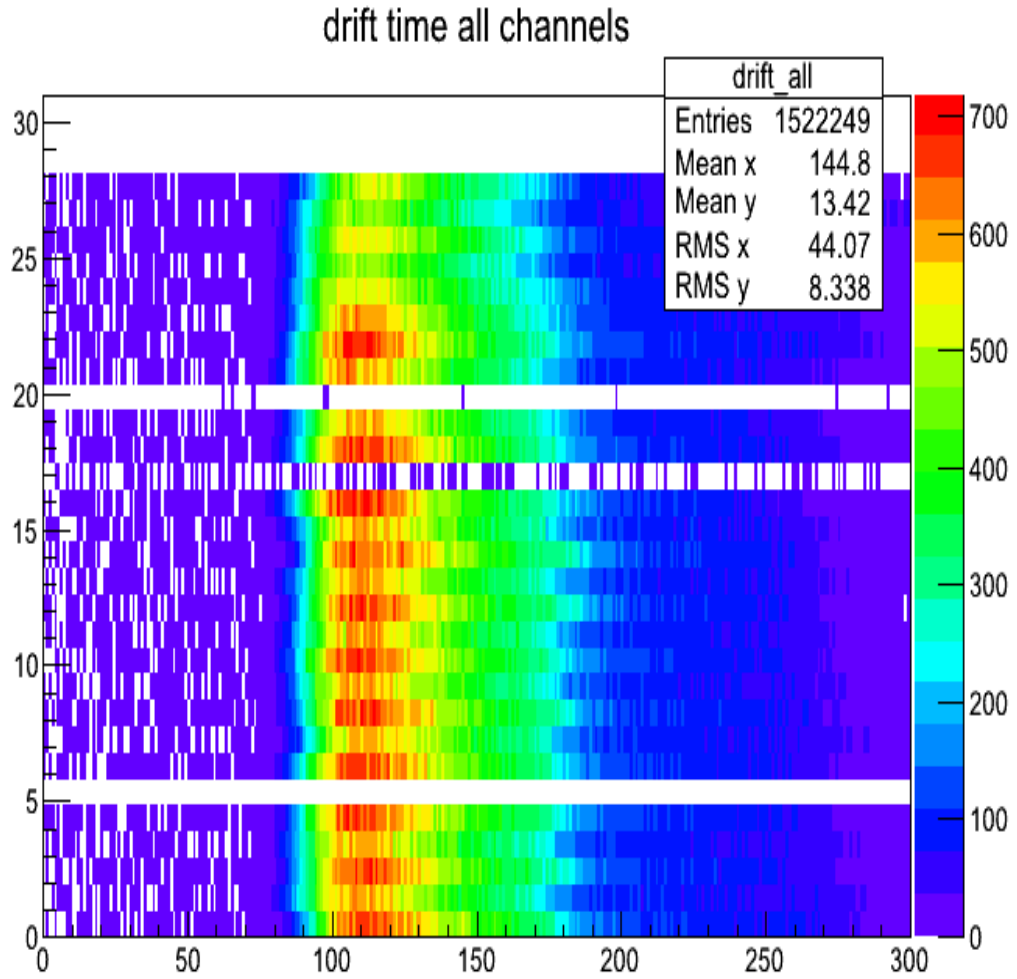
Kraków set-up with trigger as in Juelich test

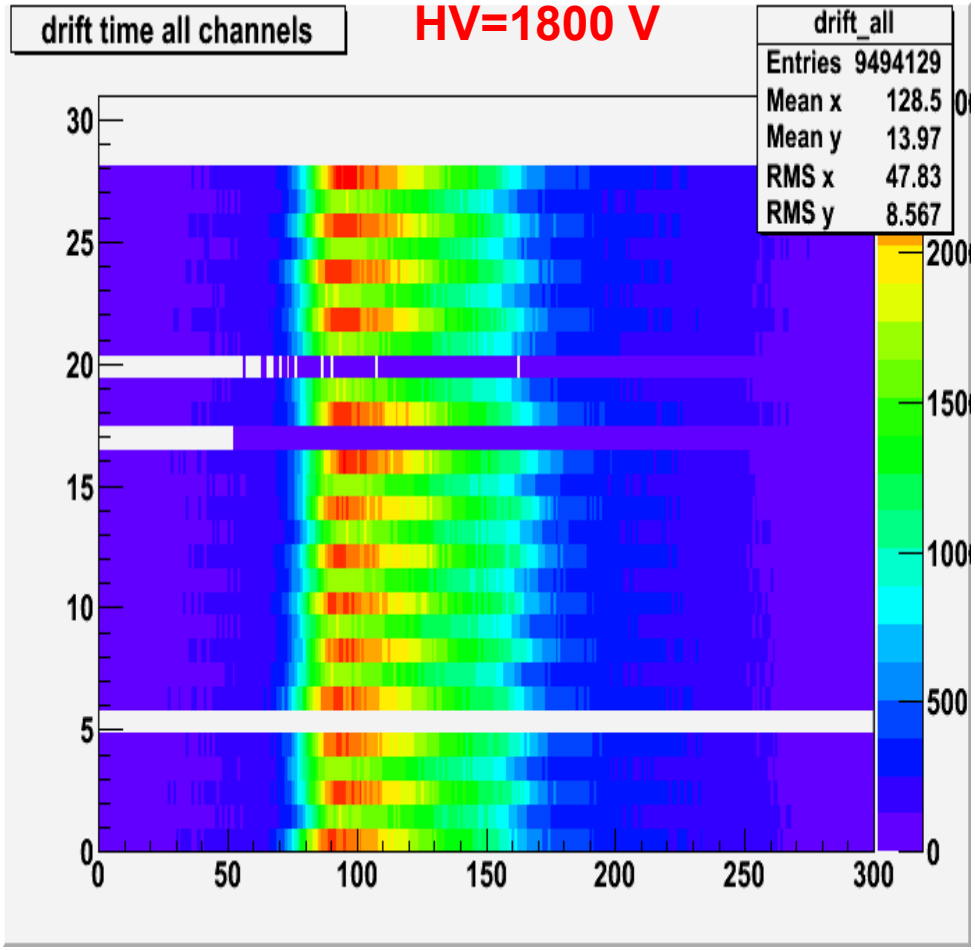
No second leg visible

distributions more smear-out (low energy electrons)

10% of one layer events

Comparison to results from december test (0.6 GeV protons)

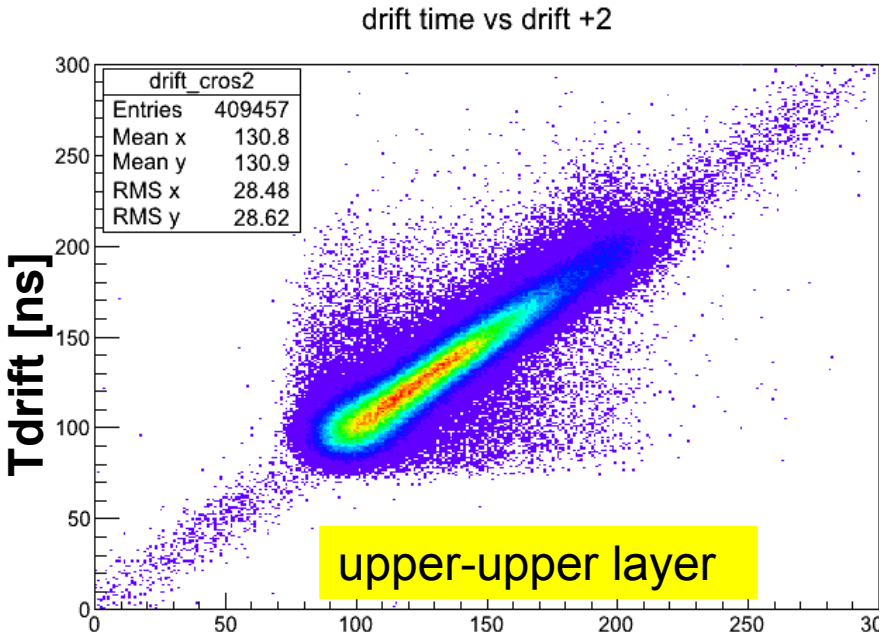


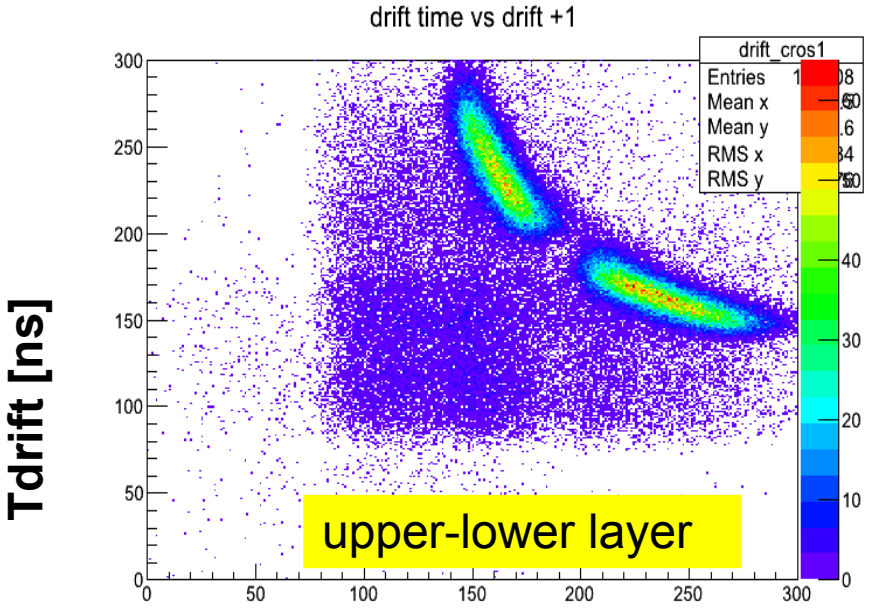


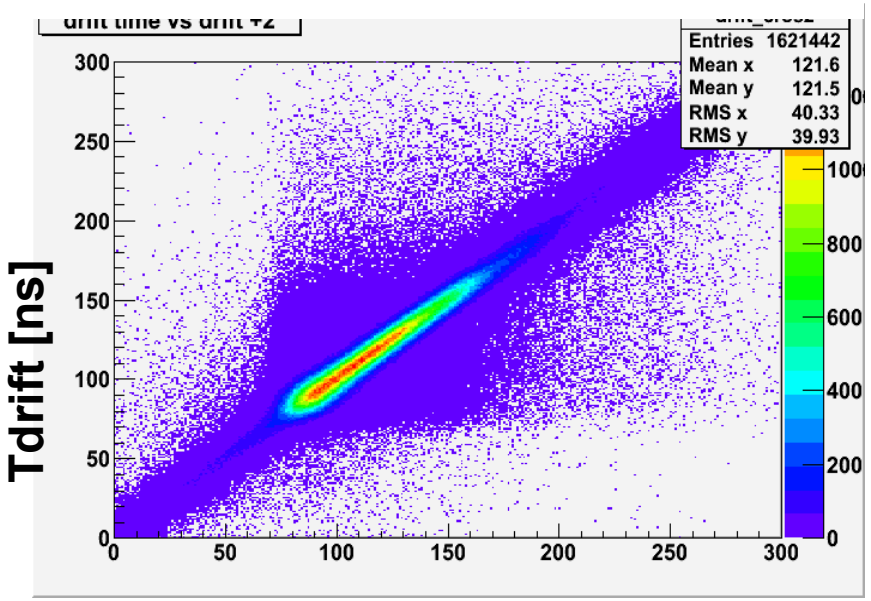
September
beam crosses both layers almost evenly

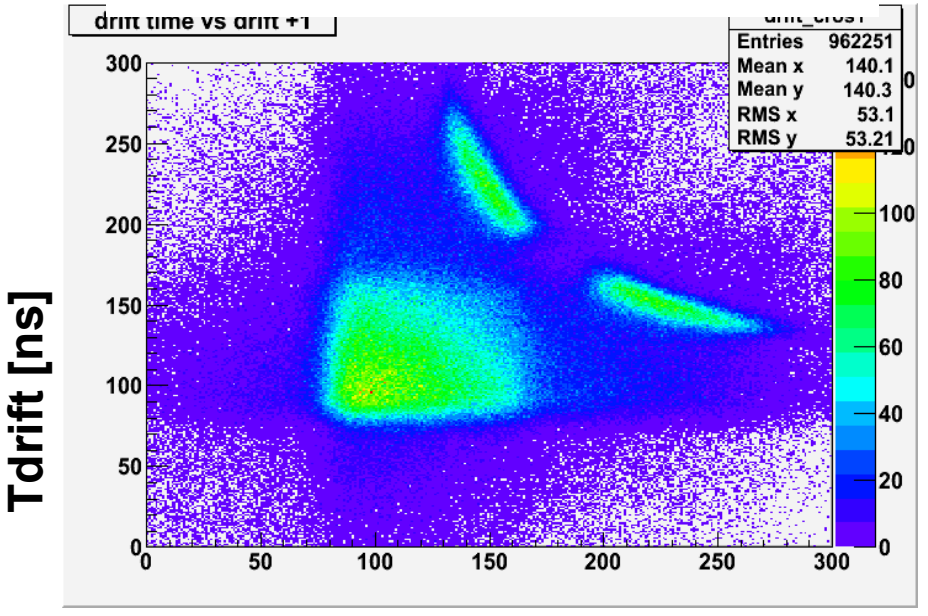
December
beam crosses more upper layer
various Pramp gain tested

Comparison of cross correlations





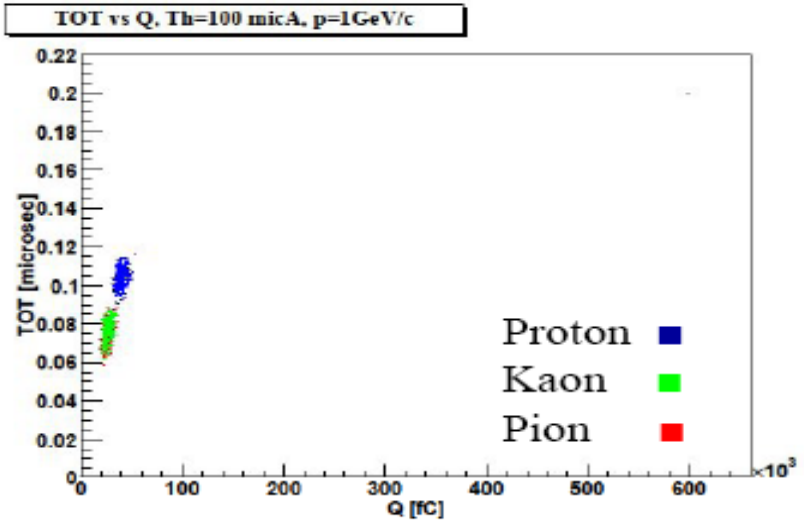


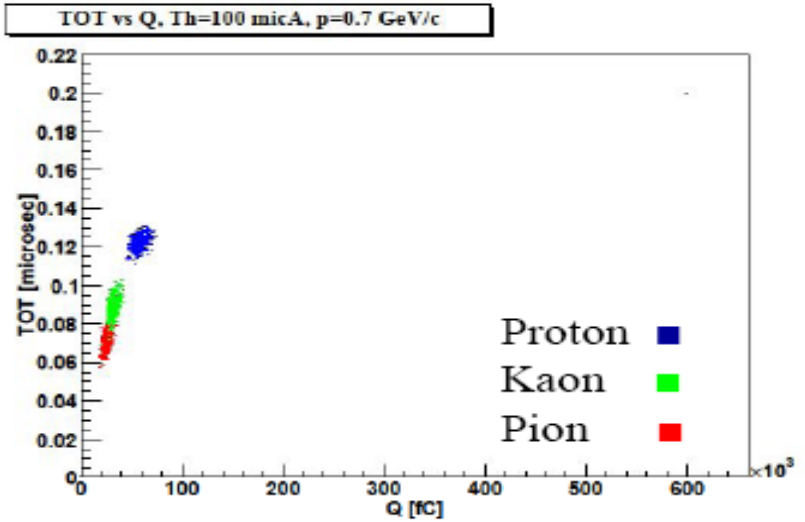


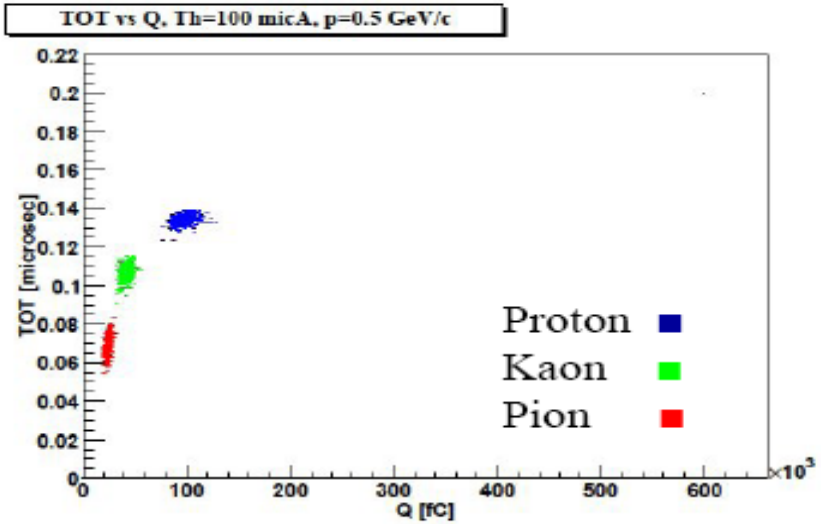
TOT : reminder II: simulation results

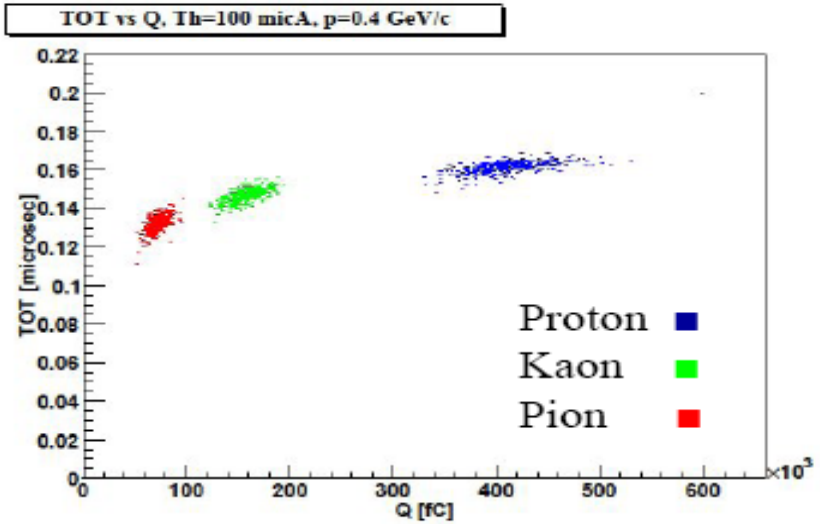
Sadigheh Jowzaee
Garfiled + FEE transfer function
threshold =100 µA

TOT vs. Charge (Threshold=100 µA)

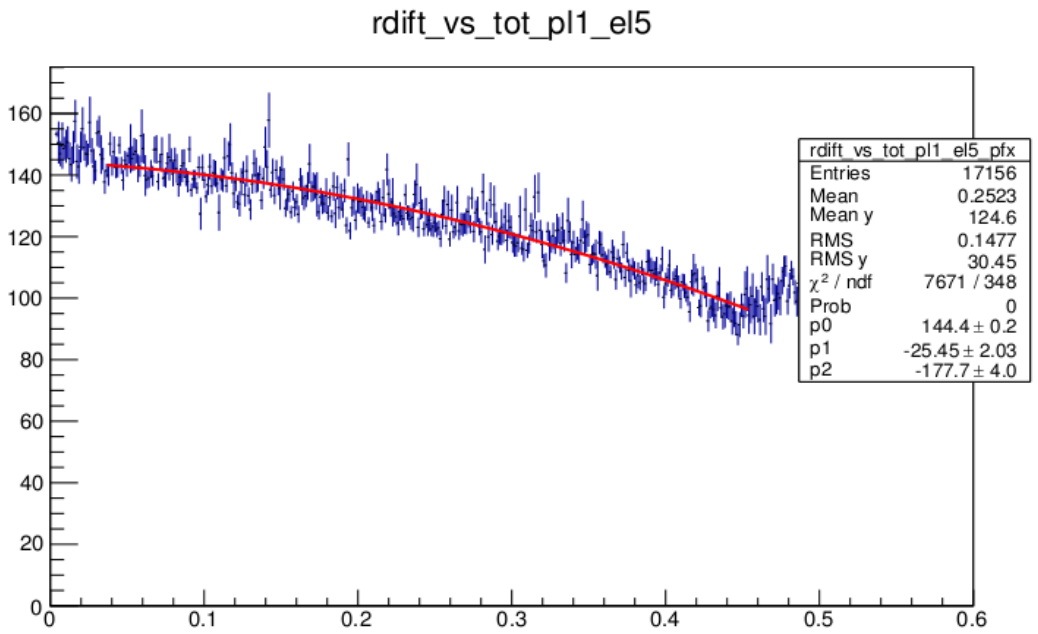


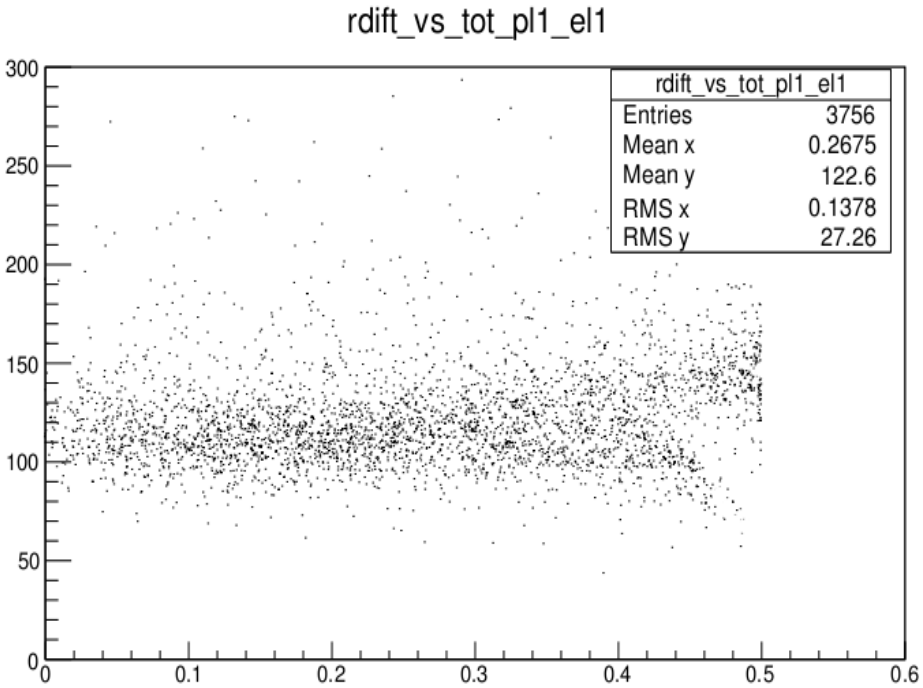




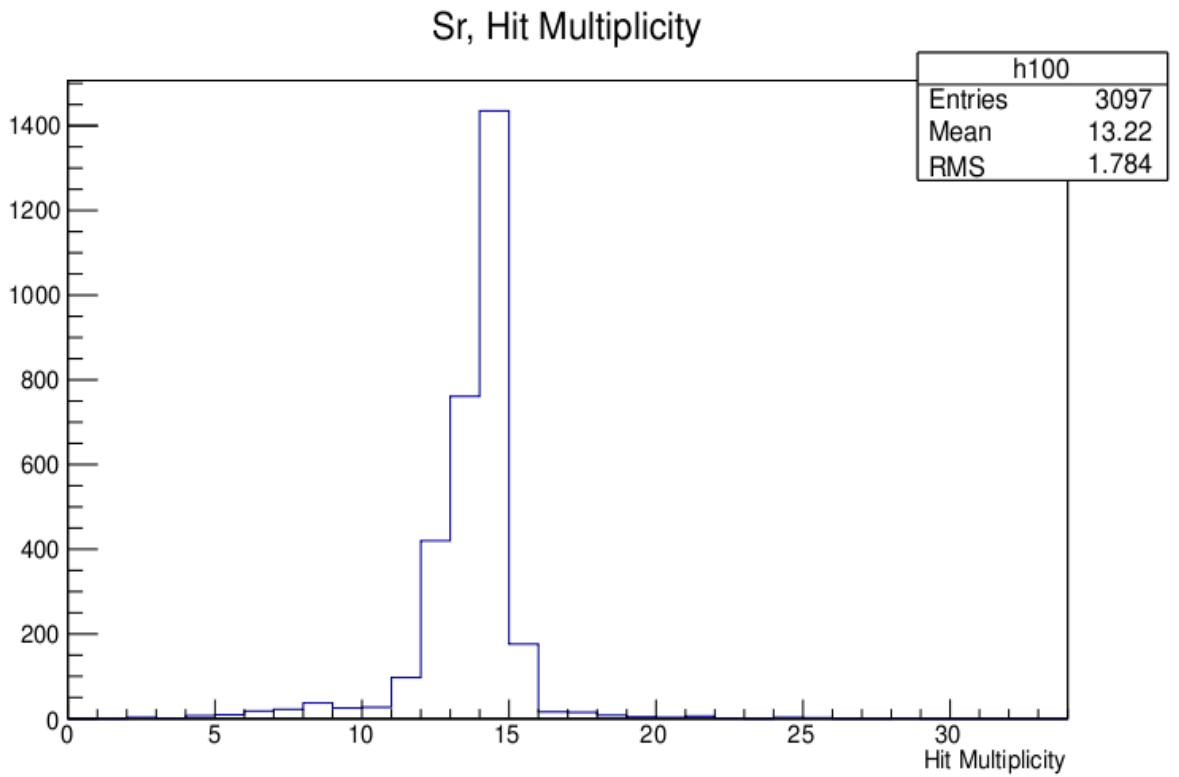


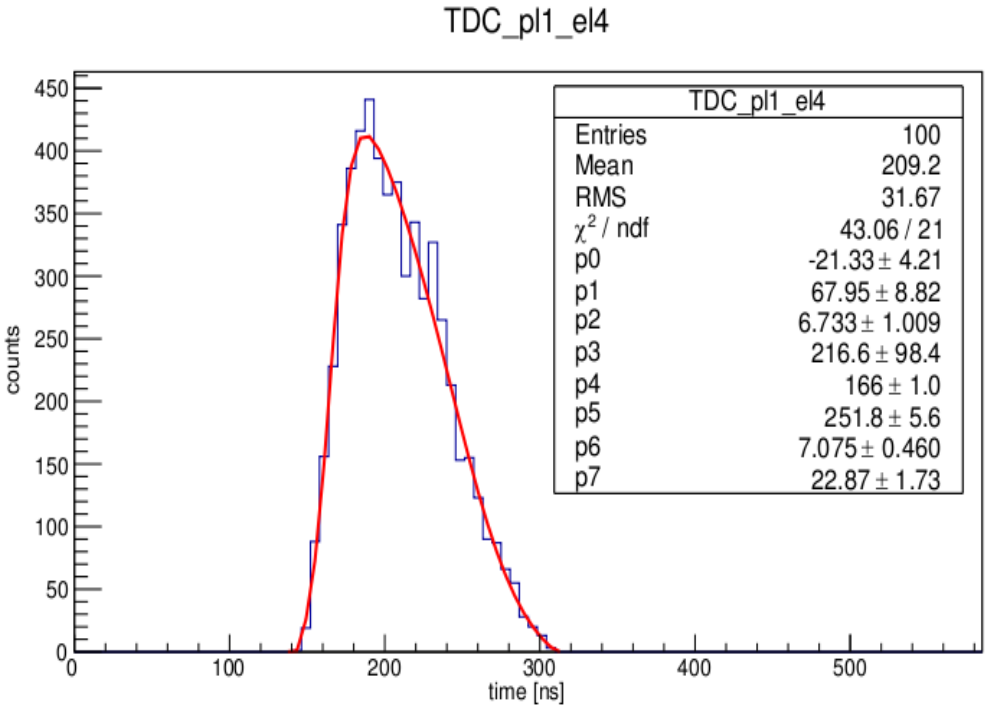
TOT vs rdrift : calibration





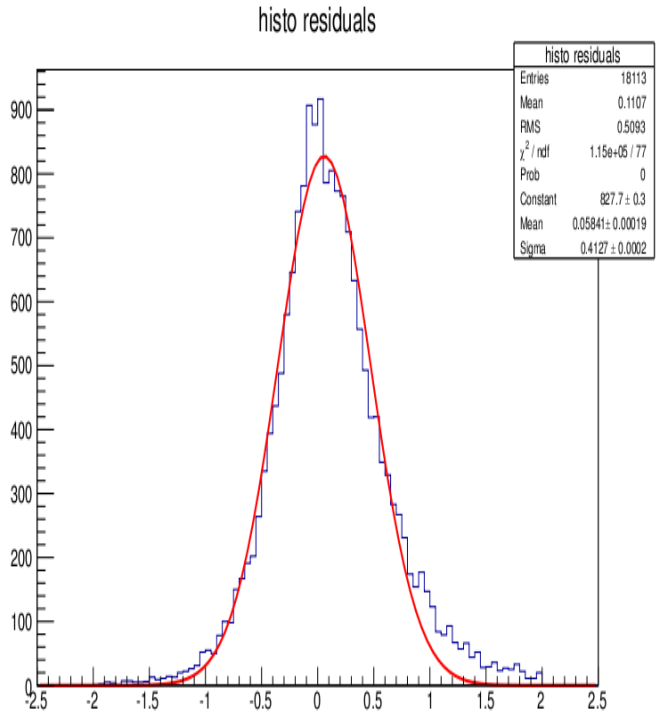
HV = 1800 V


Sr, Hit Multiplicity
h100
Entries 3097
Mean 13.22
RMS 1.784
1400
1200
1000
800
600
400
200
0
0
5
10
15
20
25
30
Hit Multiplicity

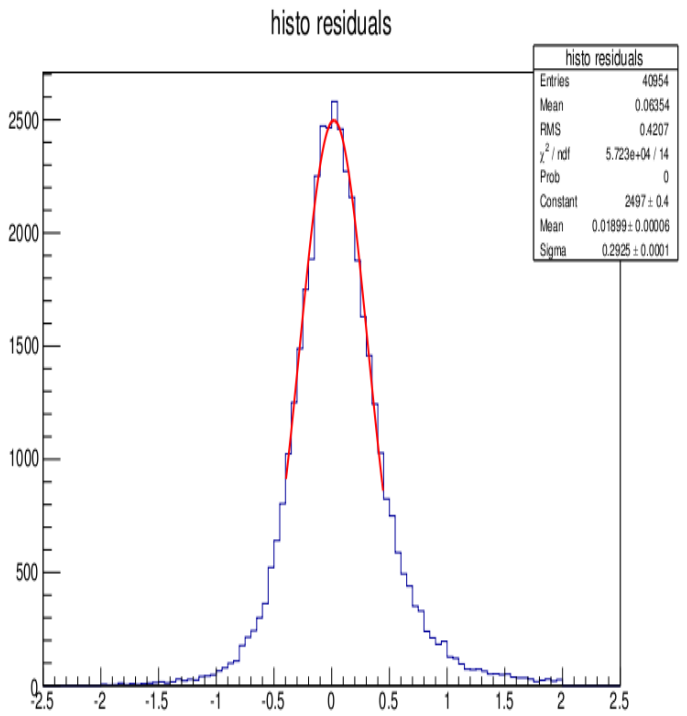

TDC_pl1_el4
TDC_pl1_el4
Entries 100
Mean 209.2
RMS 31.67
χ² / ndf 43.06 / 21
p0 -21.33 ± 4.21
p1 67.95 ± 8.82
p2 6.733 ± 1.009
p3 216.6 ± 98.4
p4 166 ± 1.0
p5 251.8 ± 5.6
p6 7.075 ± 0.460
p7 22.87 ± 1.73
counts
450
400
350
300
250
200
150
100
50
0
0
100
200
300
400
500
time [ns]

Spatial resolution

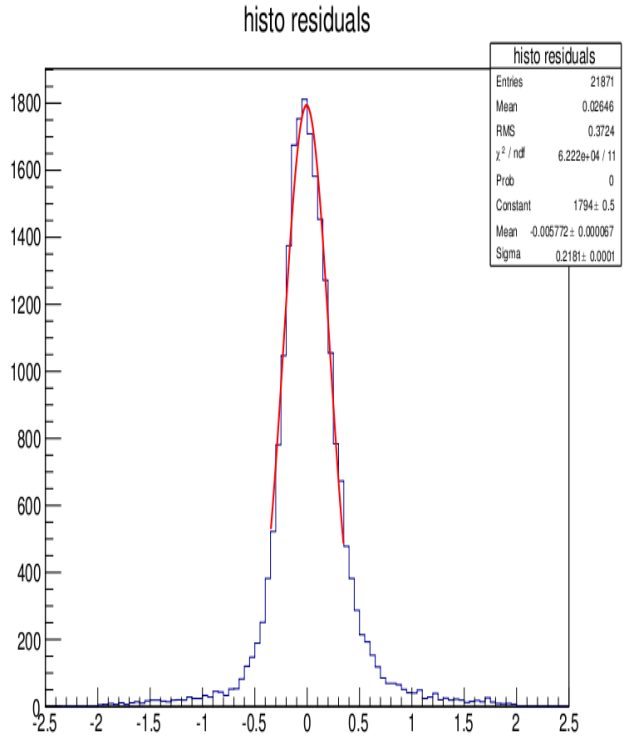
1750V



1800V

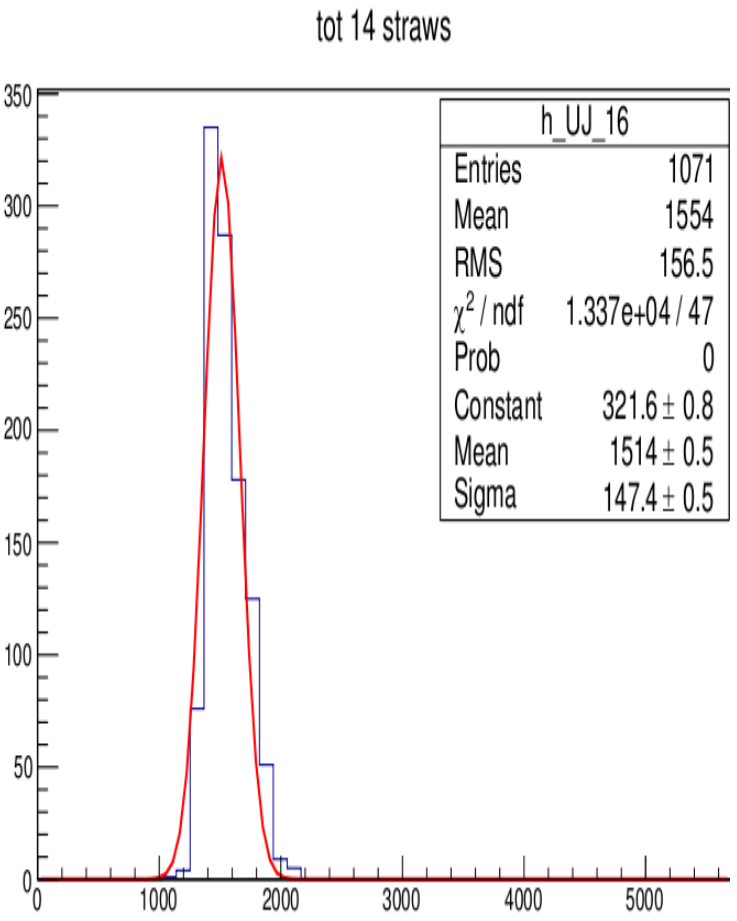


1900V

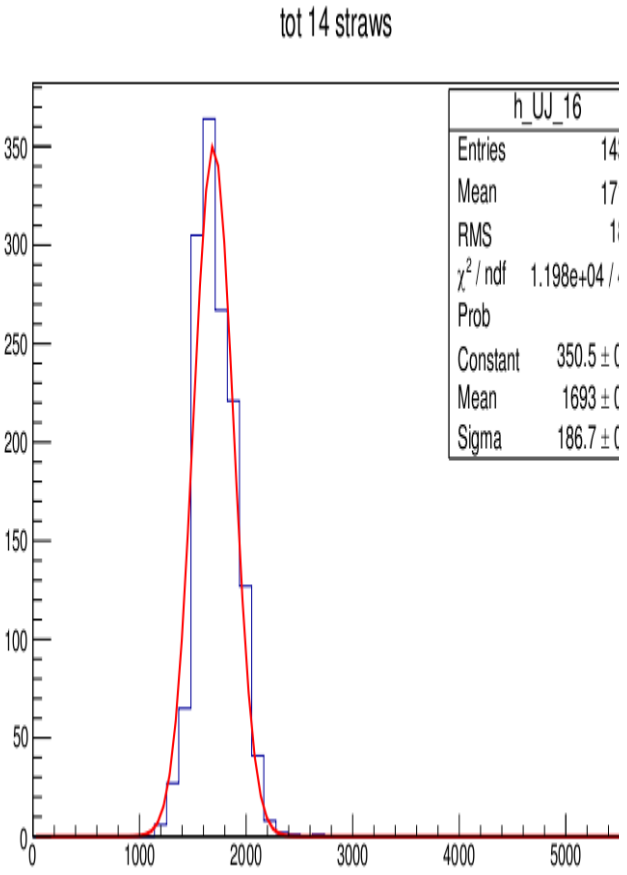


ToT 14 straw tracks

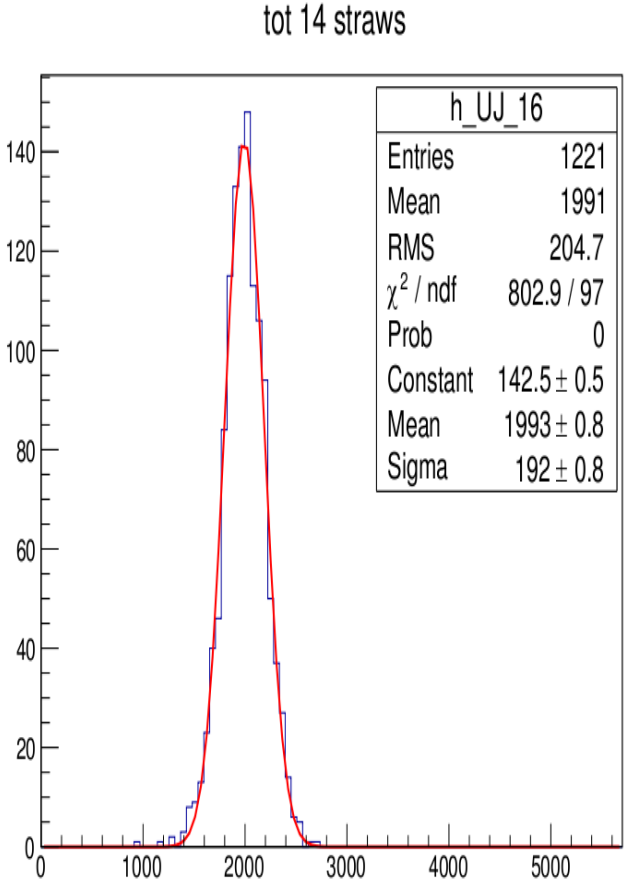
1750V



1800V

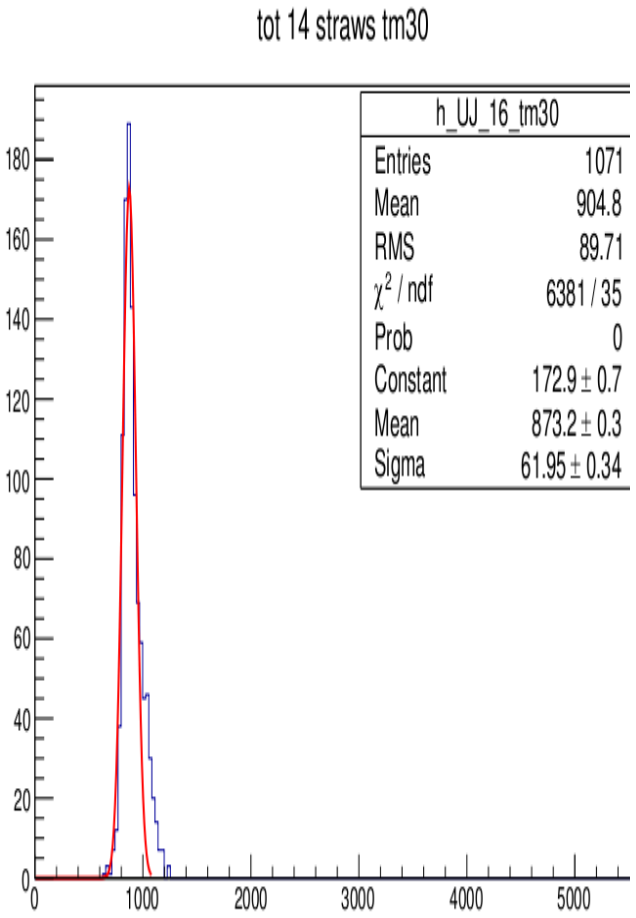


1900V

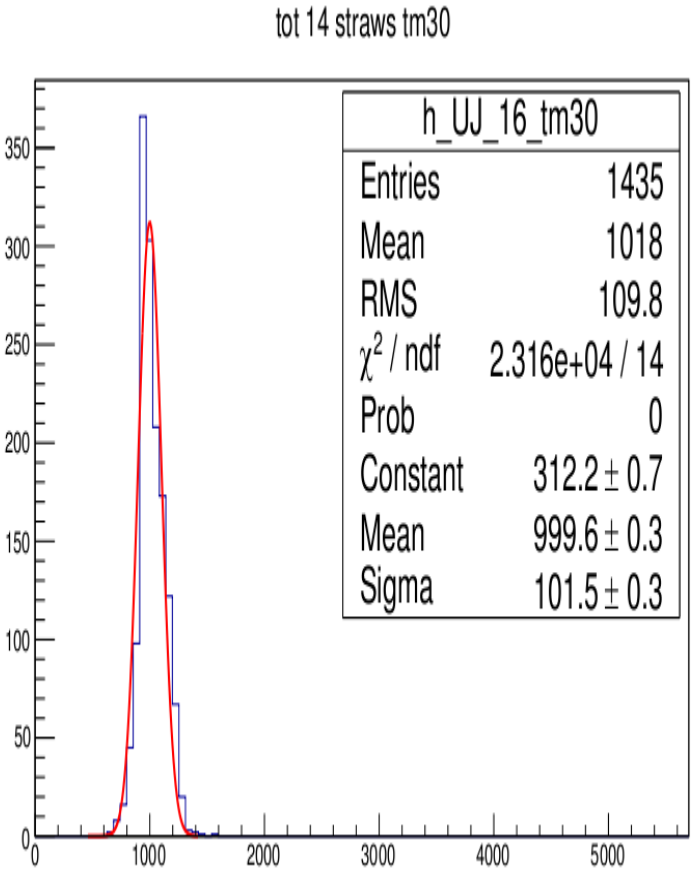


TM30

1750V



1800V



1900V