Test beam 2012

Preliminary results

Pedestal

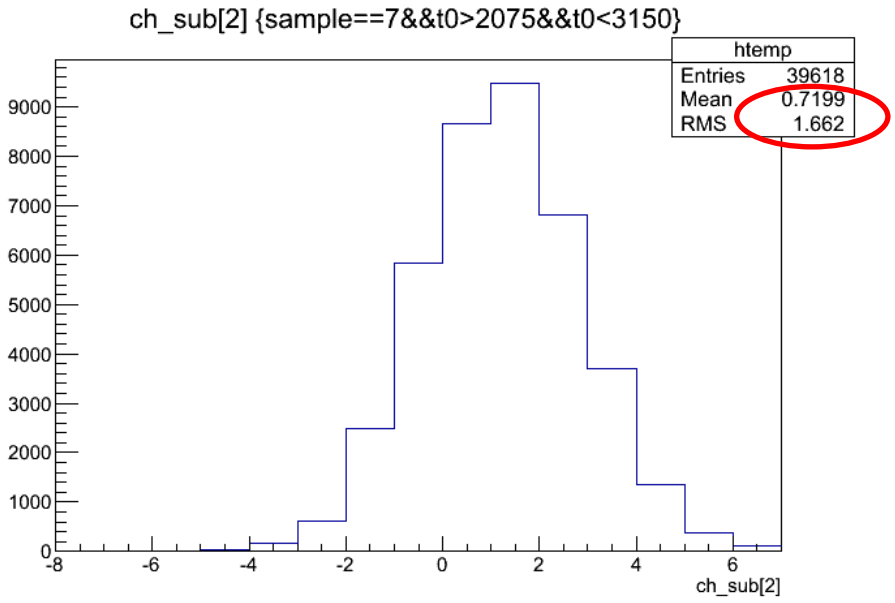
Pedestal subtraction

- How do I do it?
  - For channel 2/3, area of interest it is
    ch2: t0=[1520;2490]
    ch3: t0[2620;3300]
    in the sample 7
  - Pedestal= max(ch[2]_sample5, ch[2]_sample3);
    - “max” here corresponds to “min” signal amplitude
  - Event-by-event:
    - ch_sub[2]=-1*(ch[2] – pedestal))
  - Same for ch[3]

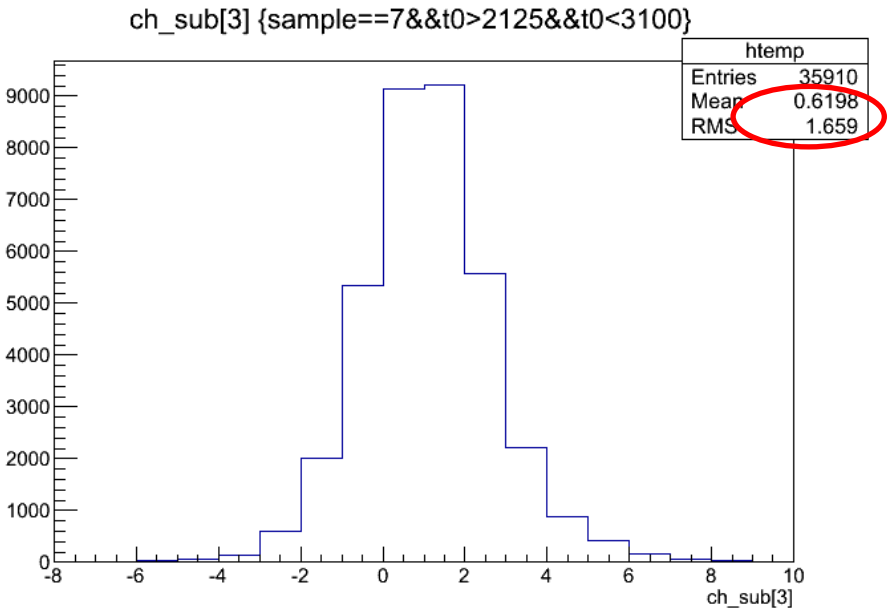
Noise

Run 558, only noise pattern==2

Ch_sub[2]



Ch_sub[3]



Centered at 0 with positive shift

Plato test

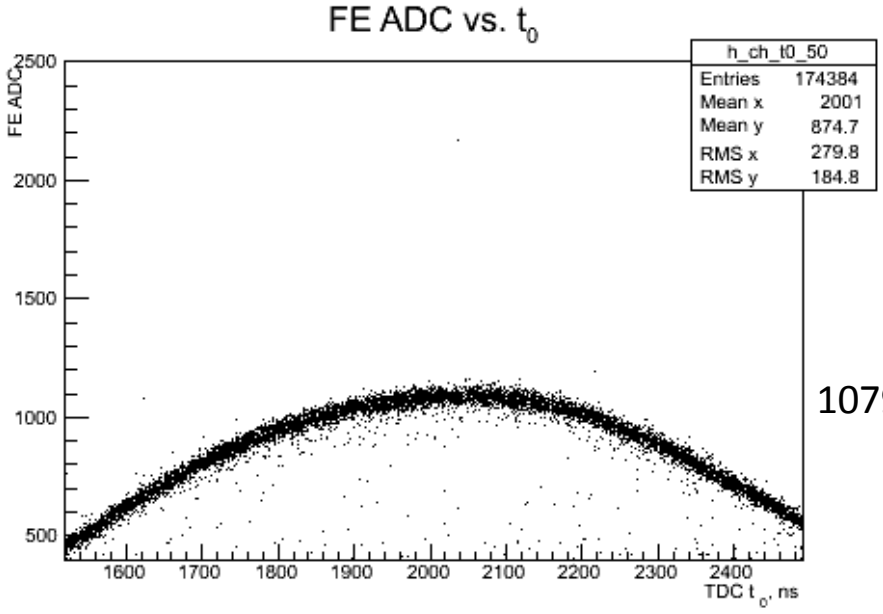
How to do

- $ADC(FE)_{ped\ subtracted}$ vs t_0 : 2D plot
- Fit with something
  - Here it is "*pol2*"
- From the ADC peak value
  make step on t_0 **±1 ns** (40 tdc), **±2ns**
  → check plato, give result in %

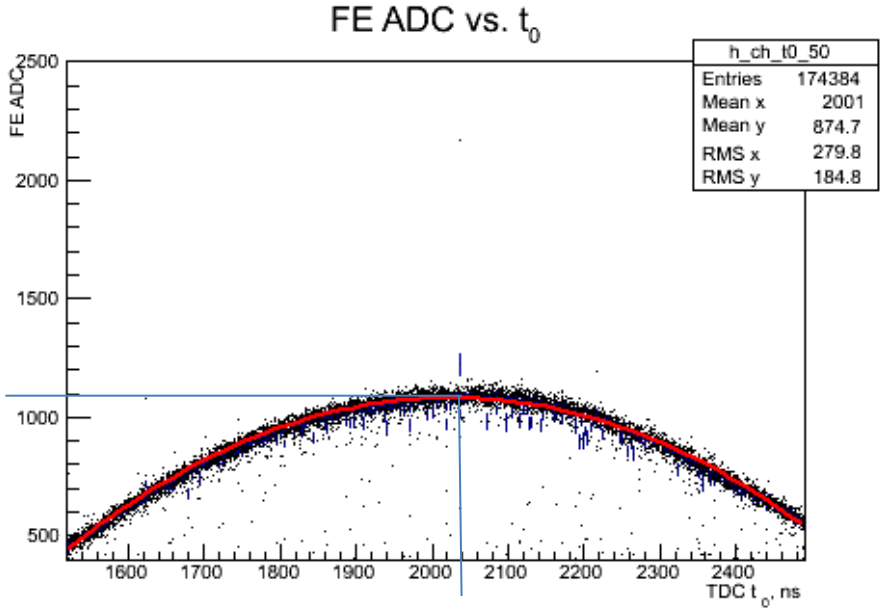
E=50GeV,

#events = 33k

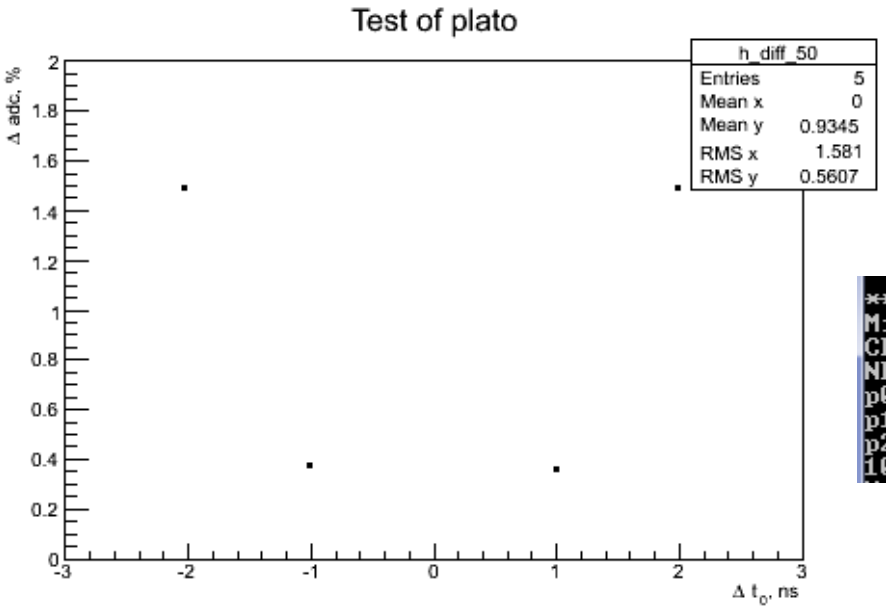
Channel 2



1079.02



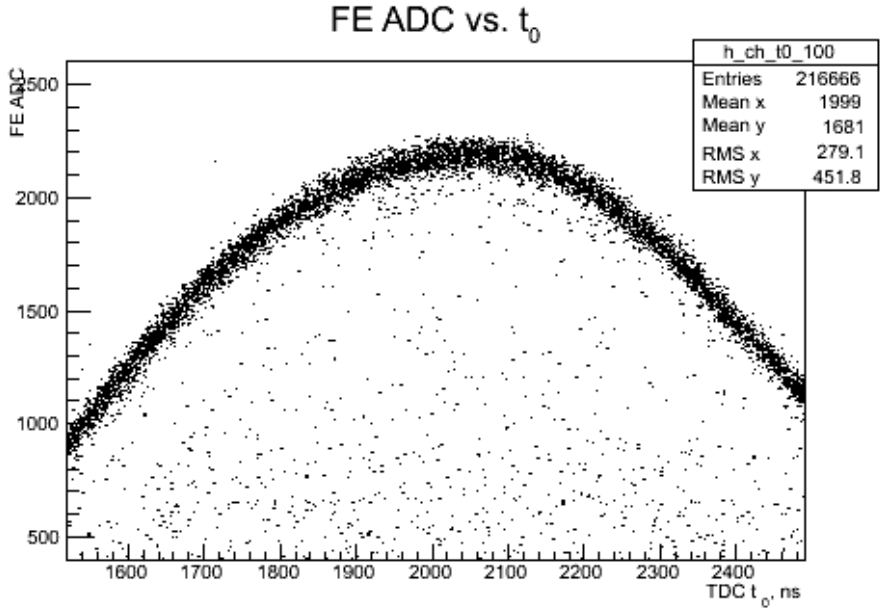
t_0 = 2026.44

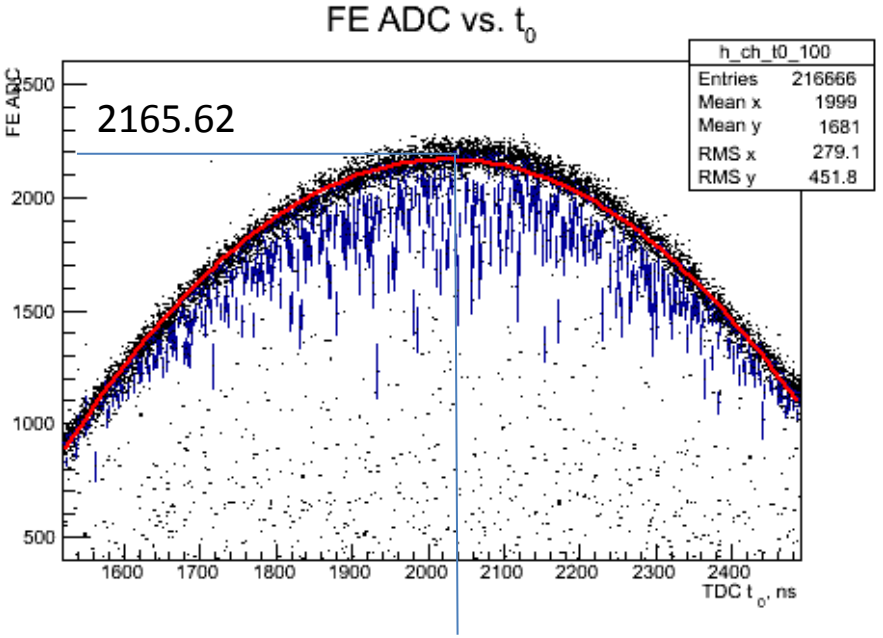



```
**********************************************
Minimizer is Linear
Chi2                      =      26107.6
NDf                       =          966
p0                        =     -9273.21   +/-   3.8259
p1                        =      10.2171   +/-   0.00387187
p2                        =  -0.00252092   +/-   9.62246e-007
1079.02 2026.44
```

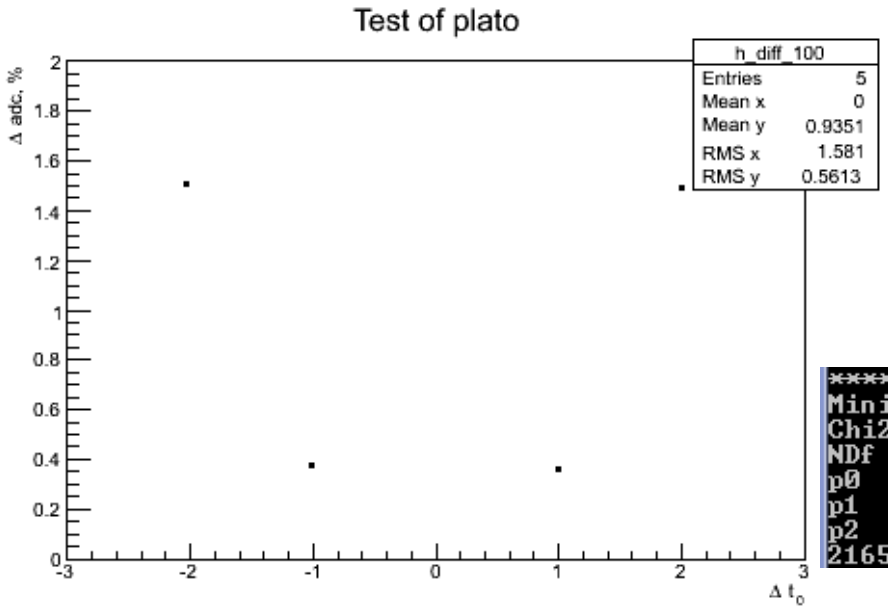
E=100 GeV,
#events = ~ 40k

Channel 2





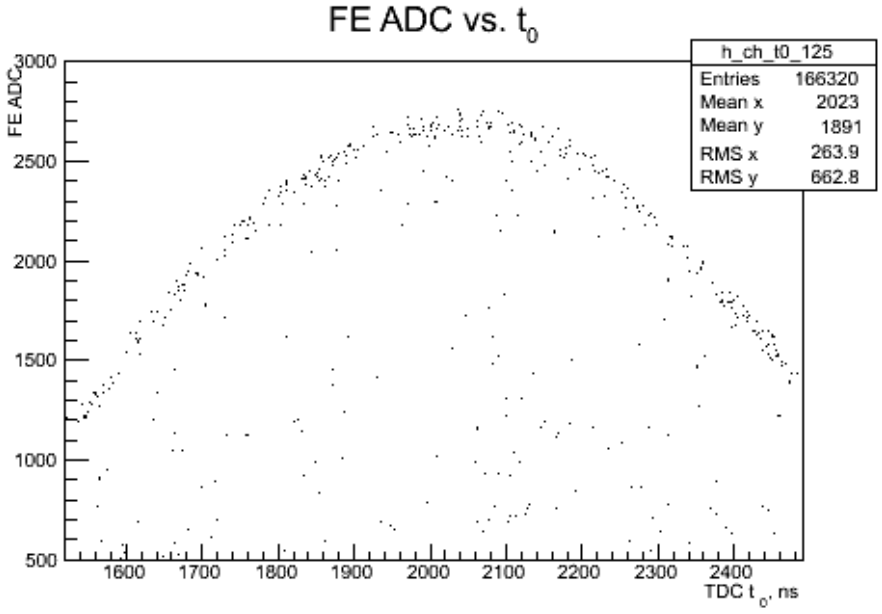
t_0 = 2026.34

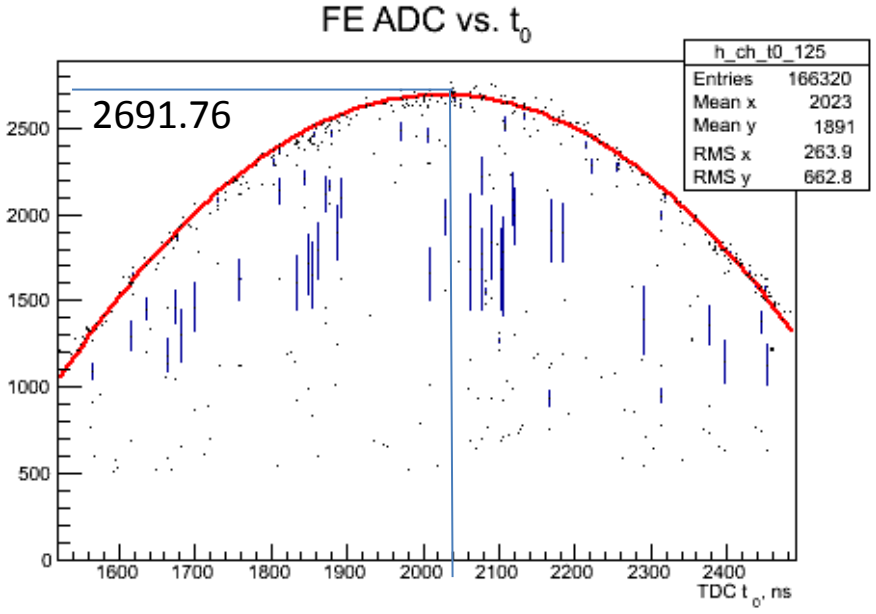



```
**********************************************
Minimizer is Linear
Chi2                      =      29645.8
NDf                       =          965
p0                        =     -18632.5   +/-   8.7426
p1                        =      20.5257   +/-   0.0088395
p2                        =   -0.00506423   +/-   2.18575e-006
2165.62 2026.34
```

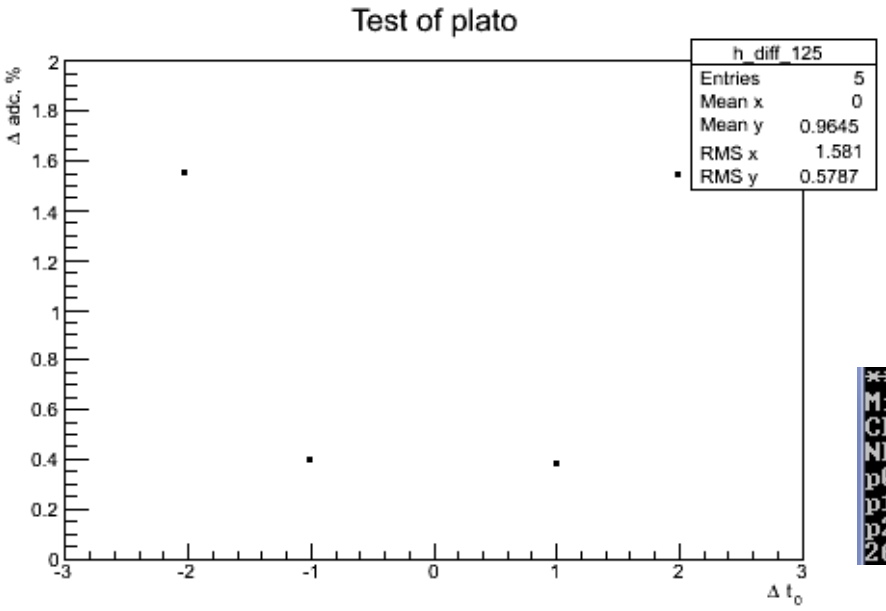
E=125 GeV,
#events = 33k

Channel 2





t_0 = 2026.82

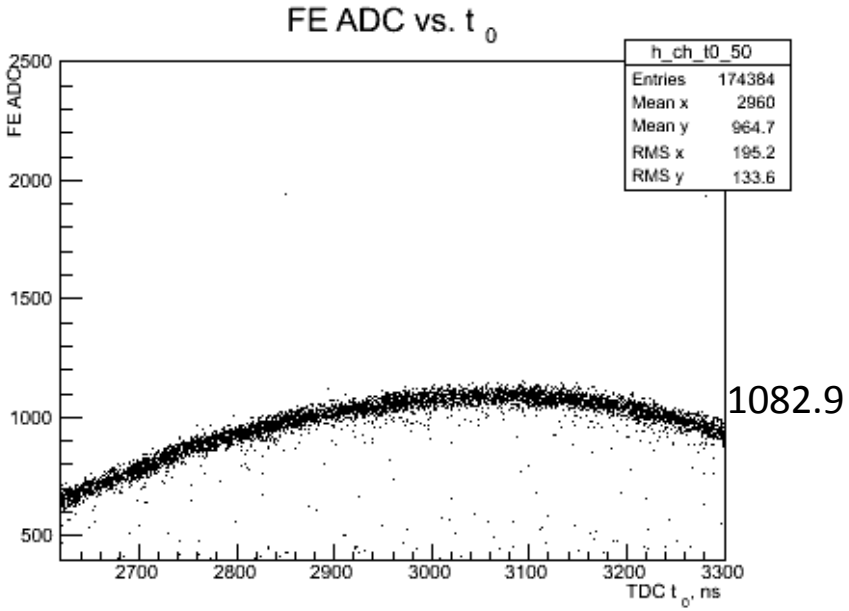



```
**********************************************
Minimizer is Linear
Chi2                      =      32928.6
NDf                       =           80
p0                        =       -23970   +/-   14.4716
p1                        =      26.3089   +/-   0.0139899
p2                        =  -0.00649019   +/-   3.353e-006
2691.76 2026.82
```

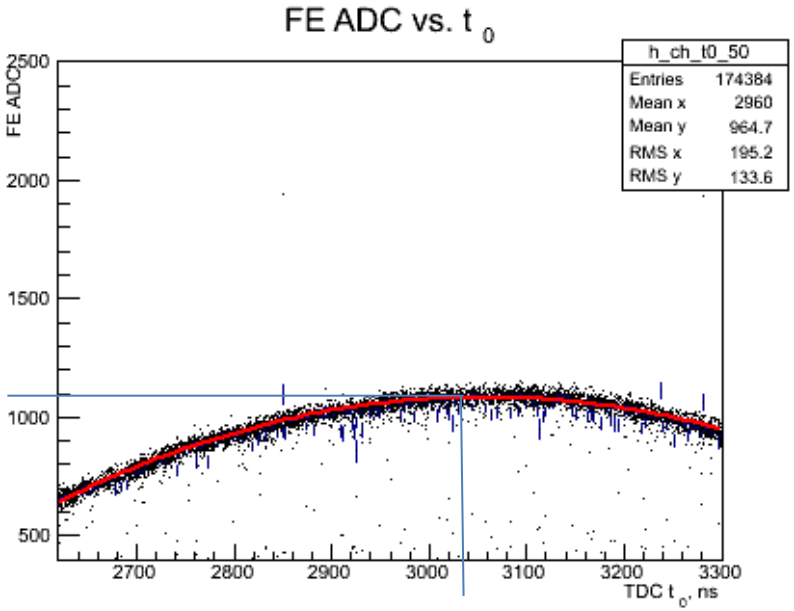
E=50GeV,

#events = 33k

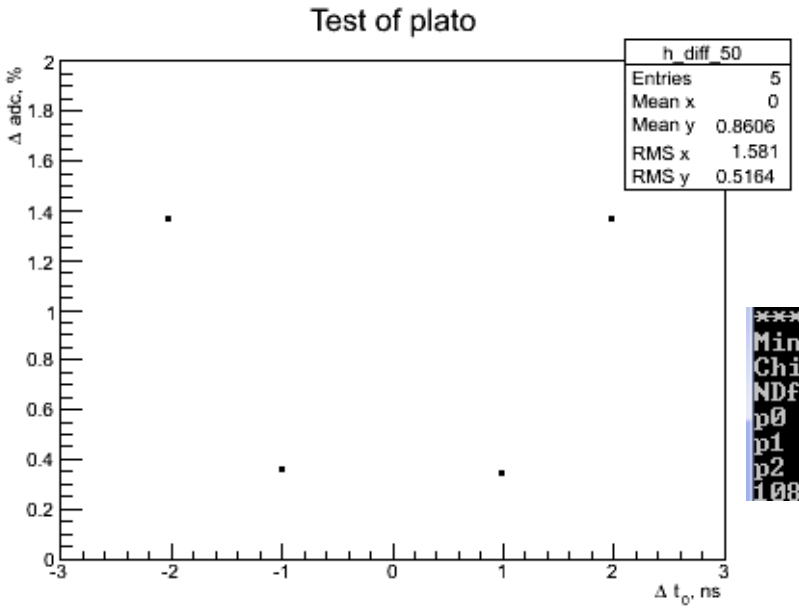
Channel 3



1082.9



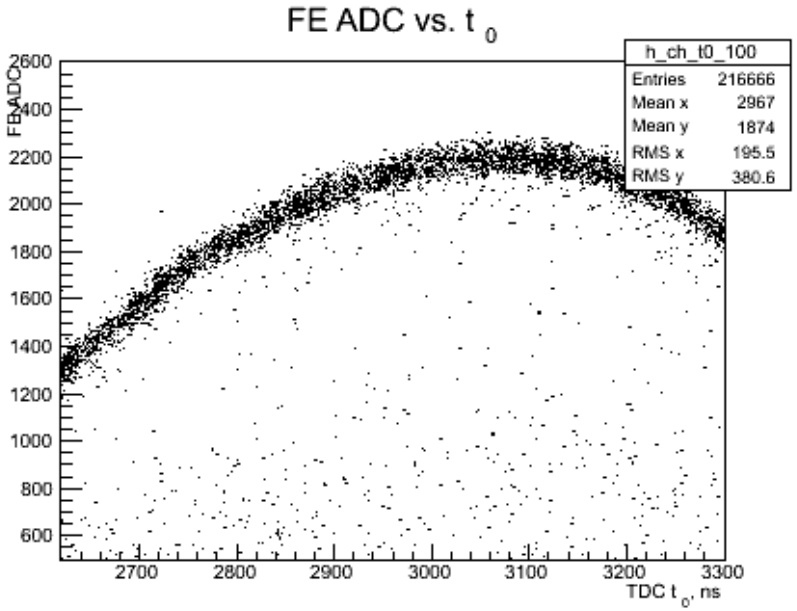
t_0 = 3057.31

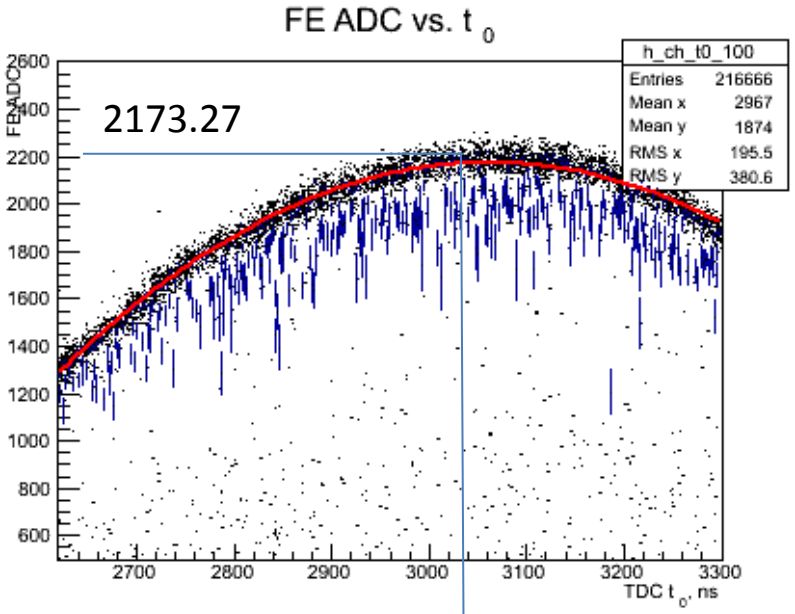



```
**********************************************
Minimizer is Linear
Chi2                      =      13471.9
NDf                       =          676
p0                        =     -20695.8   +/-   21.9034
p1                        =      14.2469   +/-   0.0148807
p2                        =  -0.00232996   +/-   2.51827e-006
1082.9 3057.31
```

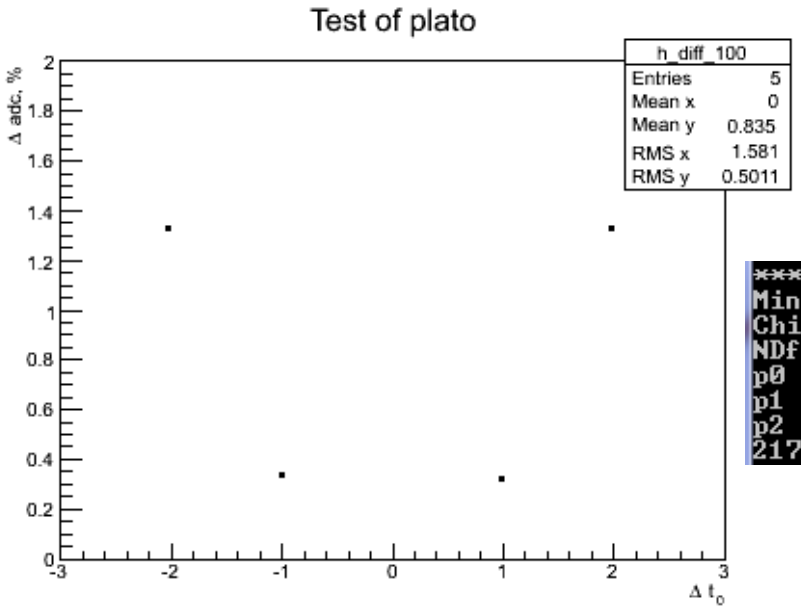
E=100 GeV,
#events = ~ 40k

Channel 3





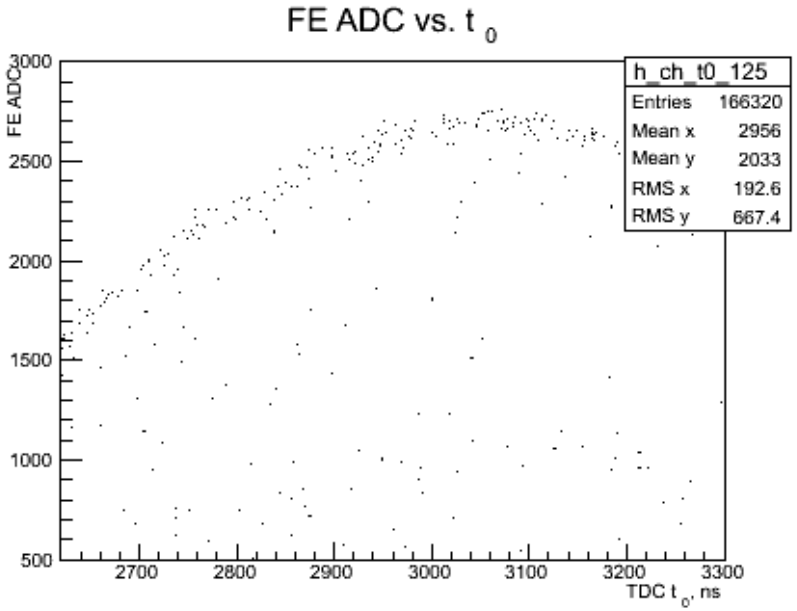
t_0 = 3063.27

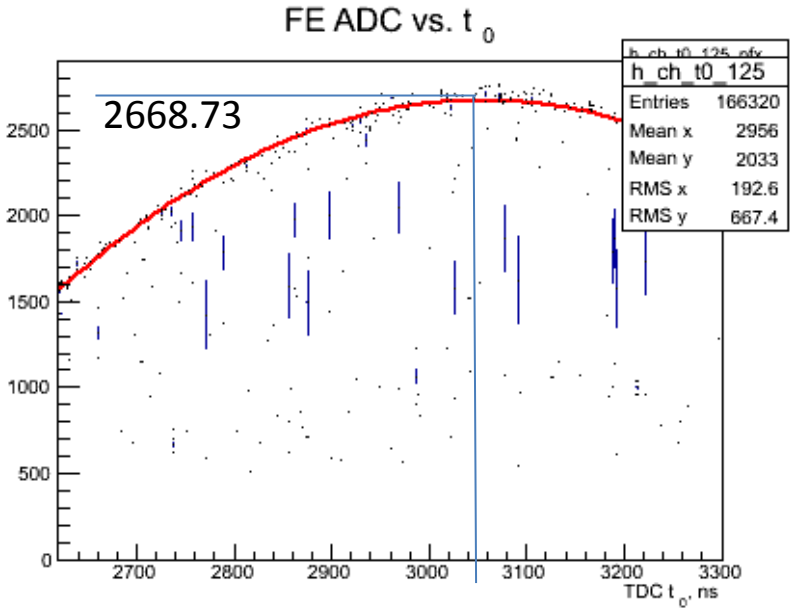



```
**********************************************
Minimizer is Linear
Chi2                      =      16922.4
NDf                       =          676
p0                        =     -40404.8   +/-   44.1683
p1                        =      27.7983   +/-   0.0299663
p2                        =  -0.00453723   +/-   5.07079e-006
2173.27 3063.36
```

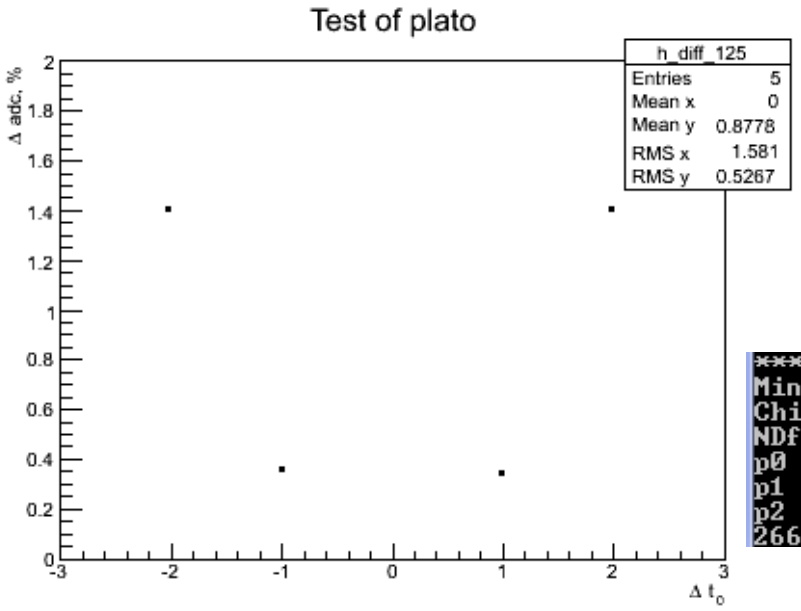
E=125 GeV,
#events = 33k

Channel 3





t_0 = 3056.36




```
**********************************************
Minimizer is Linear
Chi2                      =      50100.3
NDf                       =           46
p0                        =     -52038.8    +/-   225.427
p1                        =      35.7989    +/-   0.15569
p2                        =  -0.00585641    +/-   2.67882e-005
2668.73 3056.36
```

	Ch 2		Ch 3	
Energy	adc	tdc	adc	tdc
50 GeV	1079.02	2026.44	1082.9	3057.31
100 GeV	2165.62	2026.34	2173.27	3063.27
125 GeV	2691.76	2026.82	2668.73	3056.36

~150 ps

Energy	$\|adc\ ch[2] - adc\ ch\ [3]\|/adc\ ch[3]$
50 GeV	0.4 %
100 GeV	0.4 %
125 GeV	0.9 %

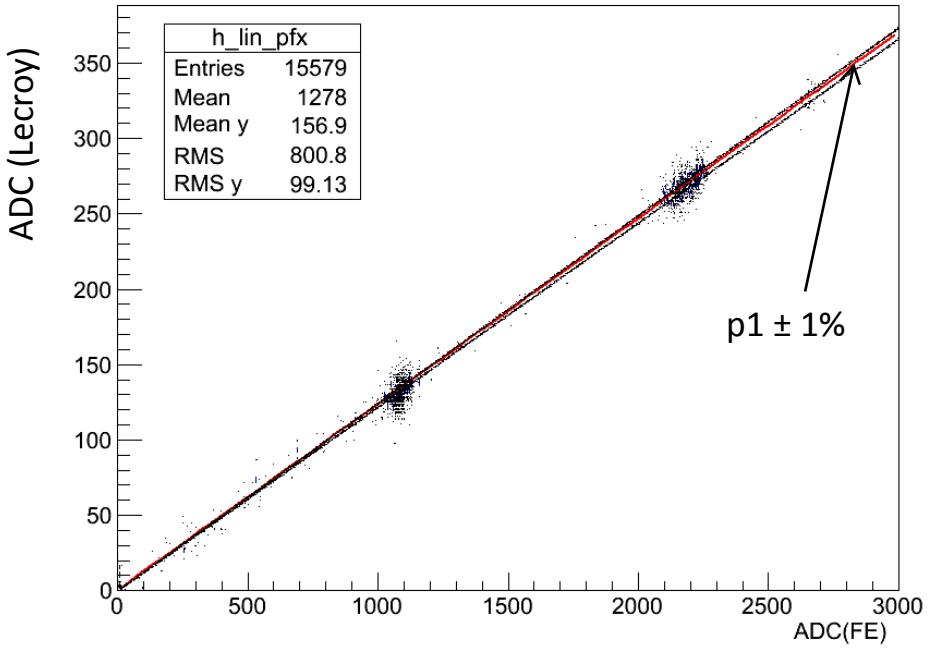
4 ns window → ~1.5 % : from the tail?

→ Test by numerically integration the scope pulse

Linearity

Channel 2

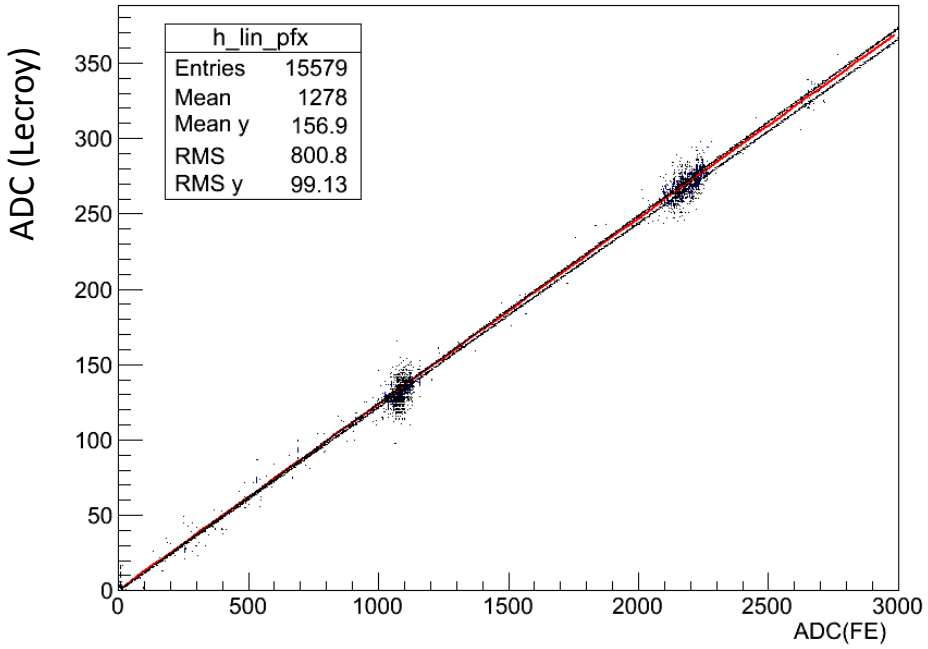
Linearity




```
Minimizer is Linear
Chi2                      =      17264.9
NDf                       =          470
p0                        =    0.0465784   +/-   0.0997708
p1                        =     0.123318   +/-   6.0036e-005
```

Channel 3

Linearity



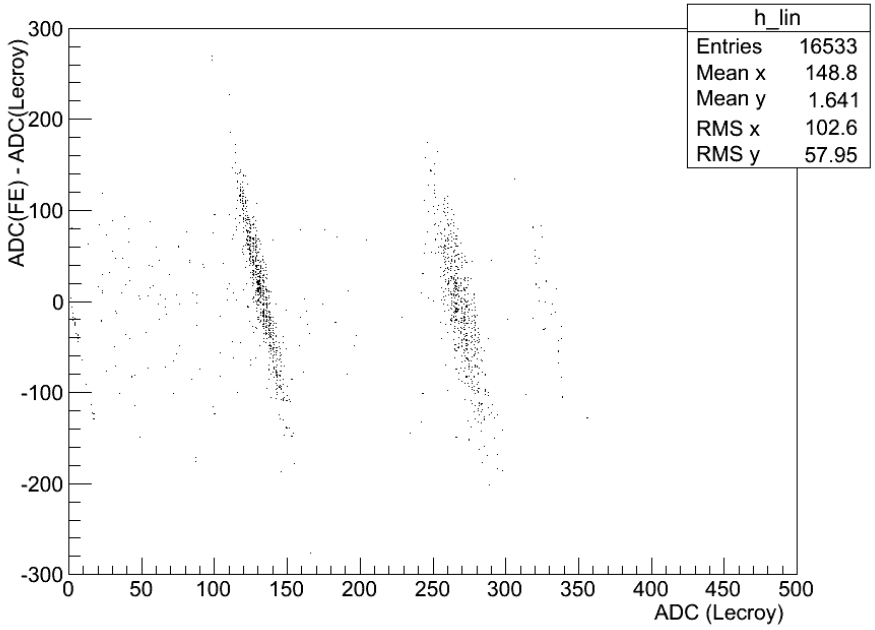

```
**********
Minimizer is Linear
Chi2                      =      19280.7
NDf                       =          460
p0                        =   -0.0445425   +/-   0.0973913
p1                        =     0.122587   +/-   5.84549e-005
```

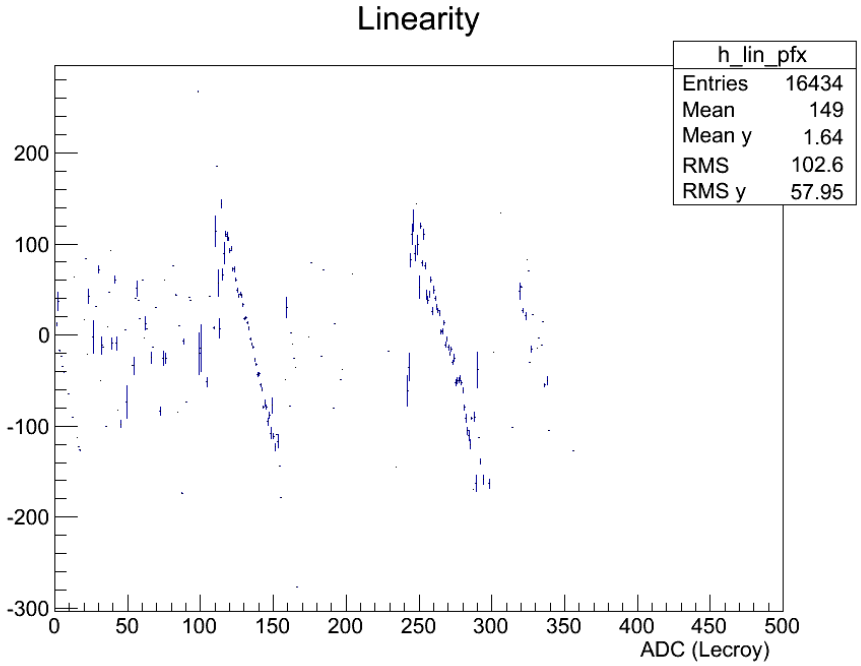
Black curve is ± 1% of the slope parameter

Next tests to do:

1) Reflection on the “T”
2) Test the pulse shape
3) Correction of the pulse shape
4) Correlated and un-correlated noise
5) Resolution for different energies
6) …

Channel 2





Channel 3