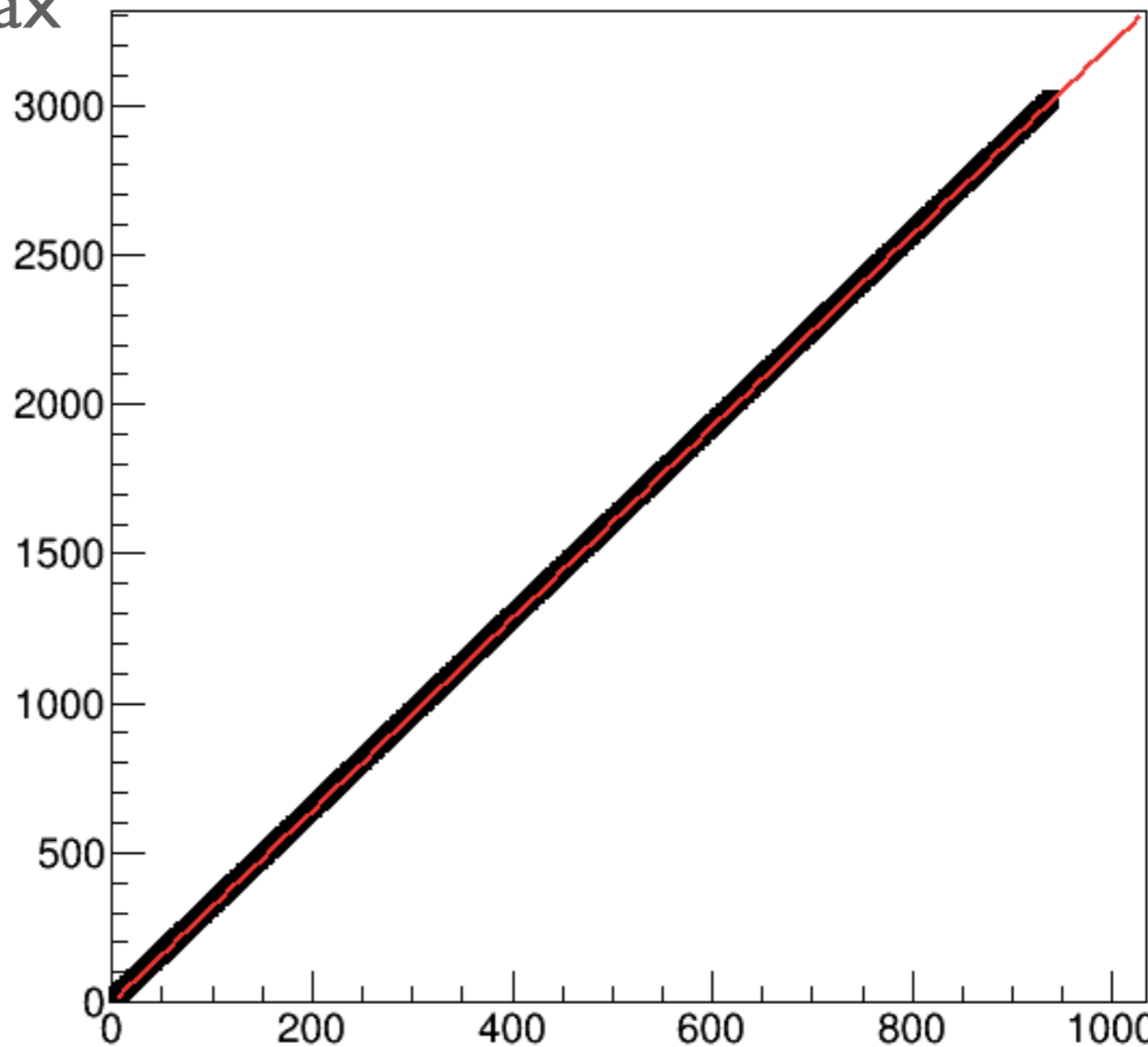

MC WAVEFORM RECONSTRUCTION

VMax

- Root simulation



Energy

Minimizer is Linear

Chi2 = 2.65218e-20

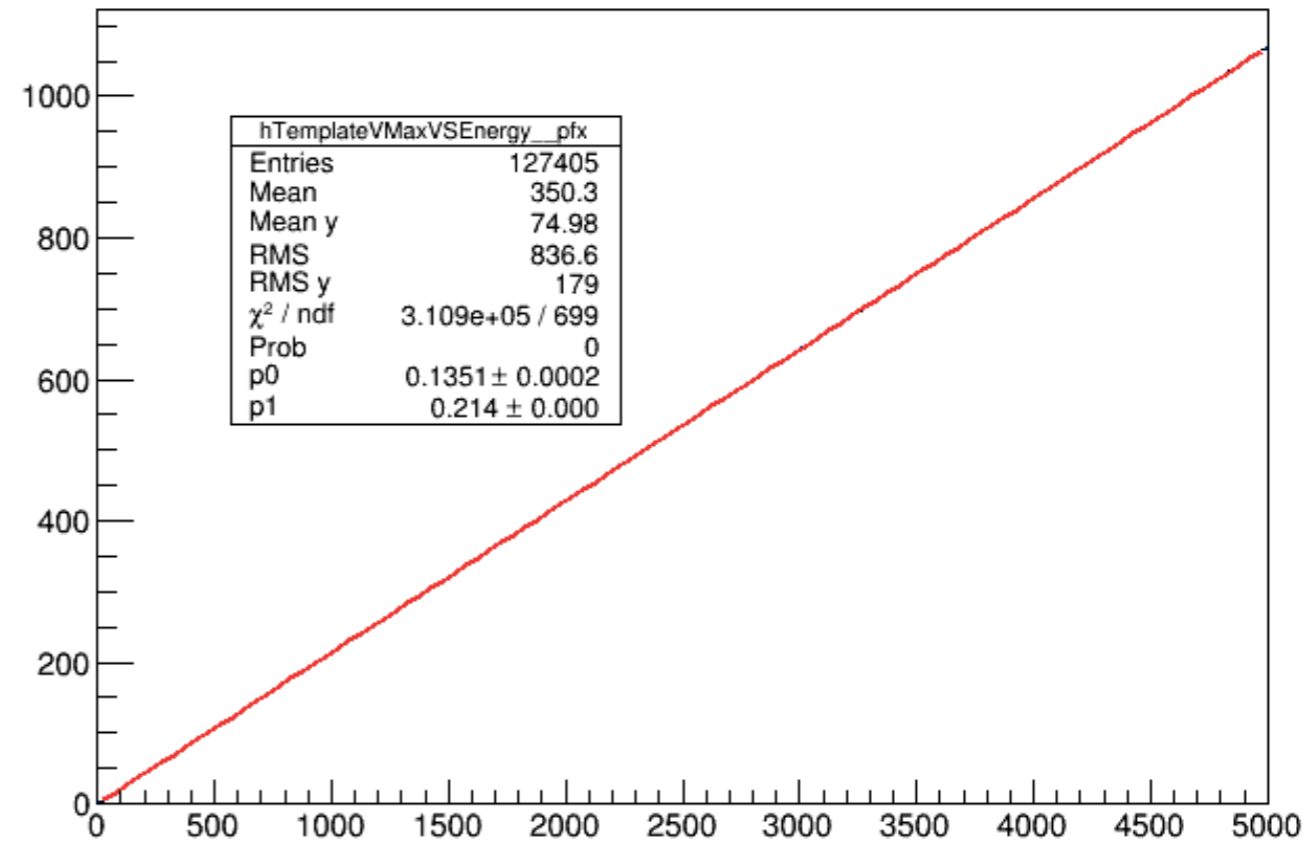
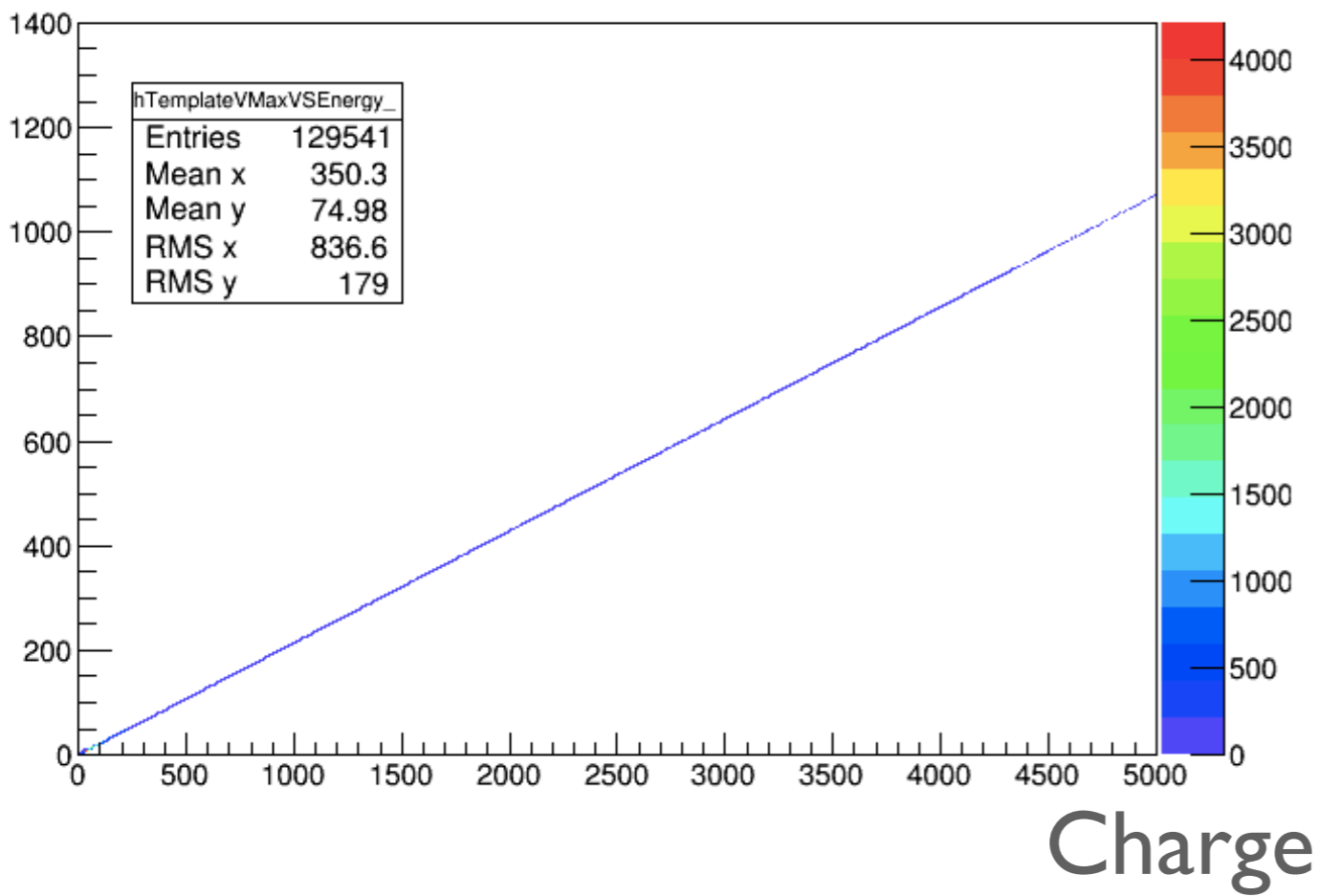
Ndf = 998

p0 = 4.60172e-13 +/- 3.29057e-13

p1 = 3.21025 +/- 6.04289e-16

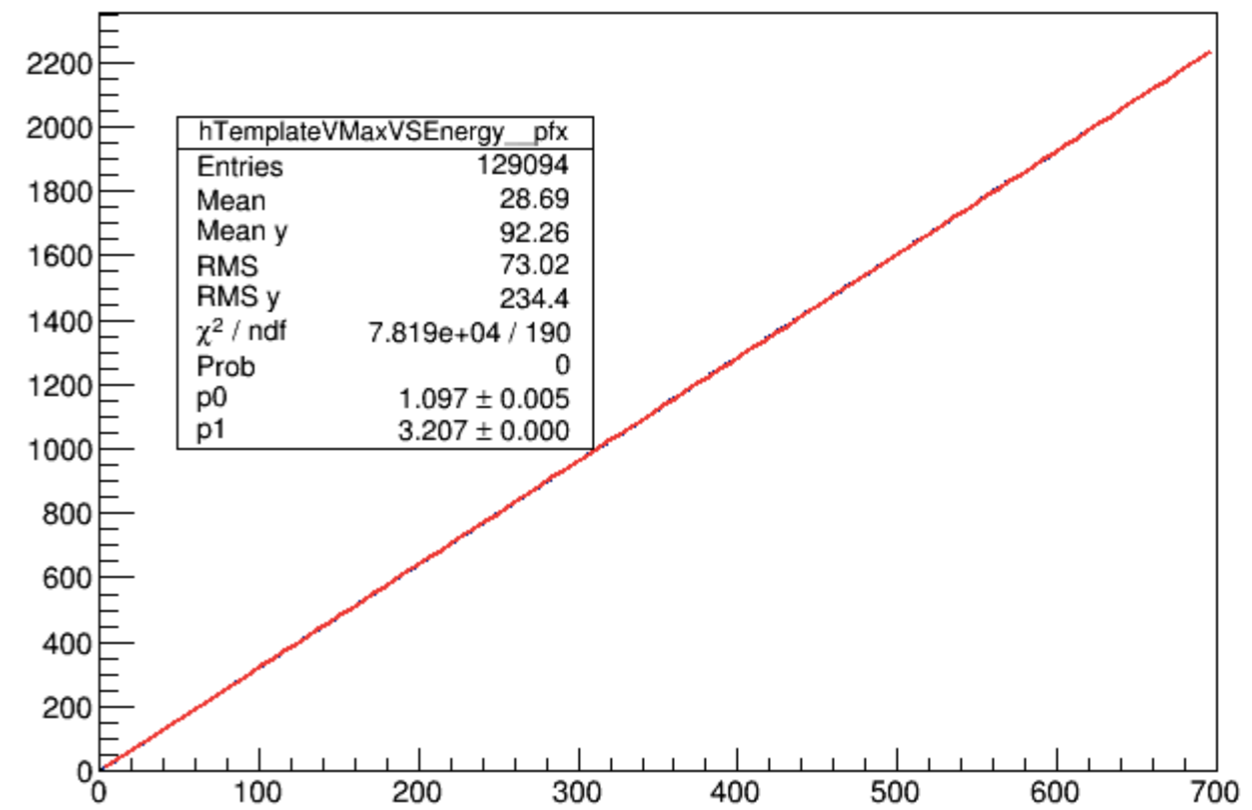
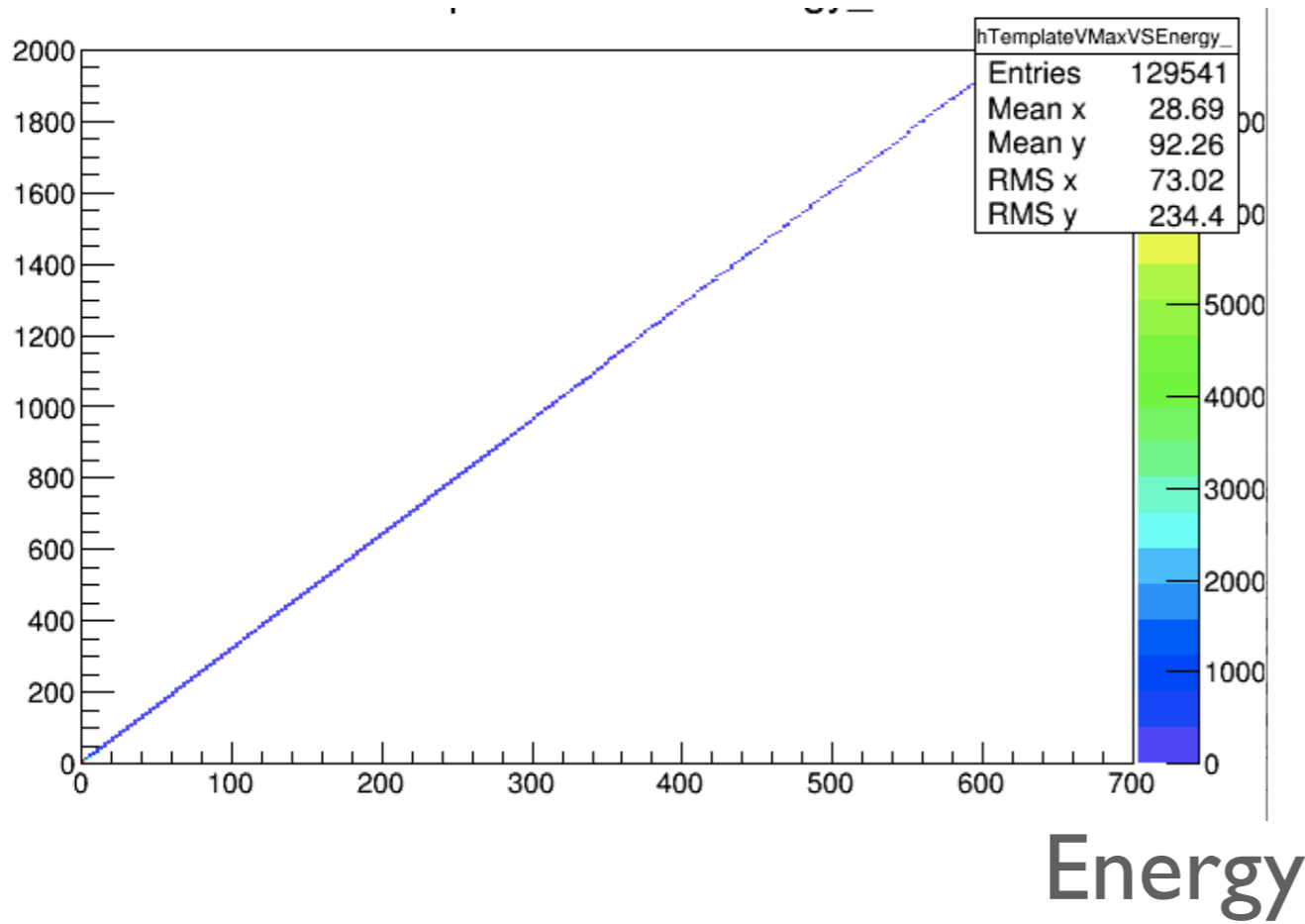
■ Data (SP)

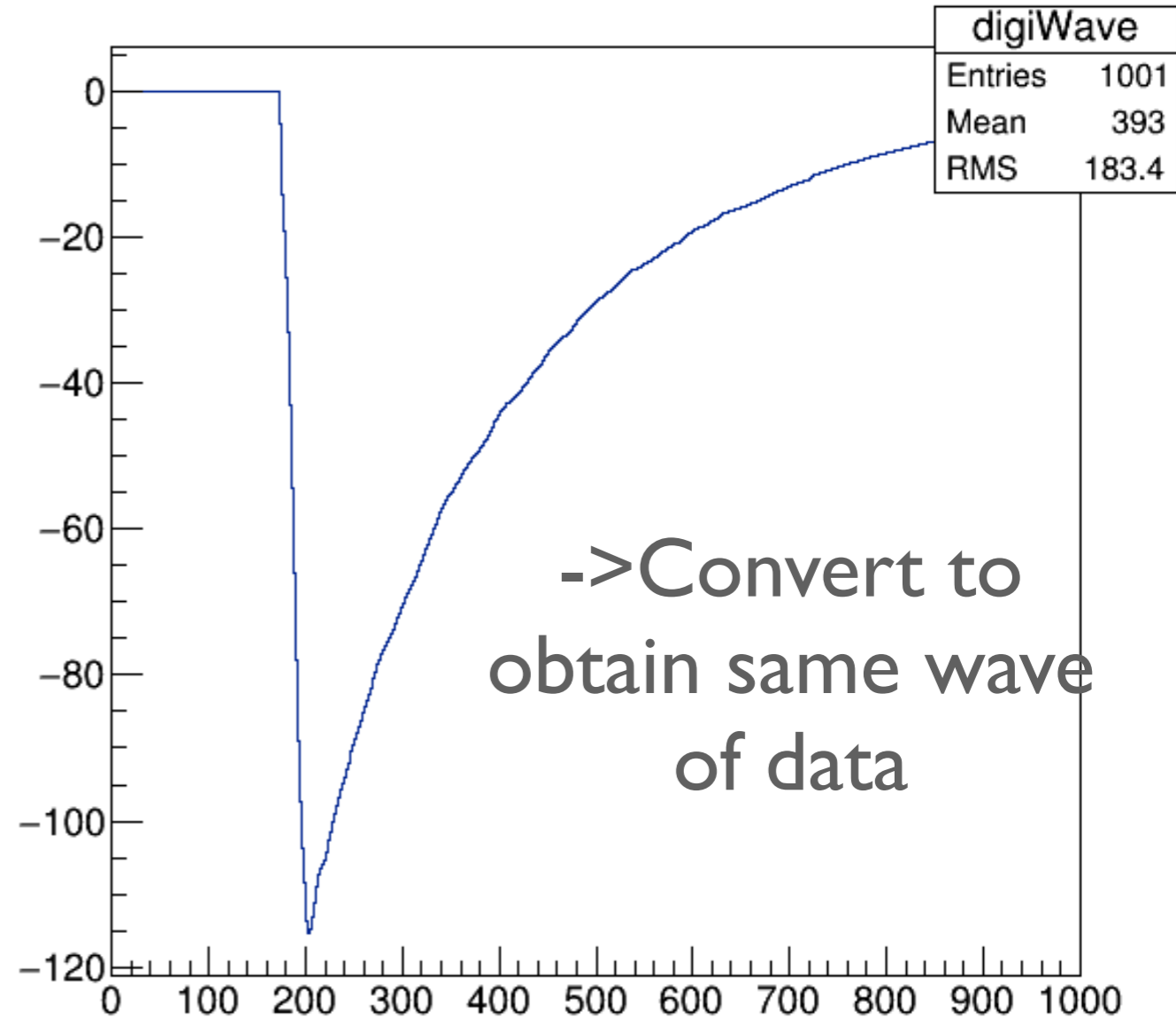
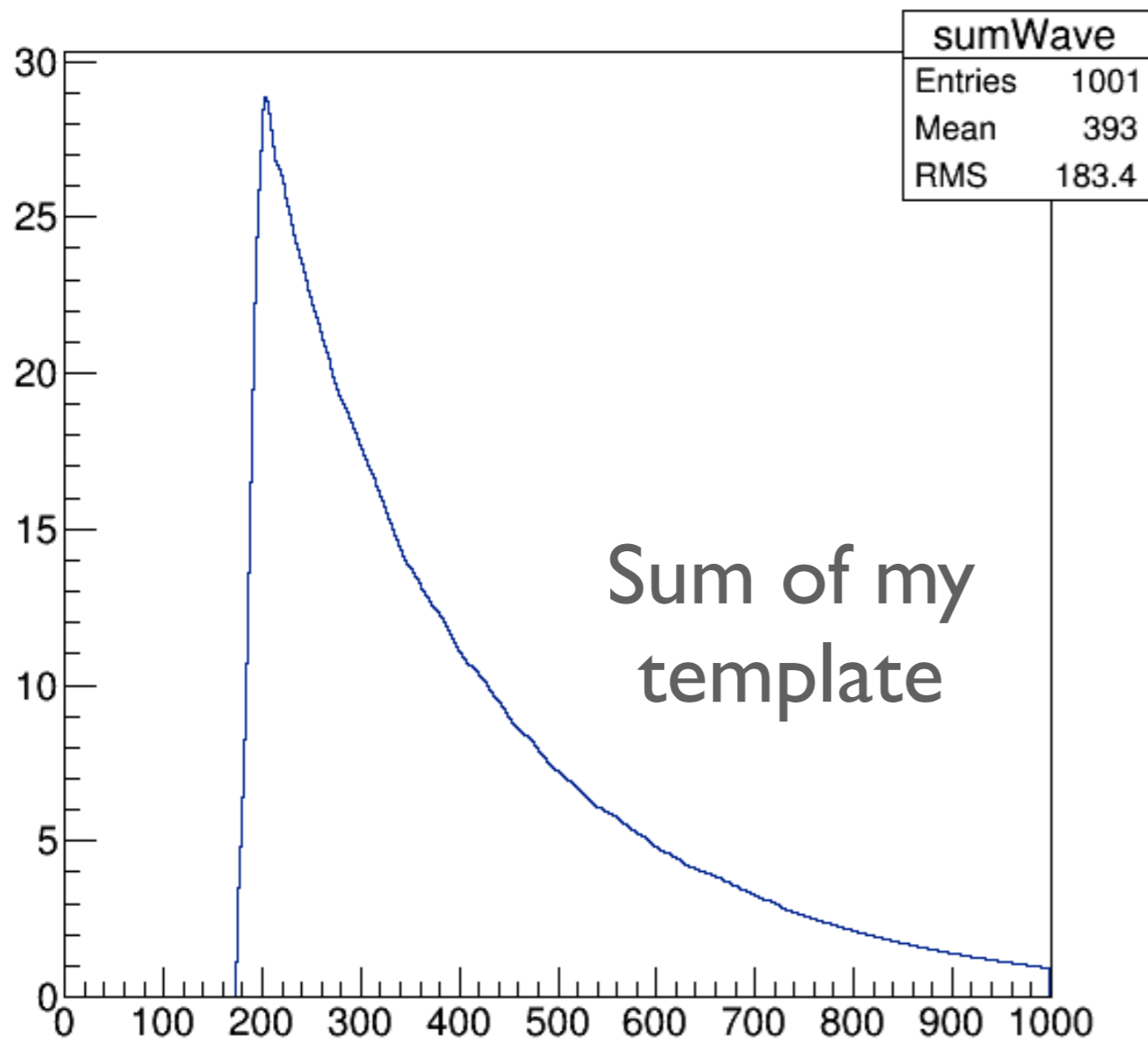
VMax



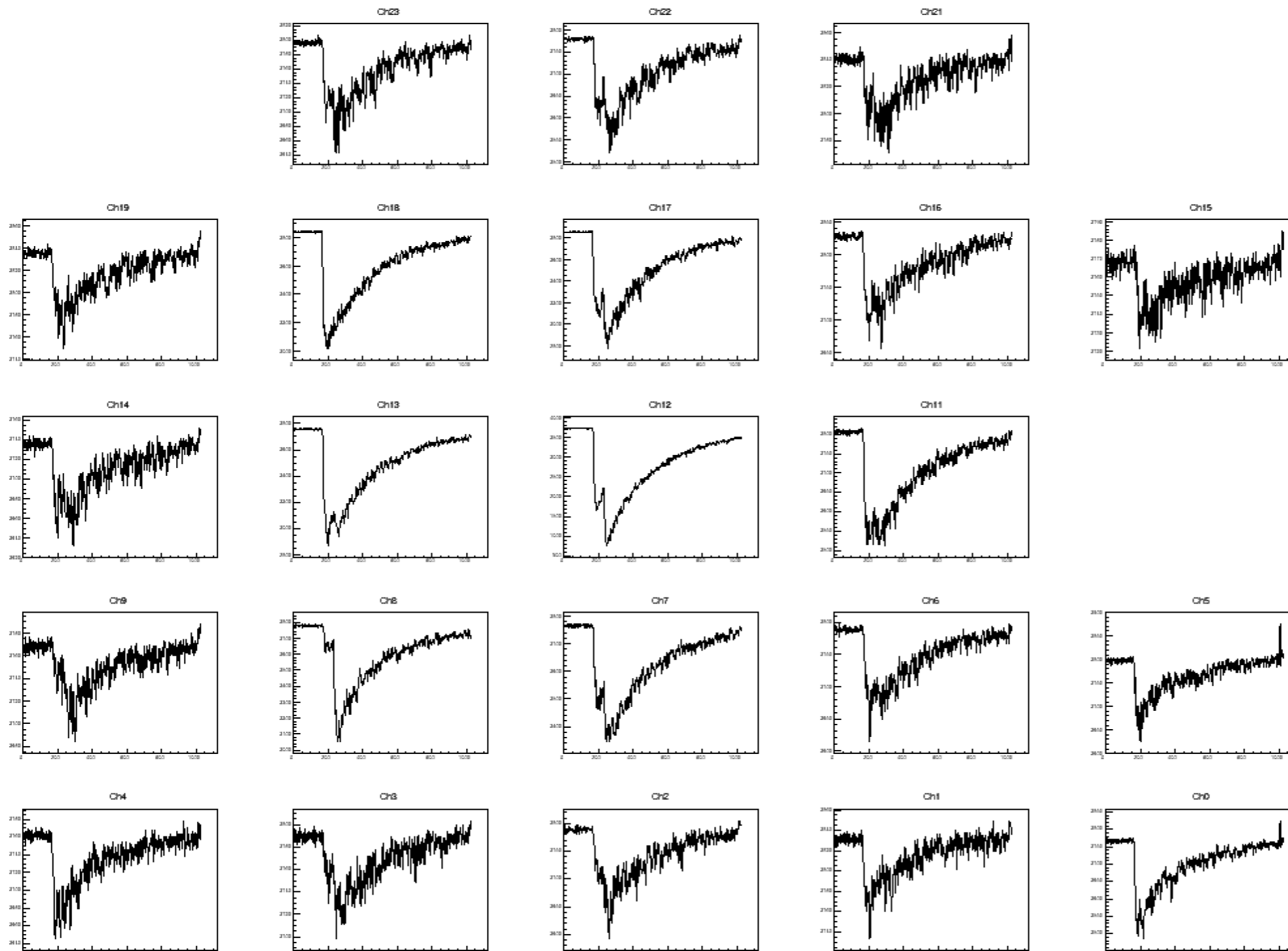
- Data (SP)

VMax

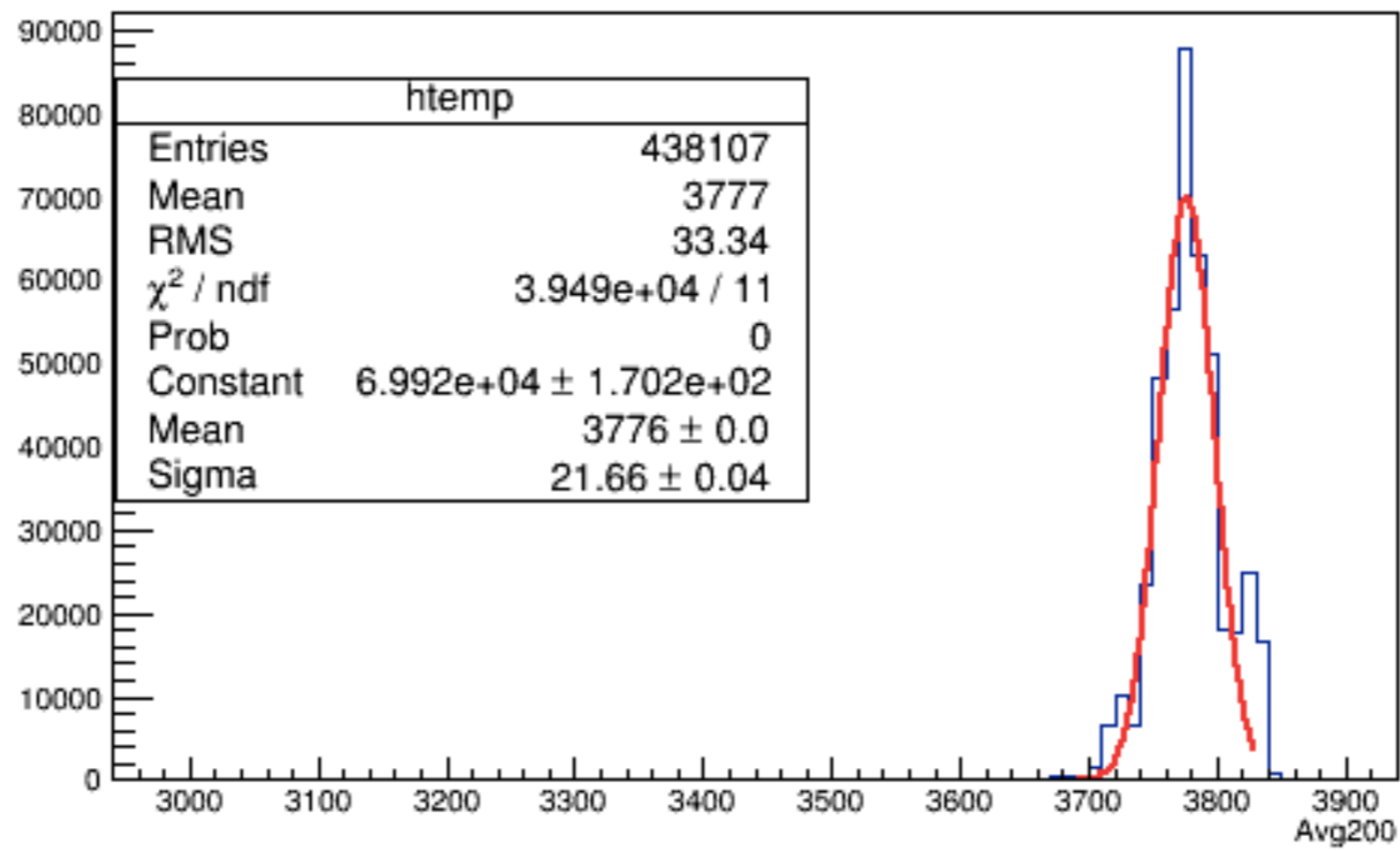




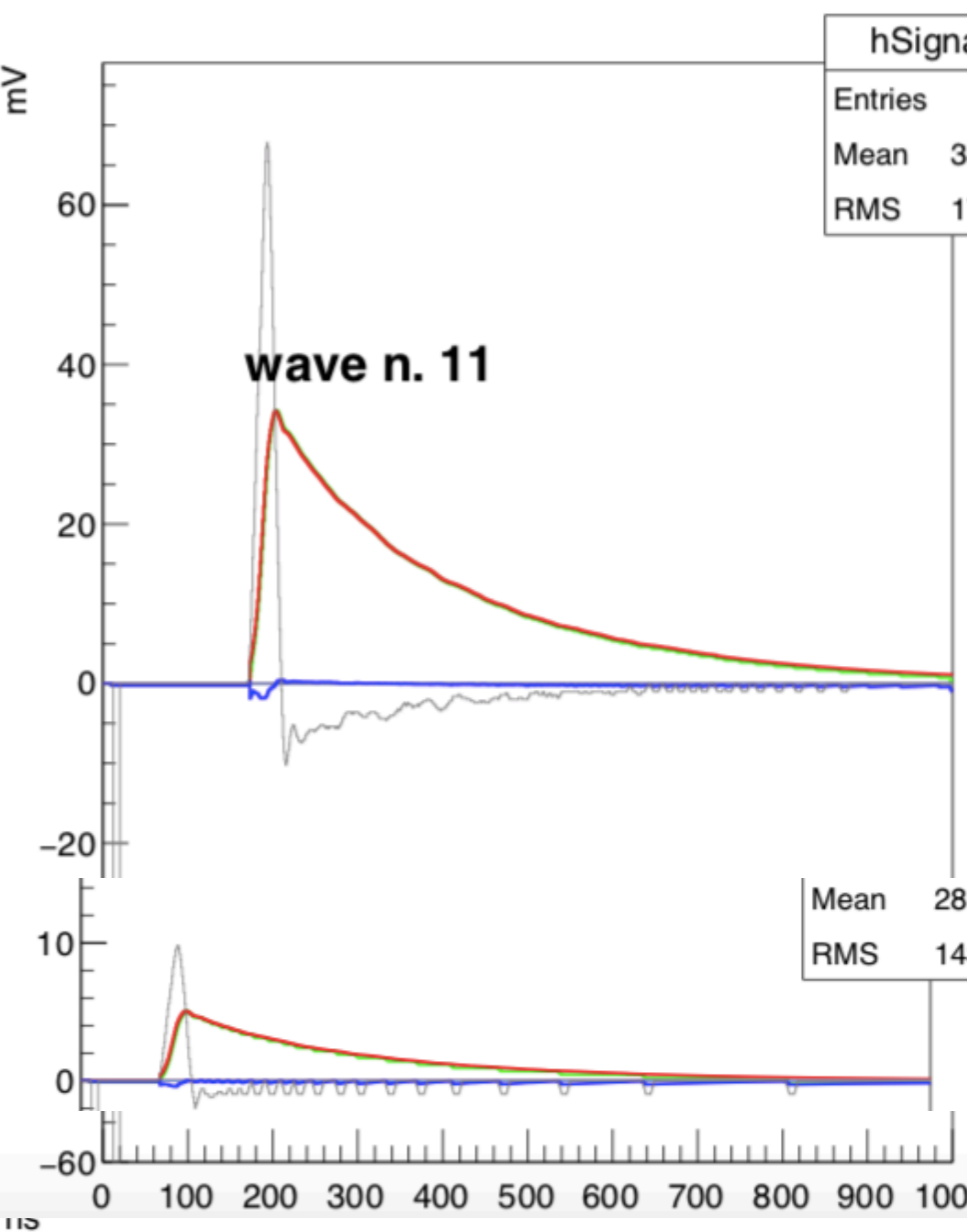
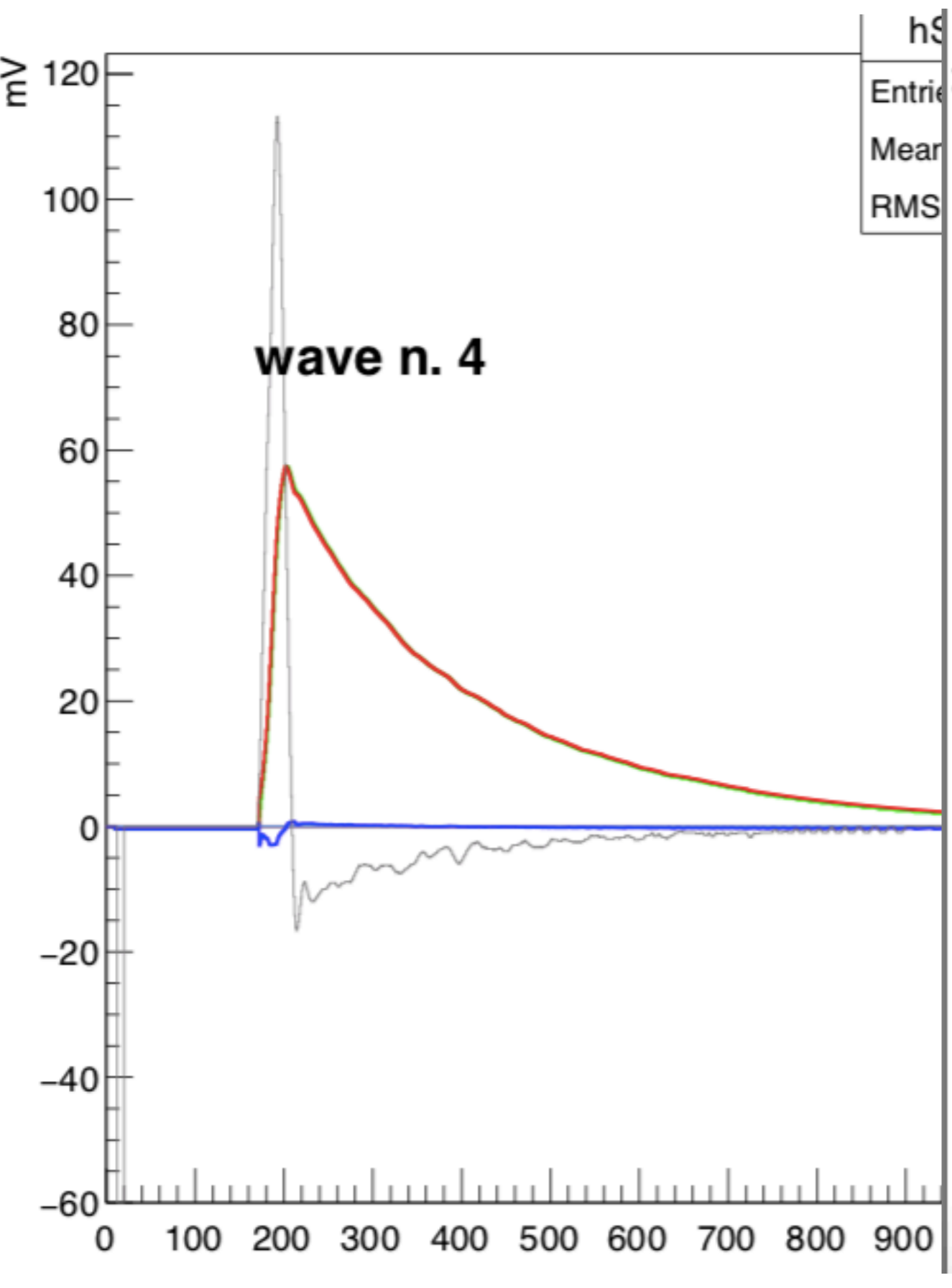
FROM DATA

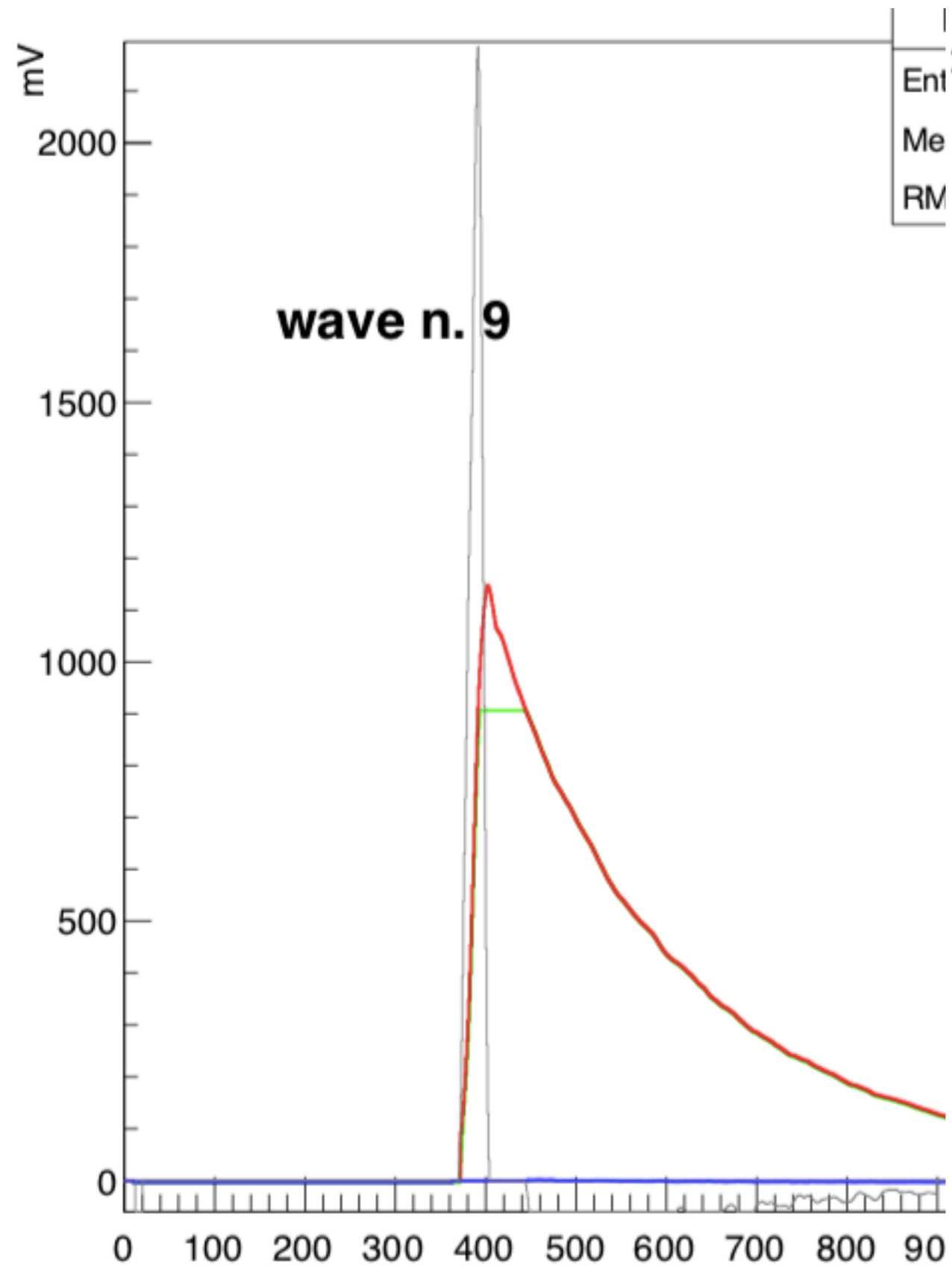


Avg200

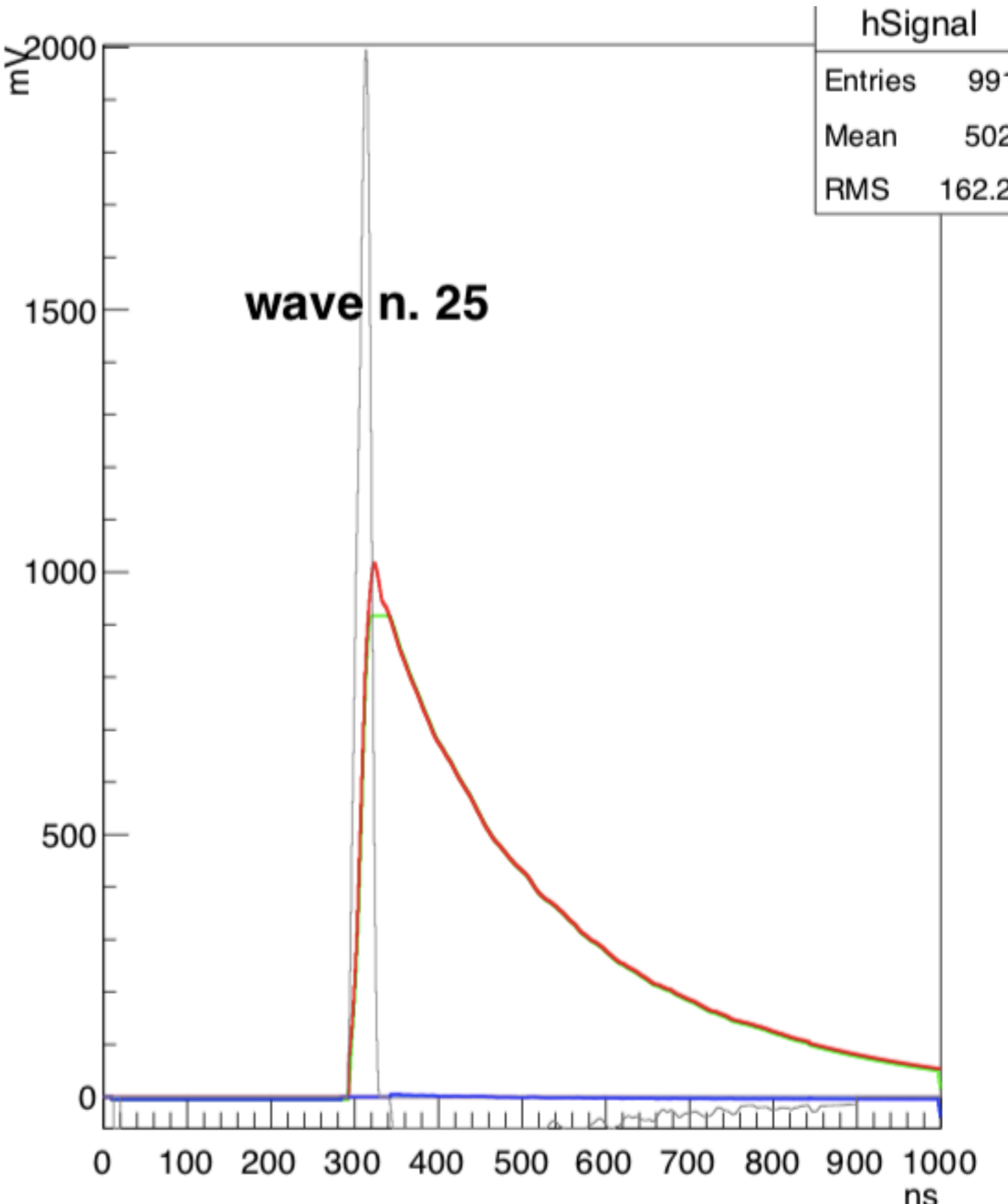


-
-
- Saturation : $\text{waveForDigitiser}(i) < 10 \rightarrow \text{waveForDigitiser}(i) = 10$
 - < 15 is the threshold to recognised the saturation
 - $\text{time} \rightarrow \text{time} + 200$: the signal starts after 200 ns & the first 200 samples are used to estimate the pedestal
 - I chose +200 because the time of the digs starts at 50ns





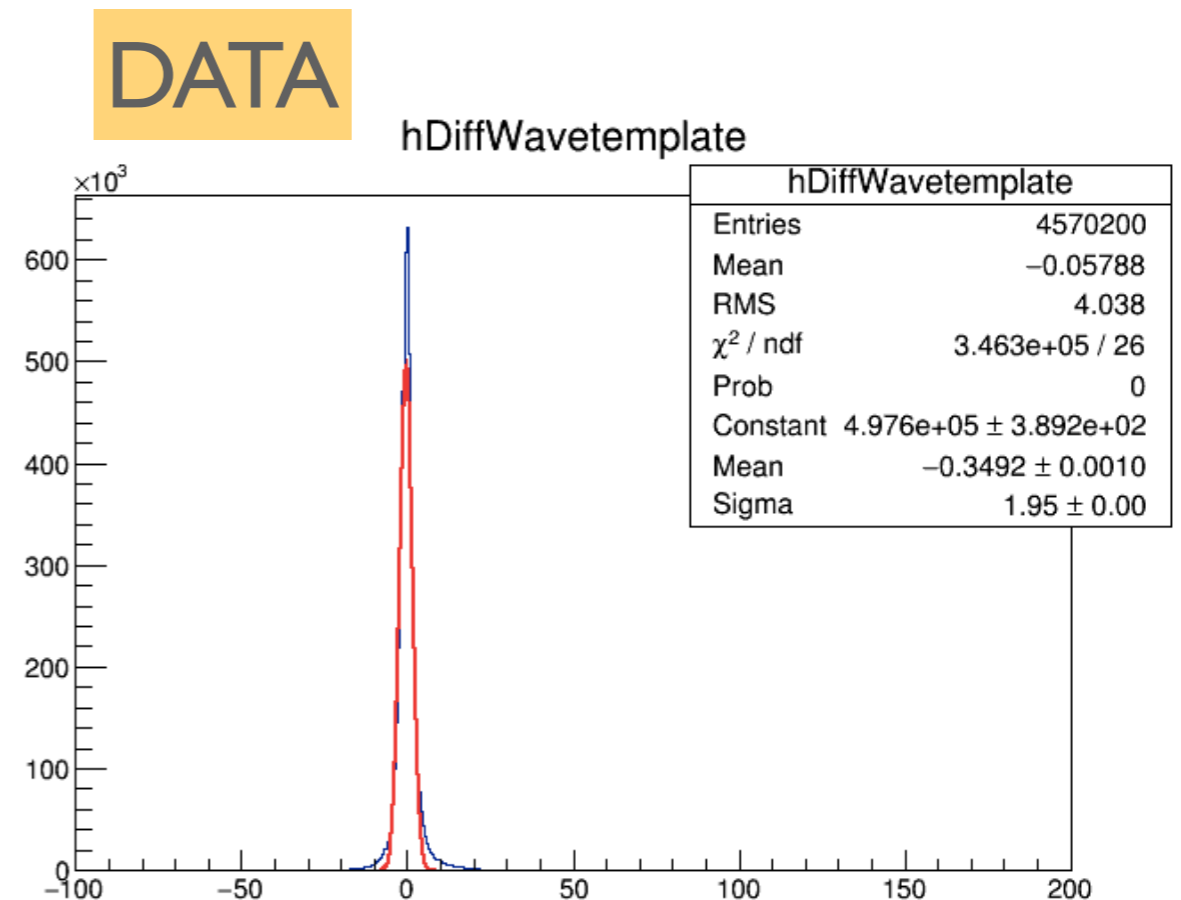
Ent
Me
RM

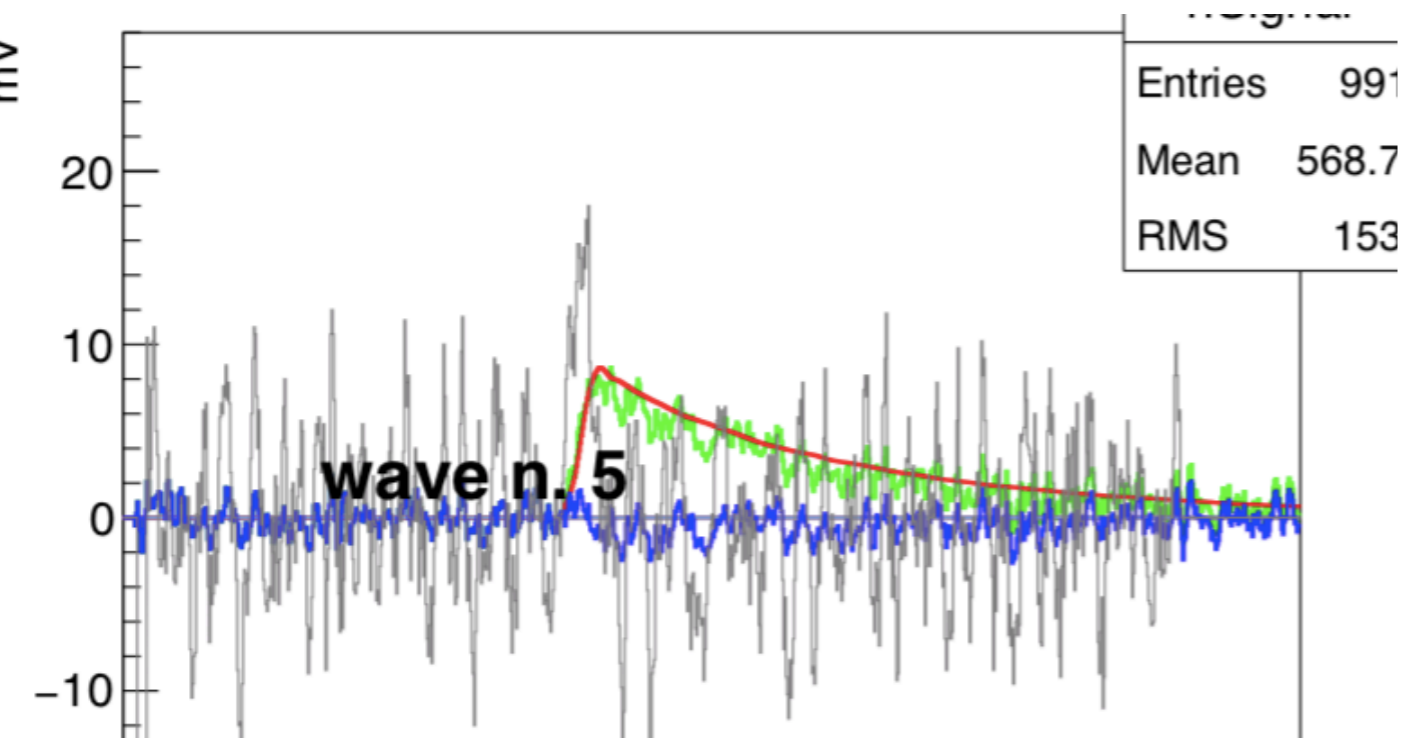
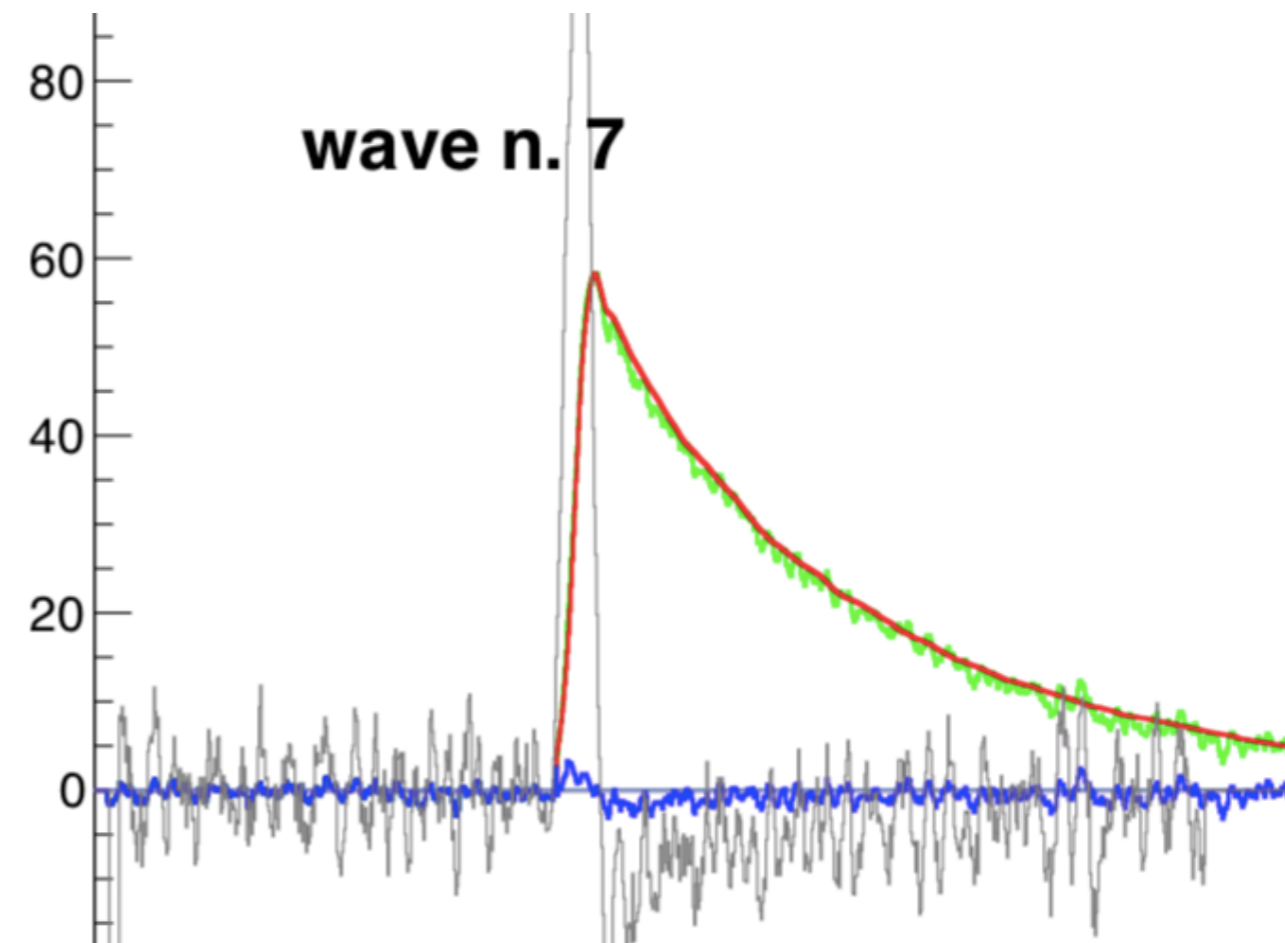
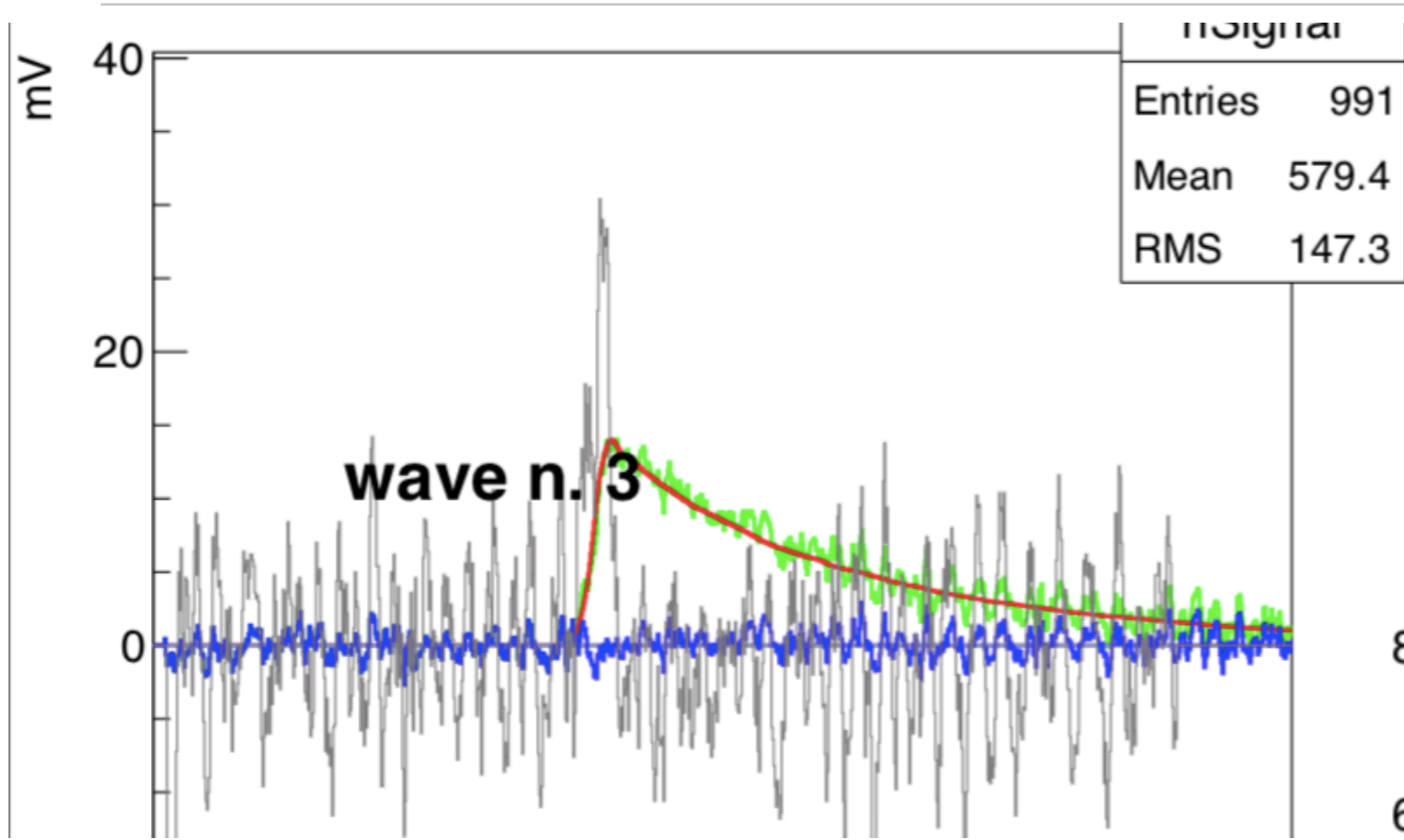


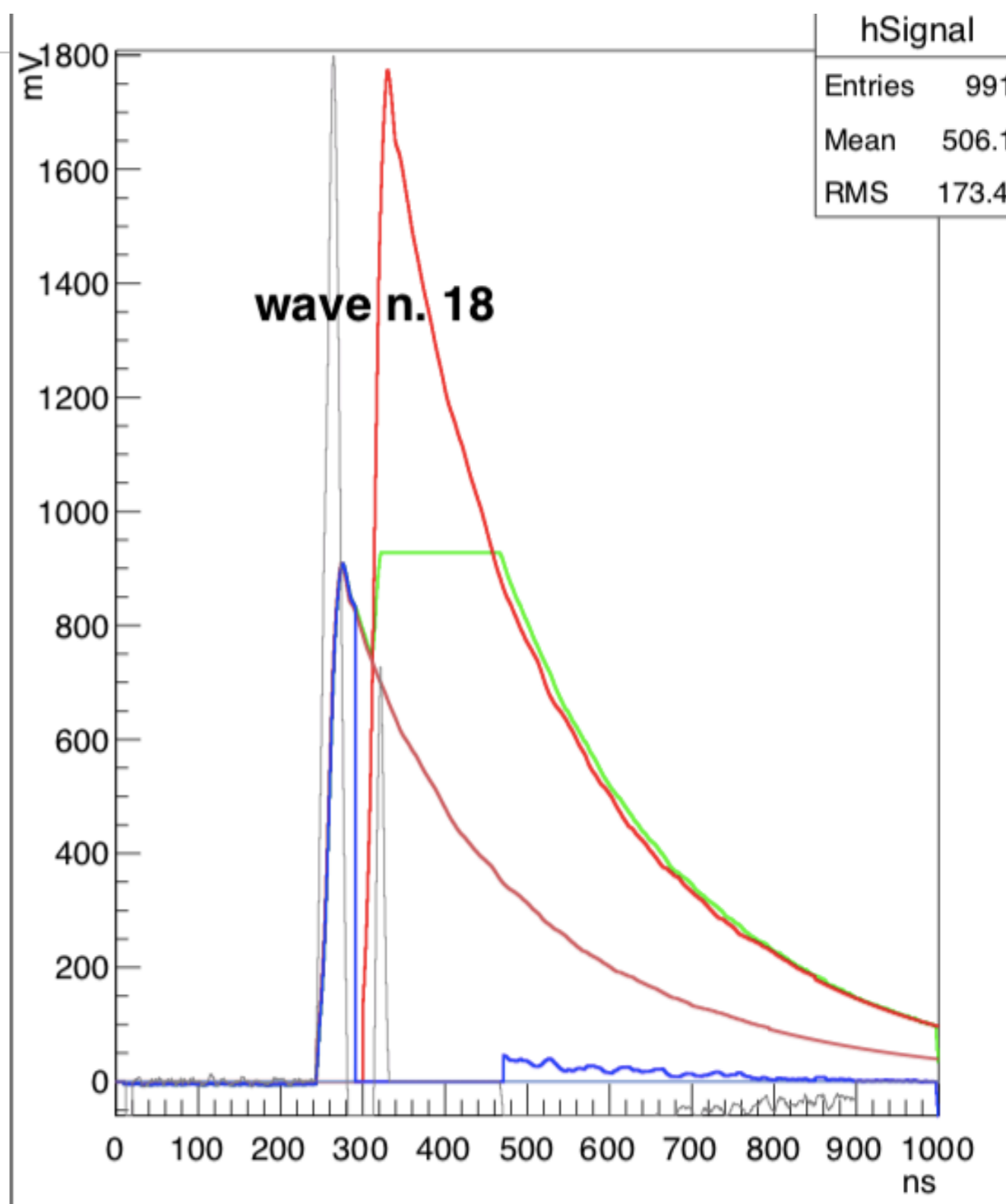
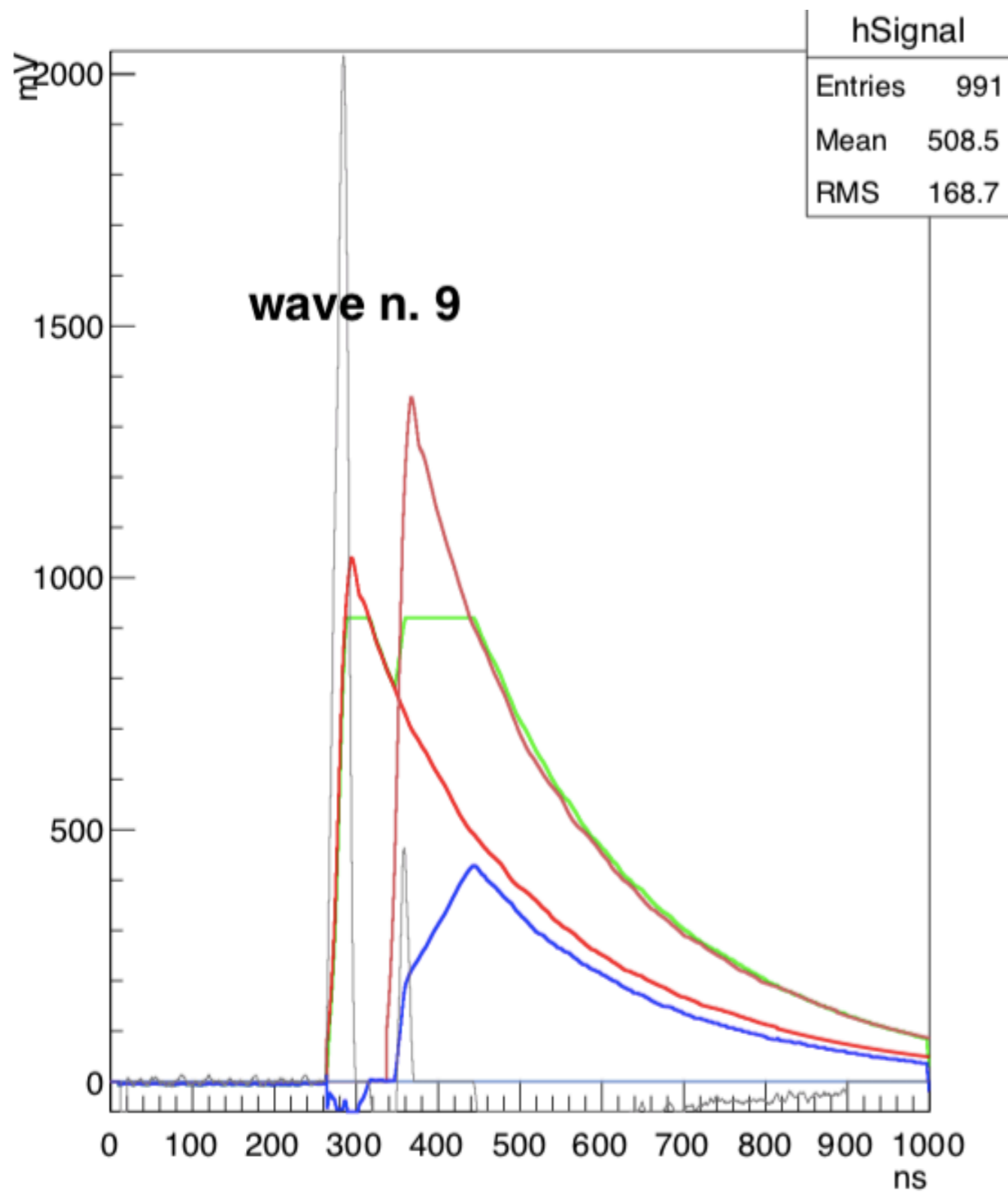
hSignal	
Entries	991
Mean	502
RMS	162.2

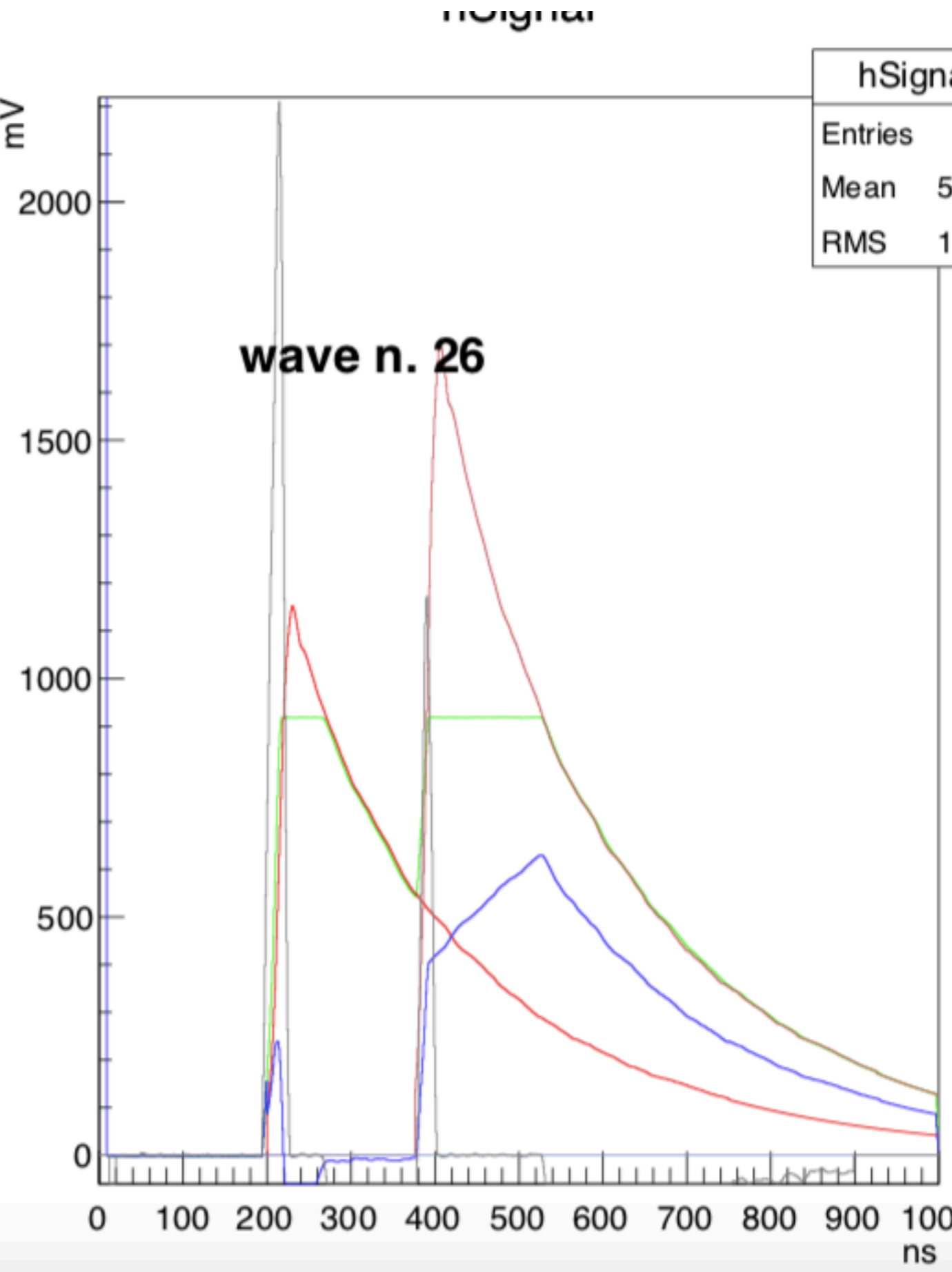
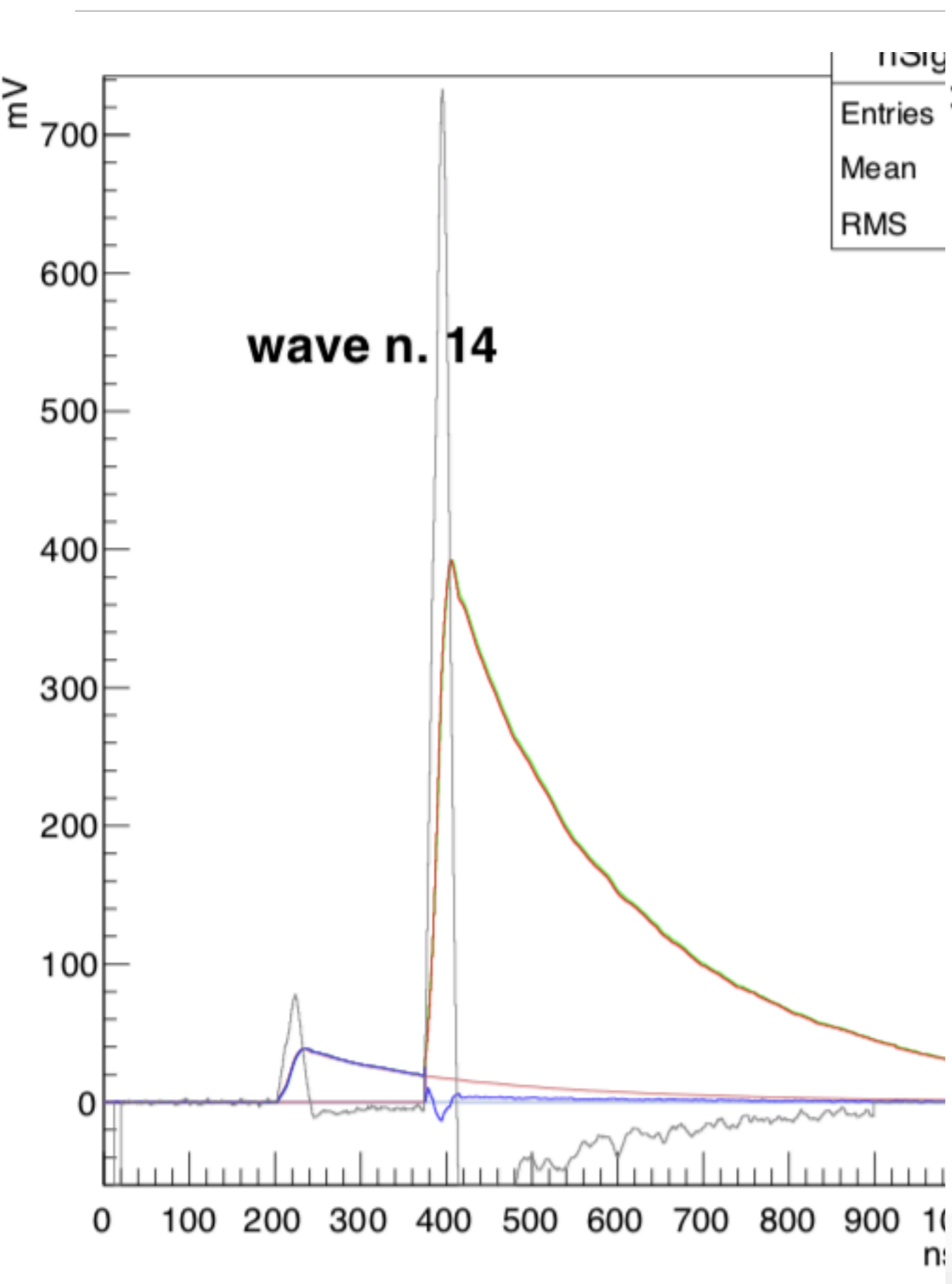
SIMULATION OF THE NOISE

- I consider the difference (of data)
 - $\text{waveform}(i) - \text{template}(i)$
- $\text{wave.at}(i) += \text{Gaus}(\text{meanNoise}, \text{sigmaNoise})$
- $\text{wave.at}(i) += \text{Gaus}(-0.3492, 1.95)$



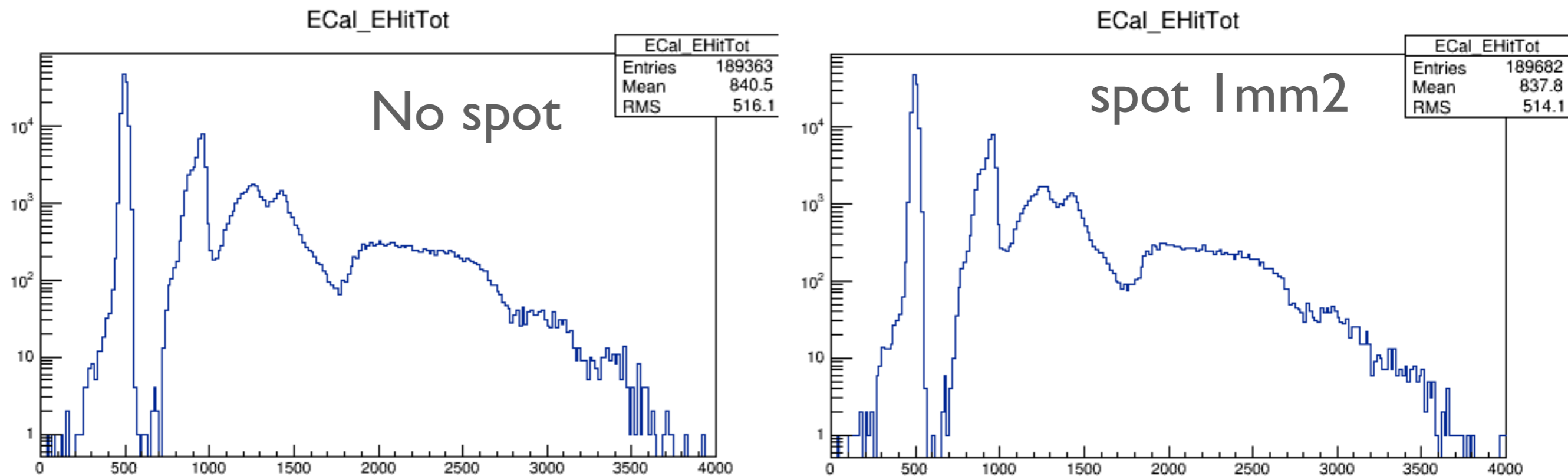






BUT...

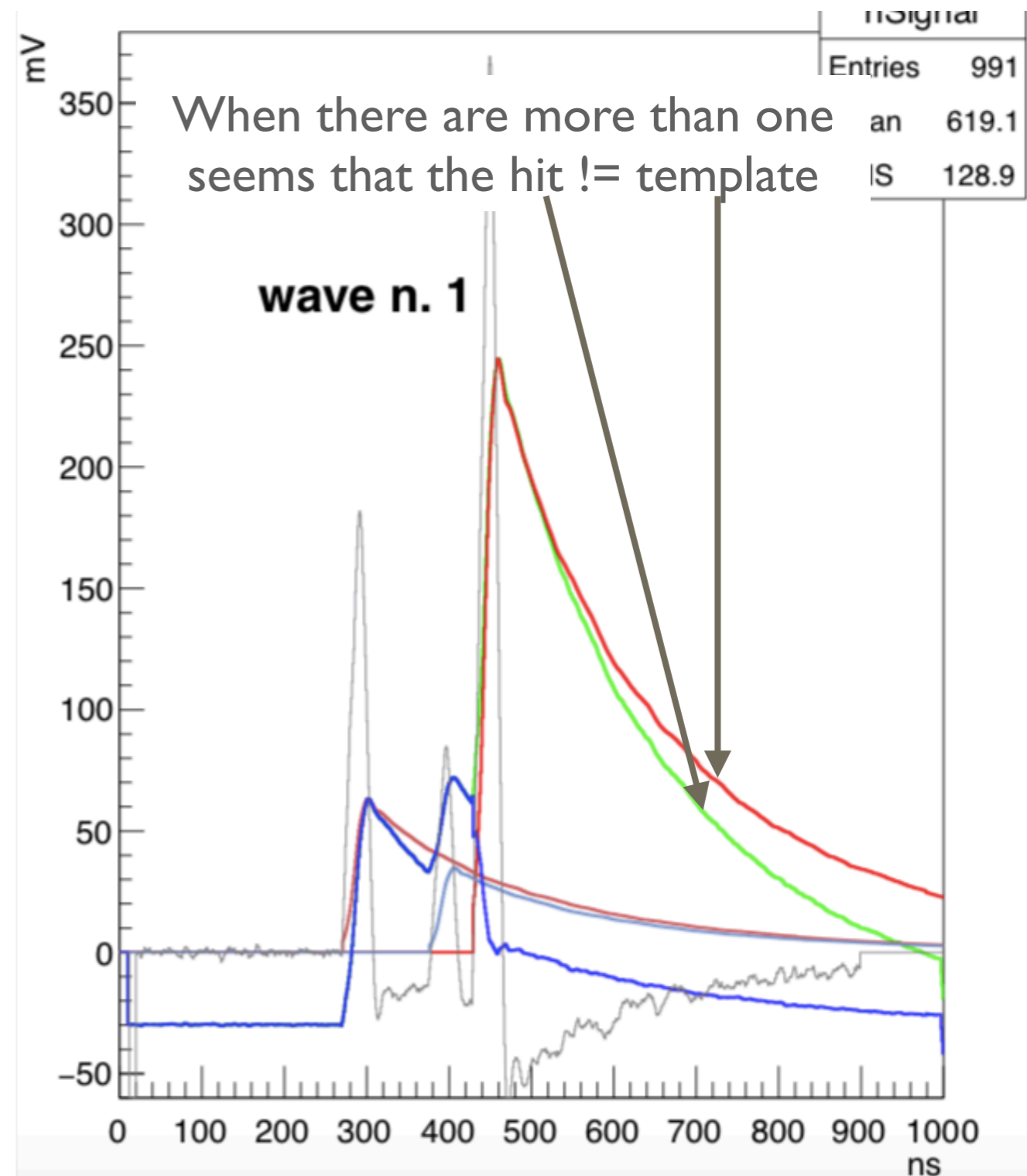
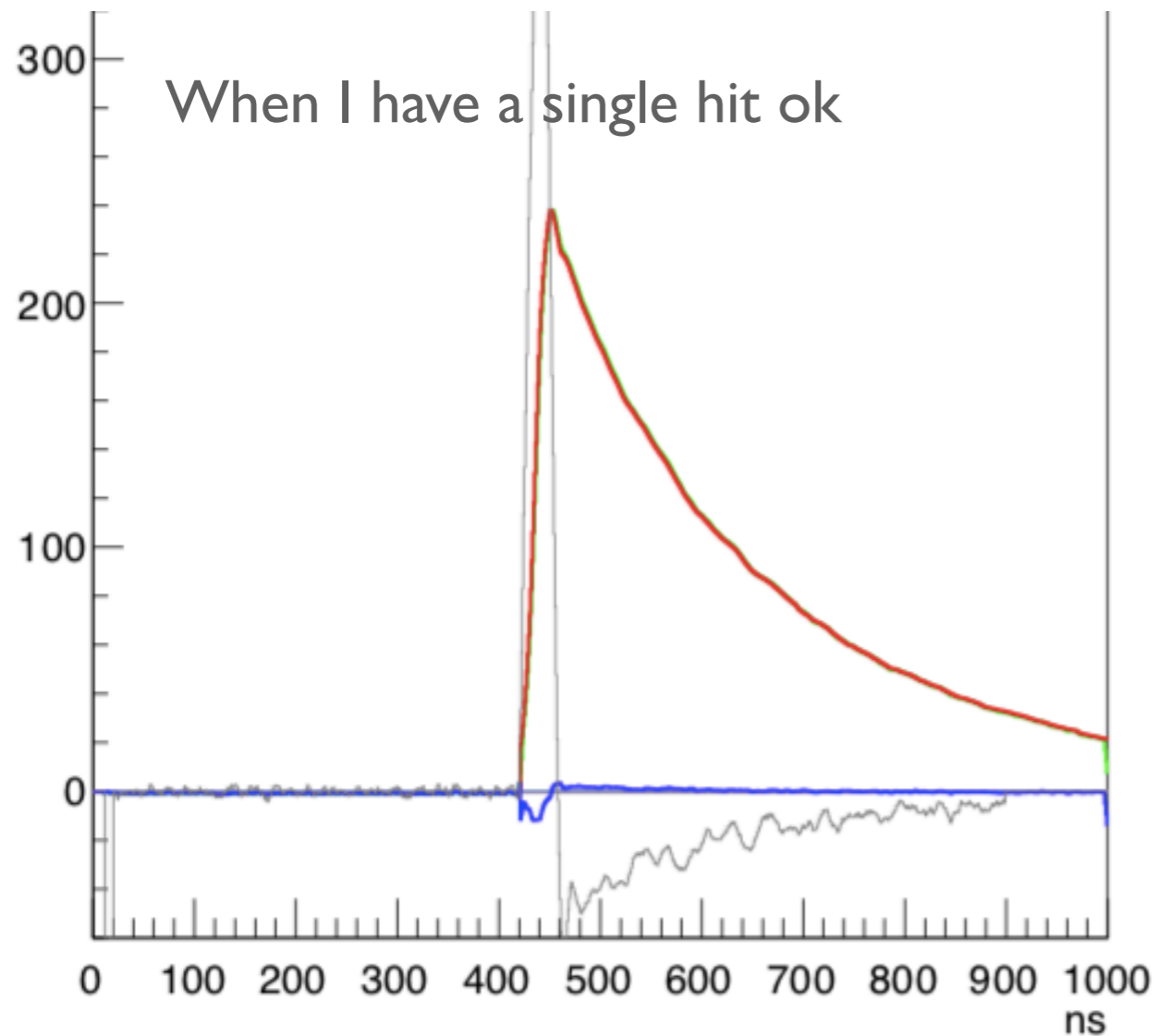
- total hit(cl) energy distribution total out



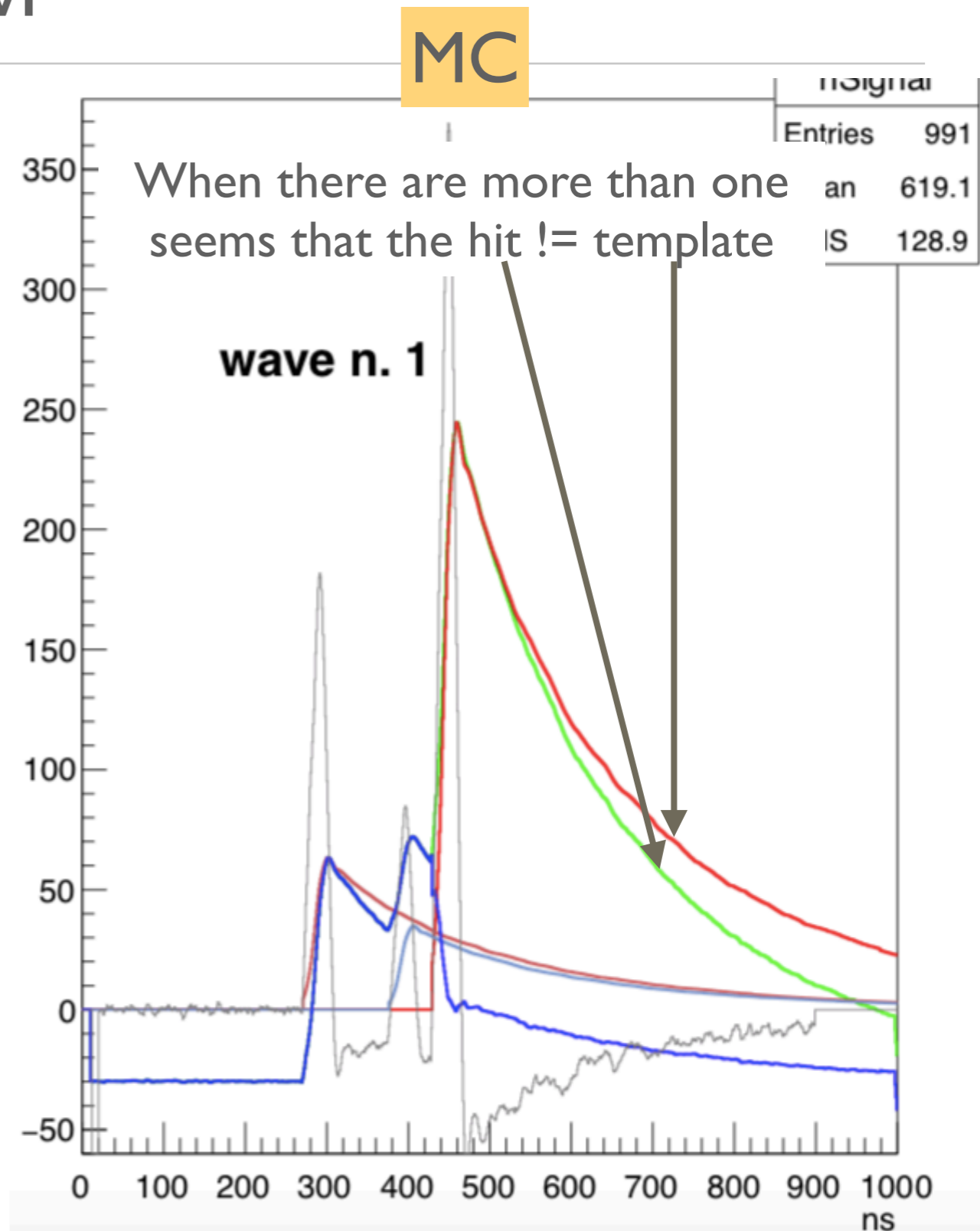
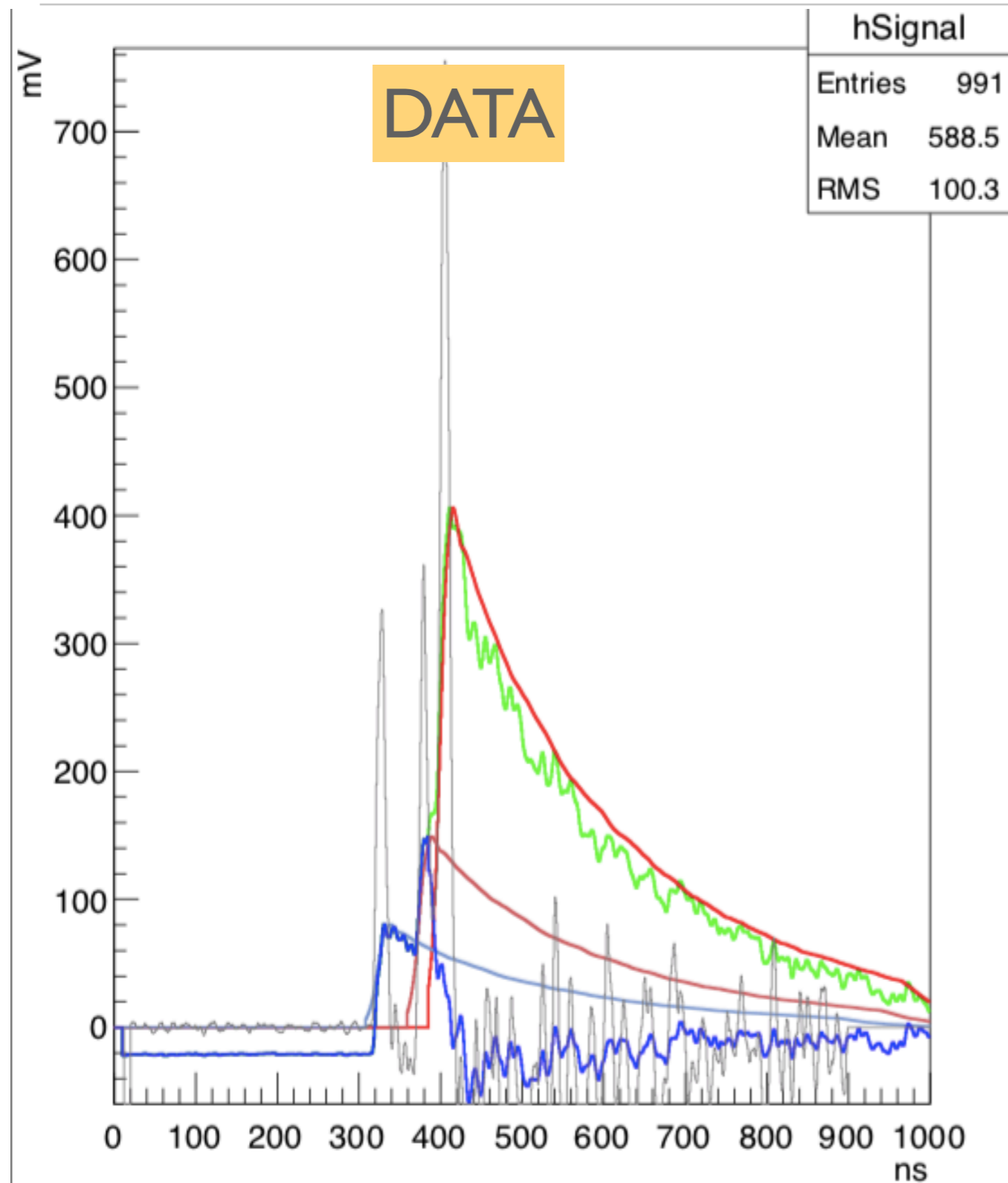
Same plot for spot 1mm2 & 5 MeV spread

- Maybe this is due to the moving of the beam in data, while the MC has a beam that hit a single crystal

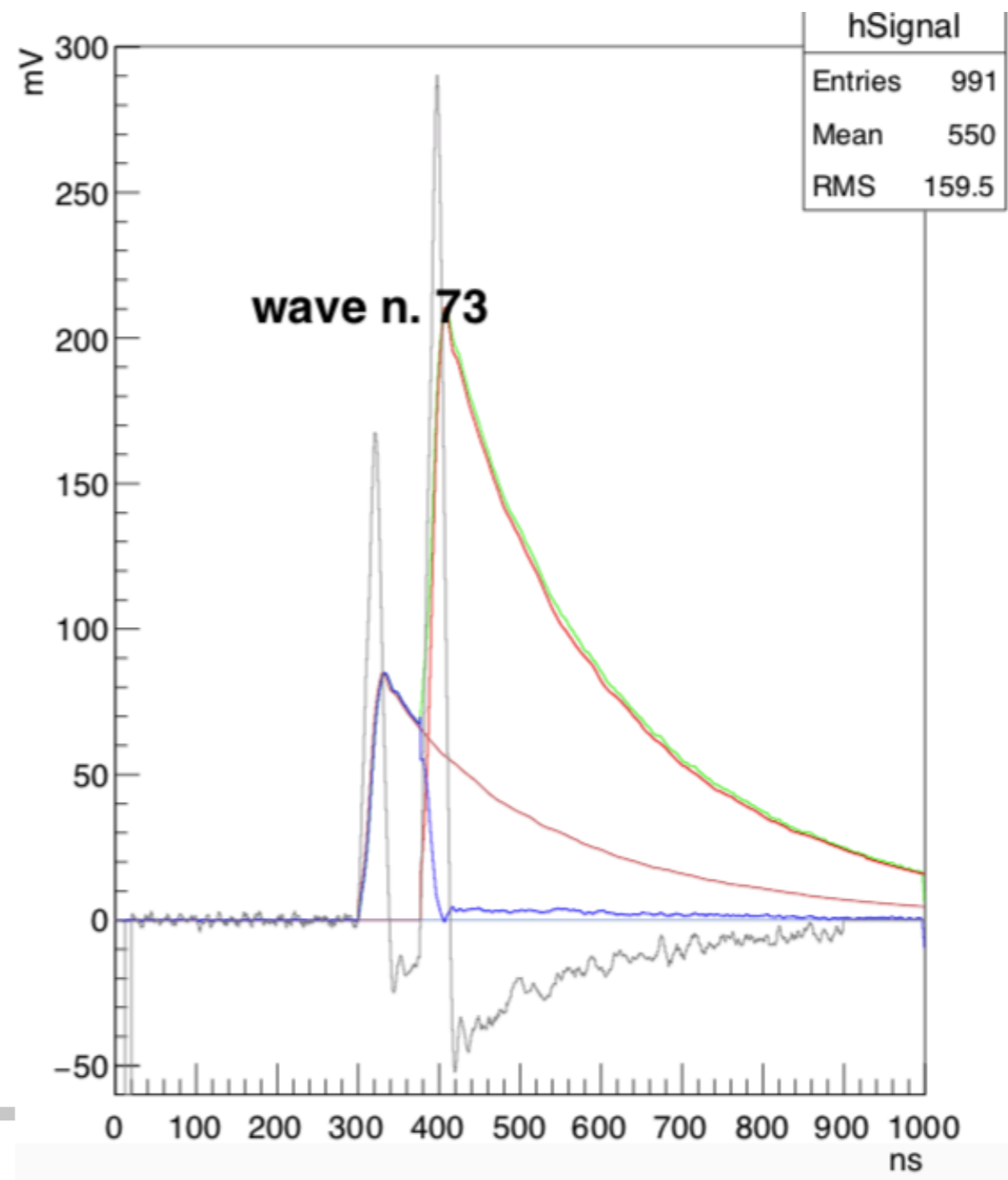
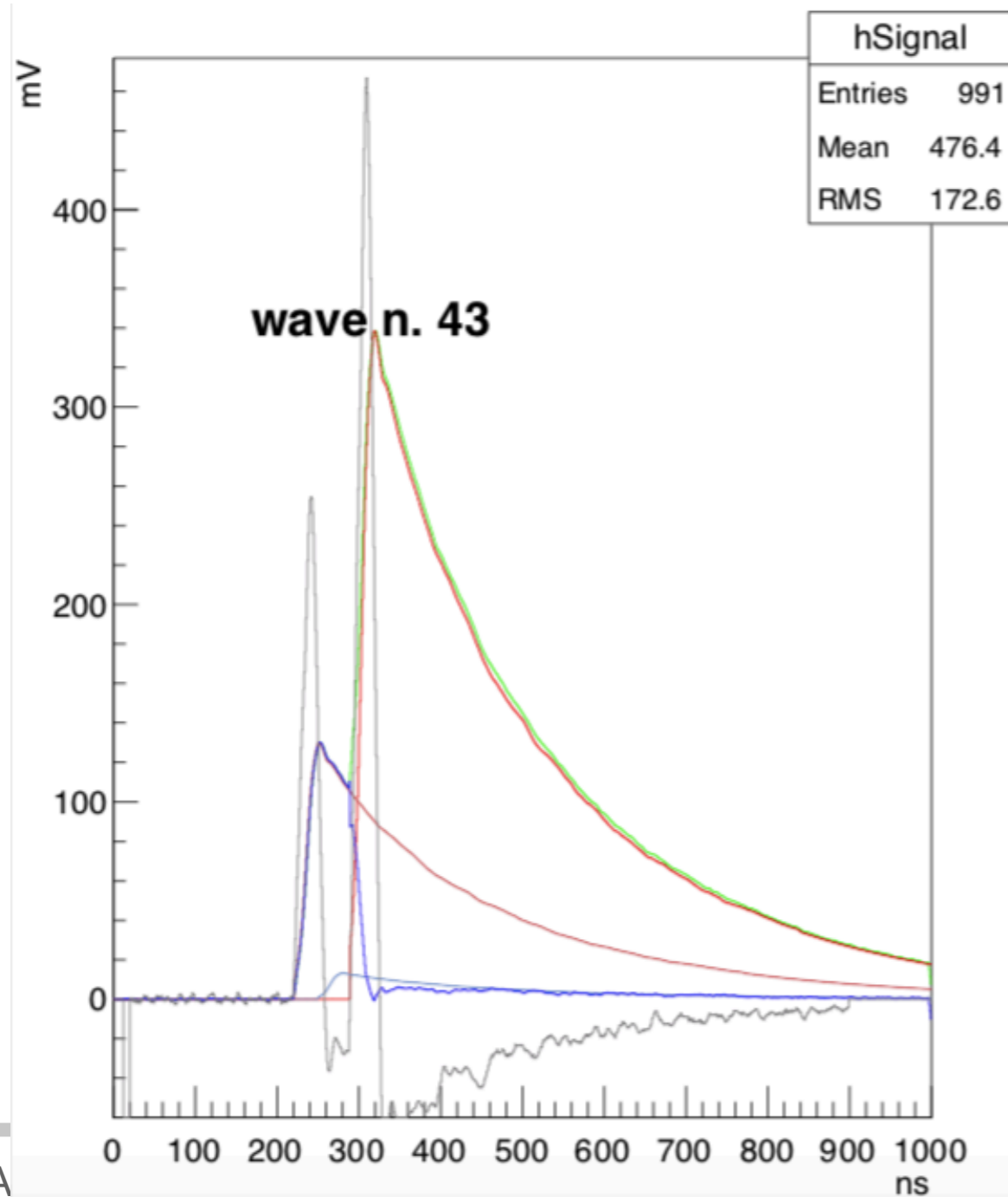
LOOKING AT WAVEFORM



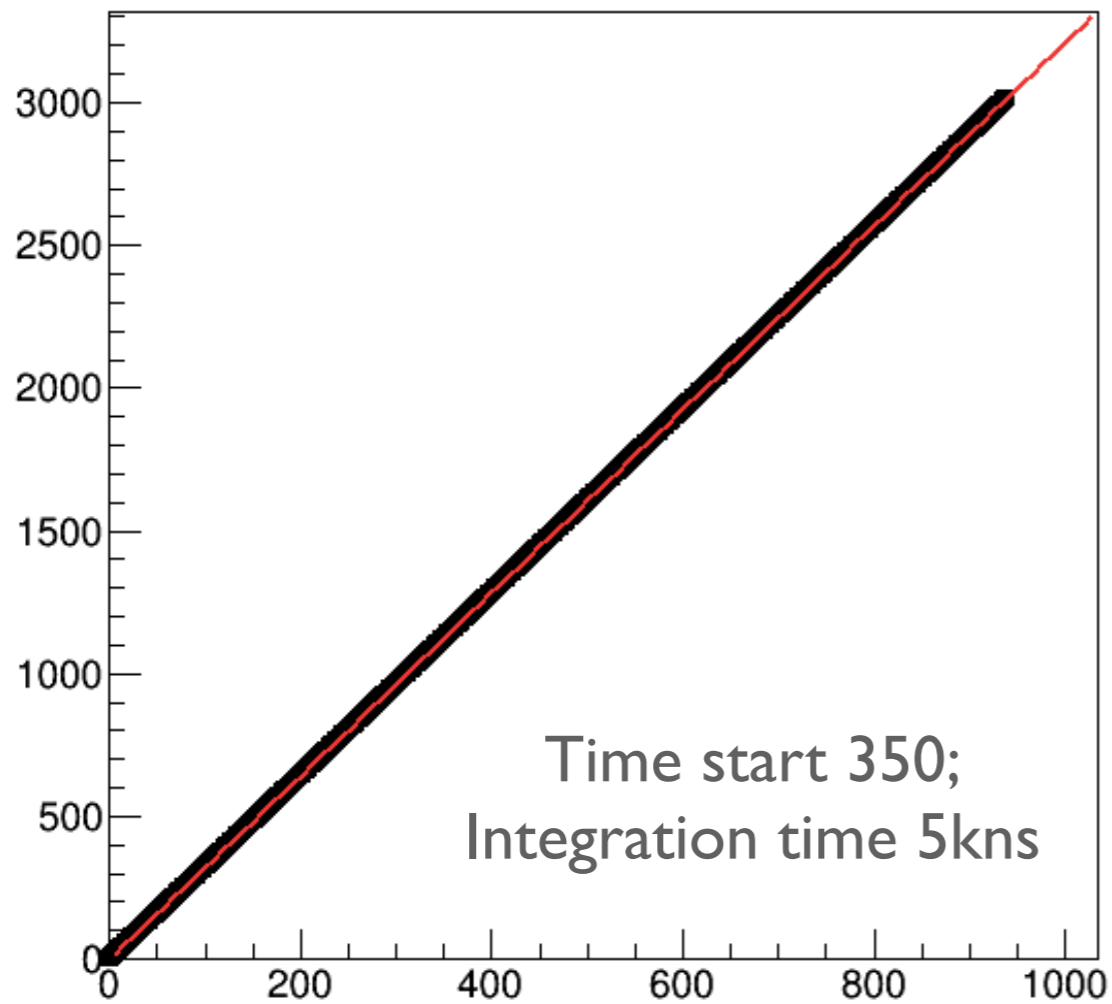
LOOKING AT WAVEFORM



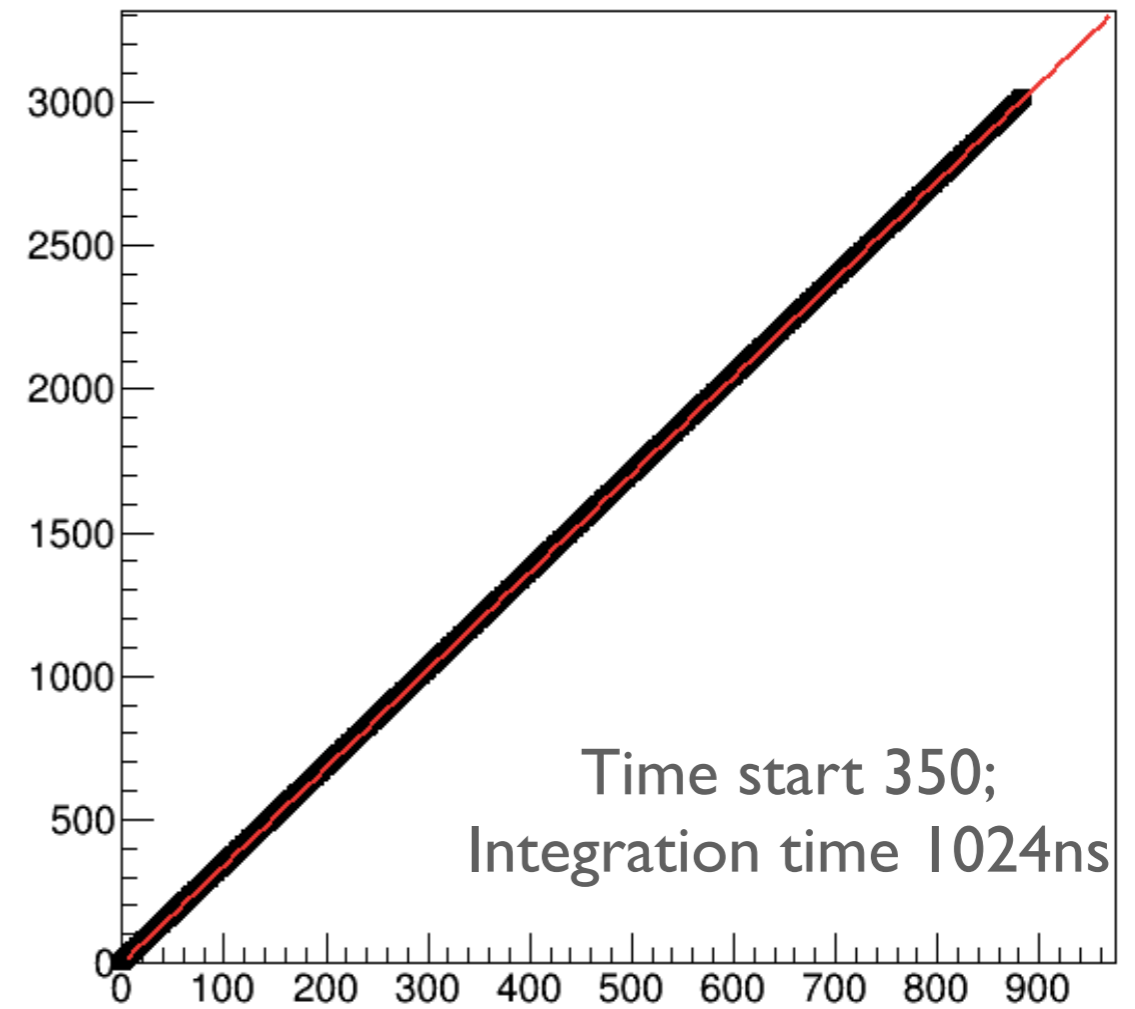
- Problem Fixed
 - Bad estimation of pedestals



Graph

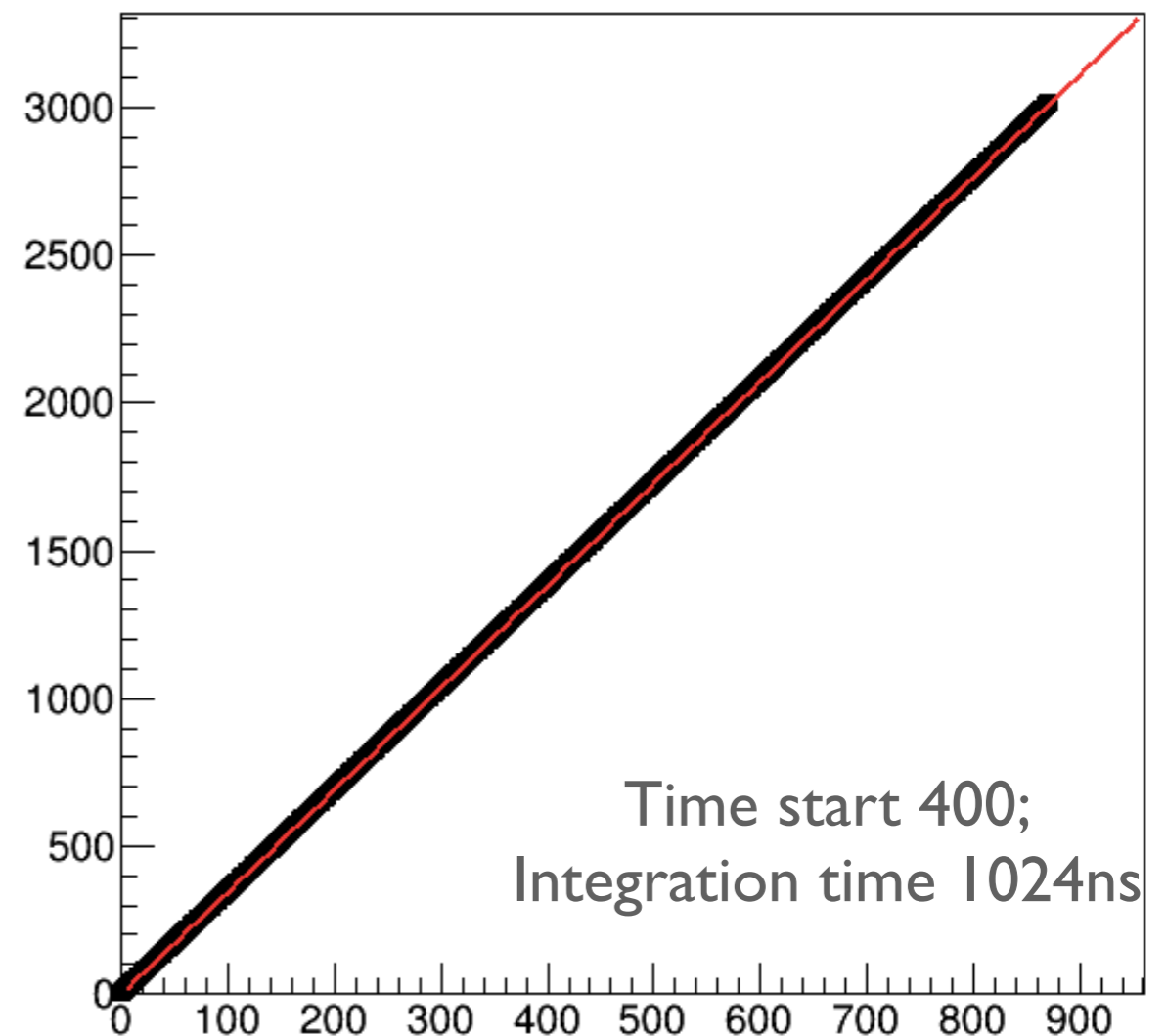
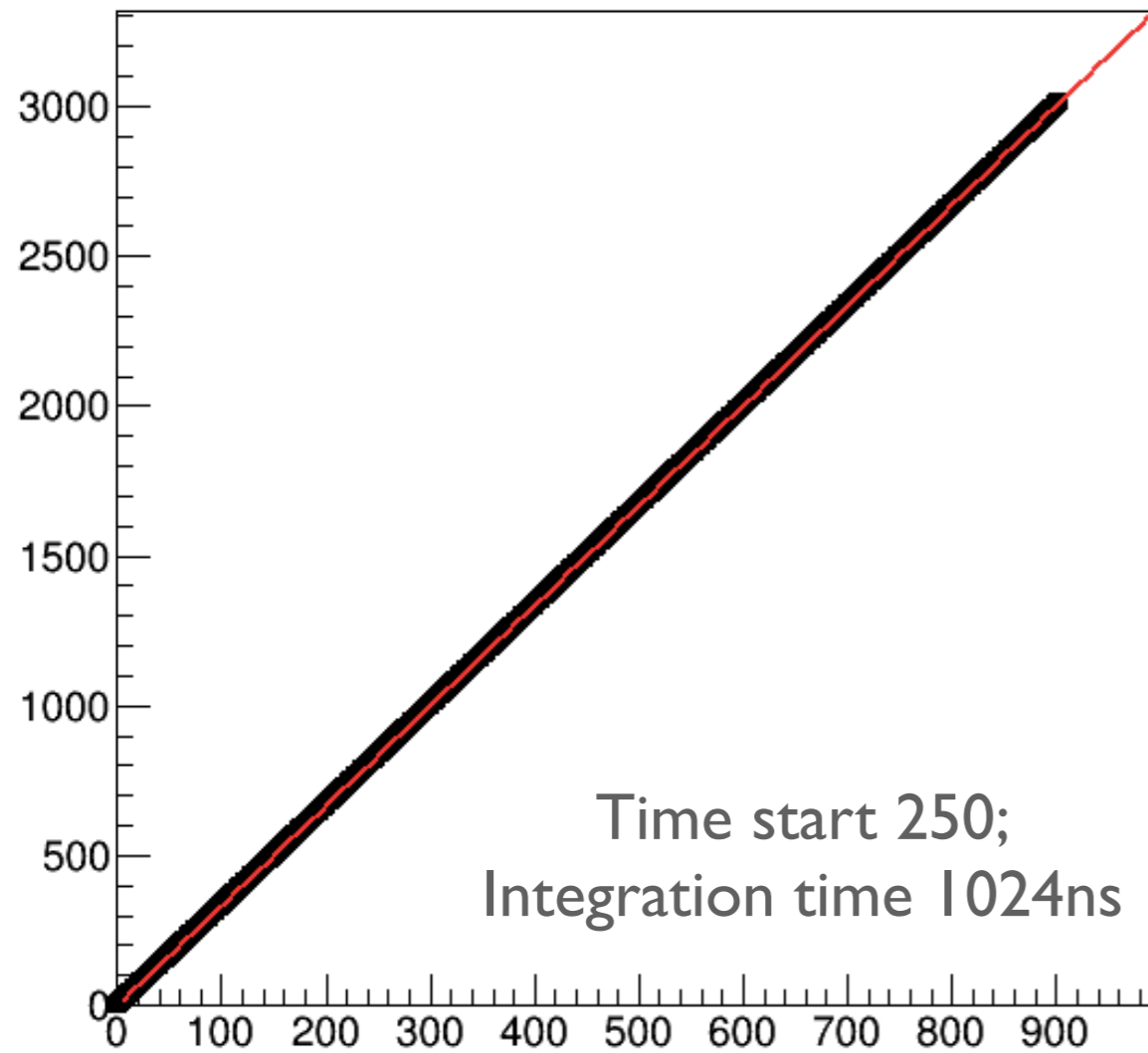


```
Minimizer is Linear  
Chi2 = 2.68772e-20  
Ndf = 1007  
p0 = 9.1623e-13 +/- 3.23914e-13  
p1 = 3.21025 +/- 5.97516e-16
```



```
Minimizer is Linear  
Chi2 = 3.48698e-21  
Ndf = 1007  
p0 = 1.37435e-12 +/- 1.16671e-13  
p1 = 3.40679 +/- 2.28396e-16
```

SOME PROBLEMS IN CHARGE ESTIMATION??



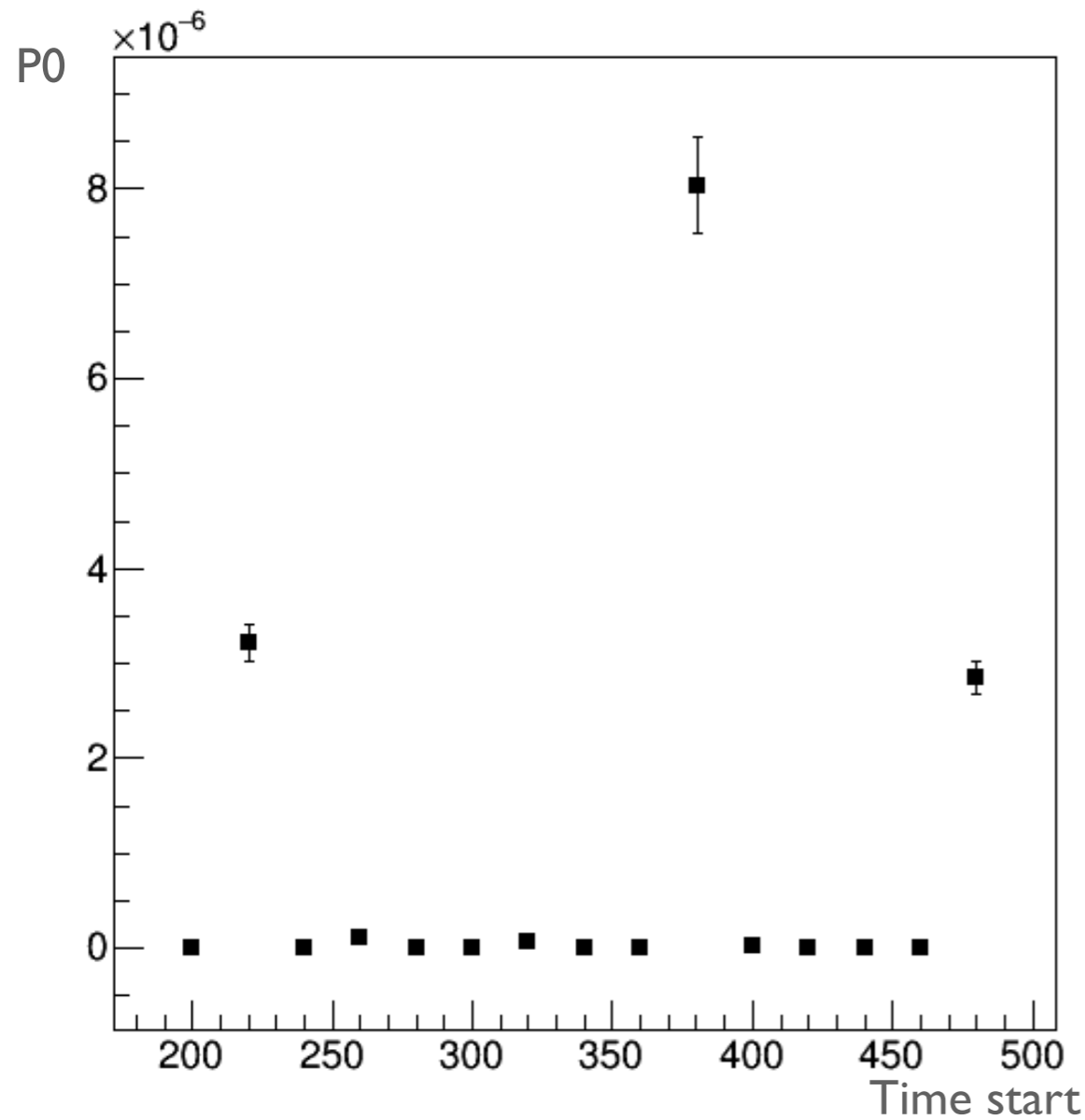
Warning in <Canvas::constructor>: Detecting canvas with same name: c1

```
root [1]
*****
Minimizer is Linear
Chi2          = 3.64228e-21
Ndf           = 1007
p0            = 0 +/- 1.19241e-13
p1            = 3.33763 +/- 2.28688e-16
```

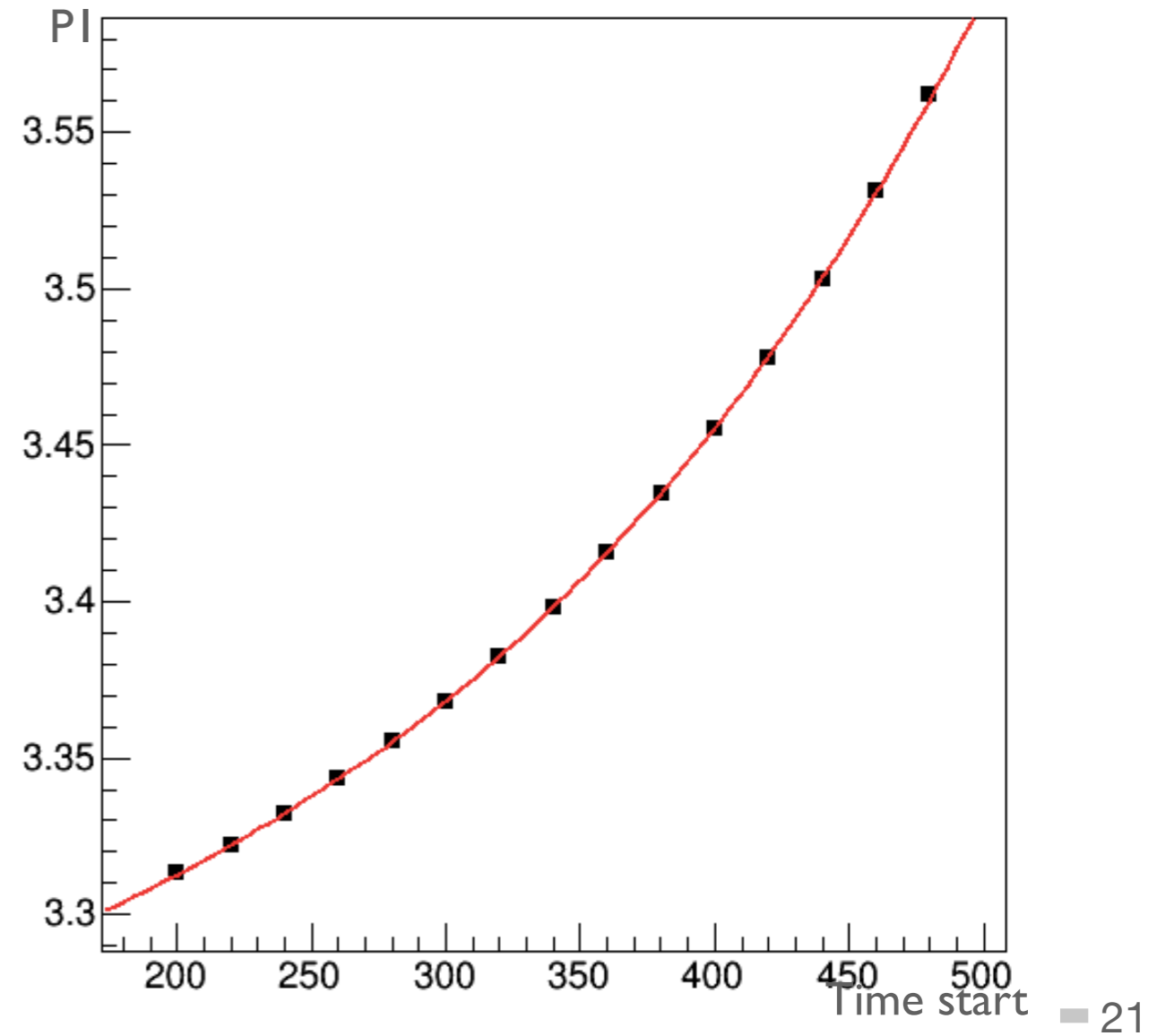
```
Minimizer is Linear
Chi2          = 4.72502e-21
Ndf           = 1007
p0            = 2.74869e-12 +/- 1.35813e-13
p1            = 3.45533 +/- 2.69656e-16
```

- p0 = 3.22416 +/- 2.42012e-12
- p1 = 0.000550996 +/- 2.1456e-14
- p2 = -1.14974e-06 +/- 6.27804e-17
- p3 = 3.04737e-09 +/- 6.07941e-20

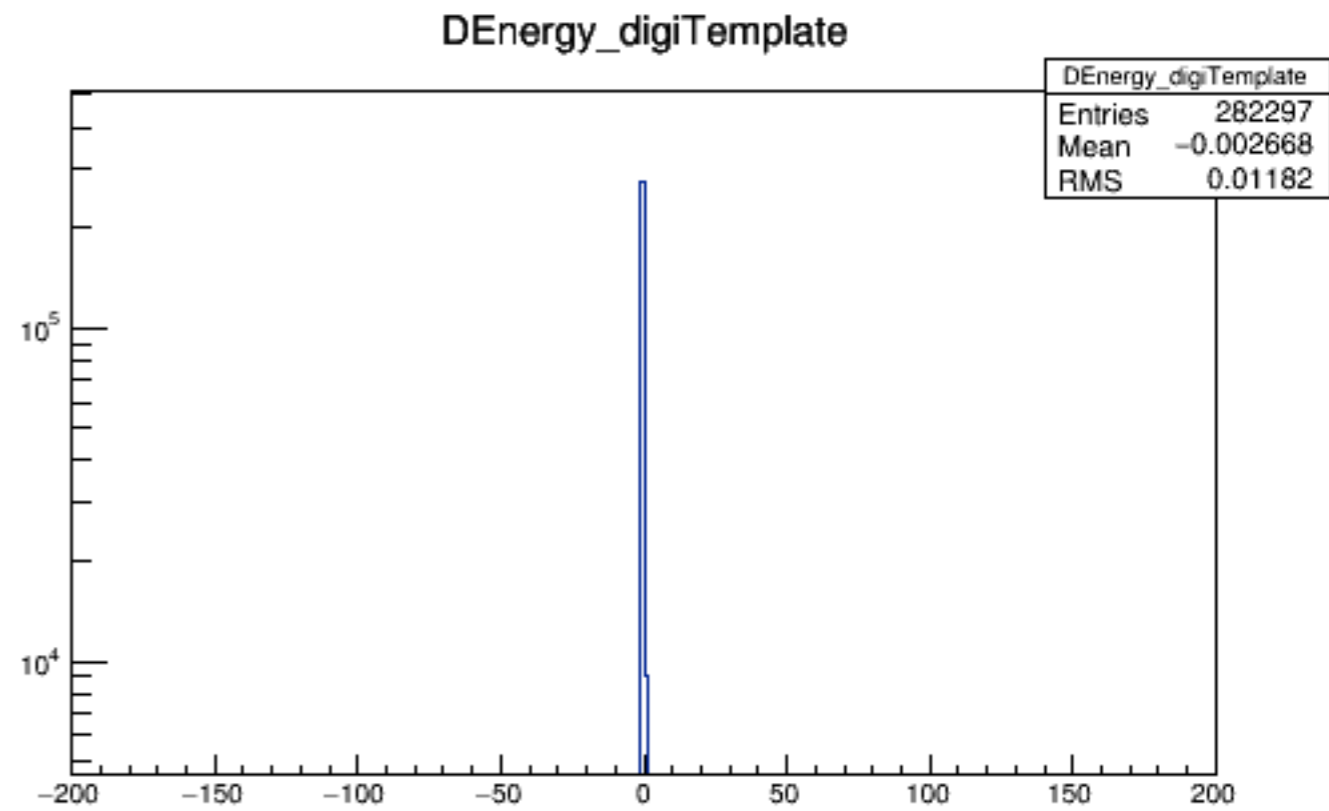
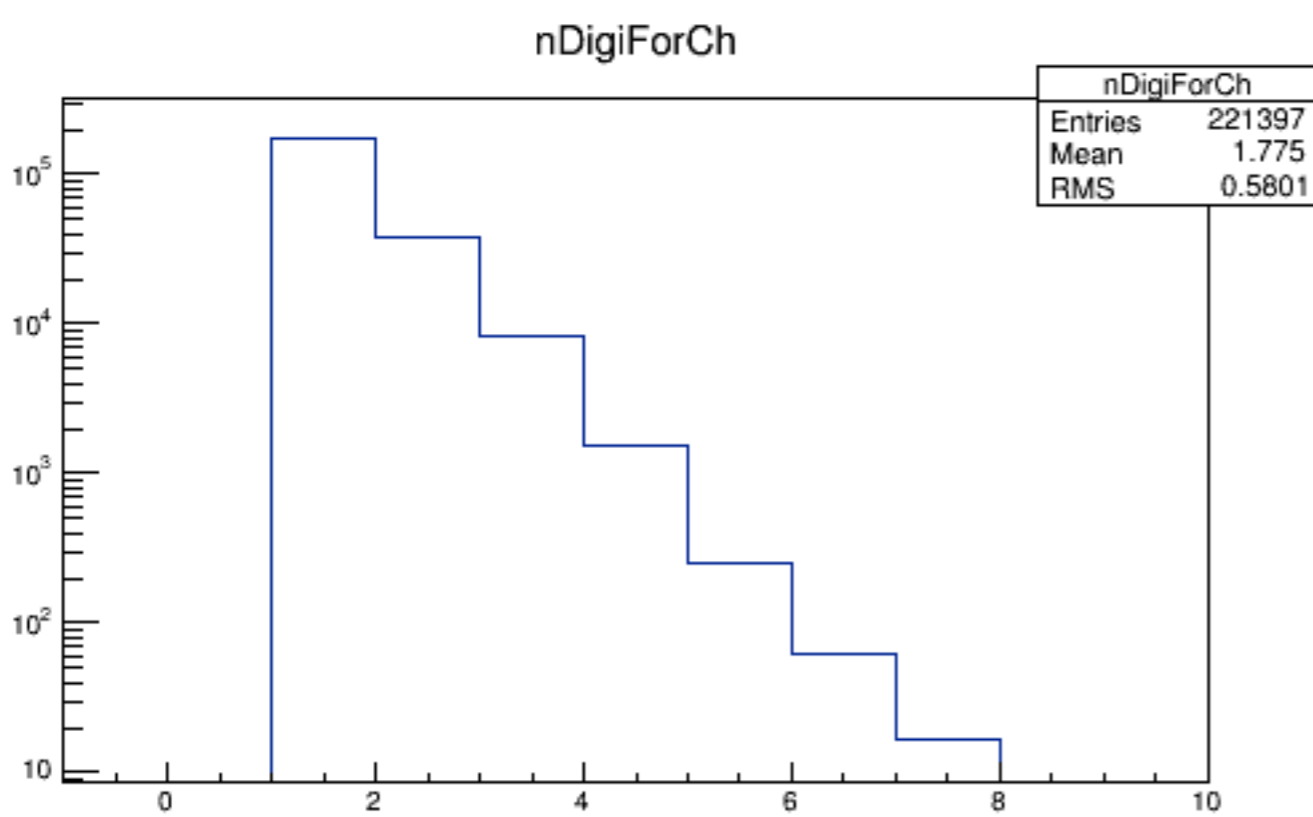
Graph



Graph



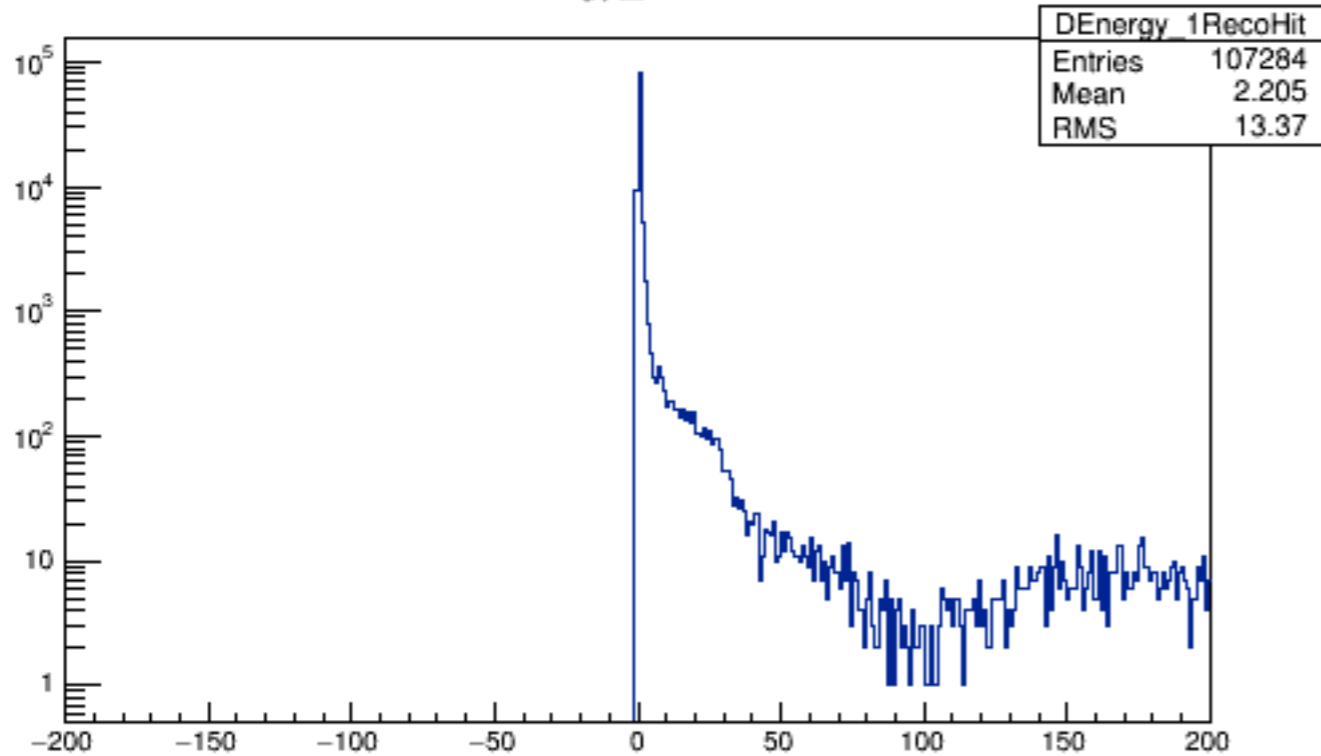
SINGLE POSITRON MC



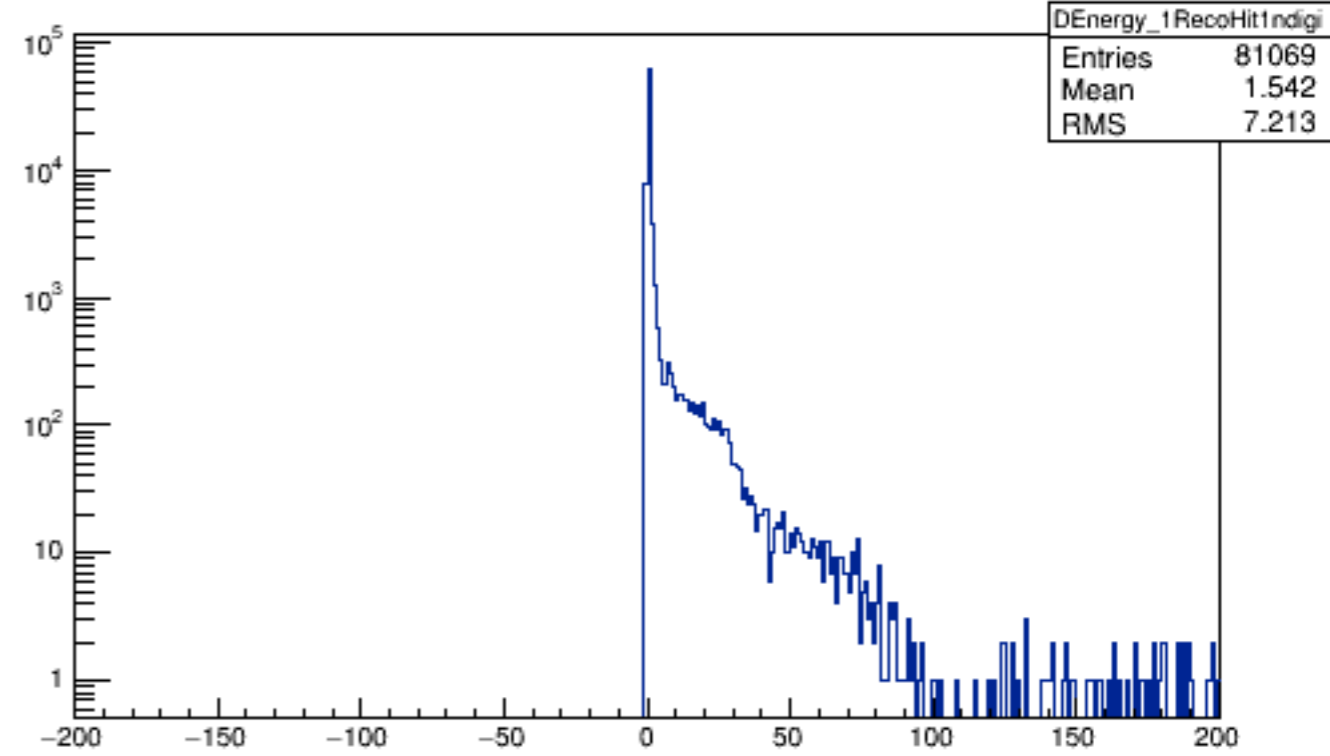
SINGLE POSITRON MC

- No correction on Reco (no tail correction)

DEnergy_1RecoHit

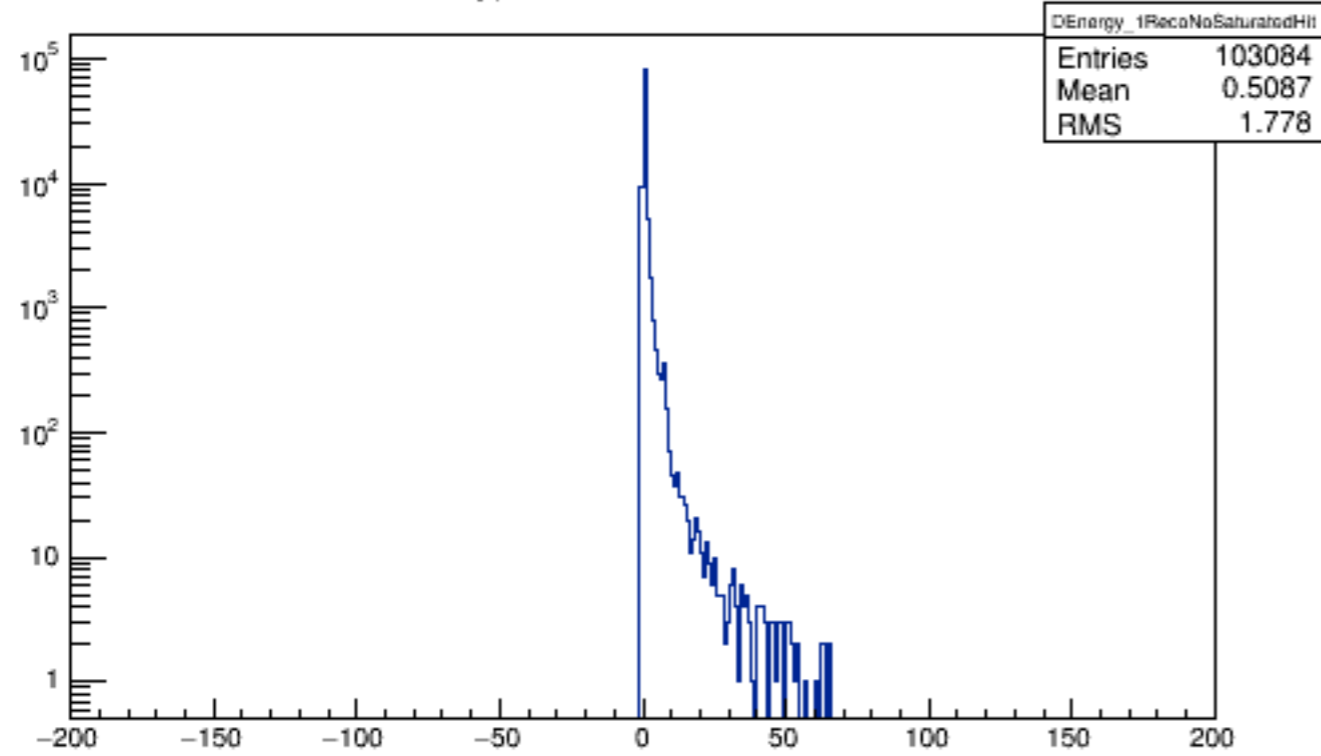


DEnergy_1RecoHit1ndigi

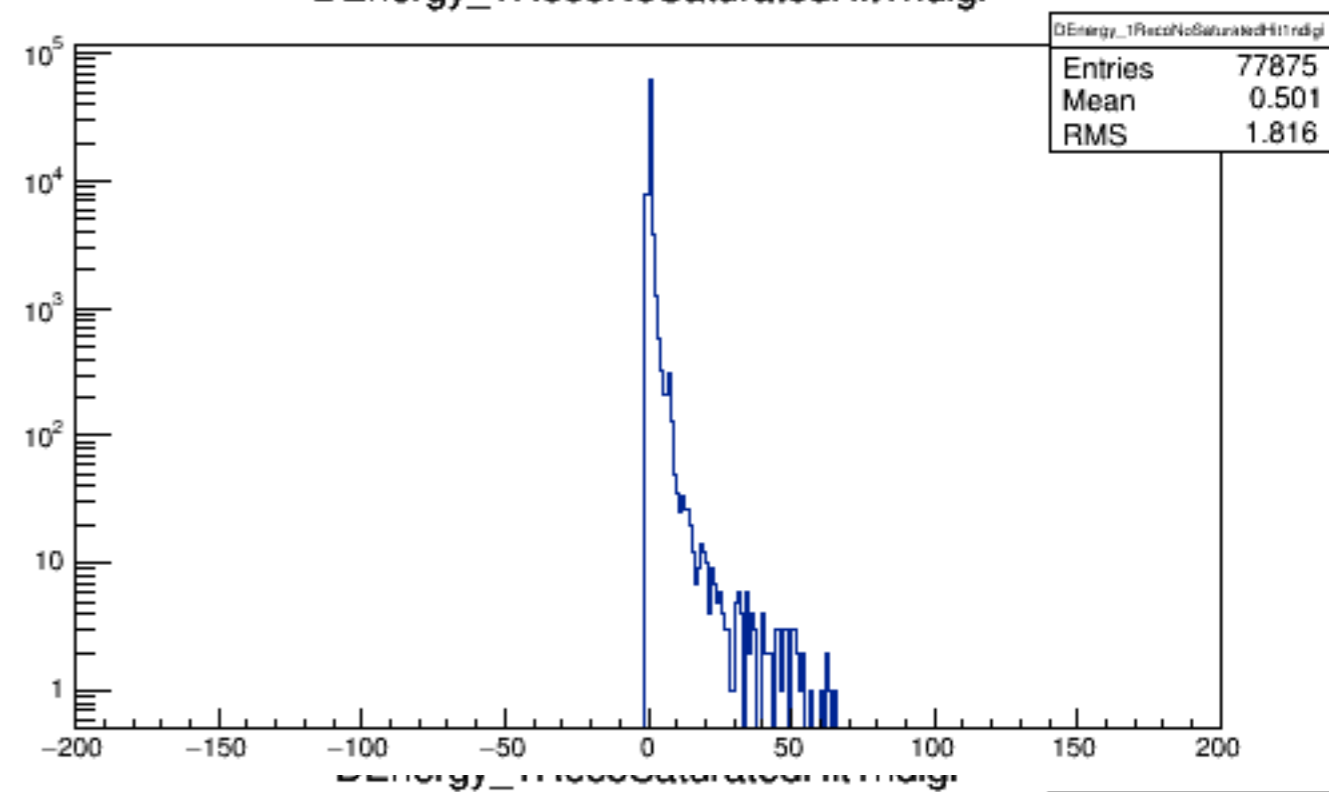


SINGLE POSITRON MC

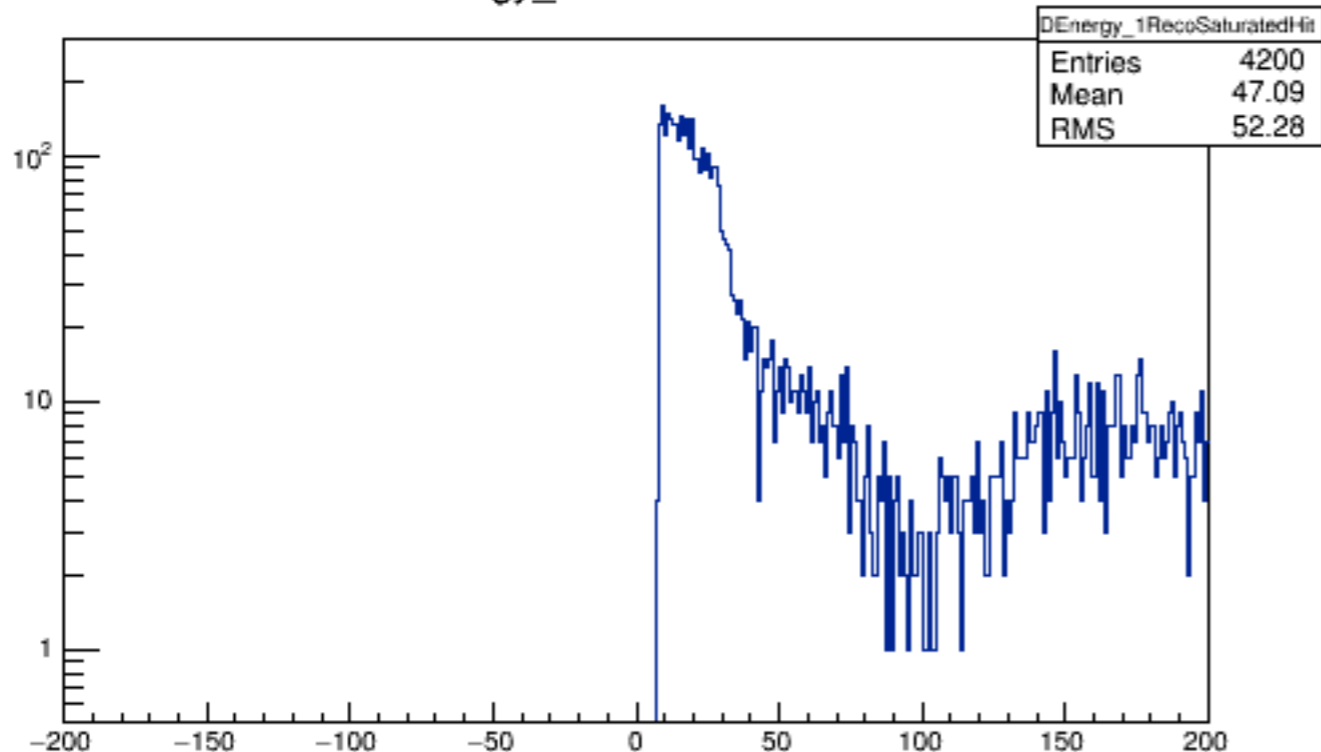
DEnergy_1RecoNoSaturatedHit



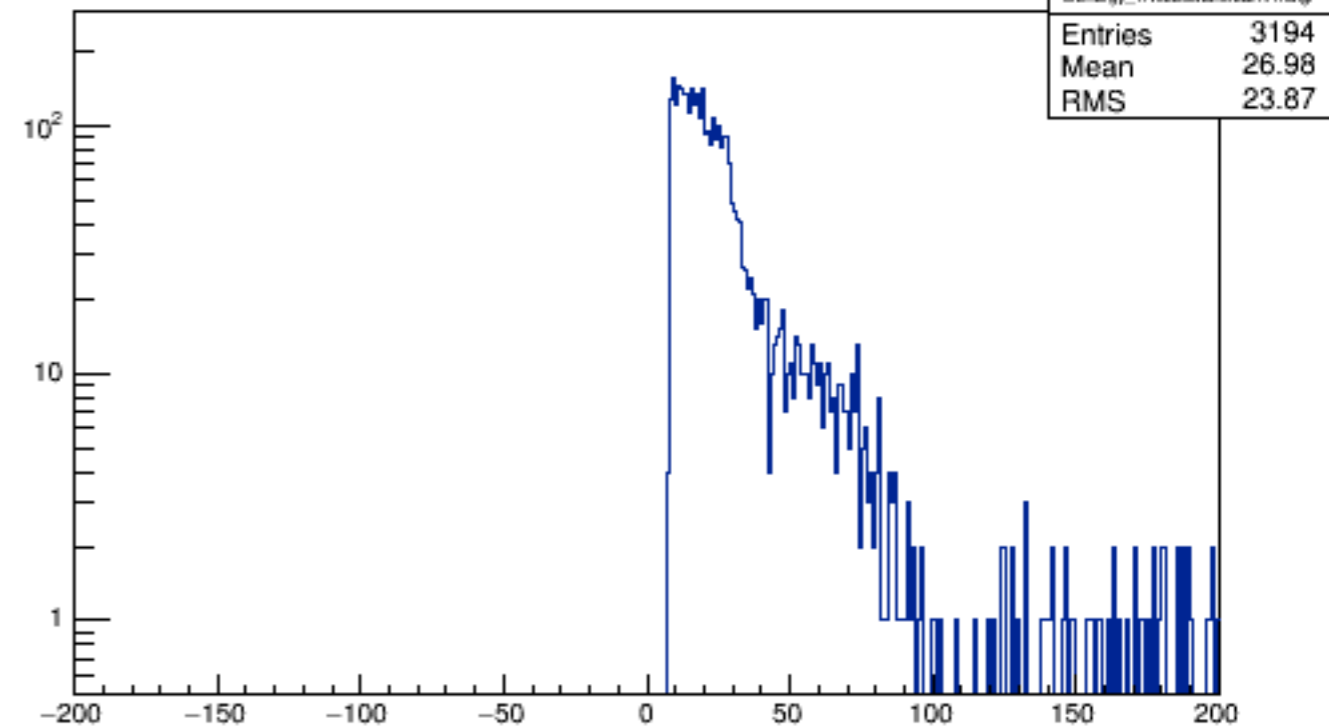
DEnergy_1RecoNoSaturatedHit1ndigi



DEnergy_1RecoSaturatedHit



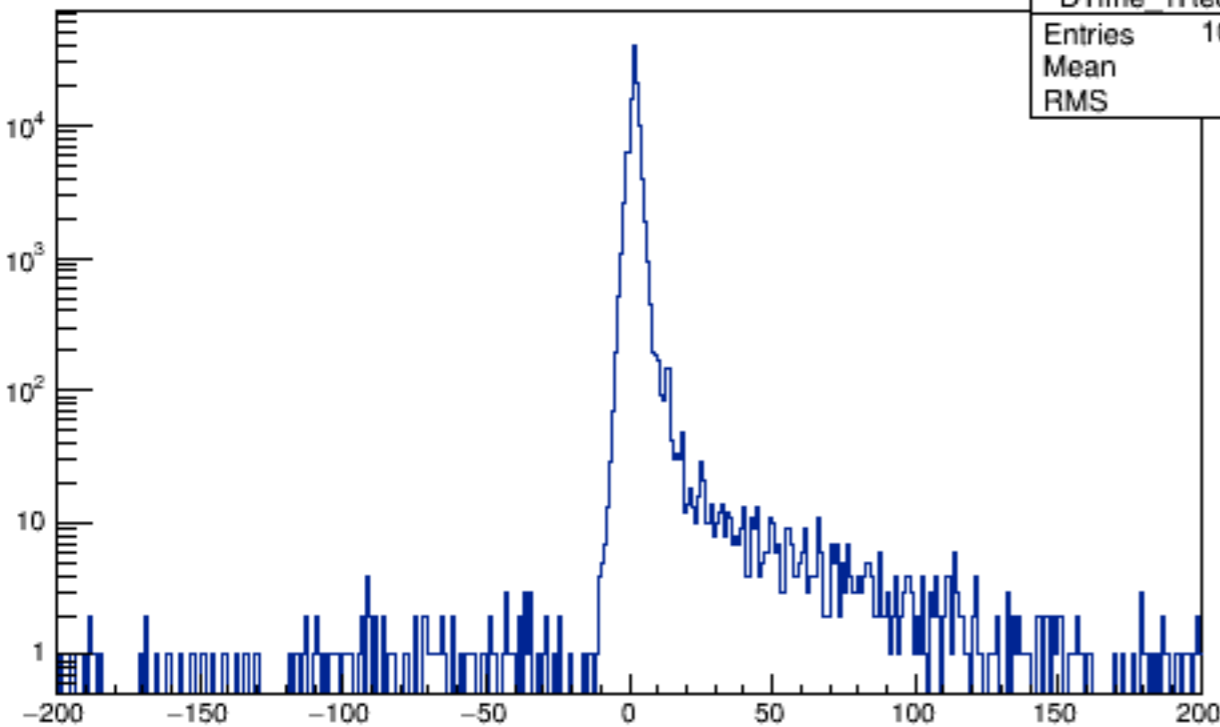
DEnergy_1RecoSaturatedHit1ndigi



SINGLE POSITRON MC

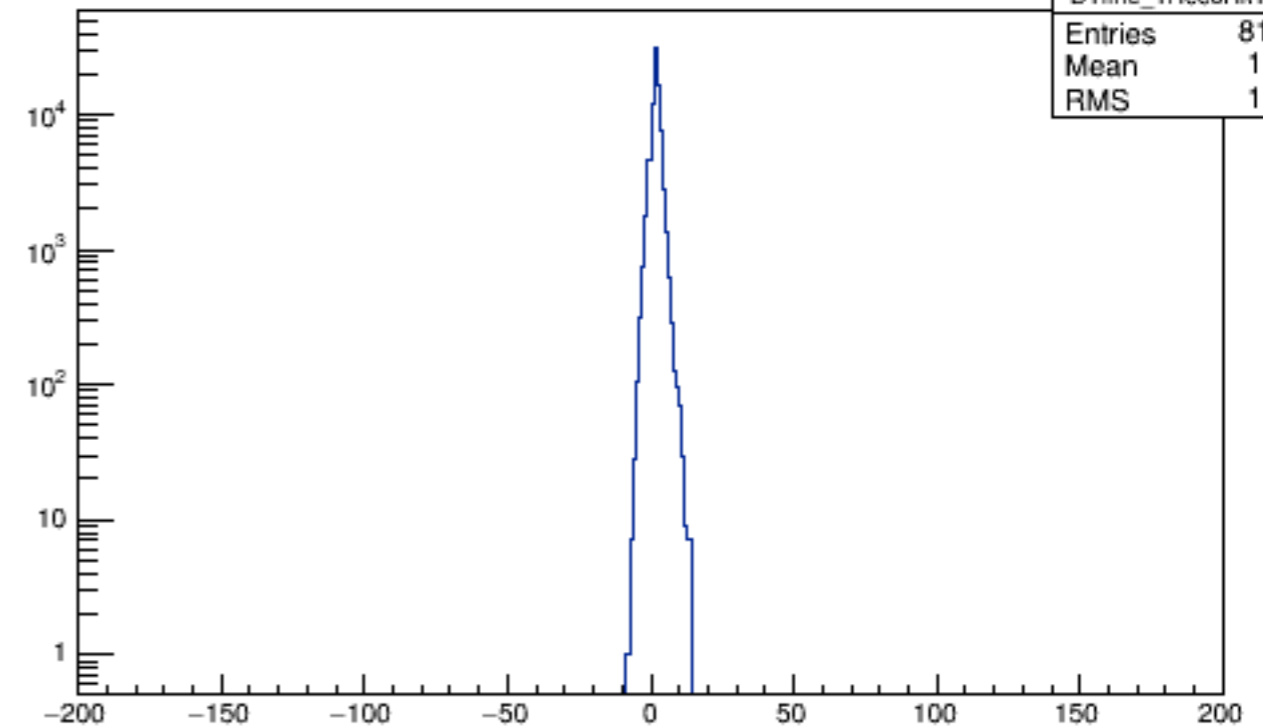
DTime_1RecoHit

DTime_1RecoHit	
Entries	107284
Mean	2.095
RMS	6.896

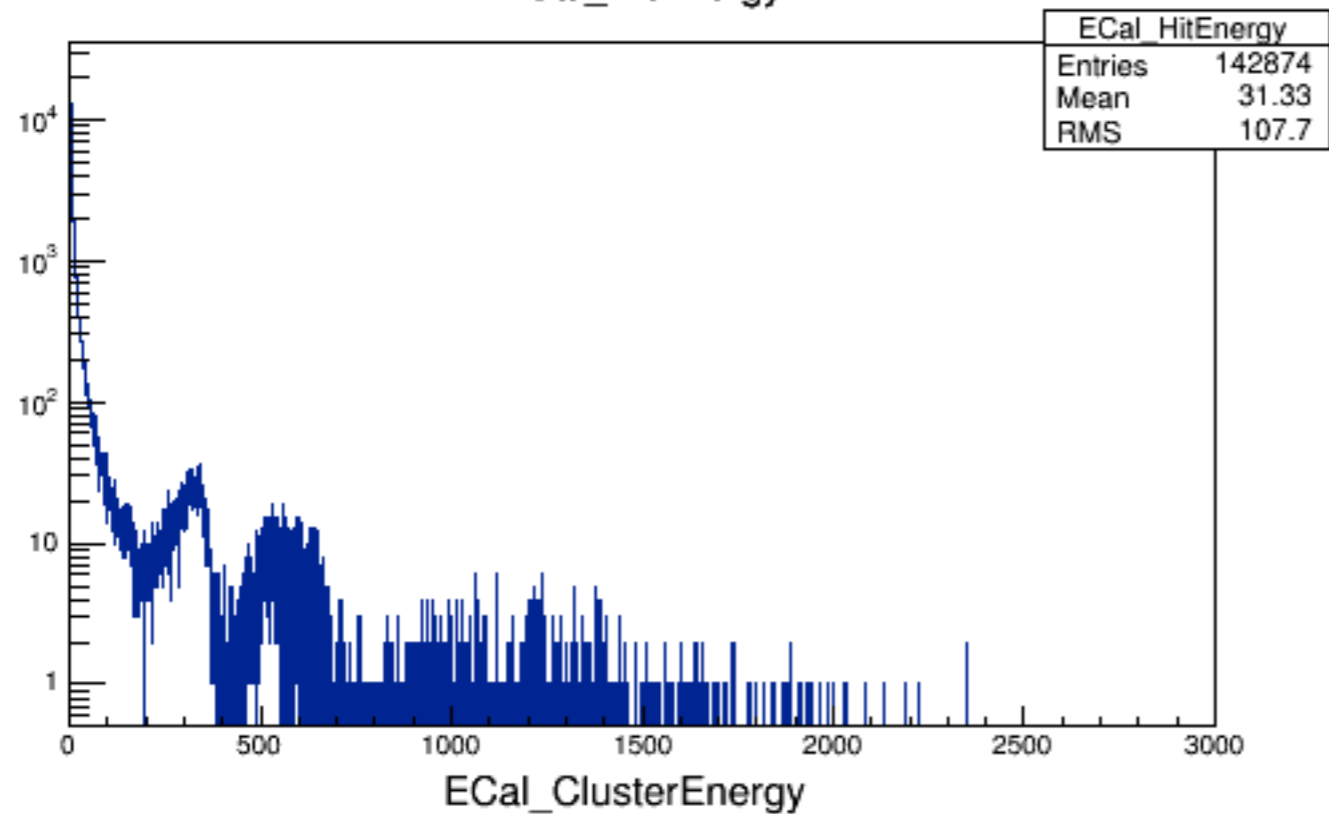


DTime_1RecoHit1ndigi

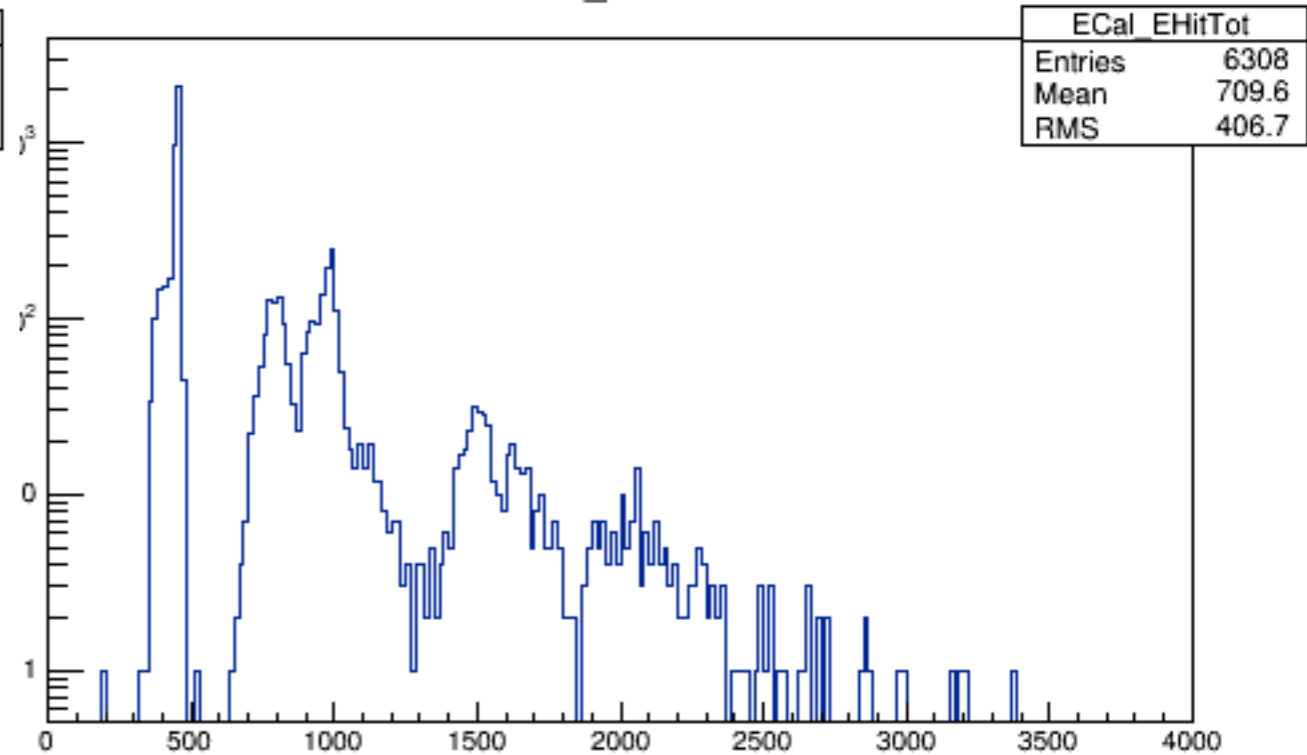
DTime_1RecoHit1ndigi	
Entries	81069
Mean	1.762
RMS	1.637



Ecal_HitEnergy



Ecal_EHitTot



Ecal_ClusterEnergy

