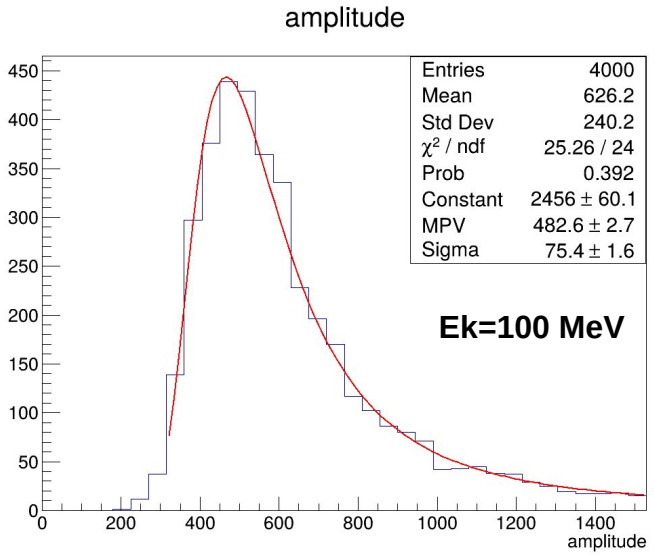
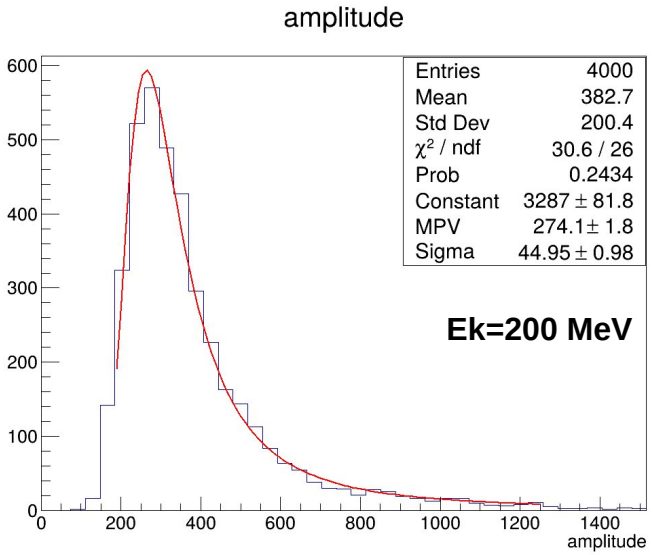
SC 1000 TestBeam Sept-Oct 2025

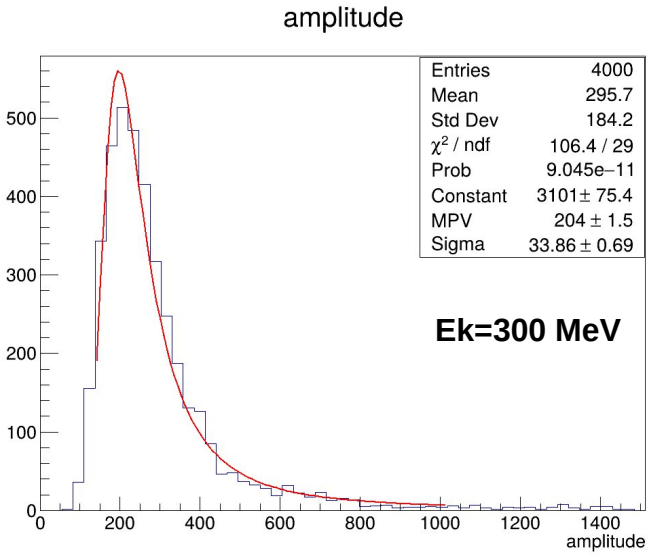
Merged data from Mu2e and CAEN		**Simulation methods**
Run 53 (protons Ek=100 MeV, 1mV/fC)	—	Integration, Convolution
Run 64 (protons Ek=200 MeV, 1mV/fC)	—	Integration, Convolution
Run 13 (protons Ek=300 MeV, 1mV/fC)	—	Integration, Convolution
Run 67 (protons Ek=400 MeV, 1mV/fC)	—	Integration, Convolution
Run 42 (protons Ek=500 MeV, 1mV/fC)	—	Convolution
Run 82 (protons Ek=600 MeV, 1mV/fC)	—	Convolution
Run 75 (protons Ek=700 MeV, 1mV/fC)	—	Convolution
Run 76 (protons Ek=800 MeV, 1mV/fC)	—	Convolution
Run 84 (protons Ek=900 MeV, 1mV/fC)	—	Integration, Convolution
Run 21 (protons Ek=1000 MeV, 1mV/fC)	—	Convolution

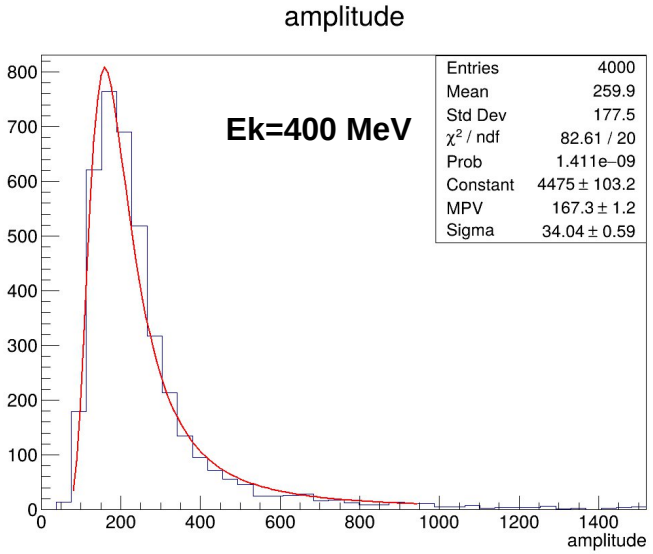
Event selection using Mu2e channels information:
- only one hit in Sci channel,
- at least one hit at MM channel,
- no double hits
- only channels with grayDecoded difference between 0 and 22 remain
- anomalies in runs 64, 13, 67, 75, 21 are excluded

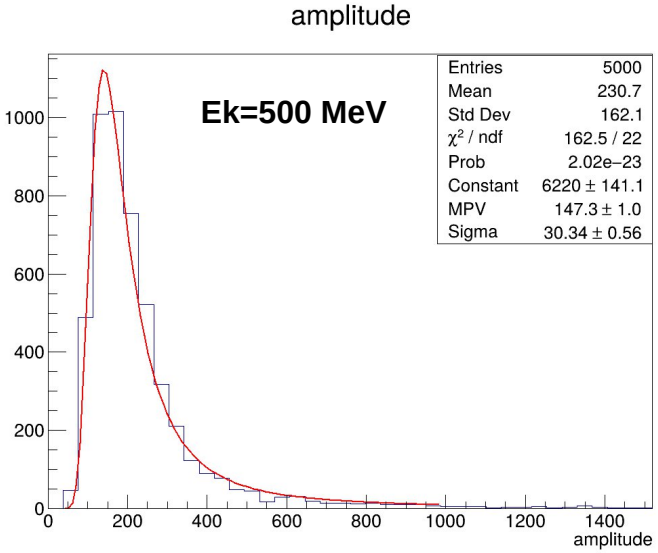
Simulation (convolution) : Landau fitting

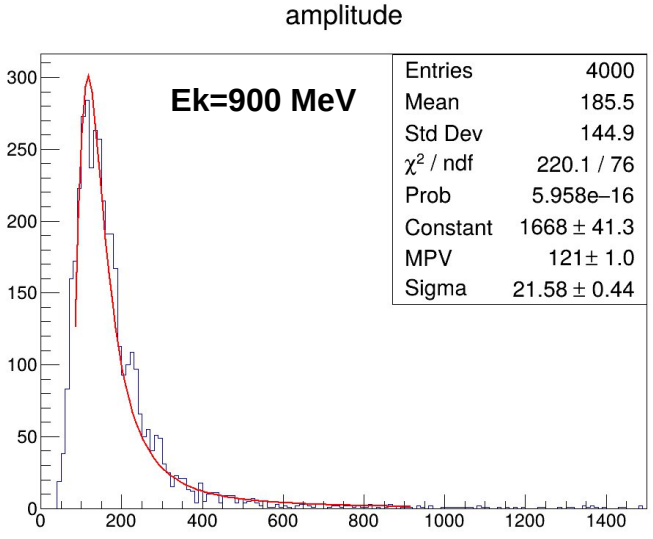


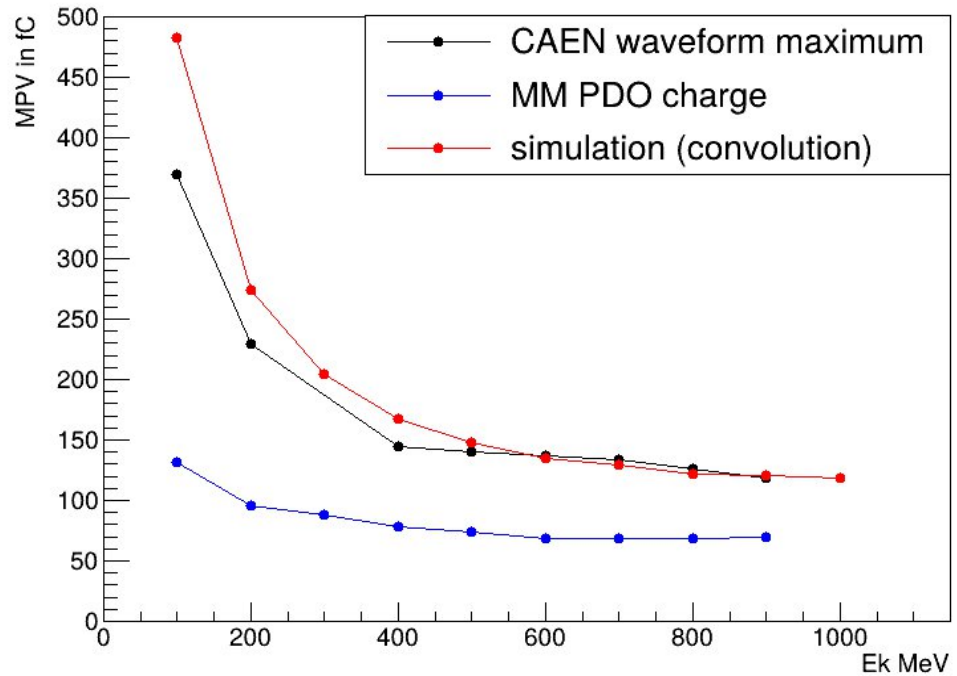








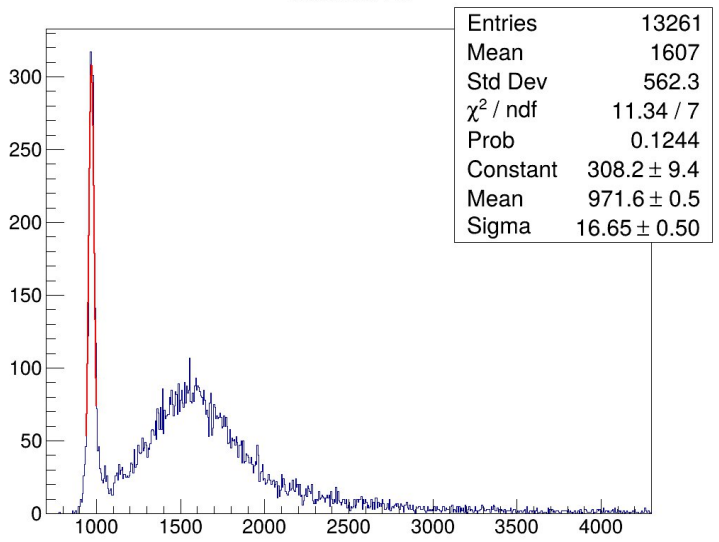



CAEN waveform maximum
MM PDO charge
simulation (convolution)
MPV in fC
Ek MeV
0
50
100
150
200
250
300
350
400
450
500
0
200
400
600
800
1000

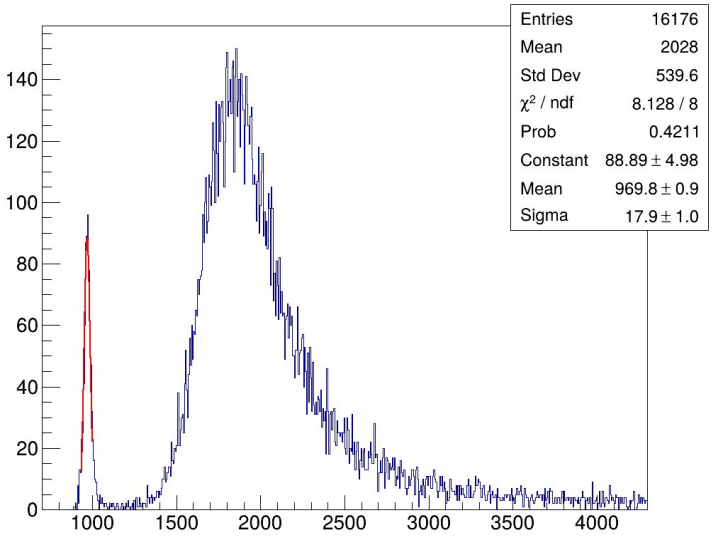
Waveform maxima distribution (noise and signal)

run 53
Ek=100 MeV

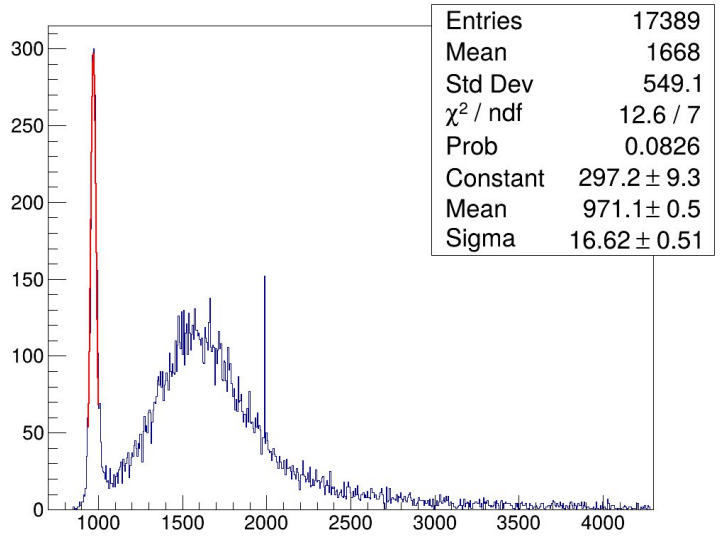
MM channel 28 (~4 mm from the wire)



MM channel 38 (~1 mm from the wire)

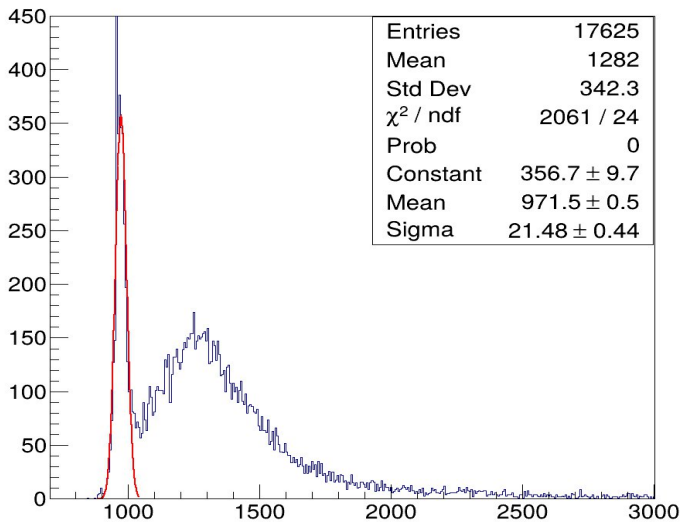


MM channel 48 (~4 mm from the wire)

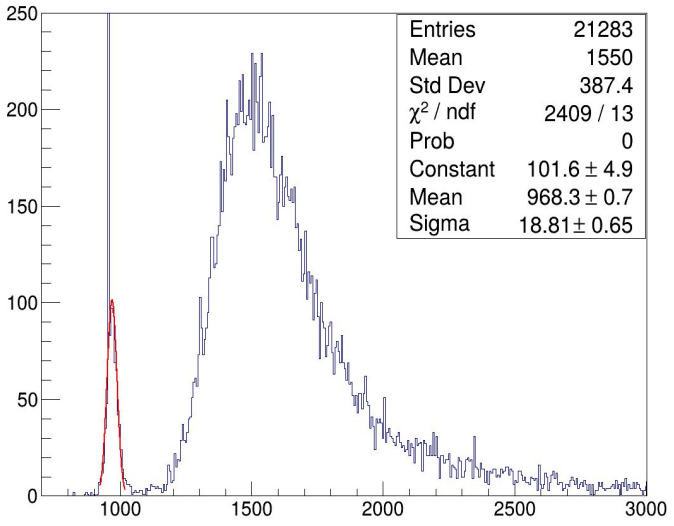


run 64
Ek=200 MeV

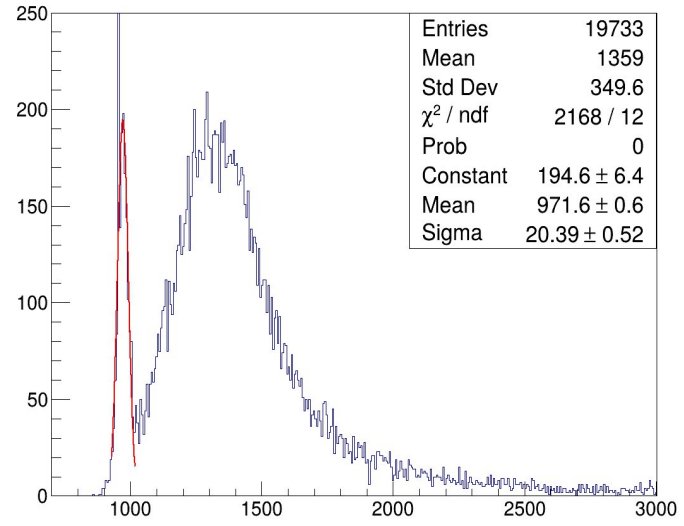
channel 28



channel 38

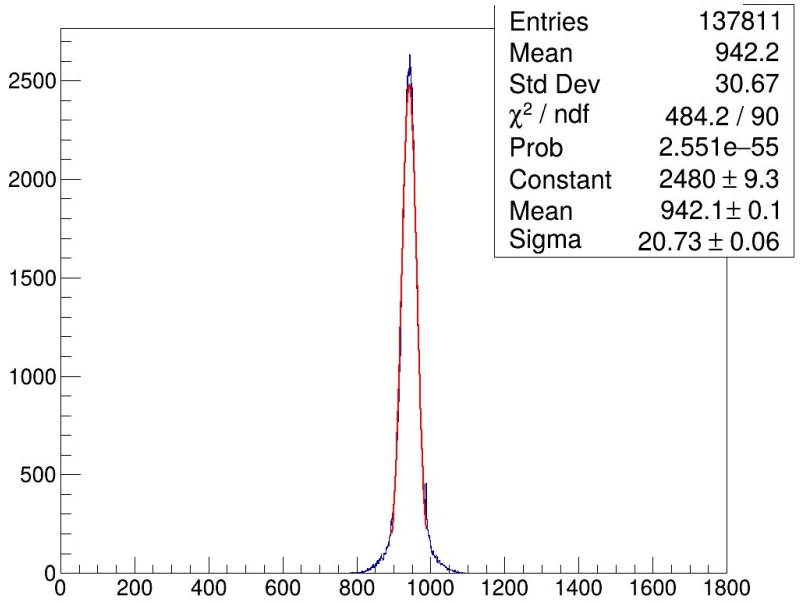


channel 48

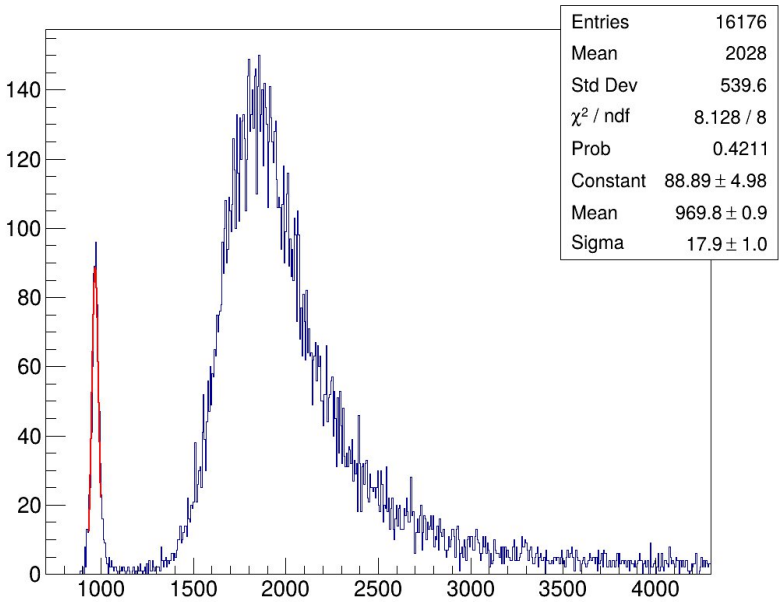


Baseline before and after the signal started (**run 53 Ek=100 MeV**)

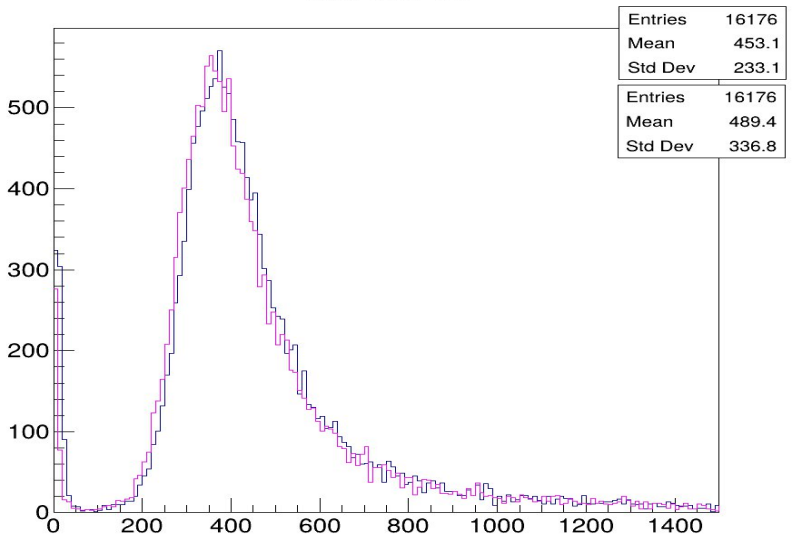
Baseline calculation (MM channels 0-50)



MM channel 38 (~1 mm from the wire)

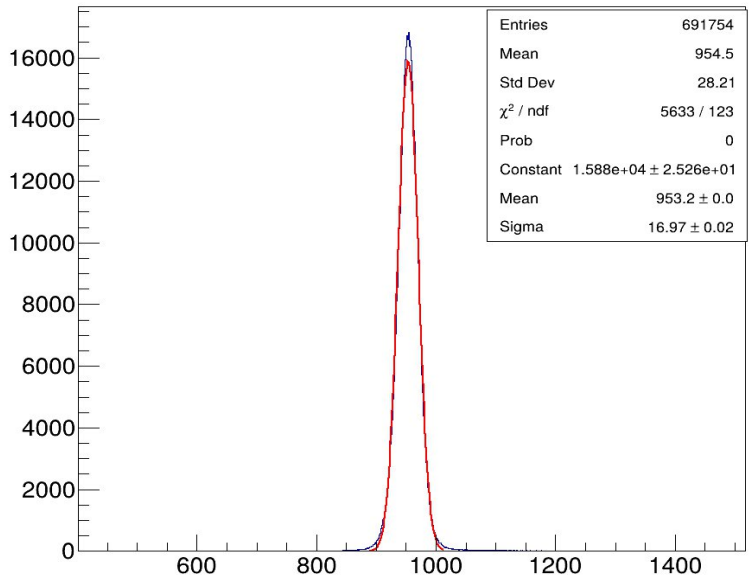


channel 38

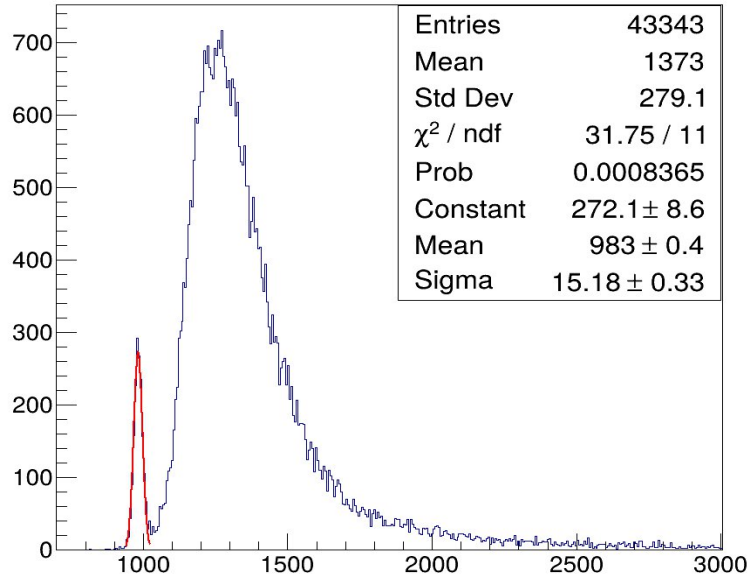


Baseline before and after the signal started (**run 84 Ek=900 MeV**)

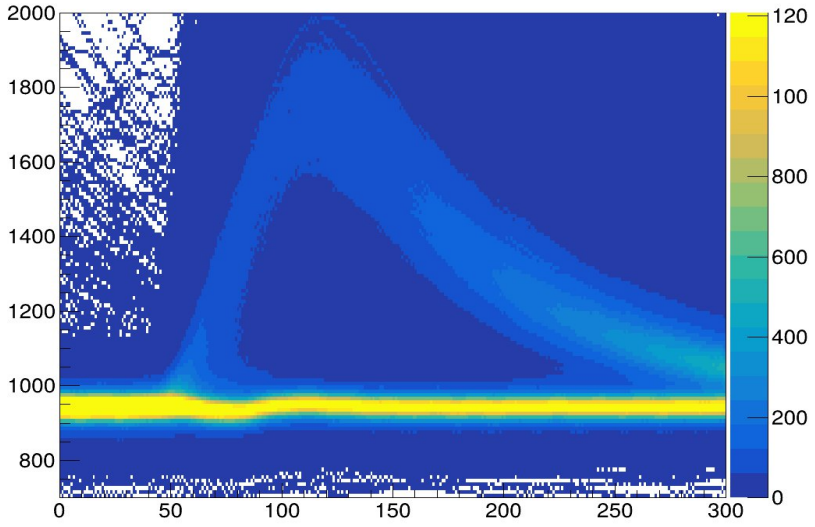
caen base 50



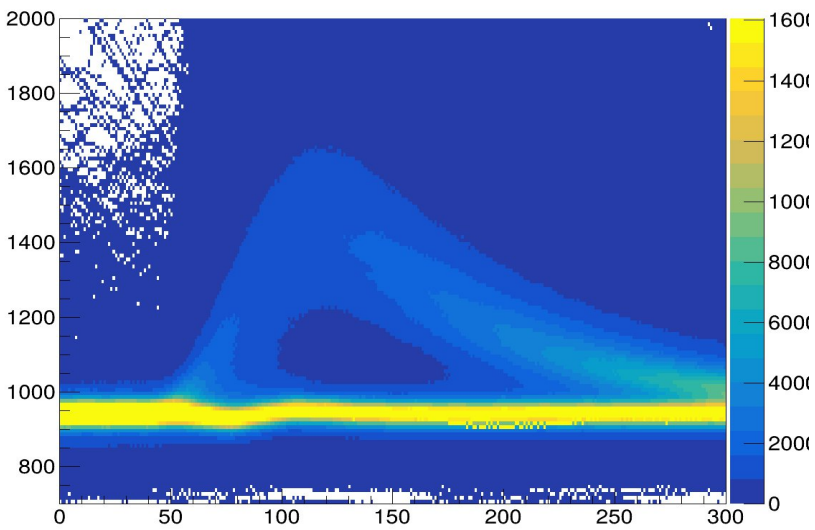
channel 40



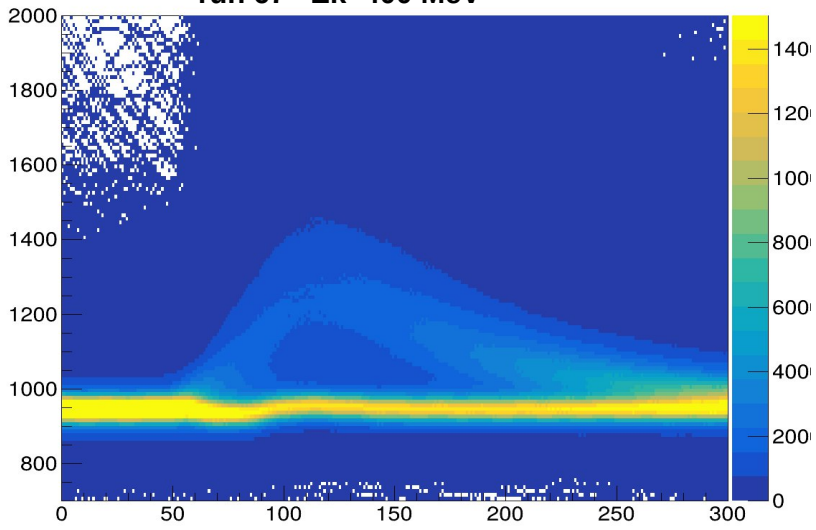
run 53 Ek=100 MeV



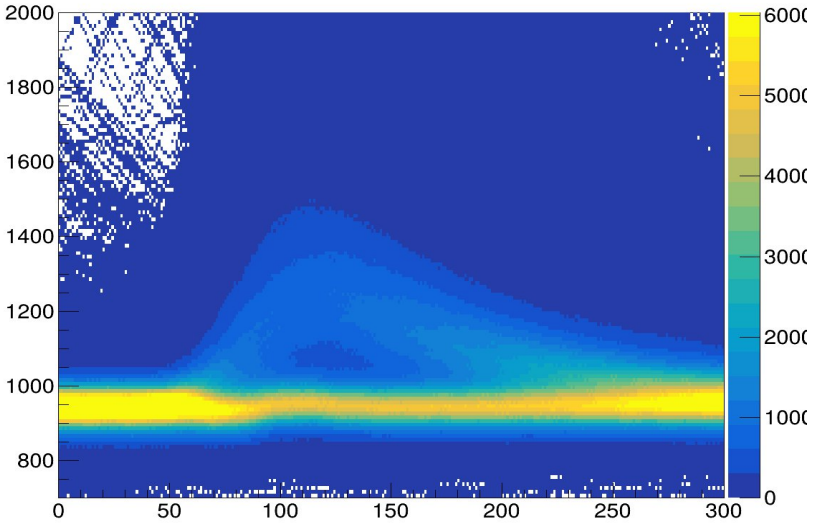
run 64 Ek=200 MeV



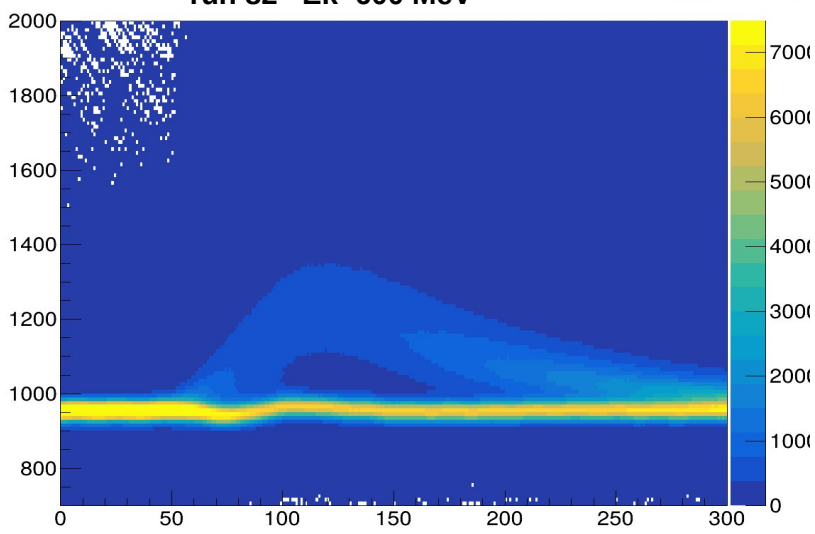
run 67 Ek=400 MeV



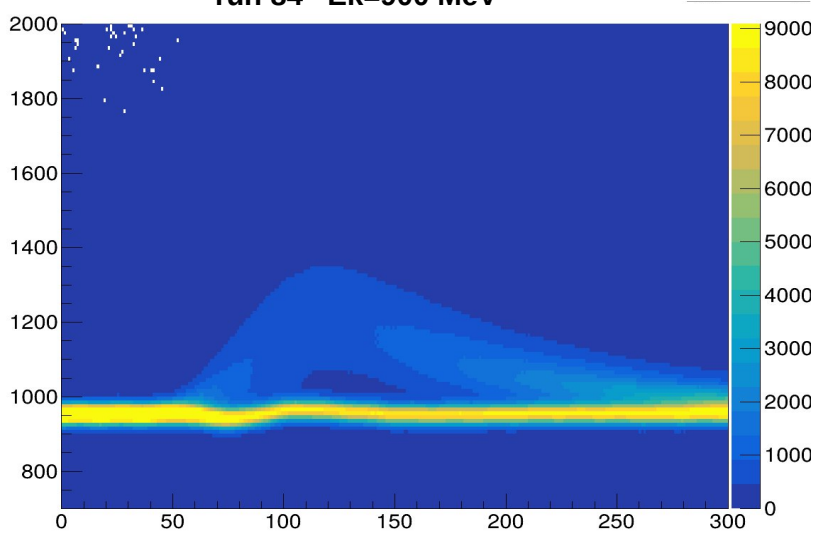
run 42 Ek=500 MeV



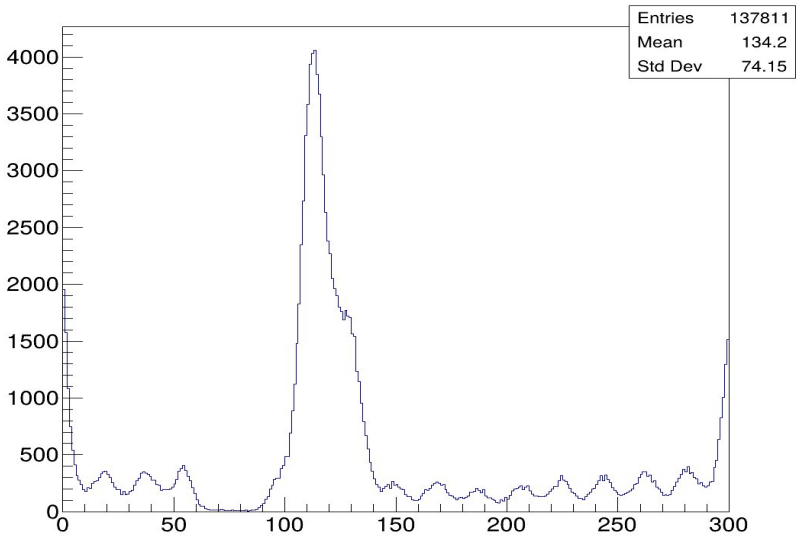
run 82 Ek=600 MeV

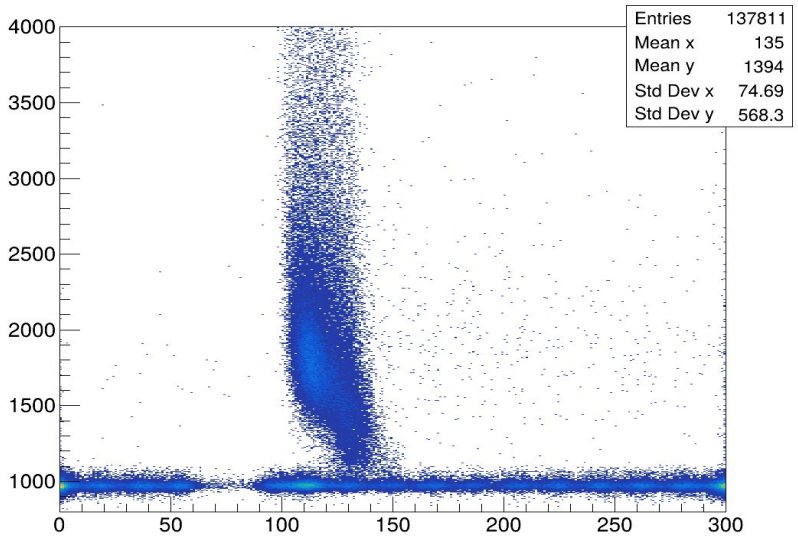


run 84 Ek=900 MeV



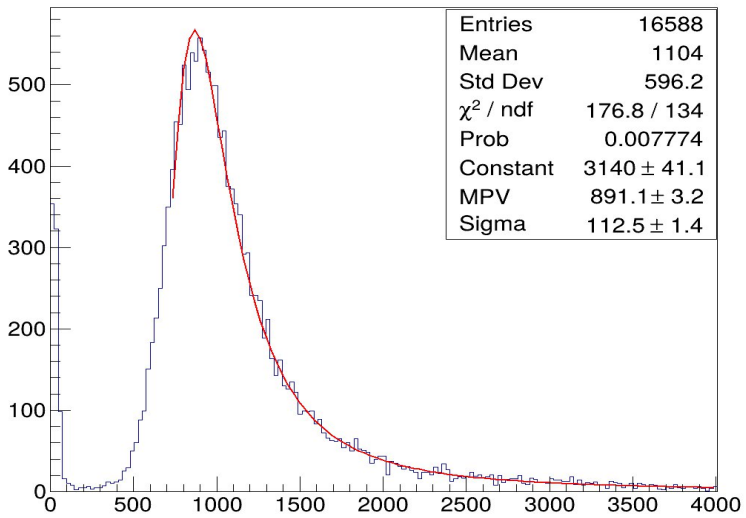
Waveform maximum position (run 53 Ek=100 MeV)



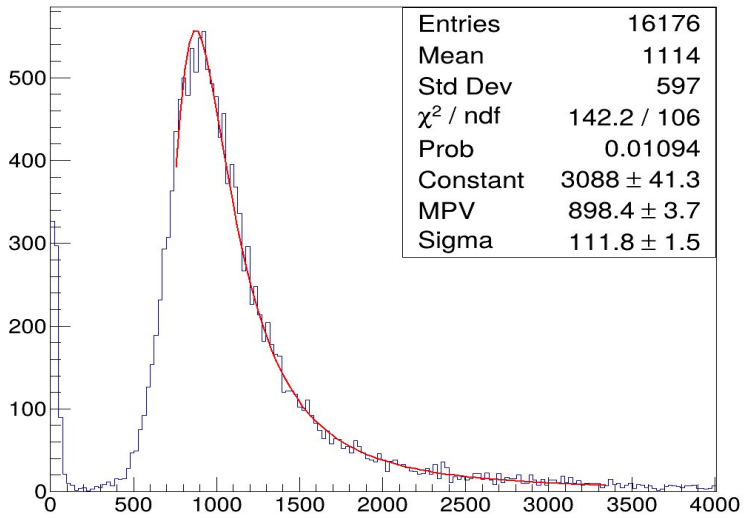


Waveform maxima distribution – no correction on track length (**run 53 Ek=100 MeV**)

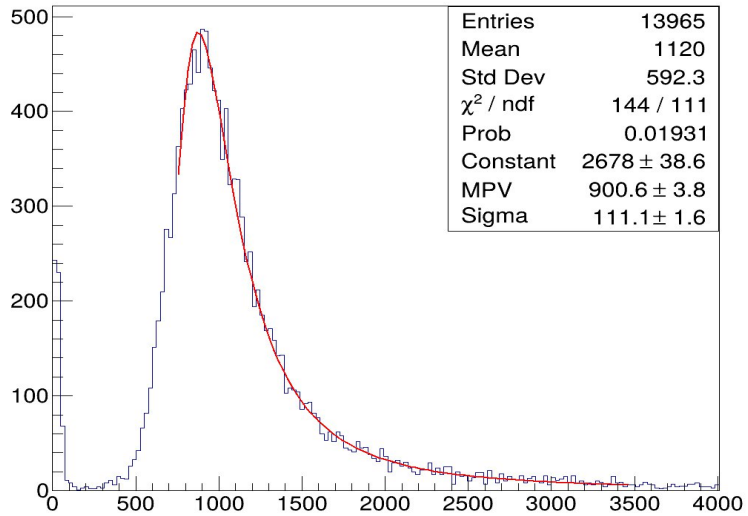
channel 36



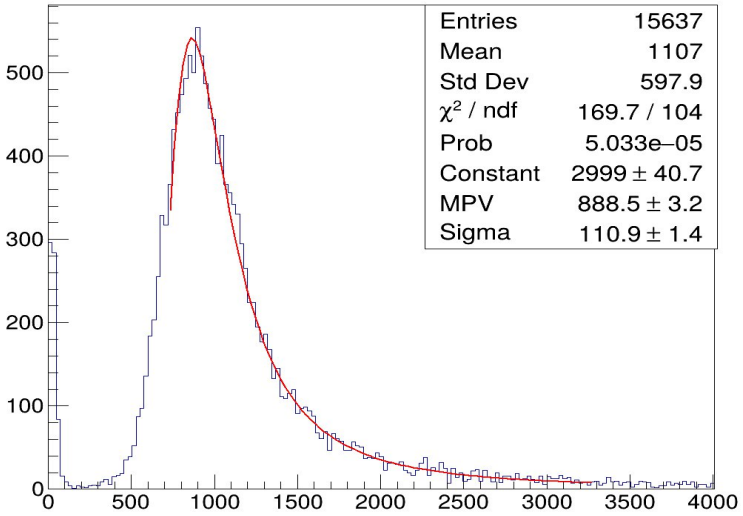
channel 38



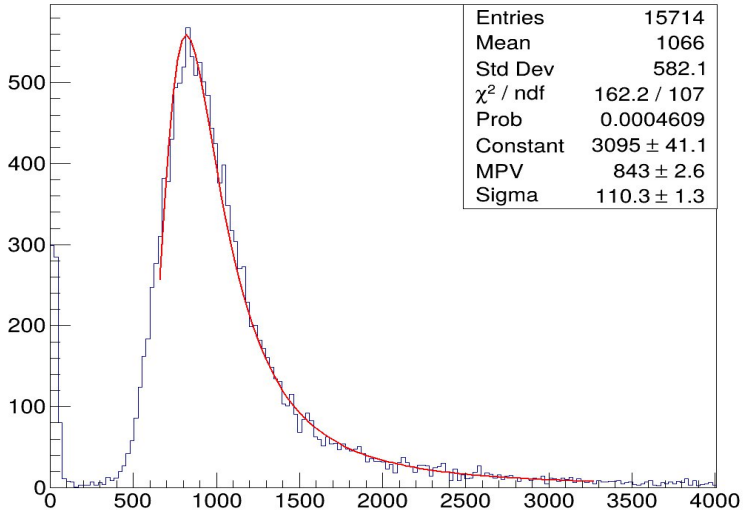
channel 39

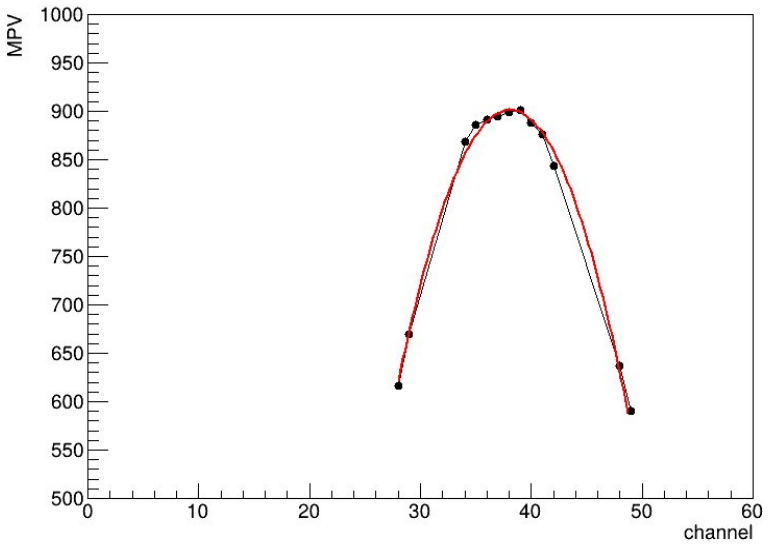


channel 40



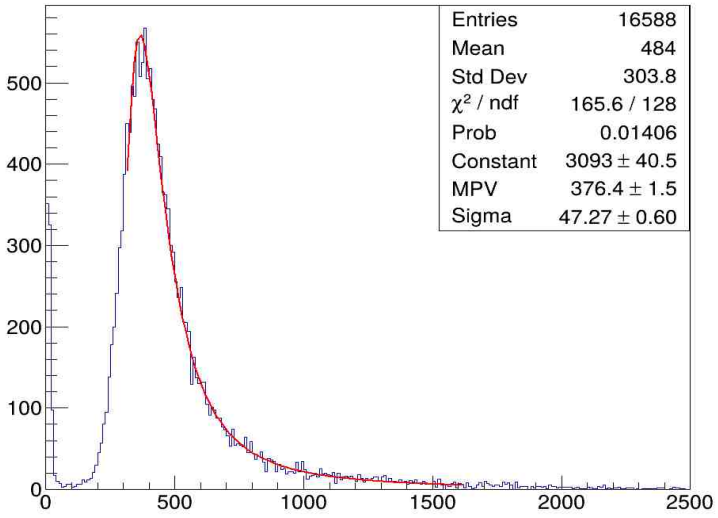
channel 42



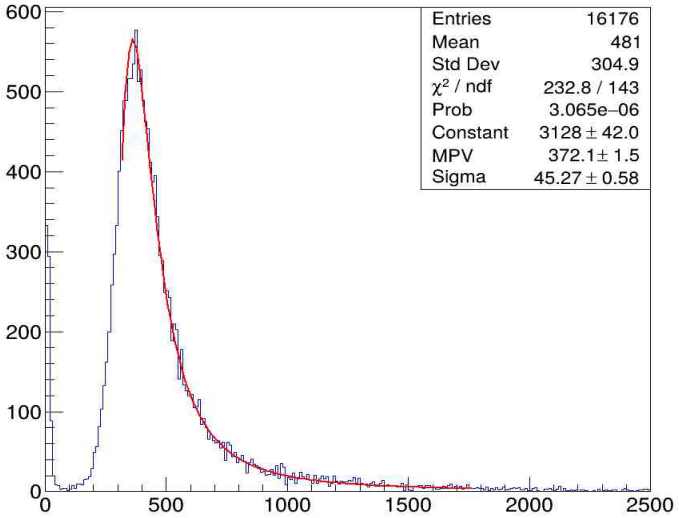


Waveform maxima distribution – adjusted for the track length and in fC (**run 53 Ek=100 MeV**)

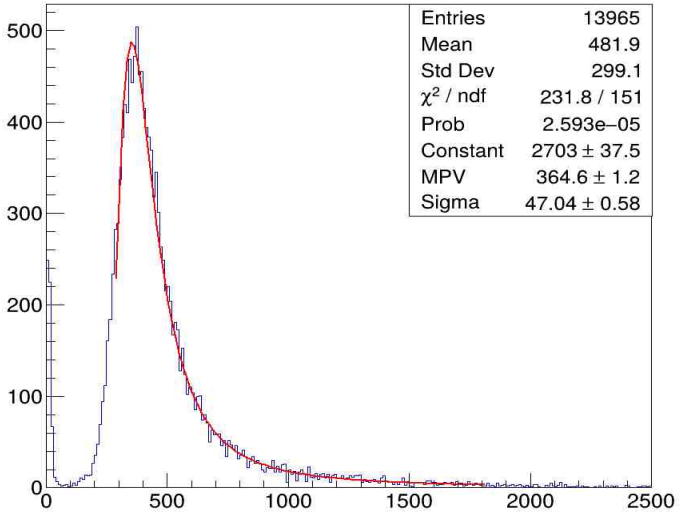
channel 36



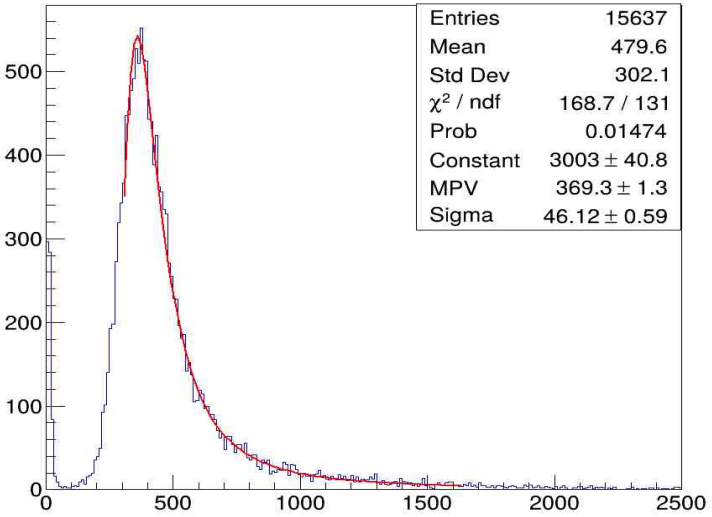
channel 38



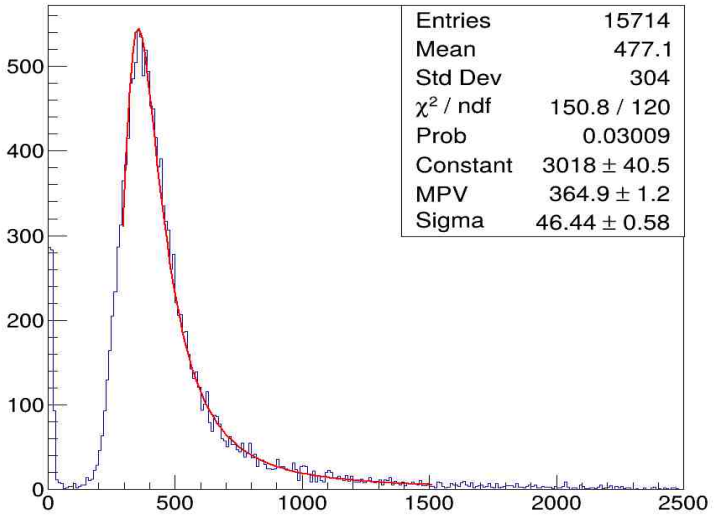
channel 39

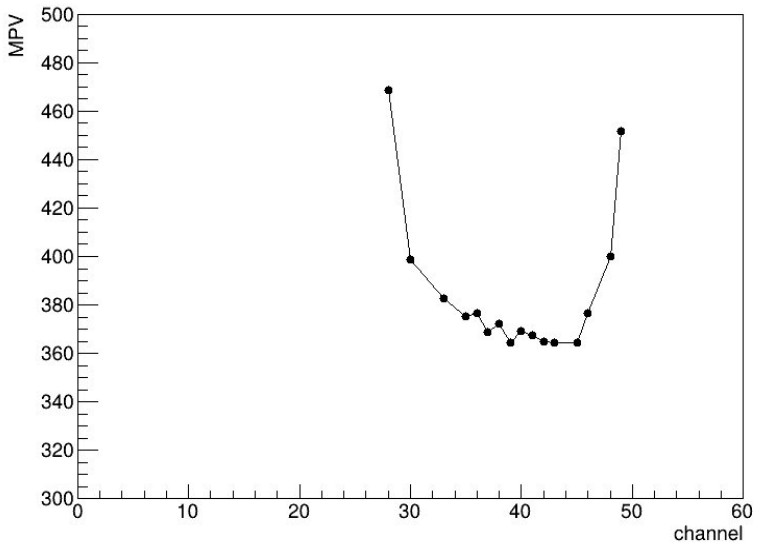


channel 40



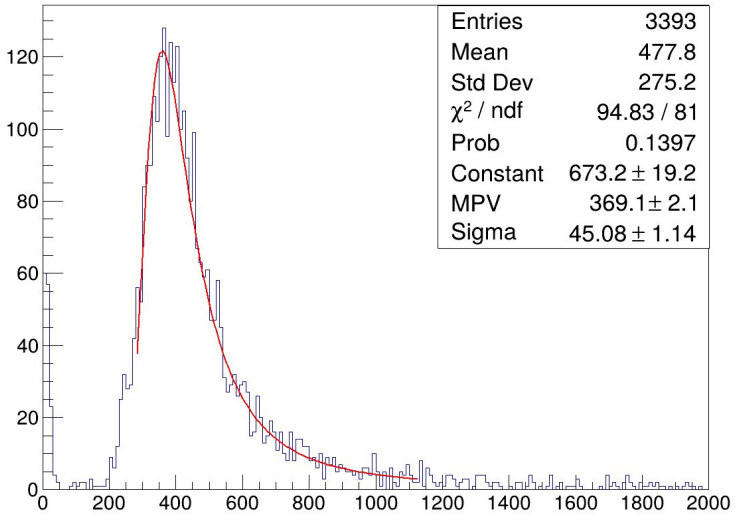
channel 42



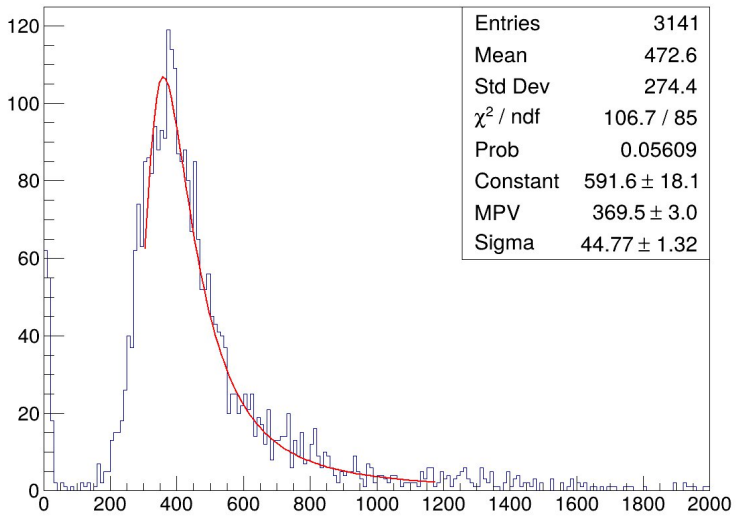


Waveform maxima distribution **for clusters** – adjusted for the track length and in fC (run 53 Ek=100 MeV)

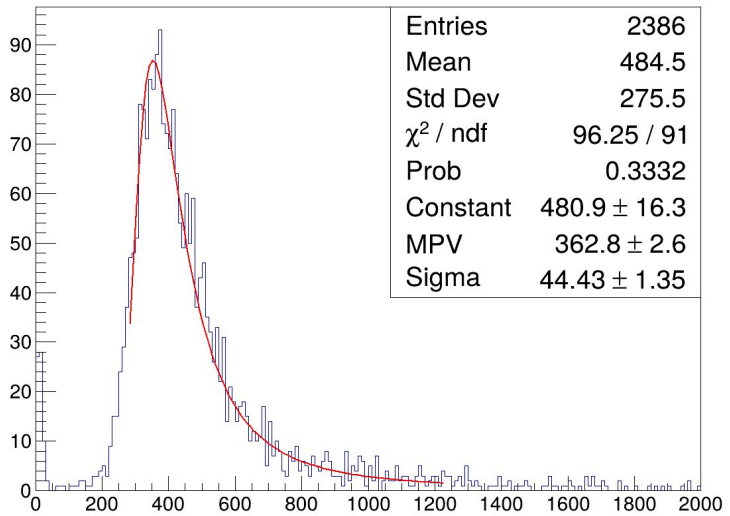
cluster center in channel 36



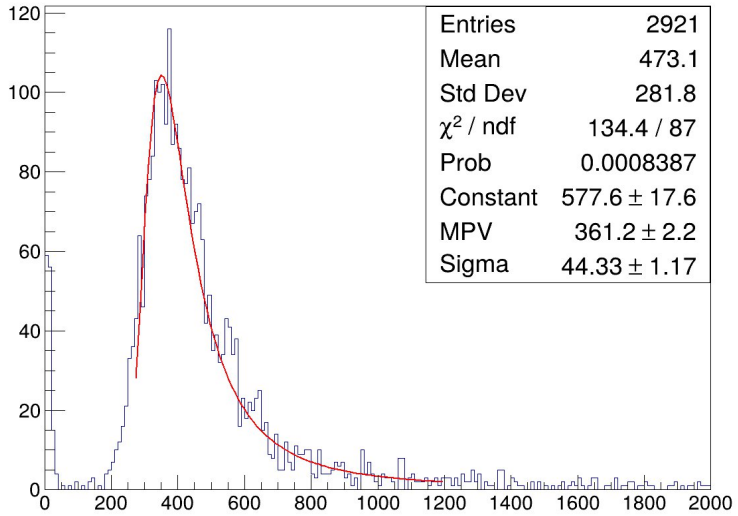
cluster center in channel 38



cluster center in channel 39



cluster center in channel 40



cluster center in channel 42

