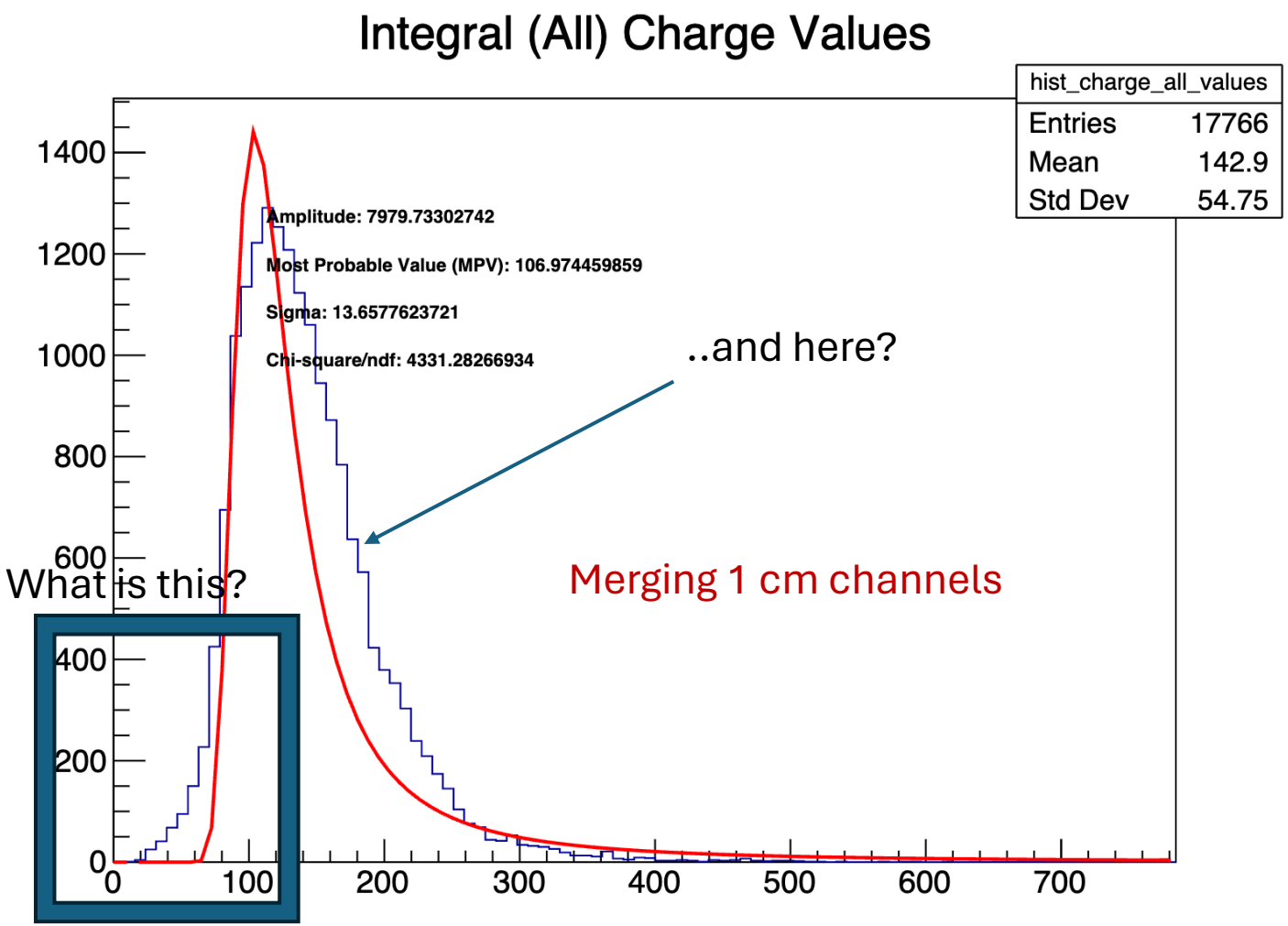
CC status

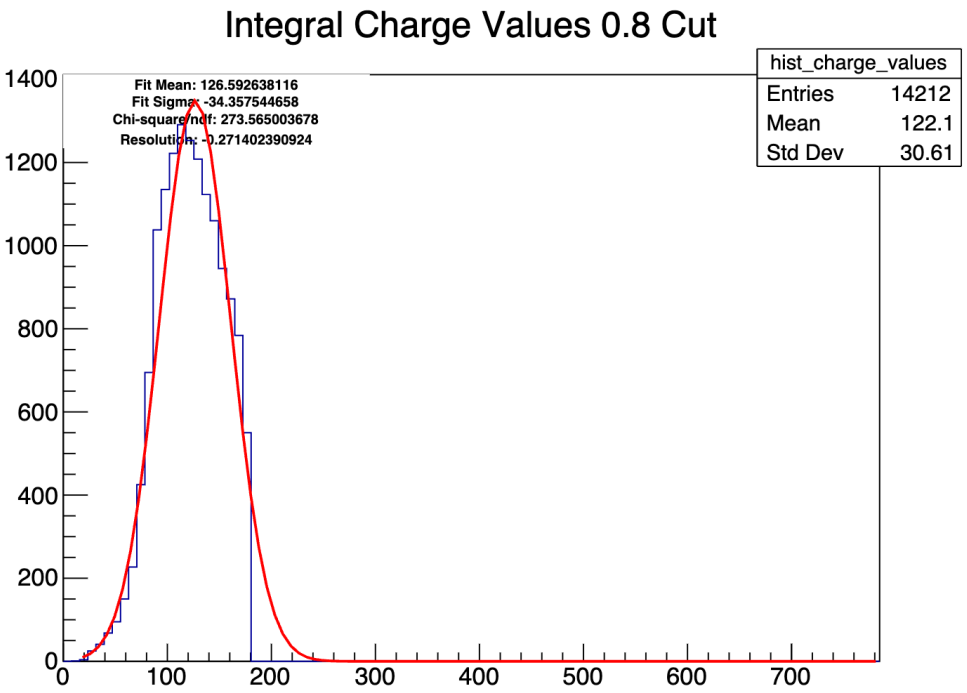
B D’Anzi
4 June 2024

If theoretical assumptions (1 month ago) were correct -> scans in HV, Angle were ok using samples of 10k events-> only resolution study missing on bigger sample (50k events)-> input mean and std devation of Cluster distributions for dNdx evaluation

1. Data usage for resolution study: 45°

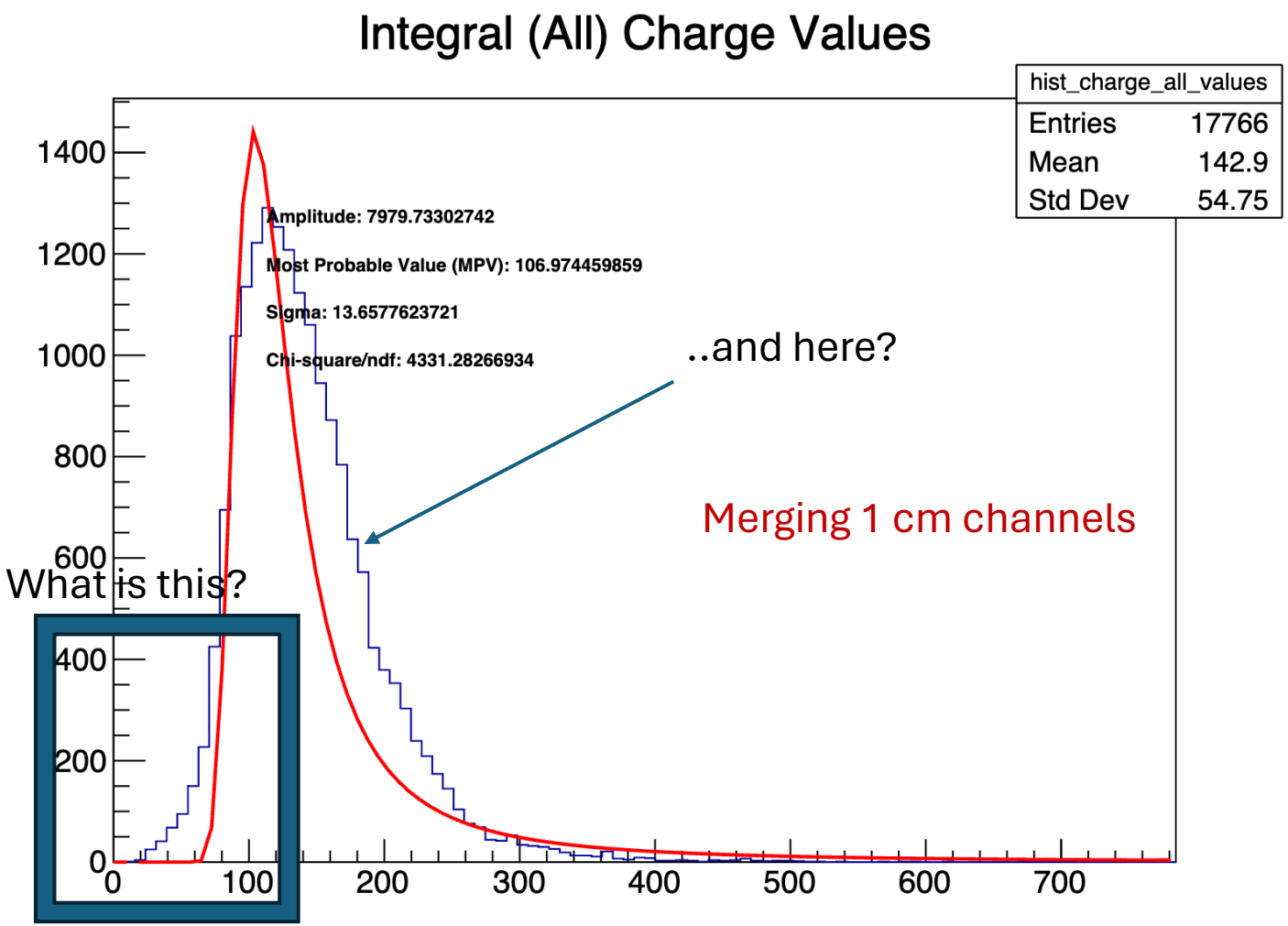
Run 2022, sample 16 , 45° , 90/10

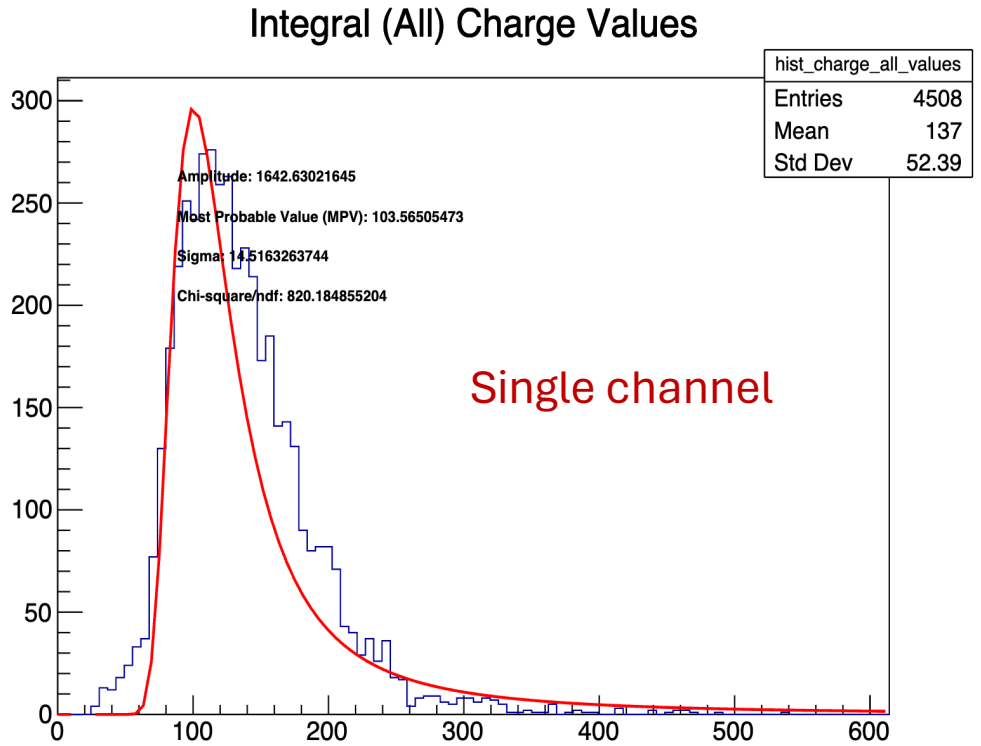




If theoretical assumptions were correct -> scans in HV, Angle were ok using samples of 10k events-> only resolution study missing on bigger sample (50k events)

Run 2022, sample 16 , 45° , 90/10





Found in the deriv script: deriv conditions

First derivative sum b/a peak

Amplitude in the peak

- `// Condition with data presented in Workshop: if (amplitude[ip]>(float)(2.5*rms) && (TMath::Abs(fderiv[ip-1]+fderiv[ip+1])< 0. || fderiv[ip]<0.) && sderiv[ip]< -sigd2/2 && (fderiv[ip-1]> 0. || fderiv[ip+1]<0. )`

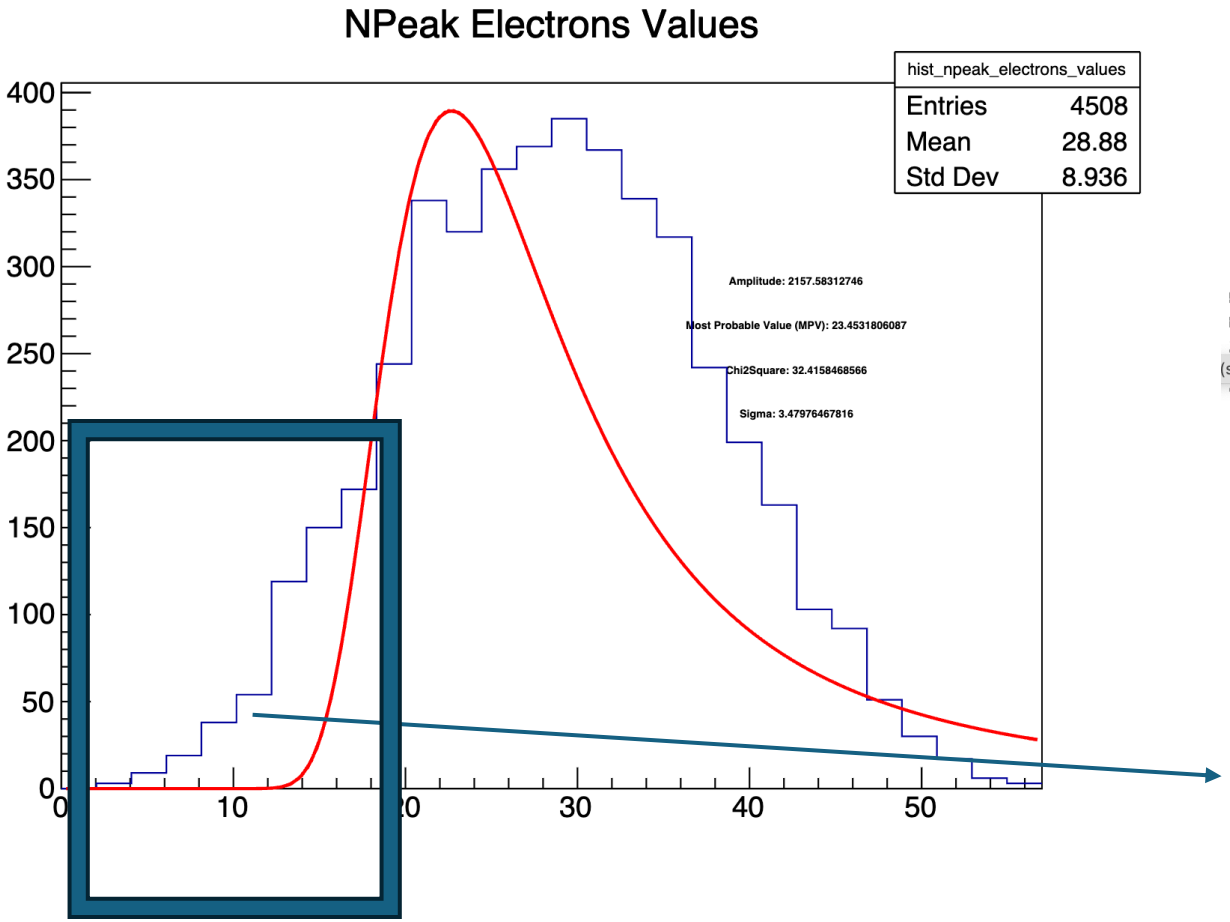
Second derivative

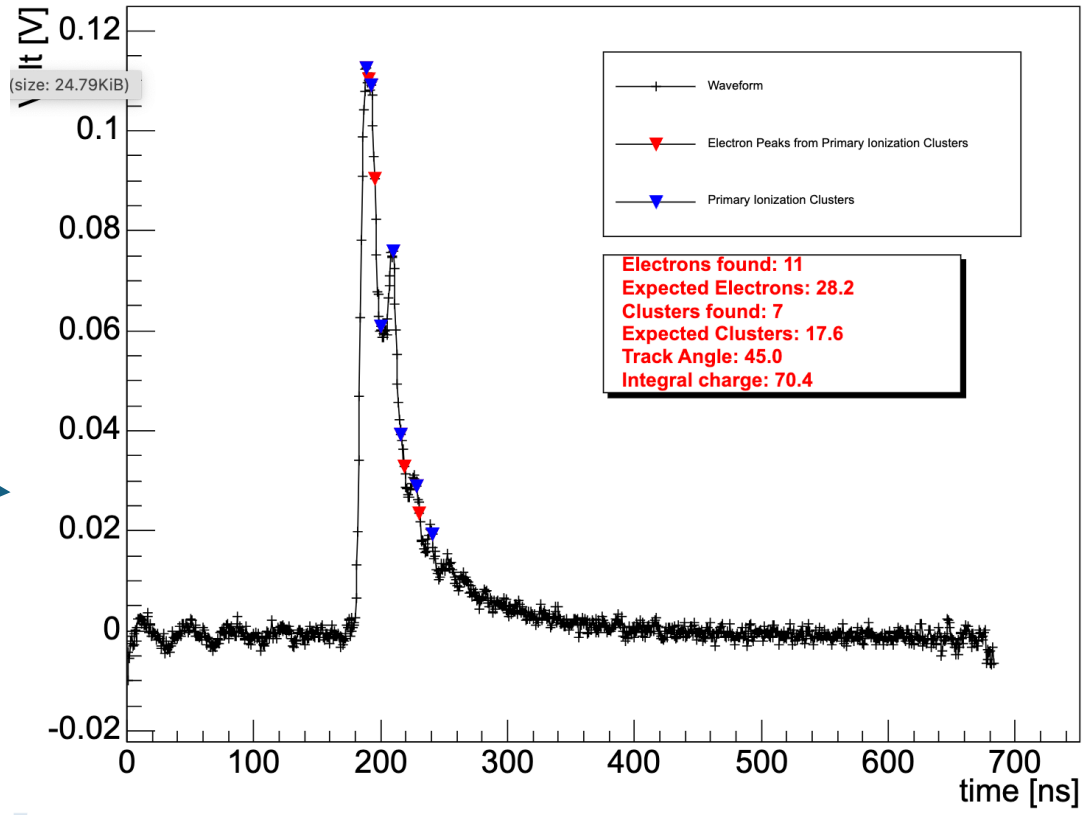
First derivative before after peak

- `//if (amplitude[ip]>(float)(rms) && fderiv[ip]< sigd1 && sderiv[ip]< sigd2`
- `//Original condition`
- `// if (amplitude[ip]>(float)(3*rms) && ( fderiv[ip]< sigd1/2) && sderiv[ip]< 0. && ((amplitude[ip]-amplitude[ip-1])>(rms) || (amplitude[ip+1]-amplitude[ip])<(rms)) && (fderiv[ip-1]> sigd1 || fderiv[ip+1]< -sigd1 )`
- `// First attempt 28 October`
- `//if (amplitude[ip]>(float)(3*rms) && ( fderiv[ip]< sigd1/2) && sderiv[ip]< sigd2/2 && ((amplitude[ip]-amplitude[ip-1])>(rms) || (amplitude[ip+1]-amplitude[ip])<(rms)) && (fderiv[ip-1]> sigd1/2 || fderiv[ip+1]< -sigd1/2 )`
- `// Attempt 2 November`
- `//if (amplitude[ip]>(float)(3*rms) && ( TMath::Abs(fderiv[ip])< sigd1/2) && sderiv[ip]< sigd2/2 && ((amplitude[ip]-amplitude[ip-1])>(rms) || (amplitude[ip+1]-amplitude[ip])<(rms)) && (fderiv[ip-1]> sigd1/2 || fderiv[ip+1]< sigd1/2 )`
- `// Attempt 2 November with variables 18.51 pm`
- `//cout << " i-th event: " << jentry <<" channel "<<channel << " ip "<< ip << " Amplitude ip "<< amplitude[ip] << " First Derivative ip "<< fderiv[ip] << " Second Derivative ip "<< sderiv[ip]<<"\n";`
- `CURRENT : if (amplitude[ip]>(float)(N_1*rms) && (amplitude[ip] - (float) (amplitude[ip-1]+amplitude[ip+1])/2 > (float) N_2*rms) && ((abs(fderiv[ip])< (float) (2.0 * N_3 * sigd1)) || (fderiv[ip-1] > (float) N_3 * sigd1 || fderiv[ip+1] < (float) (-1.0 *(float) N_3 * sigd1))) && sderiv[ip] < (float)(-1.0 * N_4 * sigd2)`

Which one is from ECFA? I tried with the first one (change of meaning for N_1,N_2,N_3 etc.)…

Run 16 , 2022, 45°, 90/10

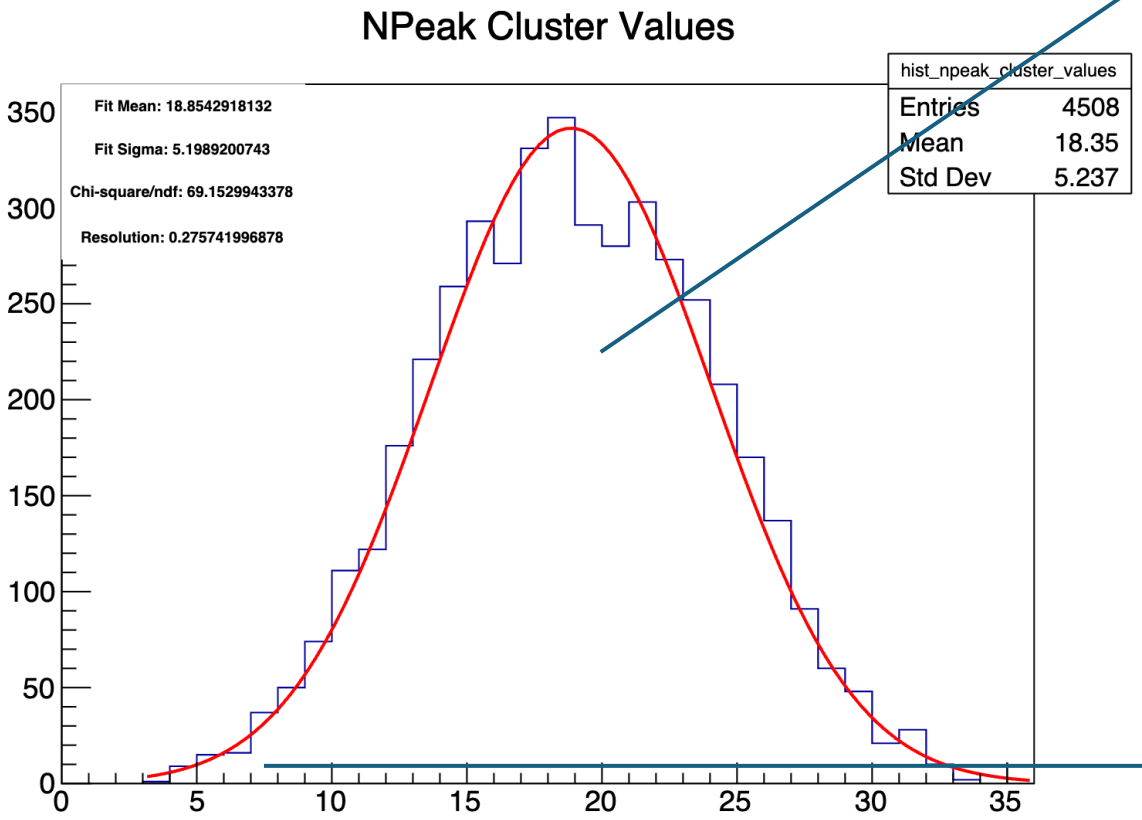




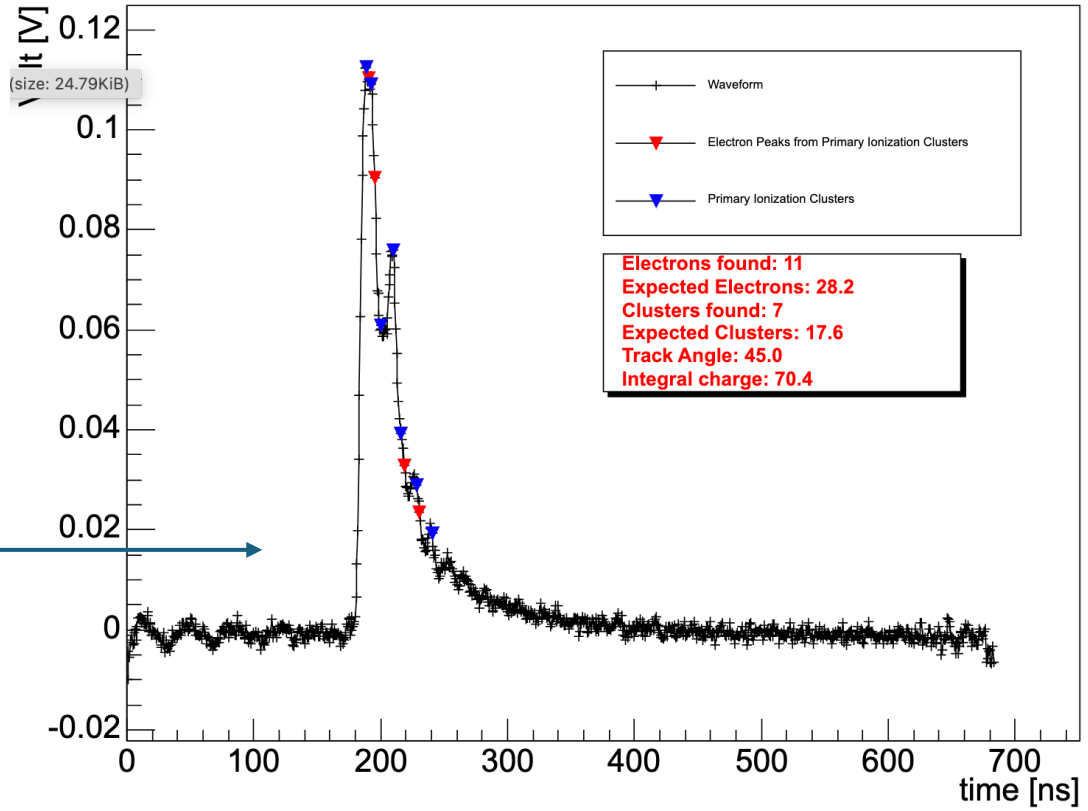
Charge integral left tail-> electron tail-> it is expected?

Run 16 , 2022, 45°, 90/10

Too large around the central region,
We don't care about tails?



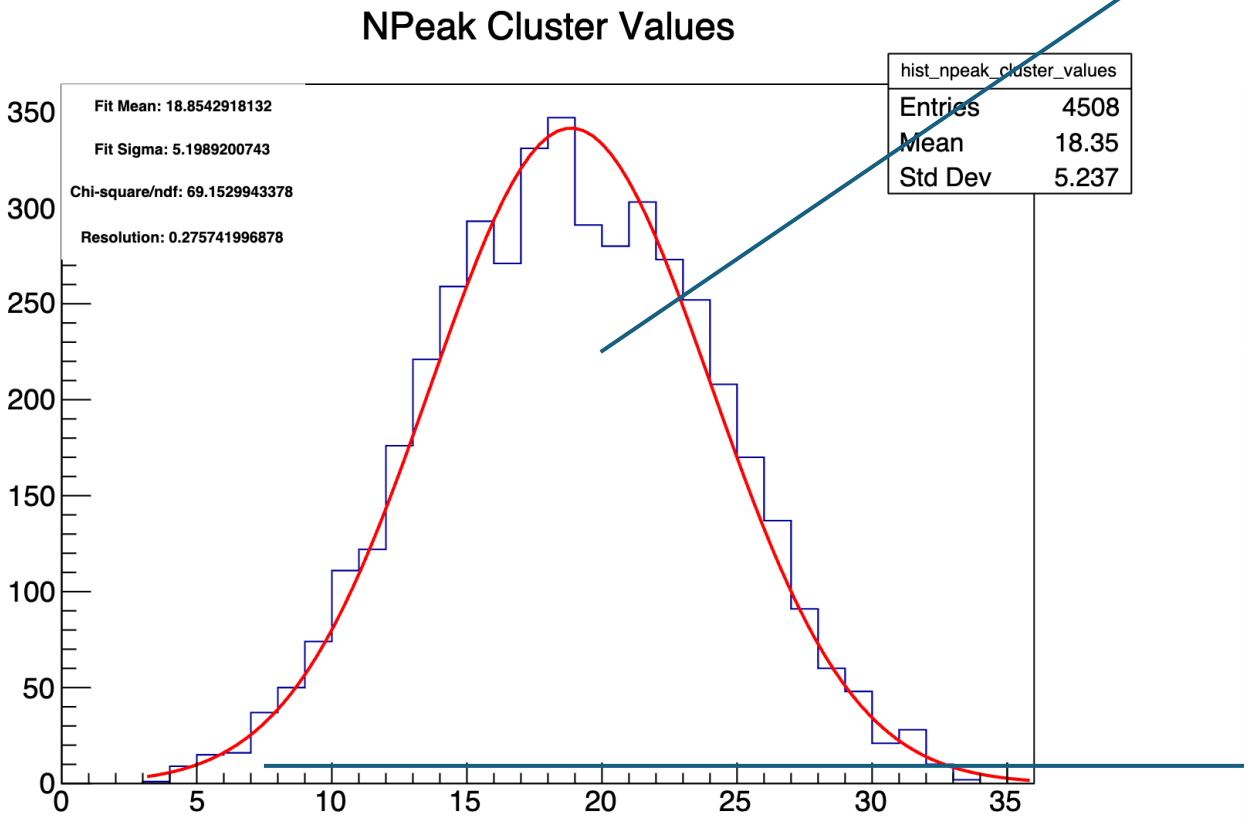
Gaussian fit for trial



Charge integral left tail->cluster tail

Run 16 , 2022, 45°, 90/10

Too large around the central region,
We don't care about tails?



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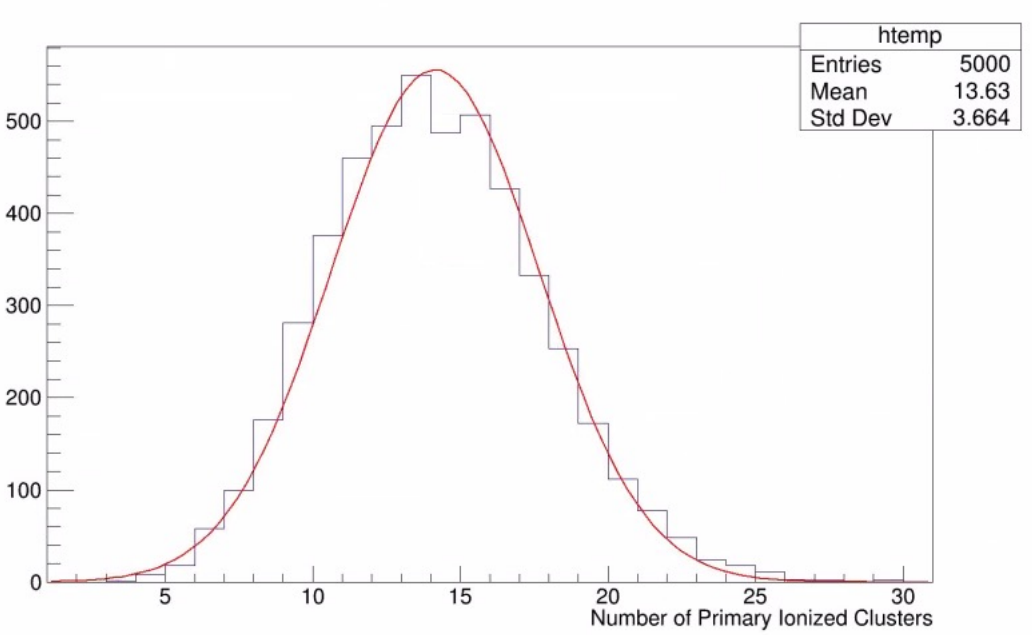
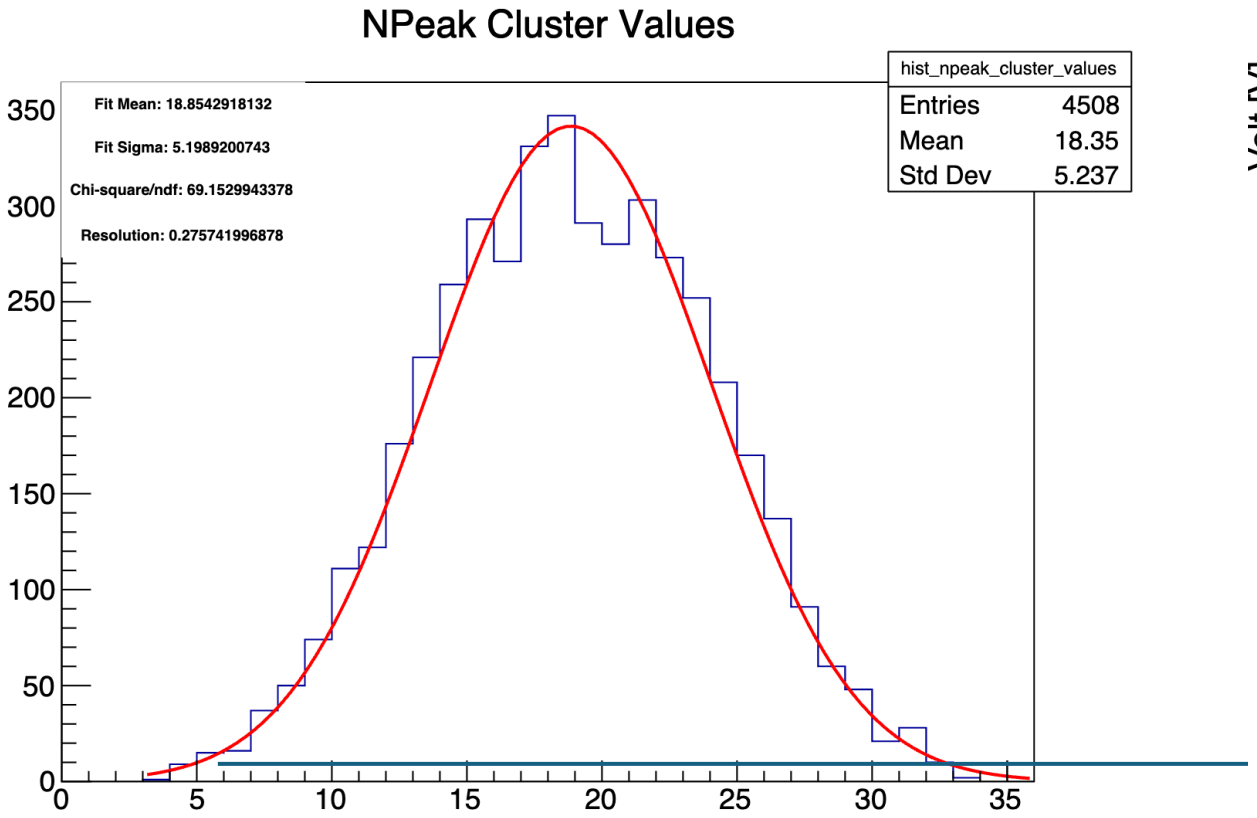
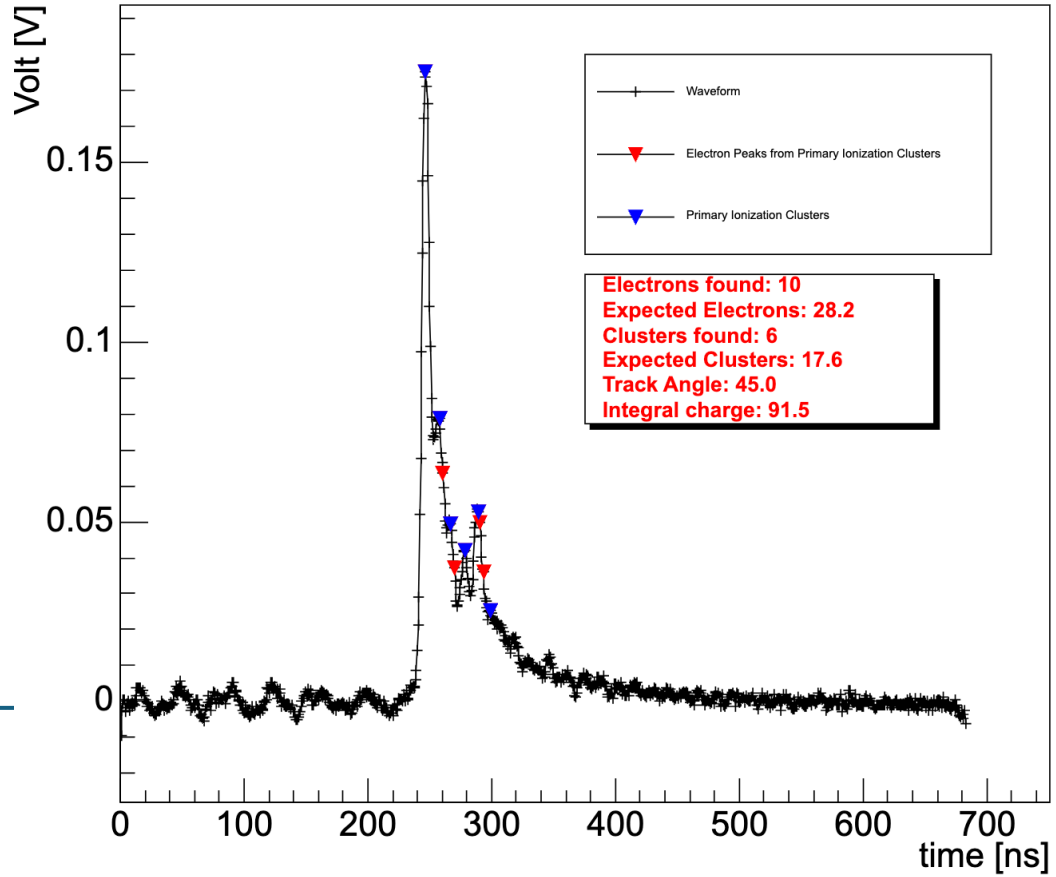


The above distribution shows the number of primary ionization clusters with mean value 13.63

Run 16 , 2022, 45°, 90/10

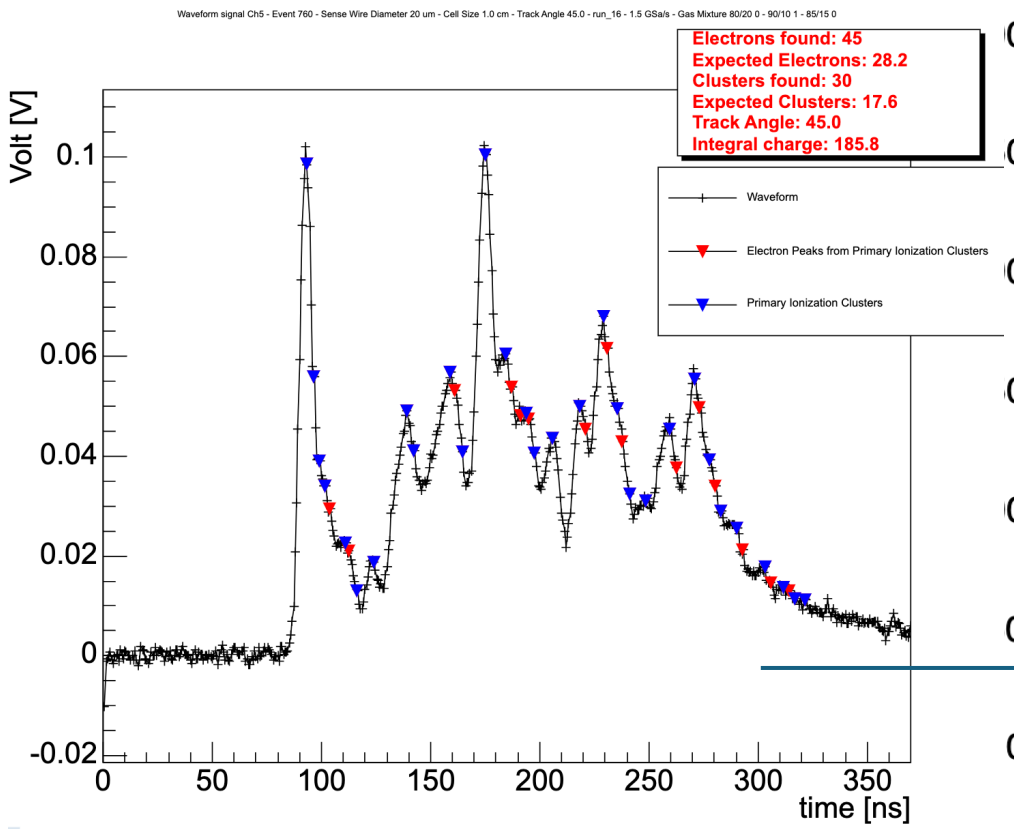


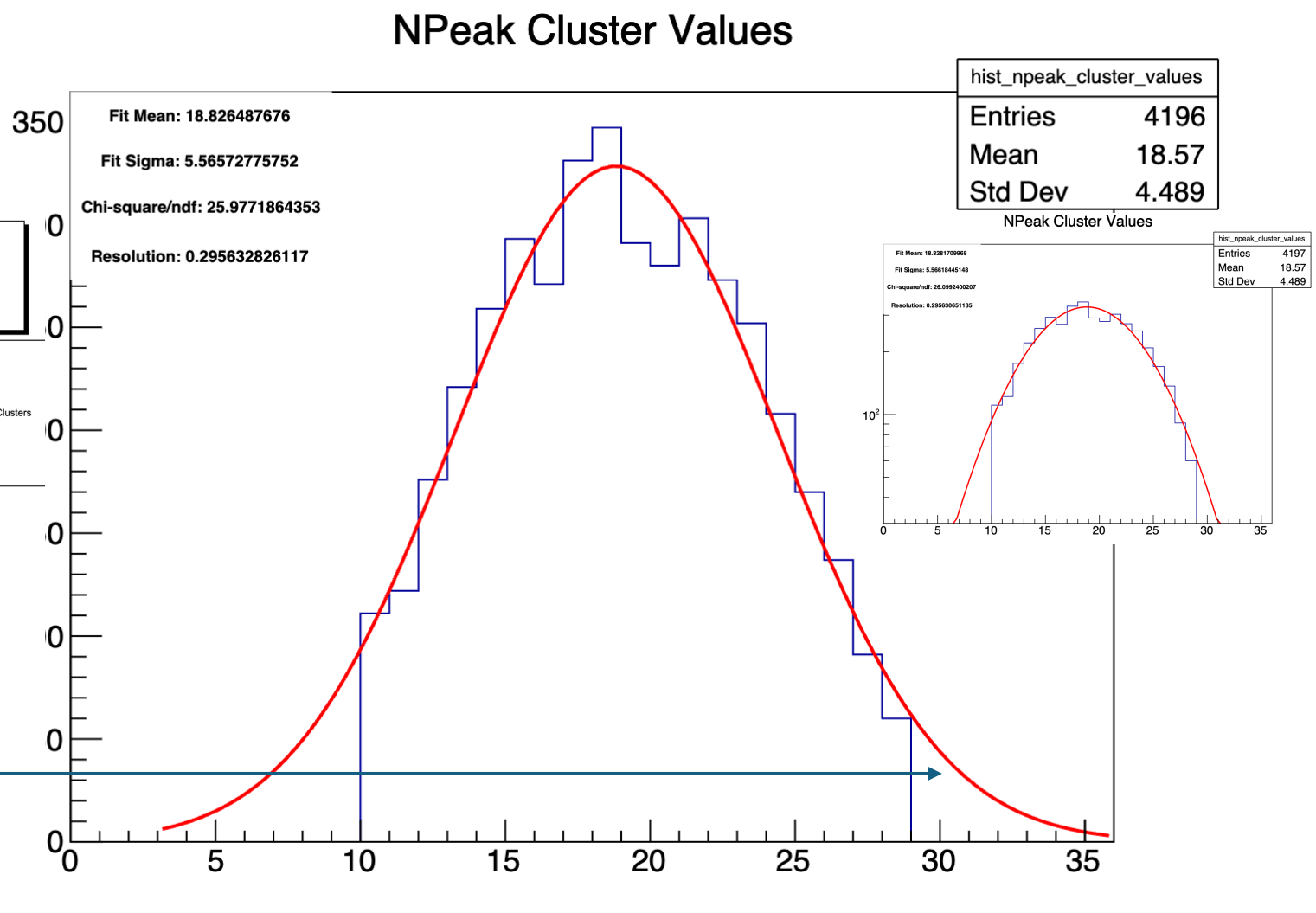
Another example of cluster tail



Run 16 , 2022, 45°, 90/10

Removing tails...





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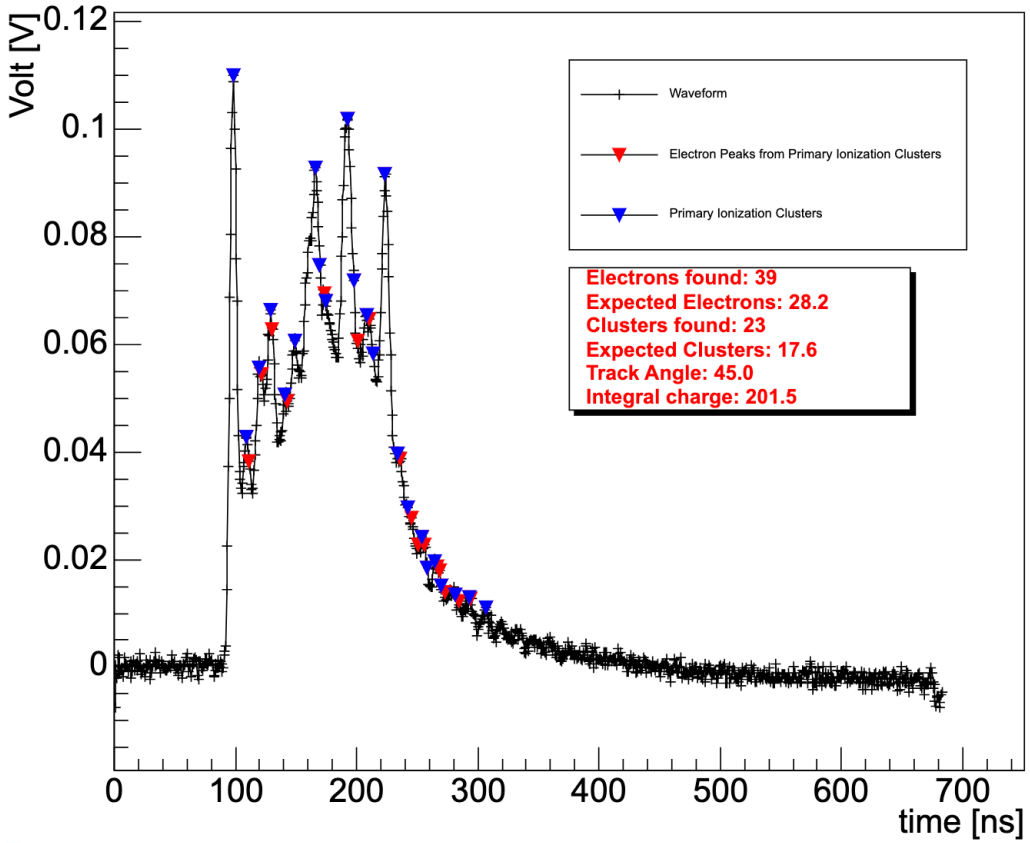
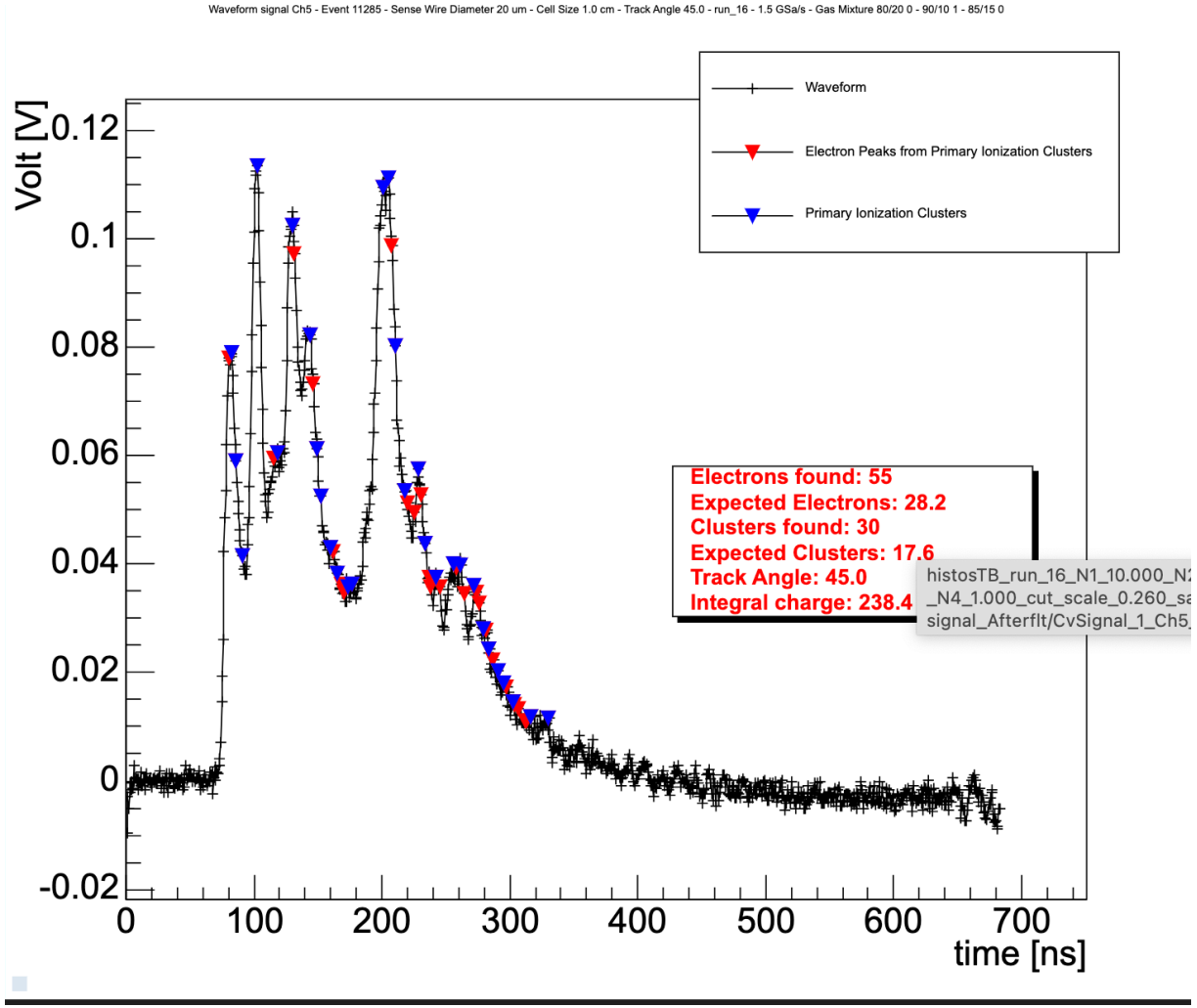
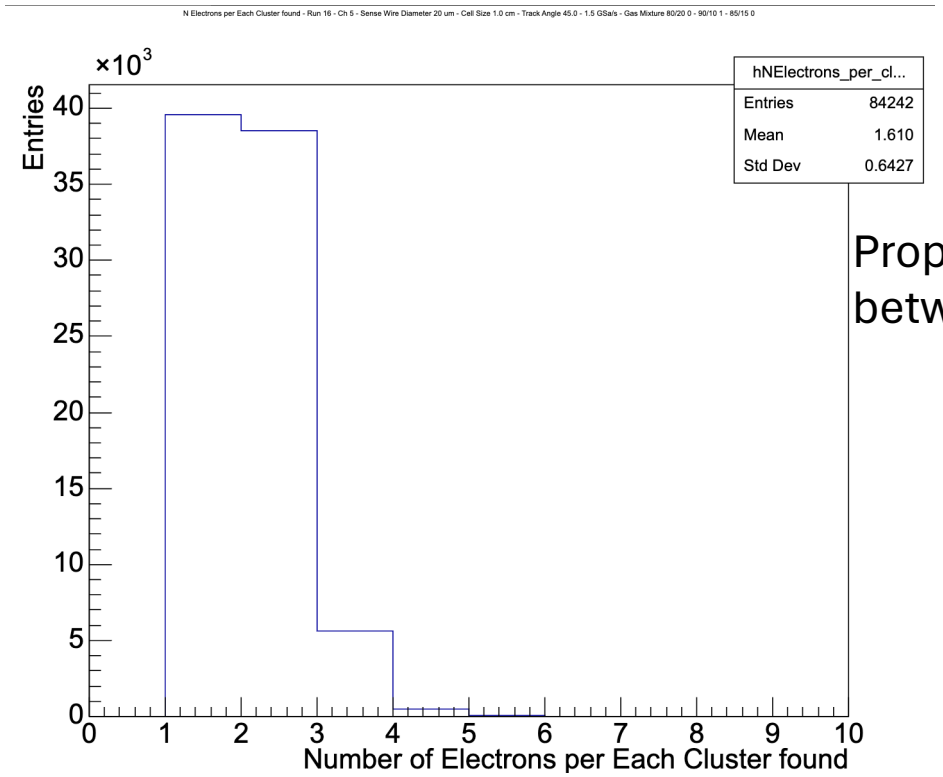




If a certain (large) integral charge searching for peaks in a certain stricter interval?

Run 16 , 2022, 45°, 90/10, issues on the tails of N cluster distribution



Proportion seems not correct between first and second bin