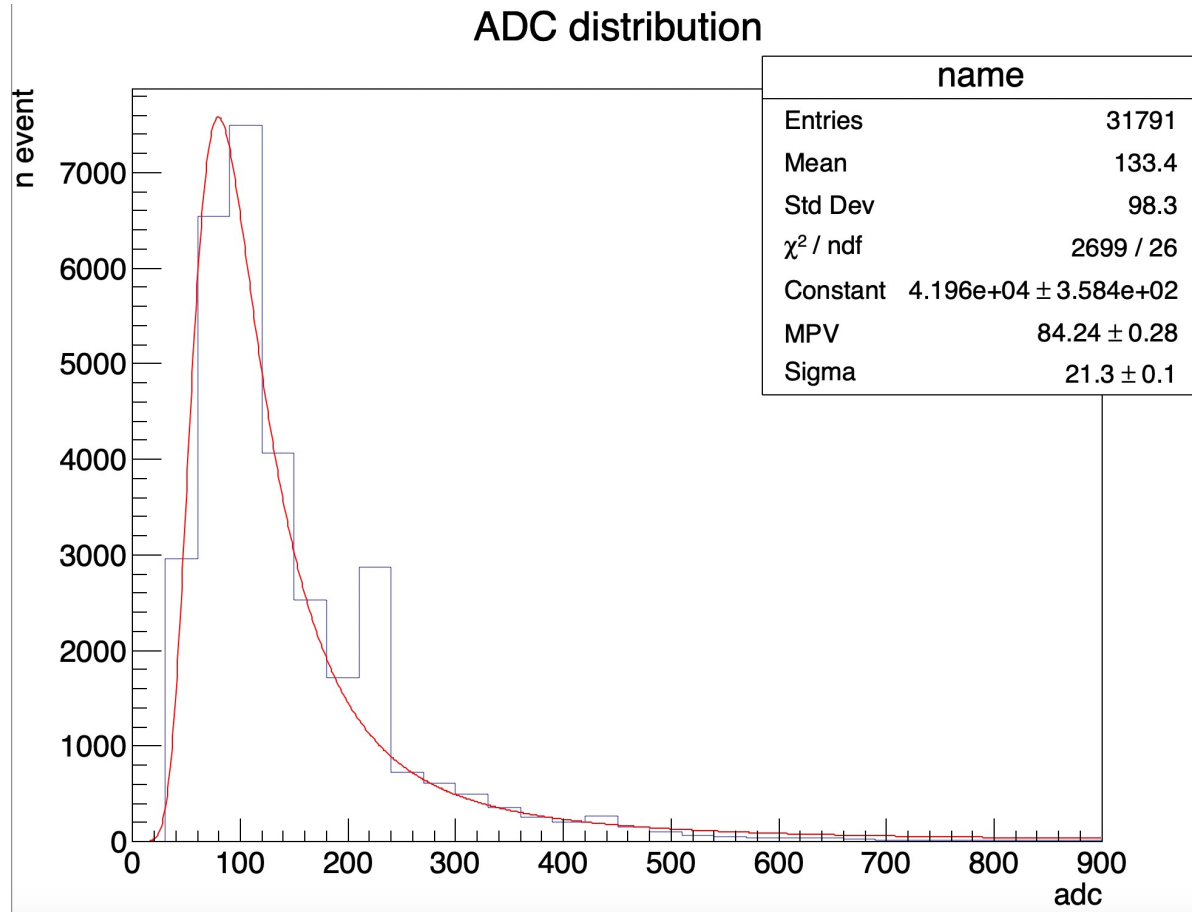


# MIP peak position

NWU M1 Yui Ishigaki

- Analysis topic (Write your topic)  
Chronological study of the MIP peak position using pp data
- Current knowledge (what you know)  
Radiation damage increases the bias voltage of Si sensors. As radiation damage larger, the position of the MIP peak should be lower due to changes in sensor performance.
- status of this topic (what you have)
- I reproduced Genki's analysis and I found the MIP peak by applying a cut of the tracking  $\theta$  to the ADC distribution. Then I fitted it with using Landau function.
- Goal for the workshop (Your goal; Please write down with priority)
  1. Updating the fitting method by using a convolution function of Landau and Gaussian
  2. Determination of  $z_{\text{vtx}}$  with better precision
- Milestones to reach to your goal  
(Write down what you need to learn/study for reaching to your goal)
  1. Learn more about the fitting process and implement the new method
  2. Learn about z vertex analysis and collaborating with Mahiro for the implementation

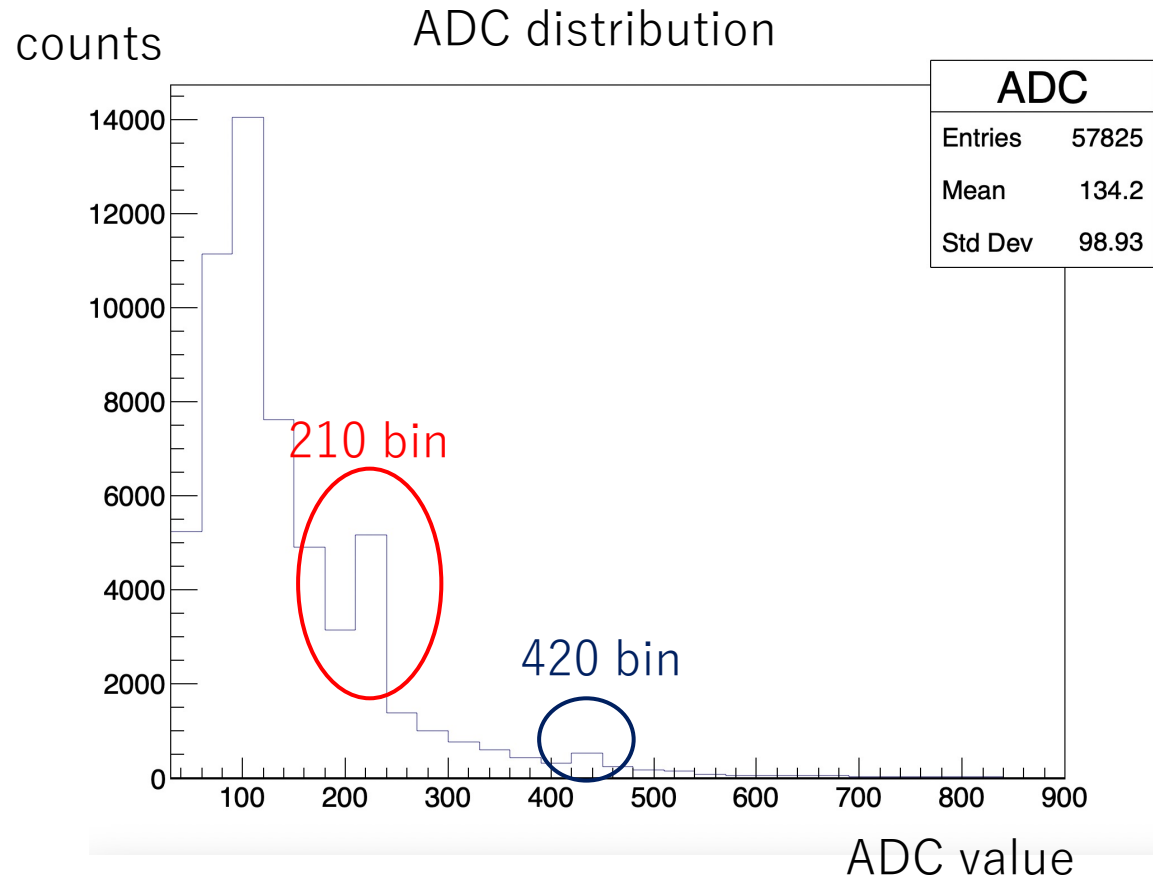
# Fitting with Landau function (last week presentation version)



The plot on the left is the MIP peak by applying a cut of the tracking  $\theta$  to the ADC distribution.

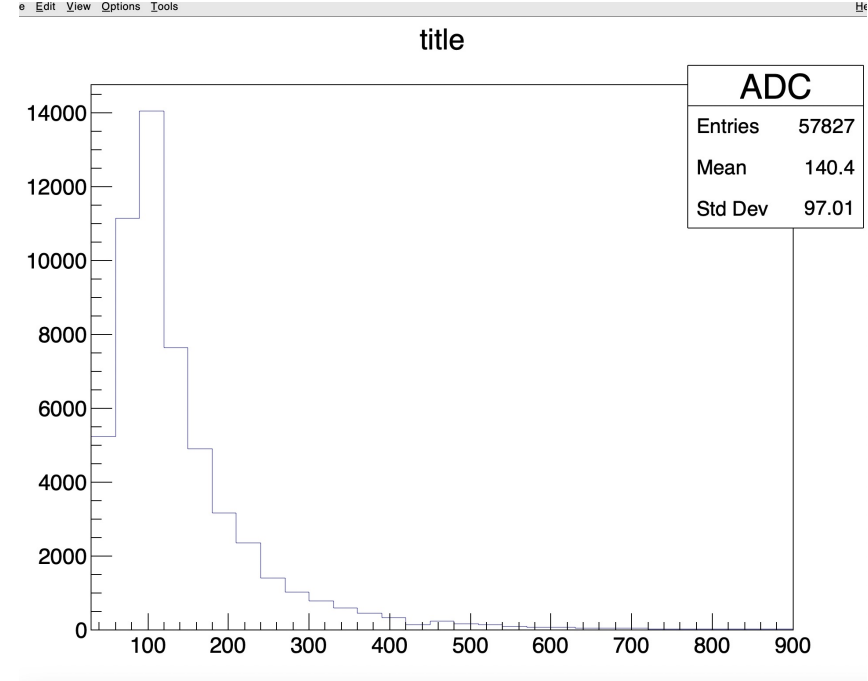
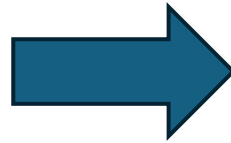
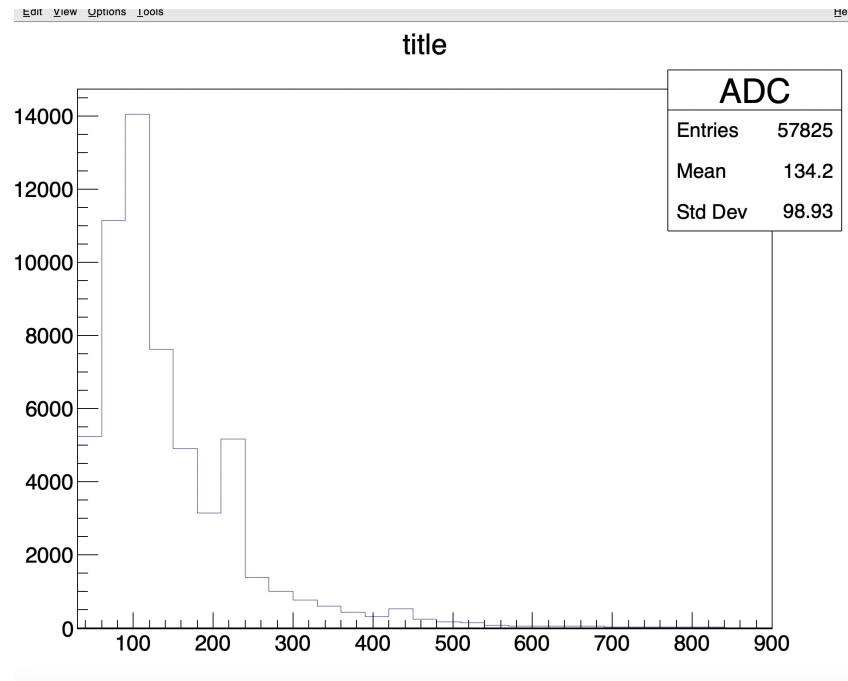
I fitted with Landau functions, but because of the noise of sensors, I would like to use Gaussian and Landau collaboration functions and Updating the fitting .

# About second peak and third peak



- After clustering, all single clusters with a DAC value of 210 or higher are counted in ADC7. It causes overflow.
- Same thing happen in double-hit clusters.
- If single-hit clusters with DAC 210 are not removed, a peak appears at DAC 210 and  $210 \times 2 = 420$ .
- Though their contribution is too high, removing all of them is overkilling.

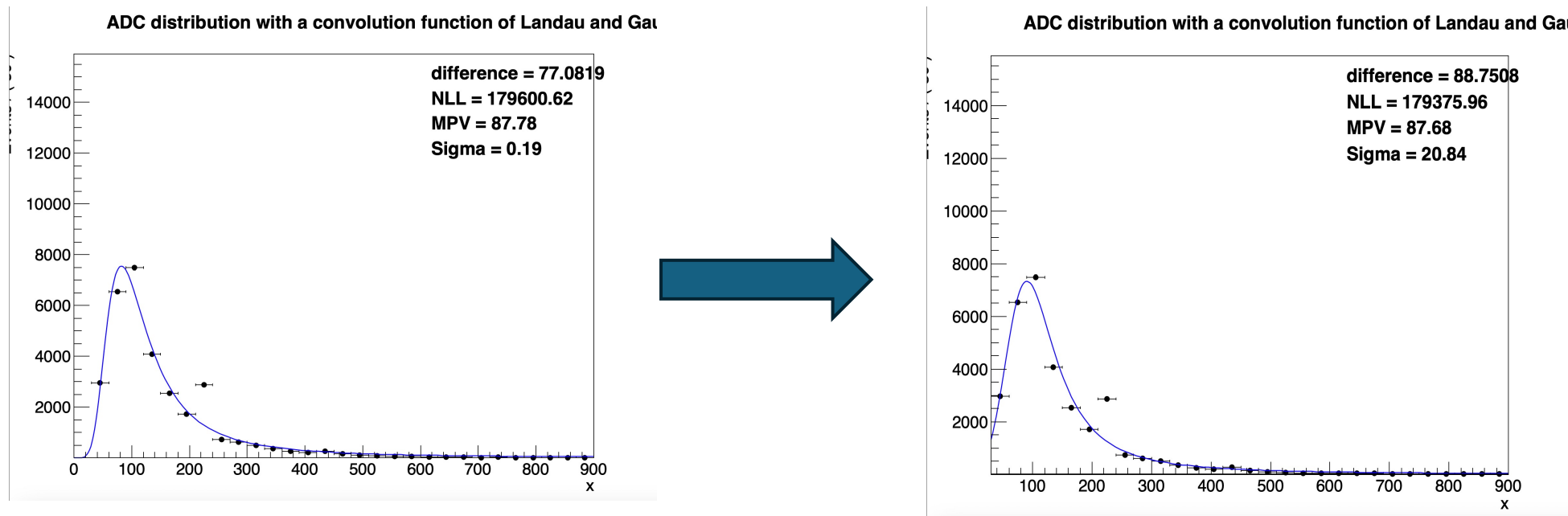
# Delete second peak and third peak



- 210 bin: (The number of single hit clusters)  $\times$   $1/3$  + (Multiple hit clusters)
- 420 bin: (The number of double hit clusters)  $\times$   $1/9$  + (Multiple hit clusters)

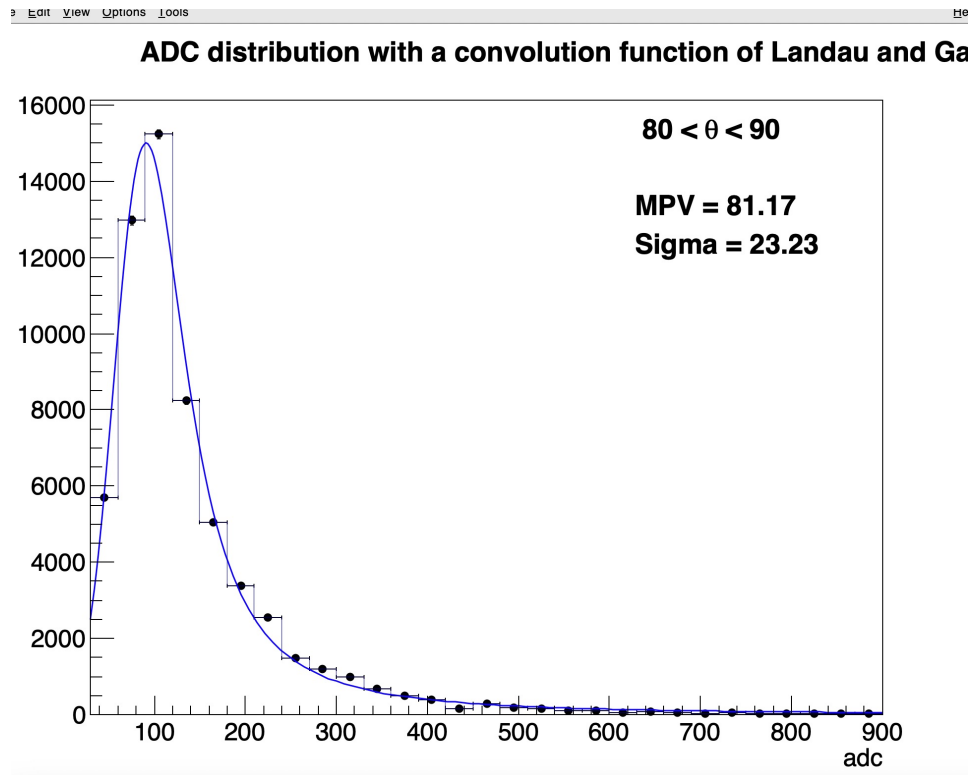
# Cut update

- Changed the fitting range from 0 to 30, and adjusted the fitting so that the point (0.0) is not included in the fitting



By including (0.0) in the fit, the line was pulled to 0, but now the line is smooth!

# Update fitting (with a convolution function of Landau and Gaussian)



Though I could not determine yet how much of an effect the noise has, I added new fitting method by using a convolution function of Landau and Gaussian

# Summary and to do list(plan)

- Success delete 210 bin peak and 420 bin peak
- Success fitting(including noise?): I will examine more detail about the effects of noise
- z\_vtx update: not yet
- Many Thanks to Genki, Takashi, Maya, Koyuki



BACK UP

# Fitting with a convolution function of Landau and Gaussian

