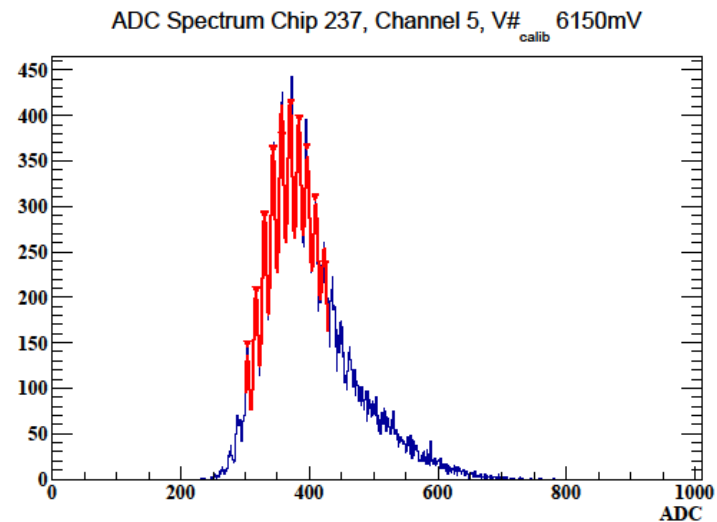
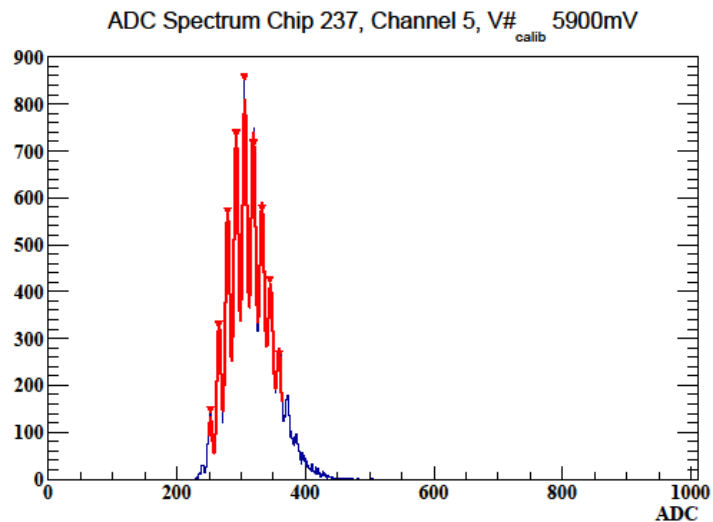
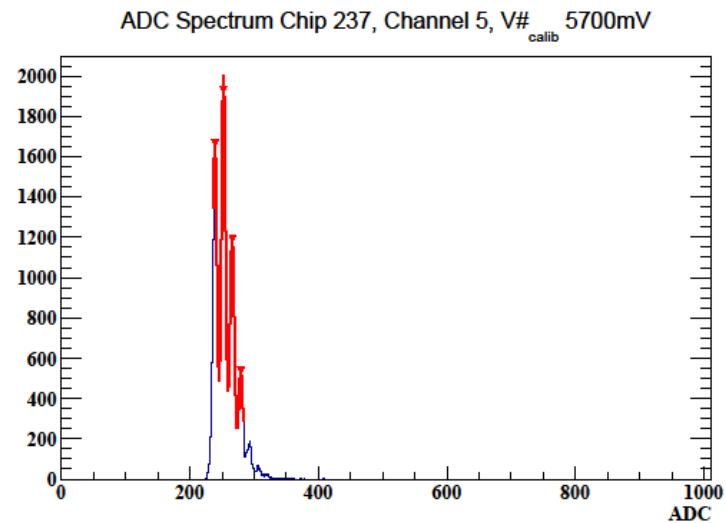
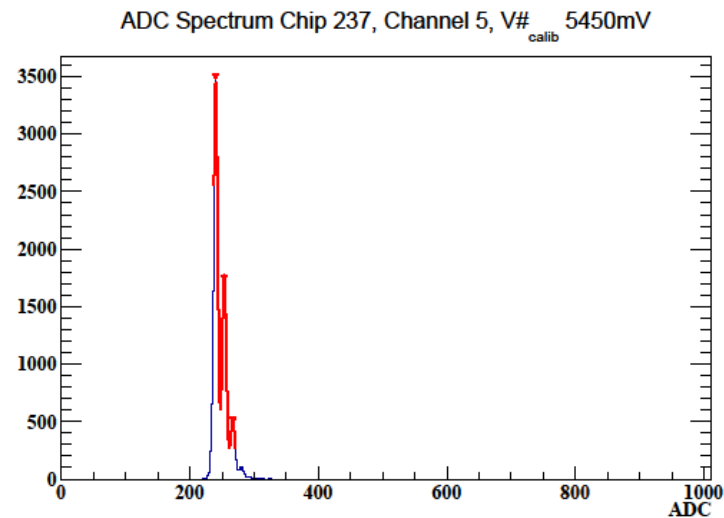


Analysis of Electrons With and Without Power Pulsing in May 2018 Data

Anna Rosmanitz
AHCAL analysis workshop
10.08.2018

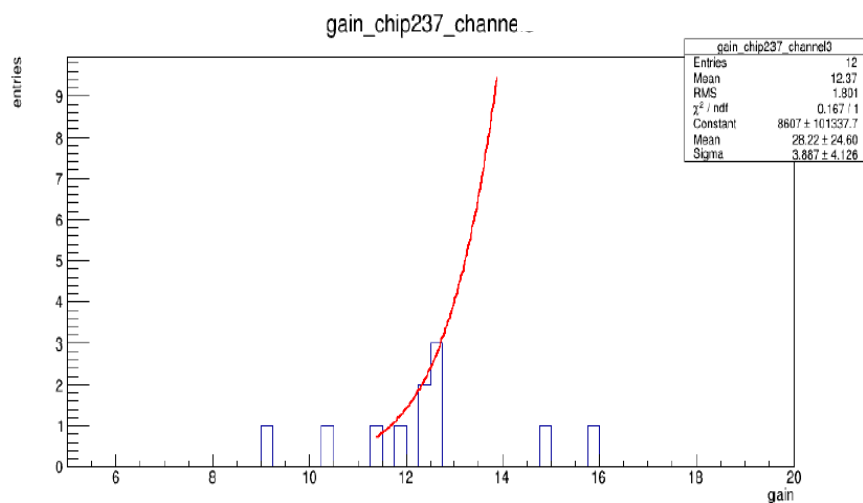
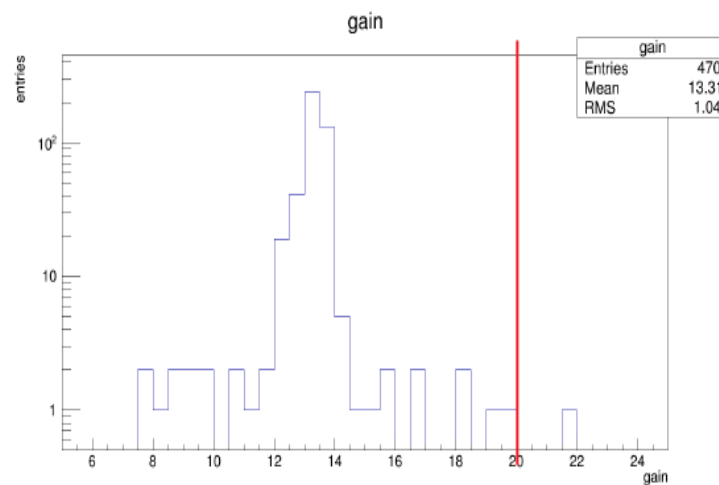
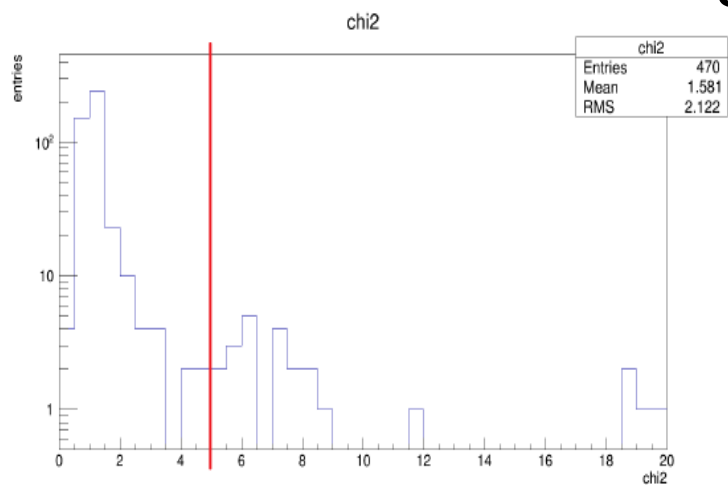
Useful Information From Old Testbeams

Fits for Different LED Voltages



Cuts

- χ^2 cut and cut on gain

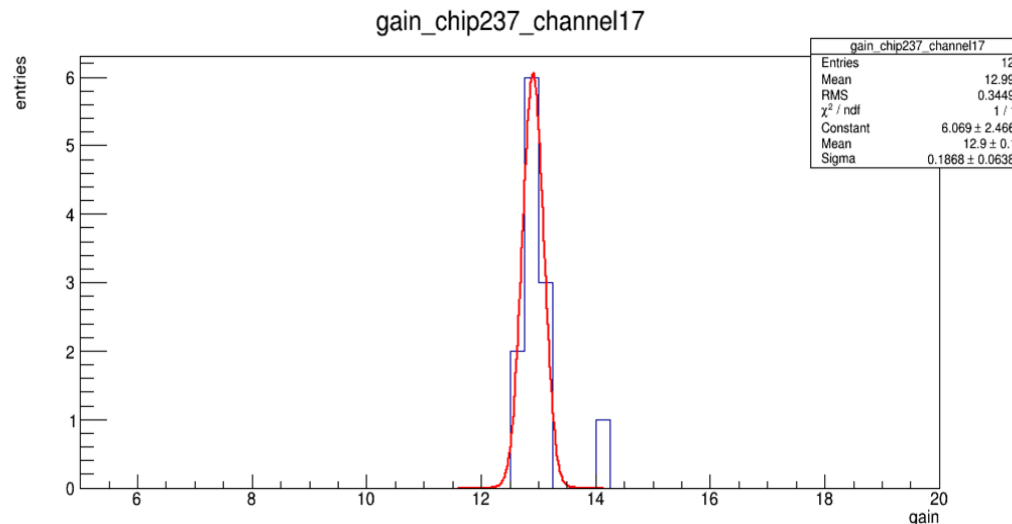


Energy Calibration: Averaging Process

- Problem: several different gains for each channel
- Method: Gaussian fits over gain value distribution for each channel

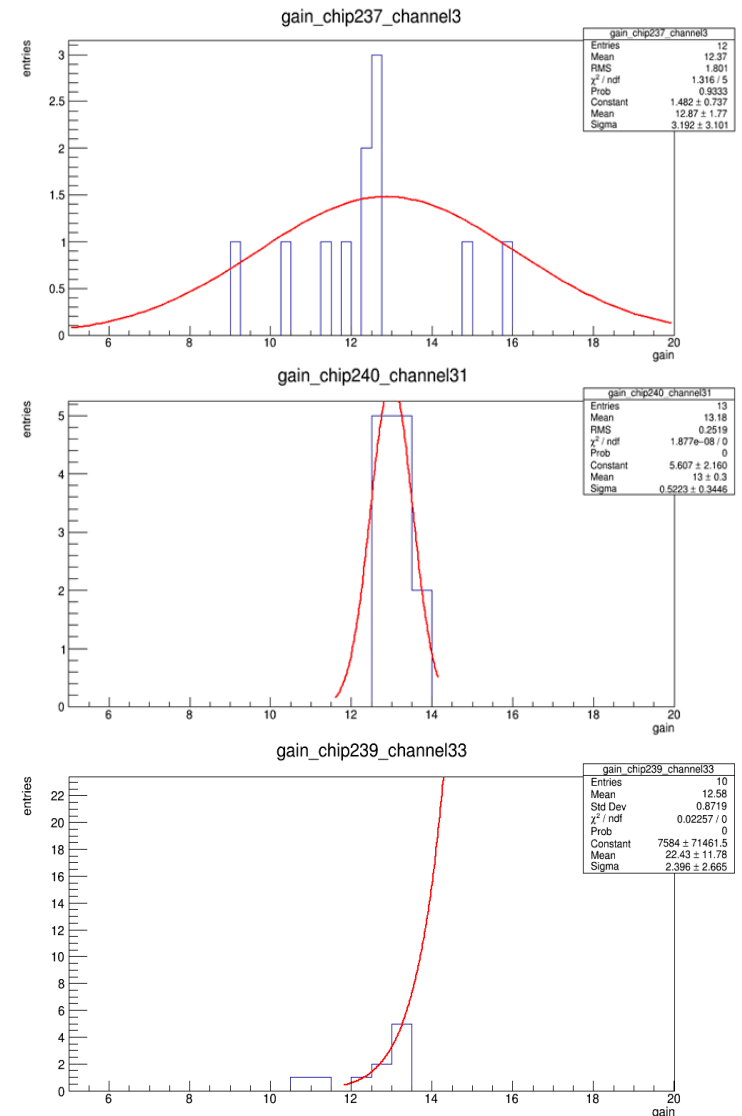
1. Fit around 10% of highest bin

⇒ Successful for 95.0% of channels

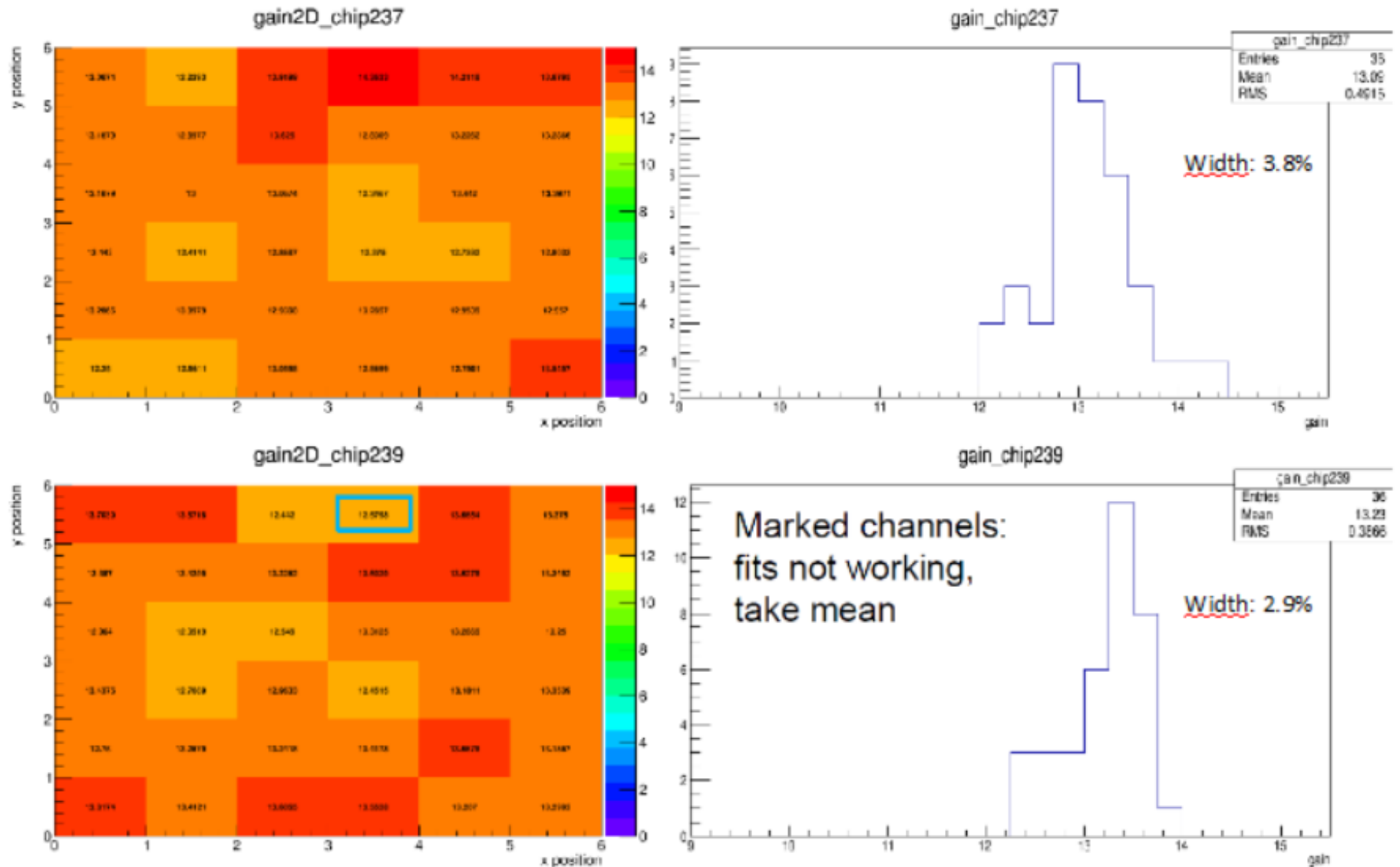


Energy Calibration: Averaging Process

2. If fit is not converging:
Gaussian fit with wider range
⇒ 1.2% of channels fitted
3. If fit not converging:
Rebin, fit again
⇒ 3.0% of channels fitted
4. If fit still not converging:
Use mean of histogram
⇒ For 0.8% of channels

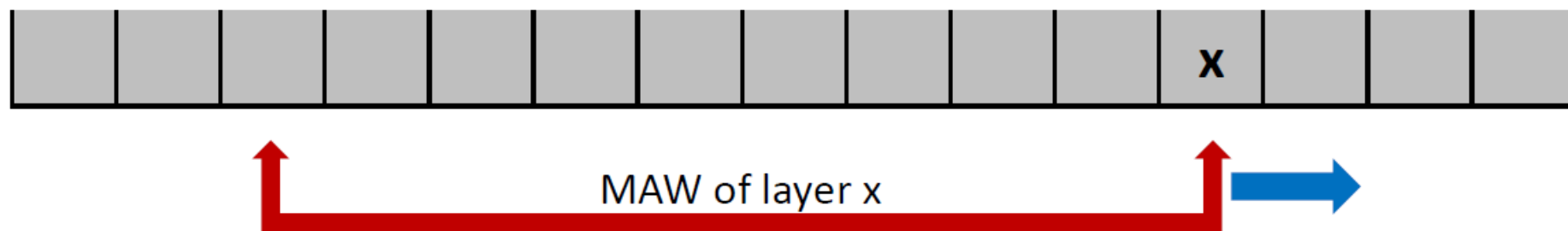


Results for Gain



Primary Track Finder

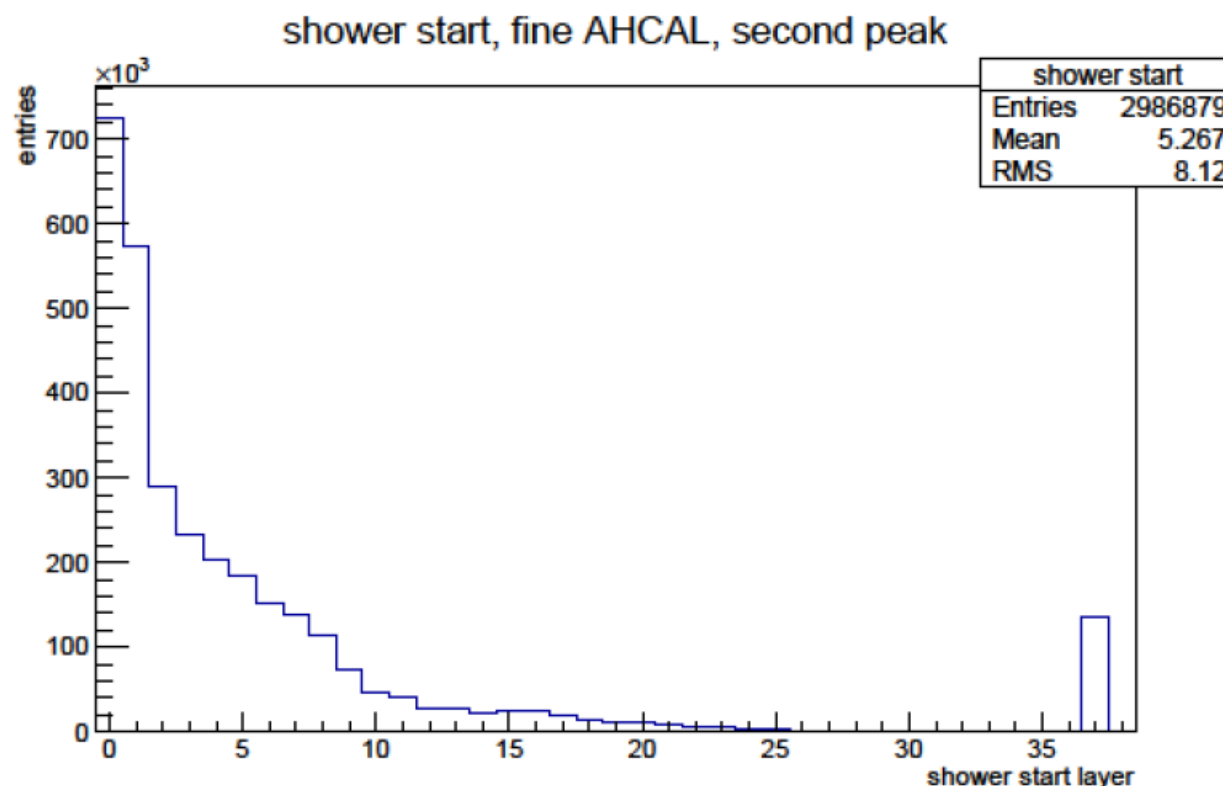
- Official tool to find the shower start layer
- Uses a “moving average window” (MAW)



- MAW builds average of energy of last 10 layers
- Moves from beginning of ACal to its end
- If the energy in the MAW and number of hits above a given threshold
 - ⇒ Layer is defined as shower start layer
- Else: Last layer is defined as shower start layer

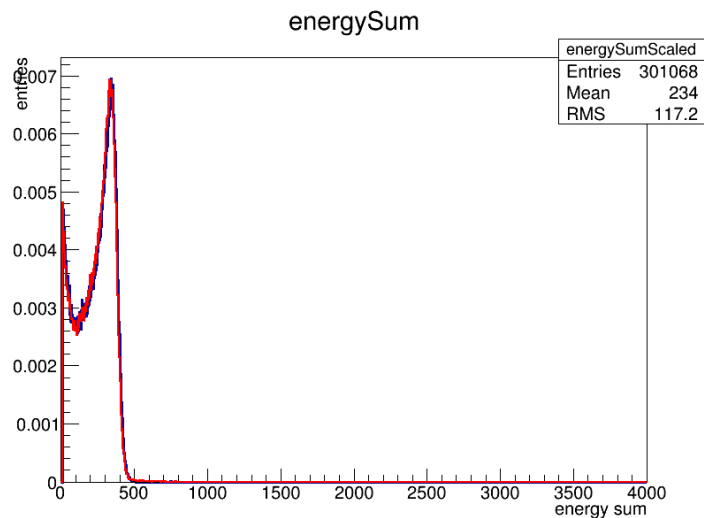
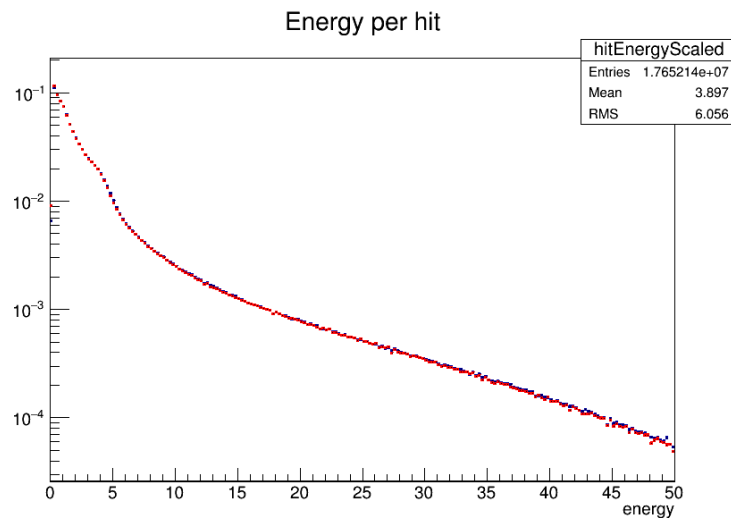
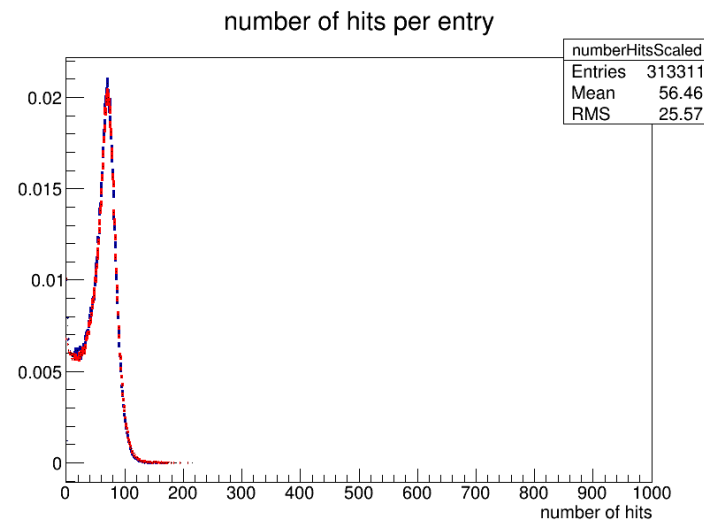
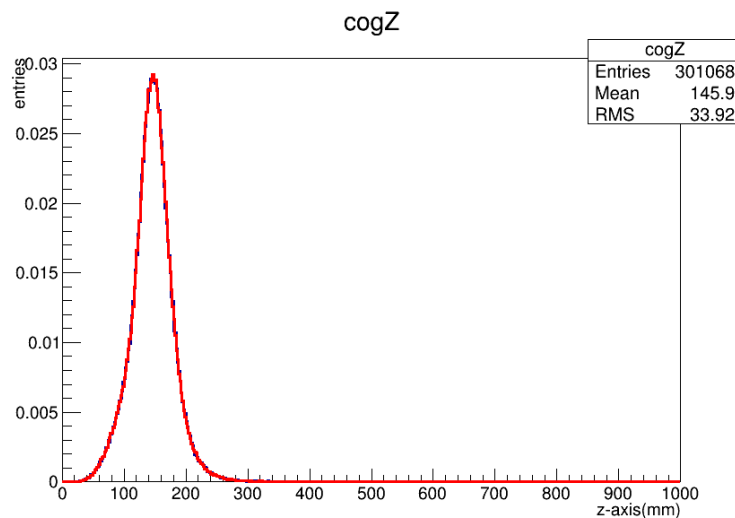
Primary Track Finder: Results

- Pi^+ , 2007 data, 30 GeV with ECAL in front
- If no shower start layer found: set to last layer



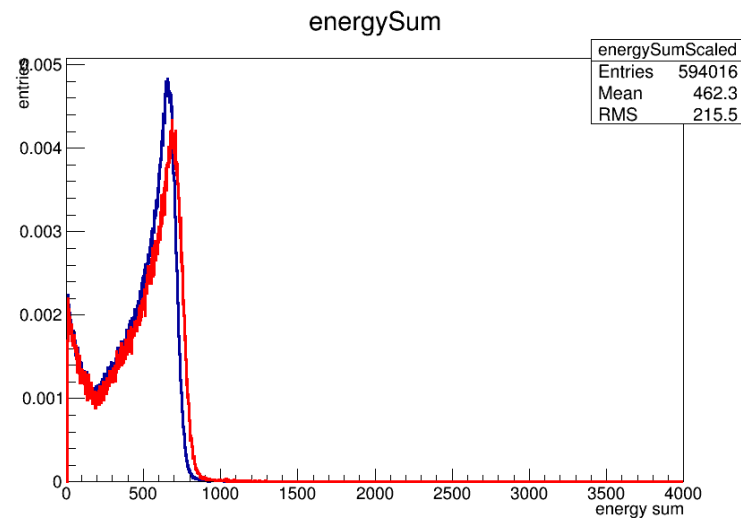
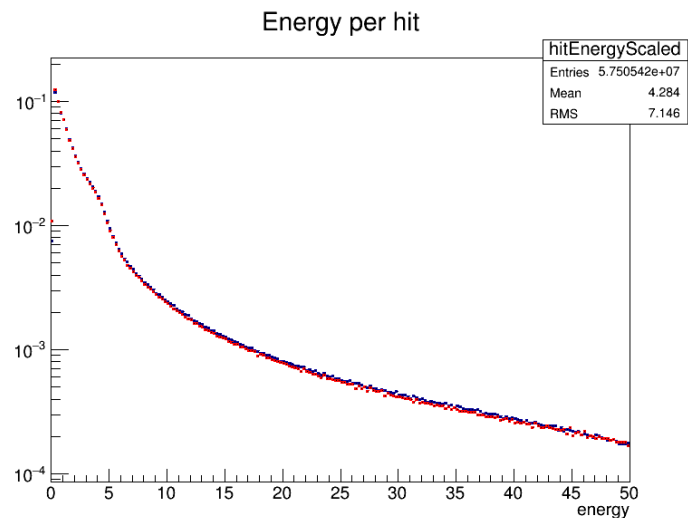
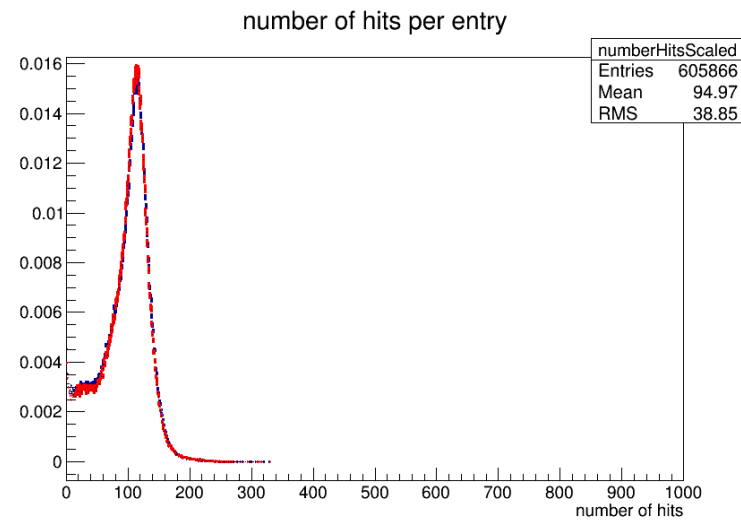
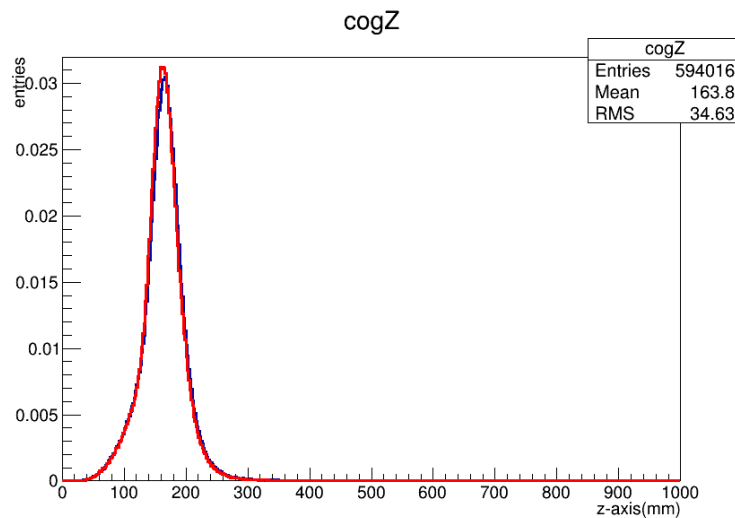
Comparison of electron data with and without power pulsing in May 2018 data

Variables After Saturation Correction: 10 GeV



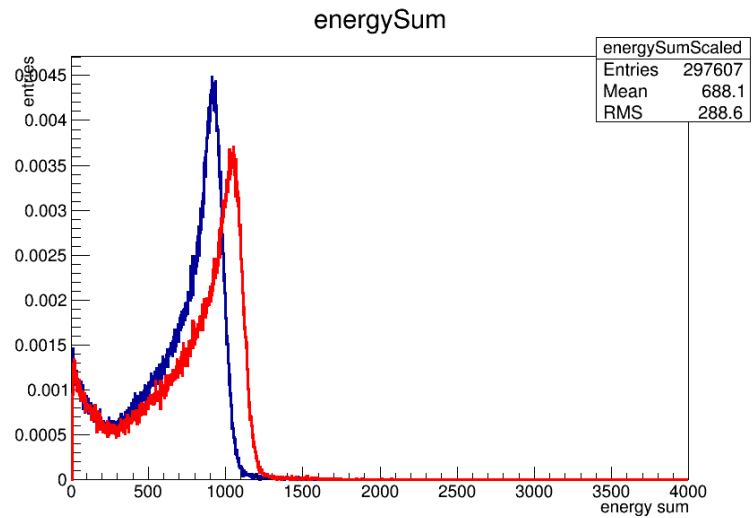
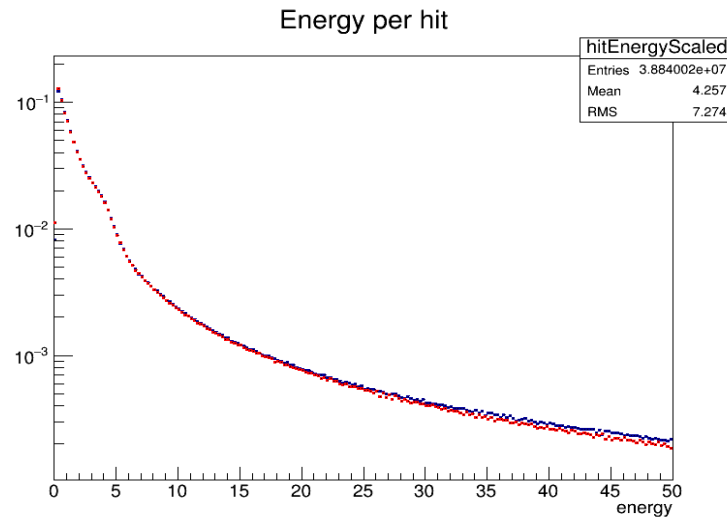
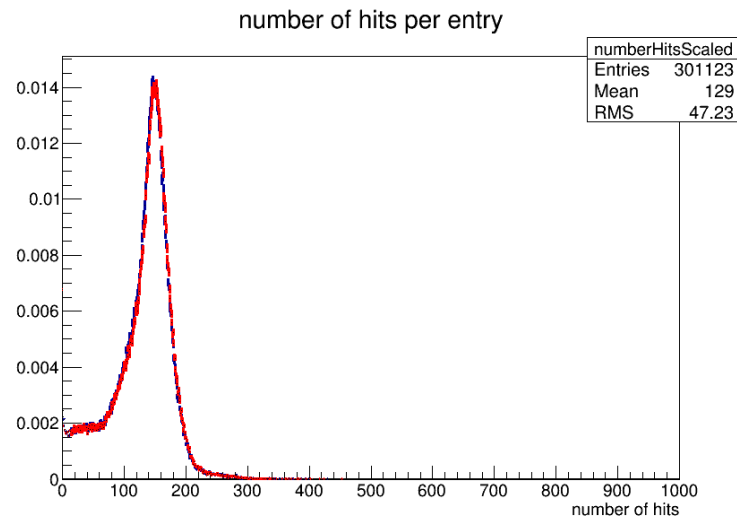
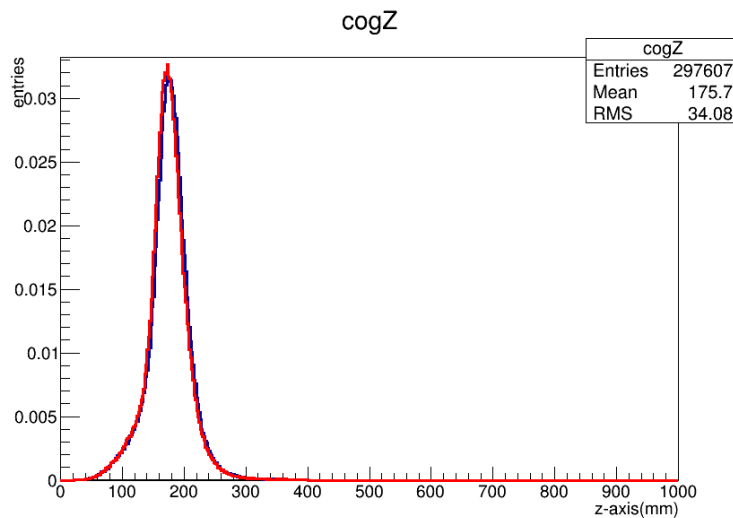
NoPP
PP

Variables After Saturation Correction: 20 GeV



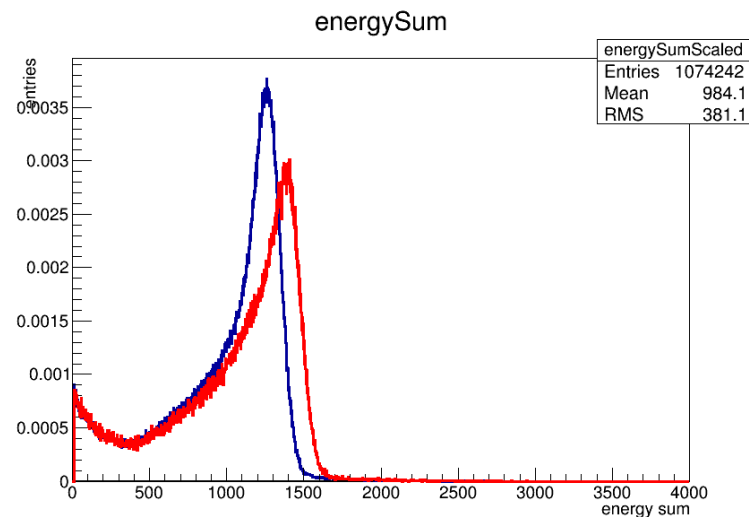
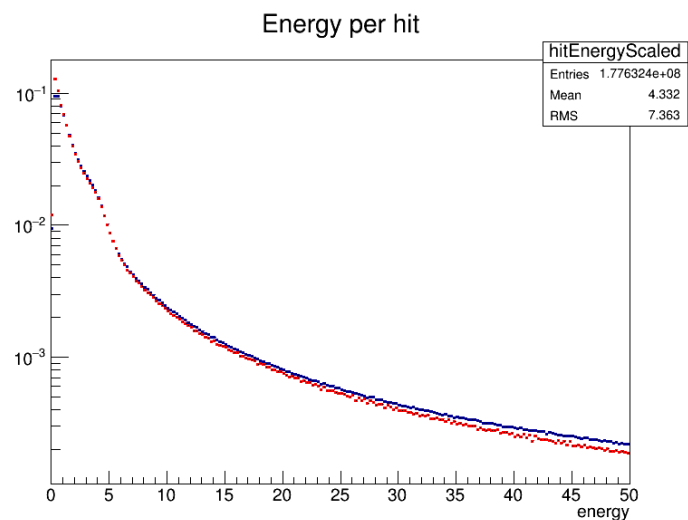
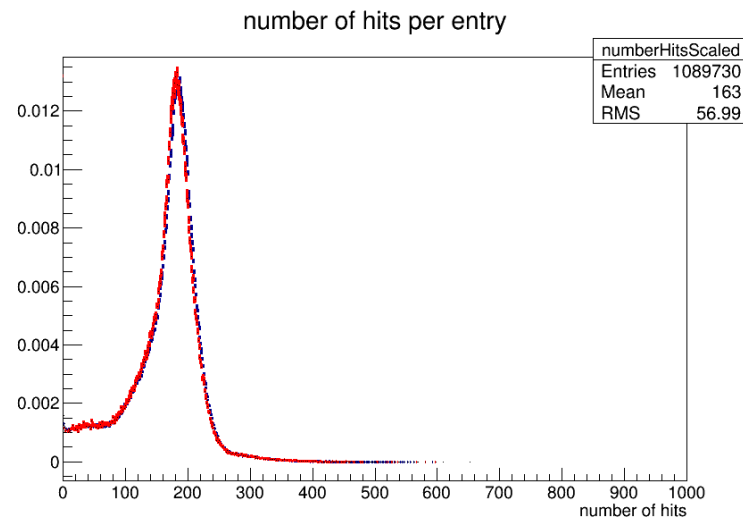
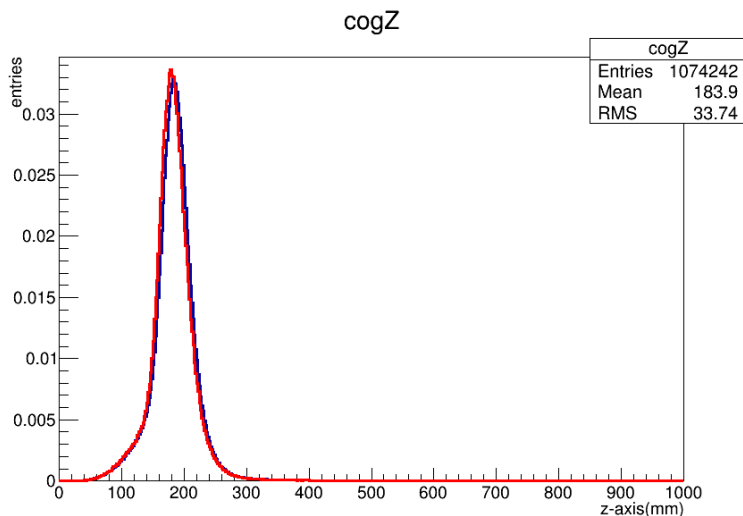
NoPP
PP

Variables After Saturation Correction: 30 GeV



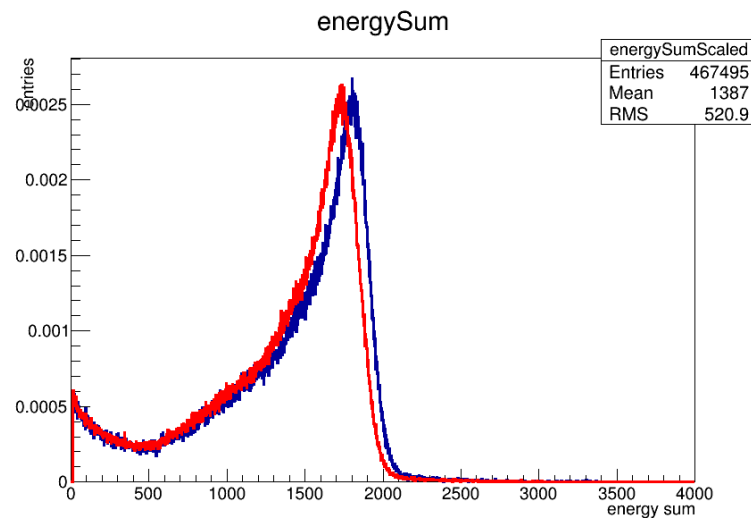
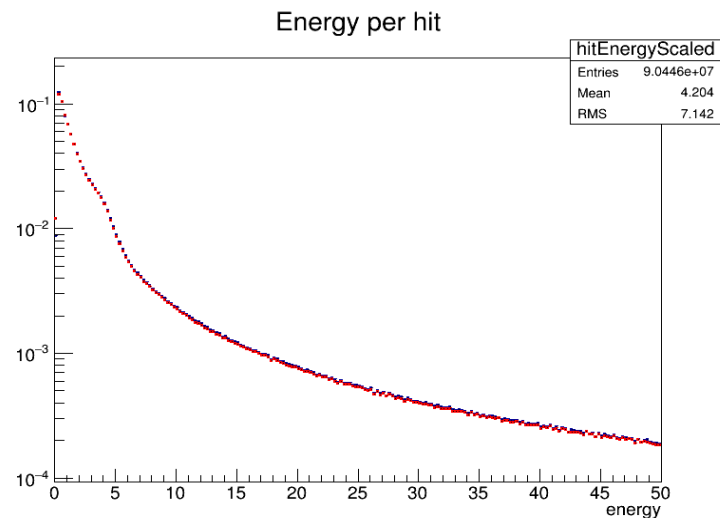
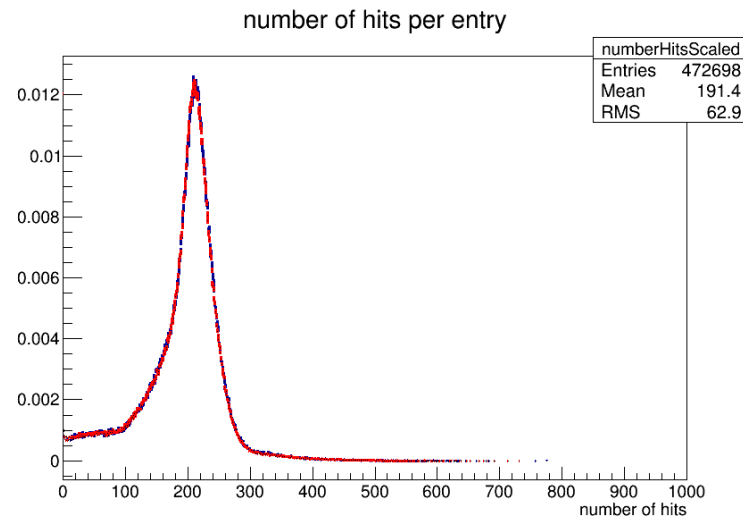
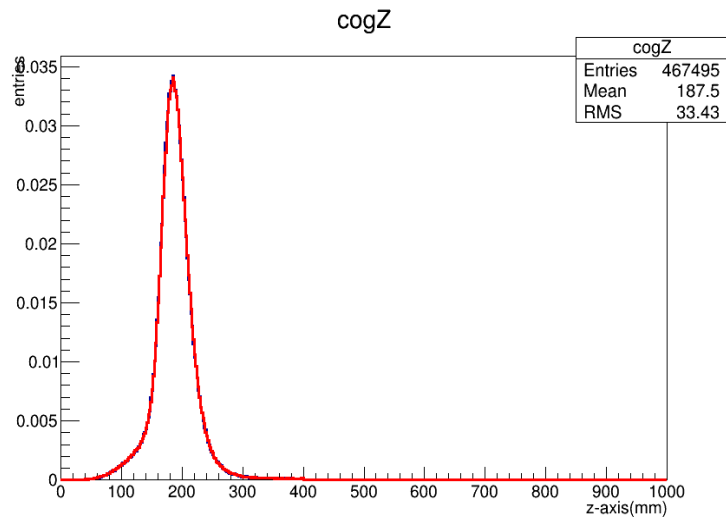
NoPP
PP

Variables After Saturation Correction: 40 GeV



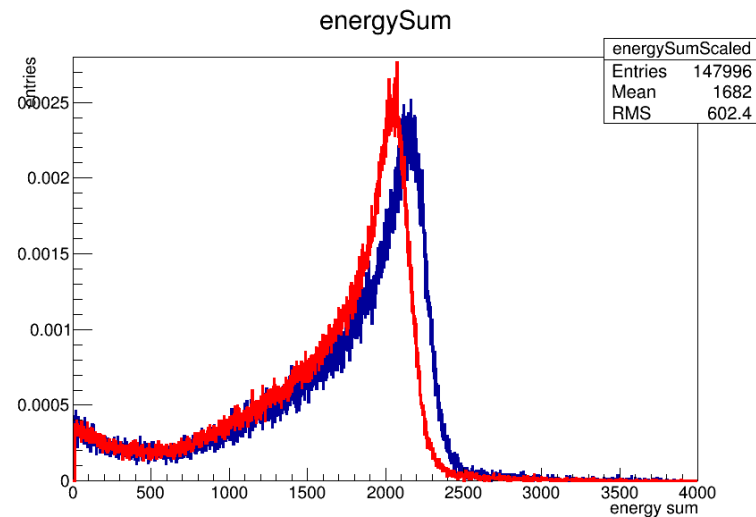
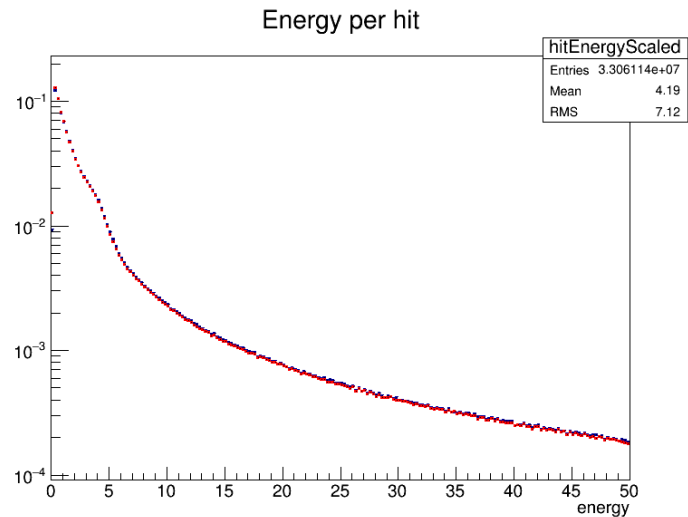
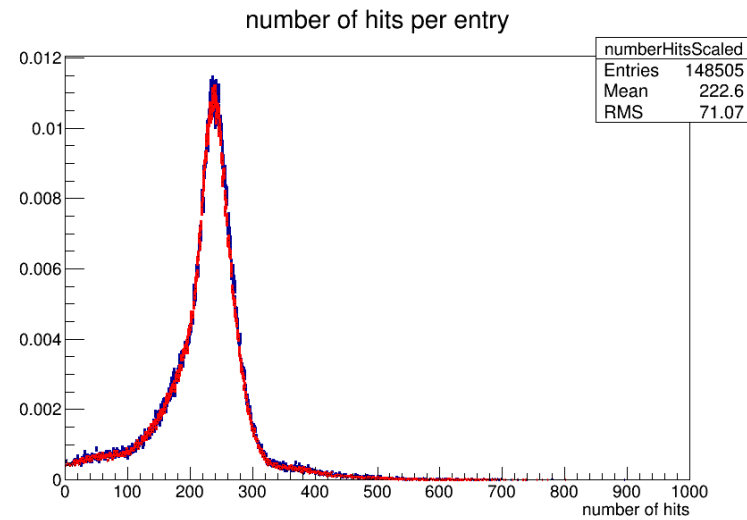
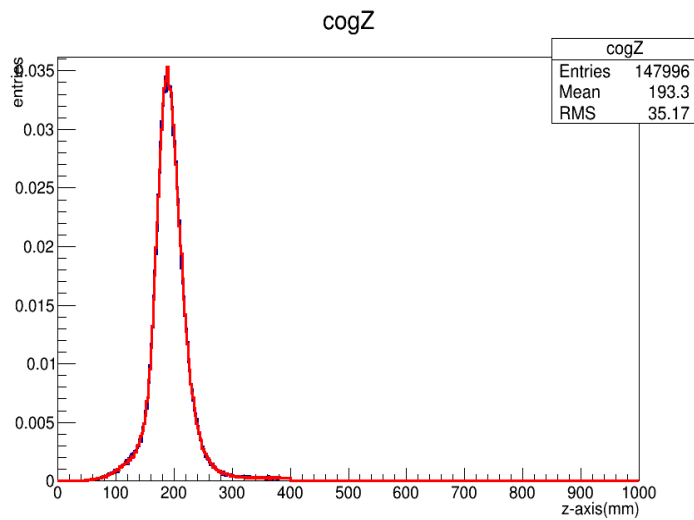
NoPP
PP

Variables After Saturation Correction: 50 GeV



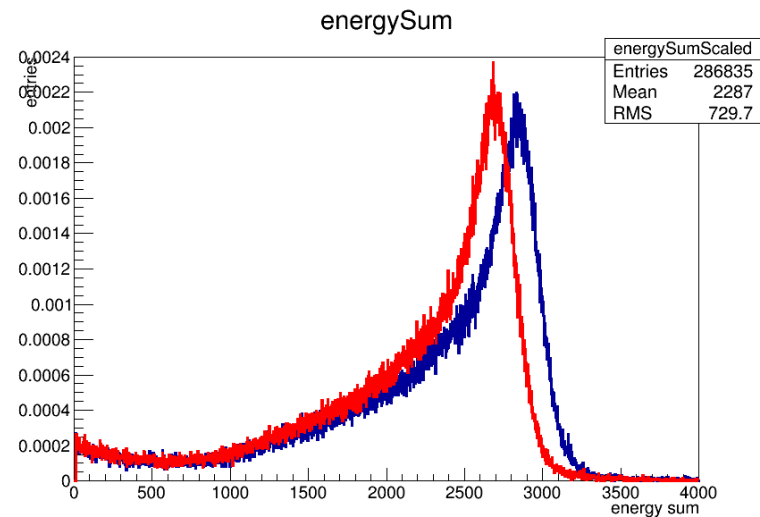
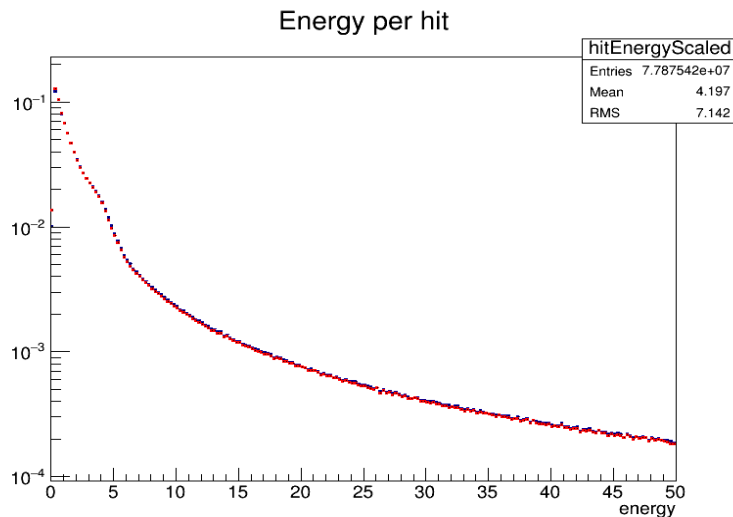
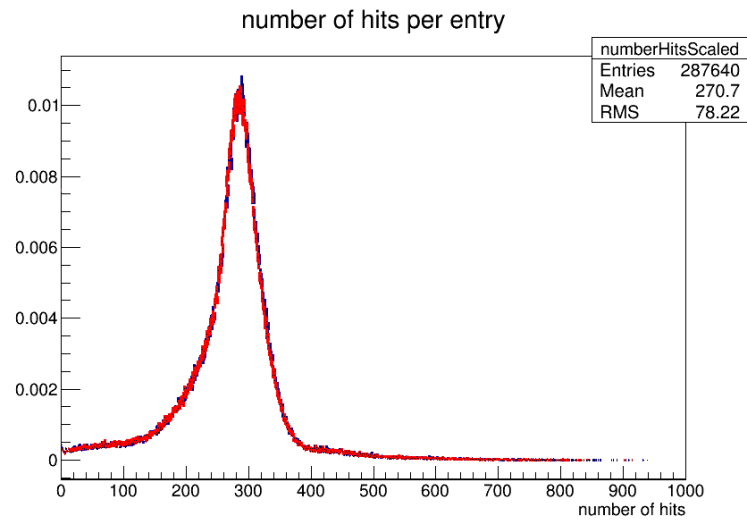
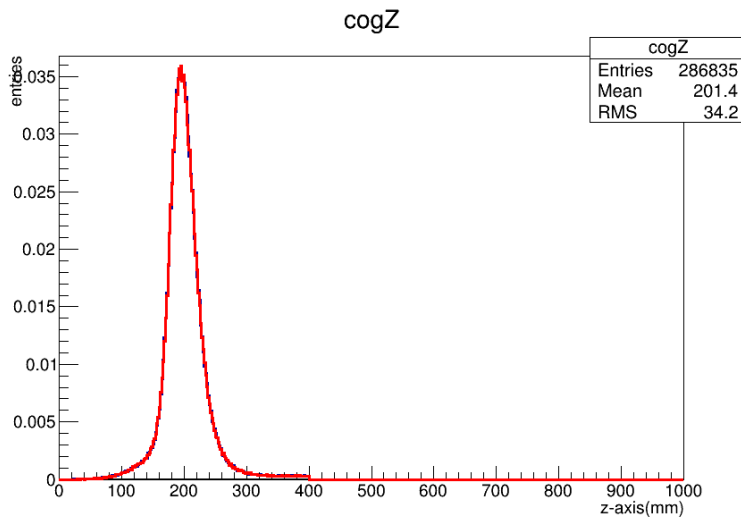
NoPP
PP

Variables After Saturation Correction: 60 GeV



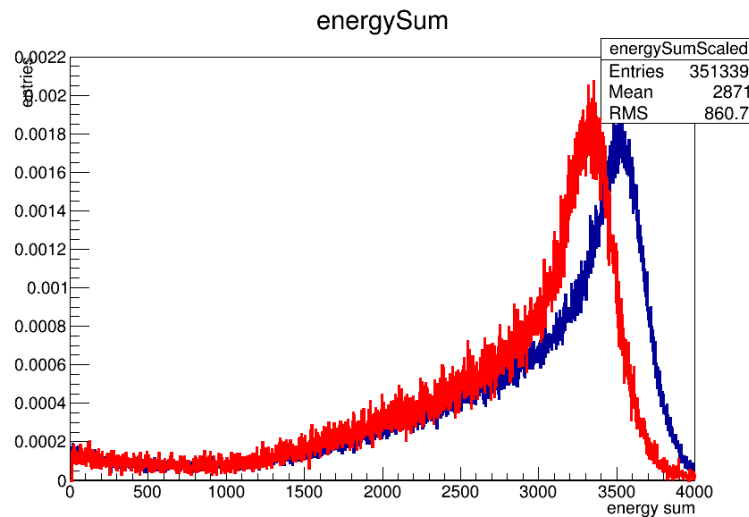
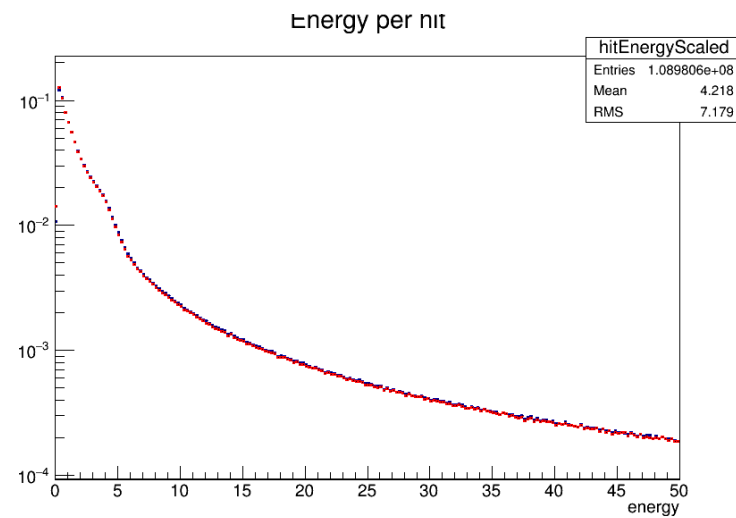
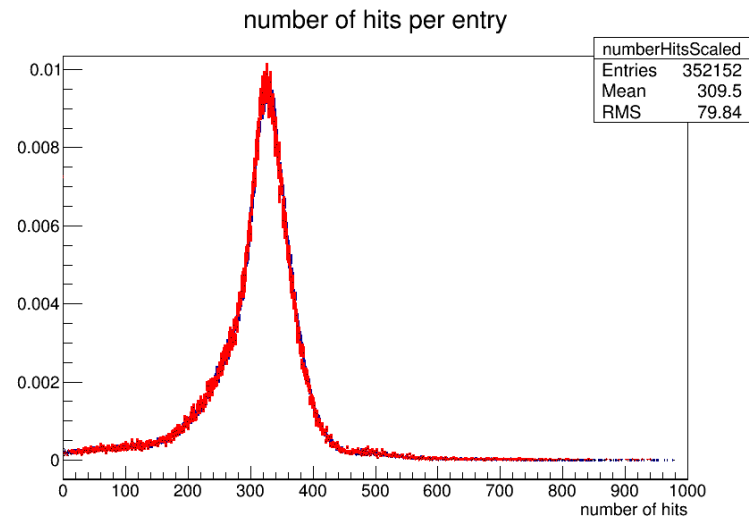
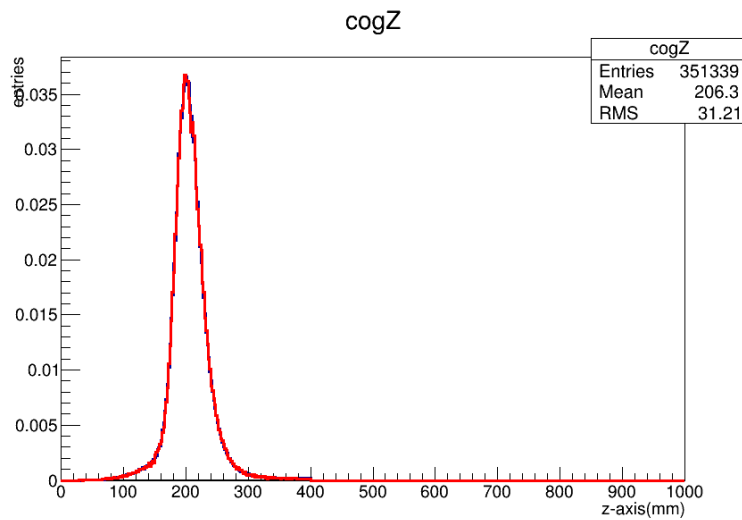
NoPP
PP

Variables After Saturation Correction: 80 GeV



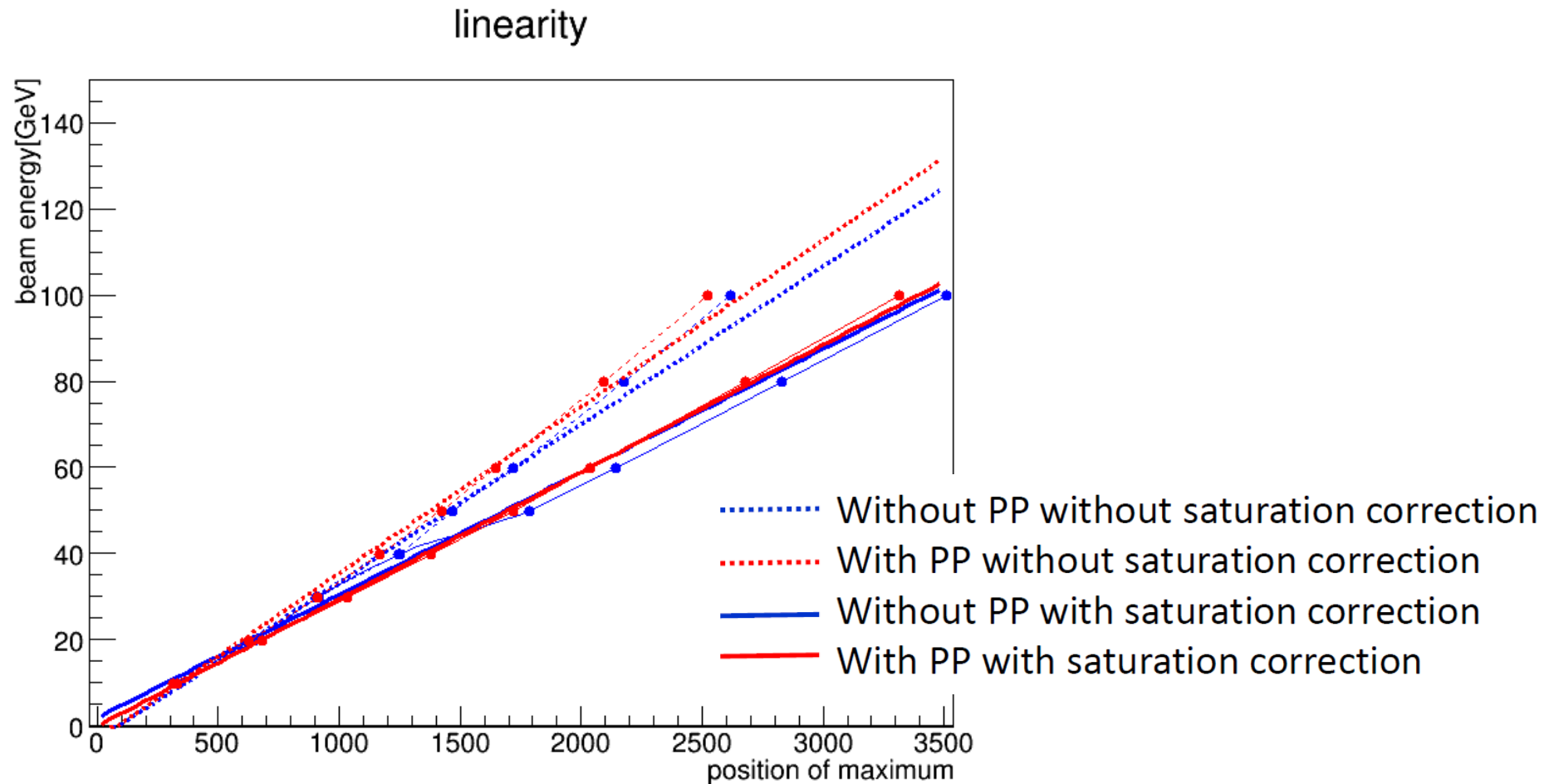
NoPP
PP

Variables After Saturation Correction: 100 GeV



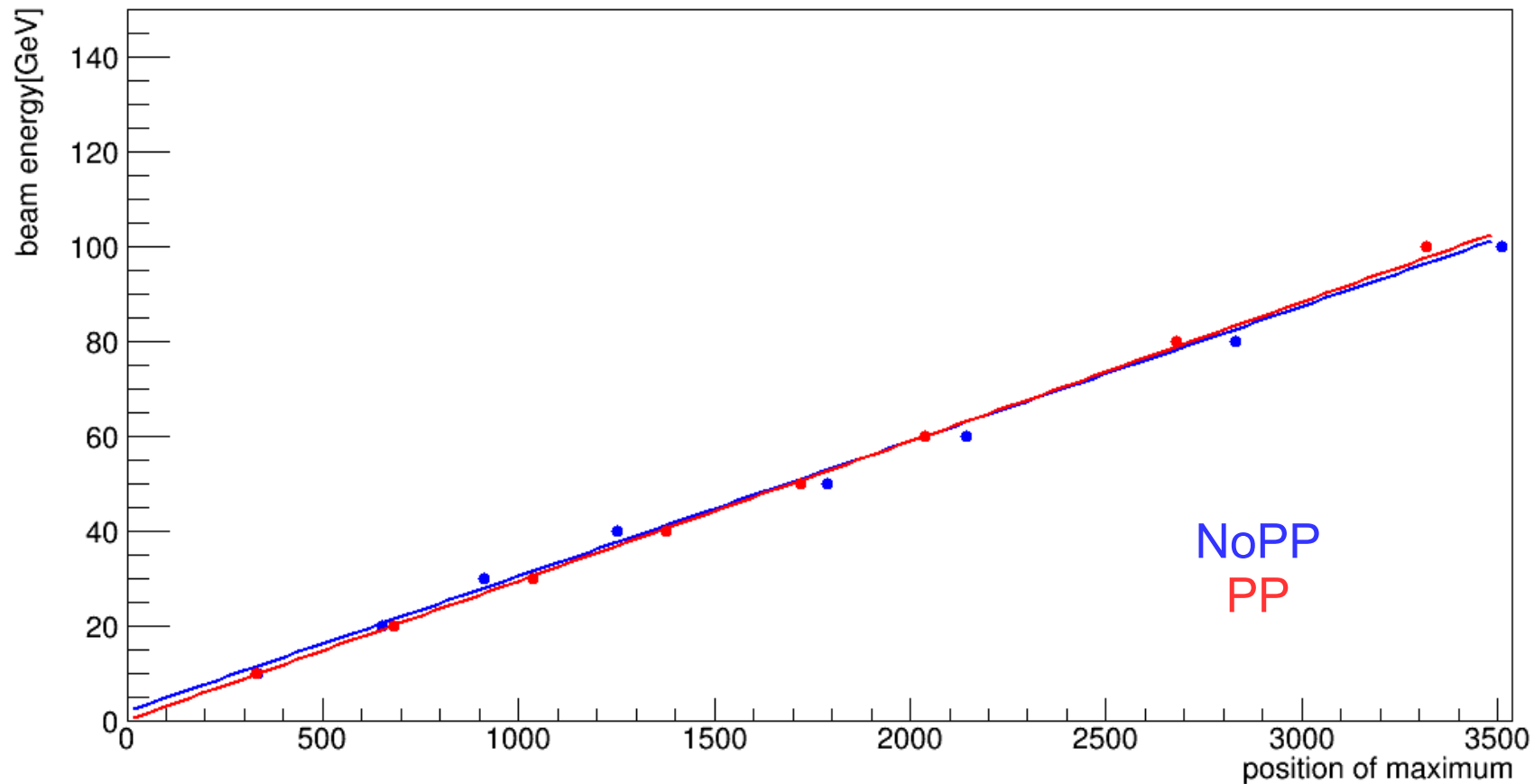
NoPP
PP

Linearity of Maximum of Energy Sum

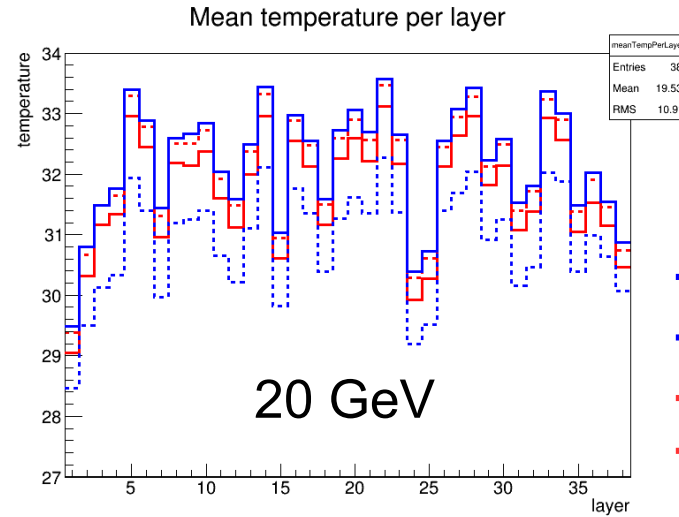
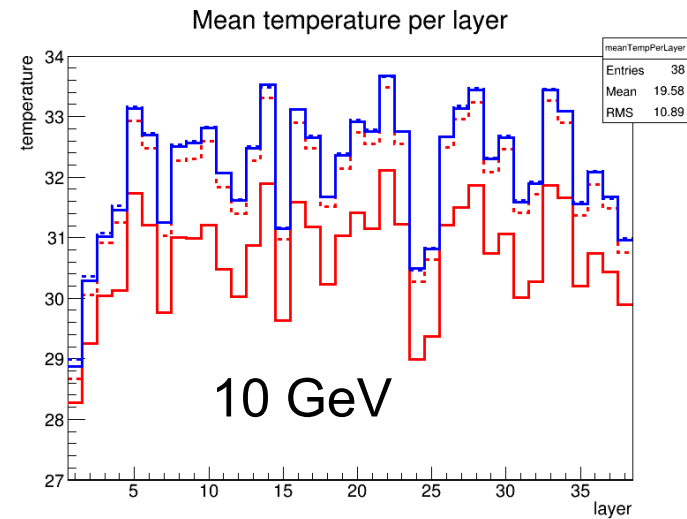


Linearity of Maximum of Energy Sum

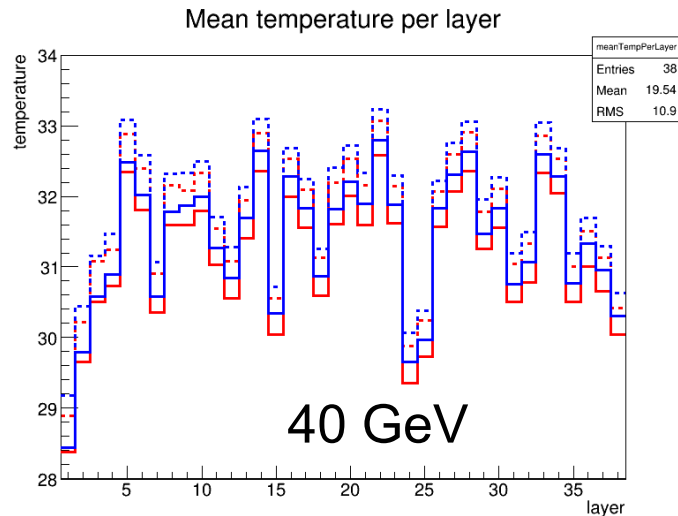
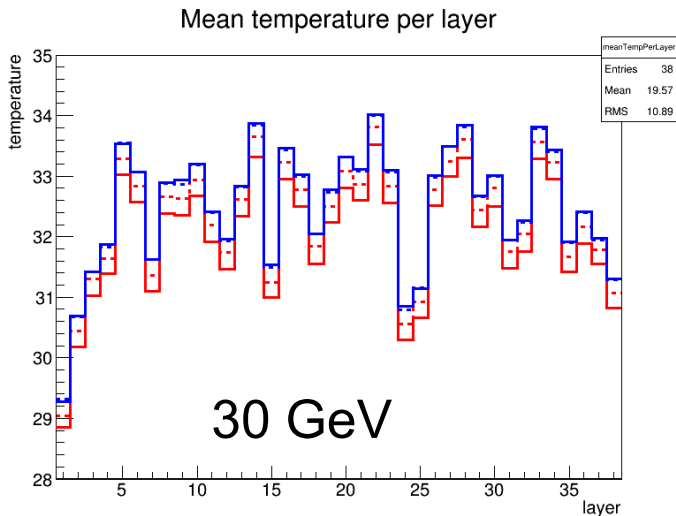
linearity



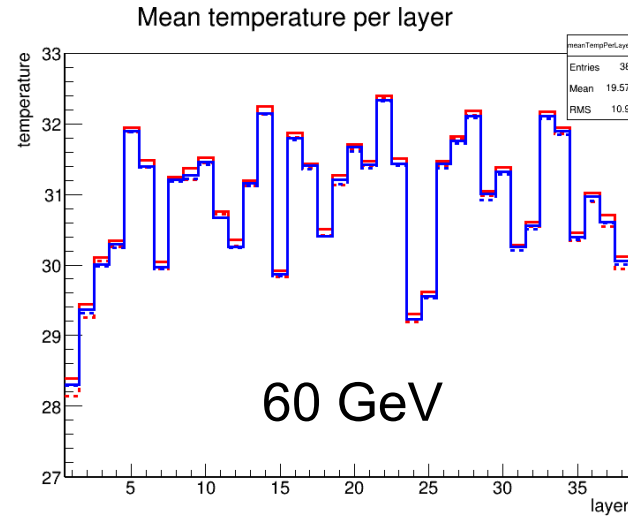
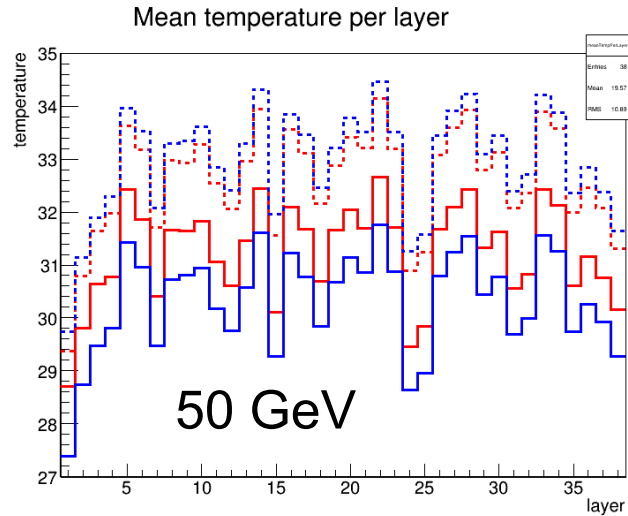
Temperature



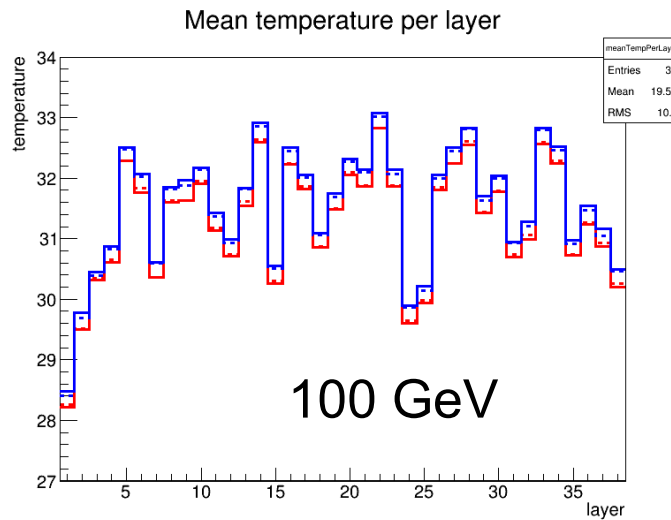
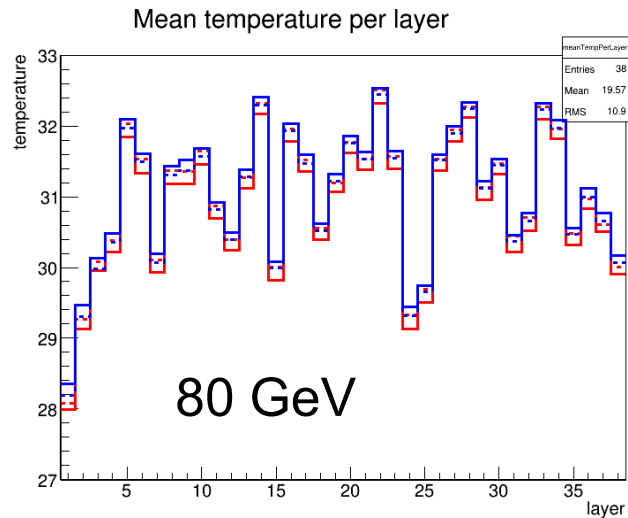
- NoPP, first temp
- NoPP, last temp
- PP, first temp
- PP, last temp



Temperature



- NoPP, first temp
- NoPP, last temp
- PP, first temp
- PP, last temp



Outlook

- Apply temperature corrections
- Longitudinal shower profile
- Understand remaining differences
- Compare with simulation