

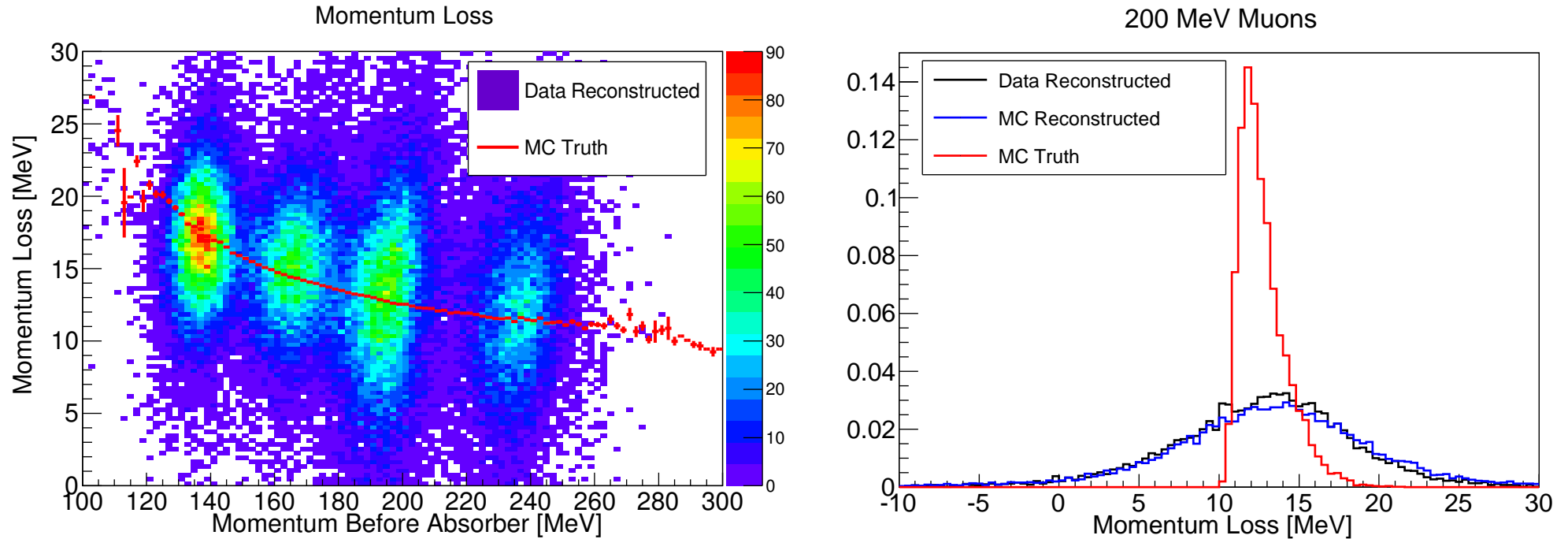
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# Energy Loss Analysis

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# Momentum Loss Measurement



- With two working trackers, simple measurement is easy
- 200 MeV MC:  $(13.3 \pm 5.9)$  MeV  
200 MeV Data:  $(12.8 \pm 5.3)$  MeV
- Can improve upon this simple measurement

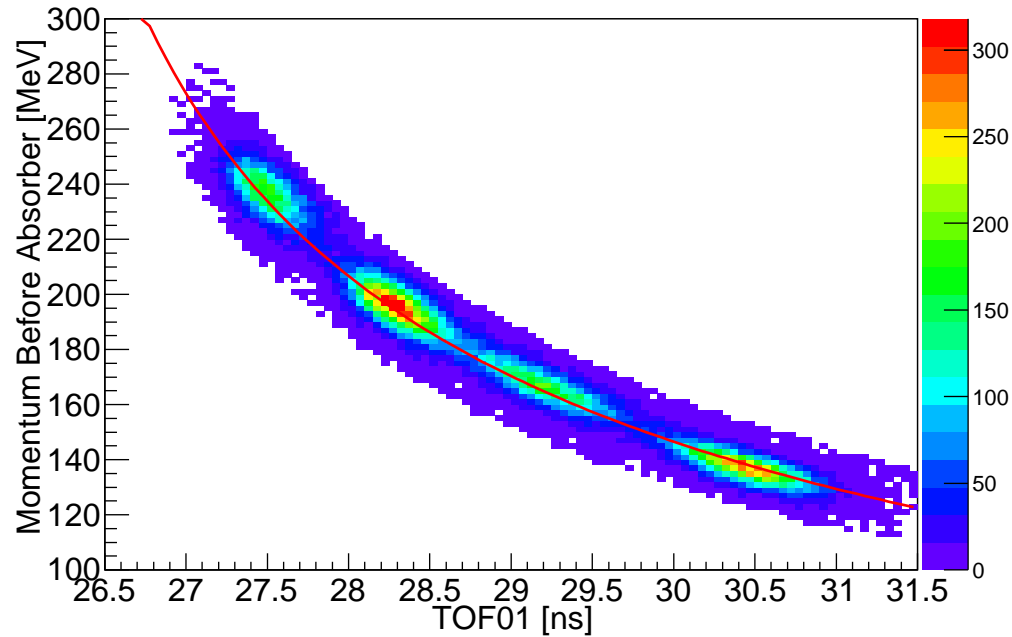
# Sample Selection

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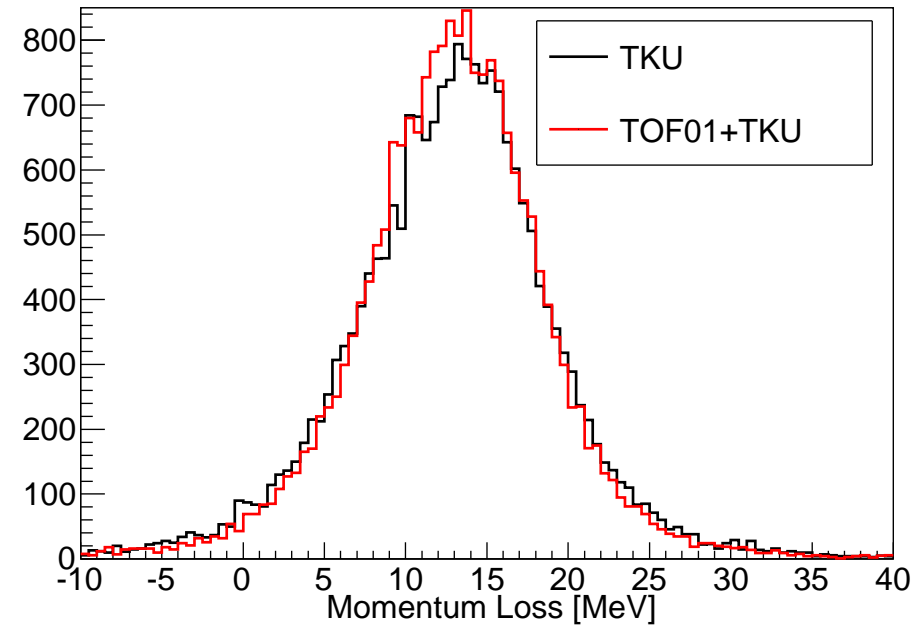
- Exactly one helical track upstream and downstream
- Loose TOF01 - TKU cut to cut out pions and scraped muons
- $p_T/p > 0.1$  to ensure momentum is well-measured

# Adding TOF

TOF - Momentum Fit



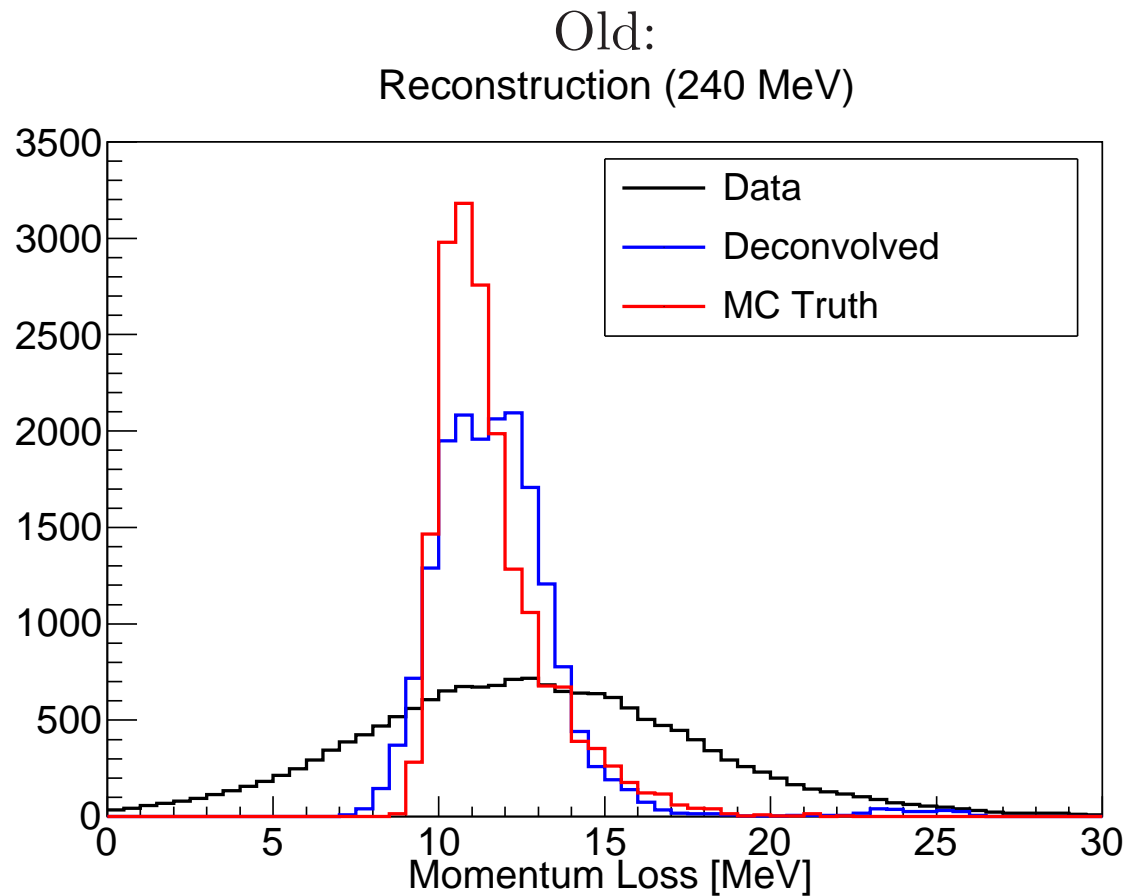
Momentum Loss (200 MeV Run)



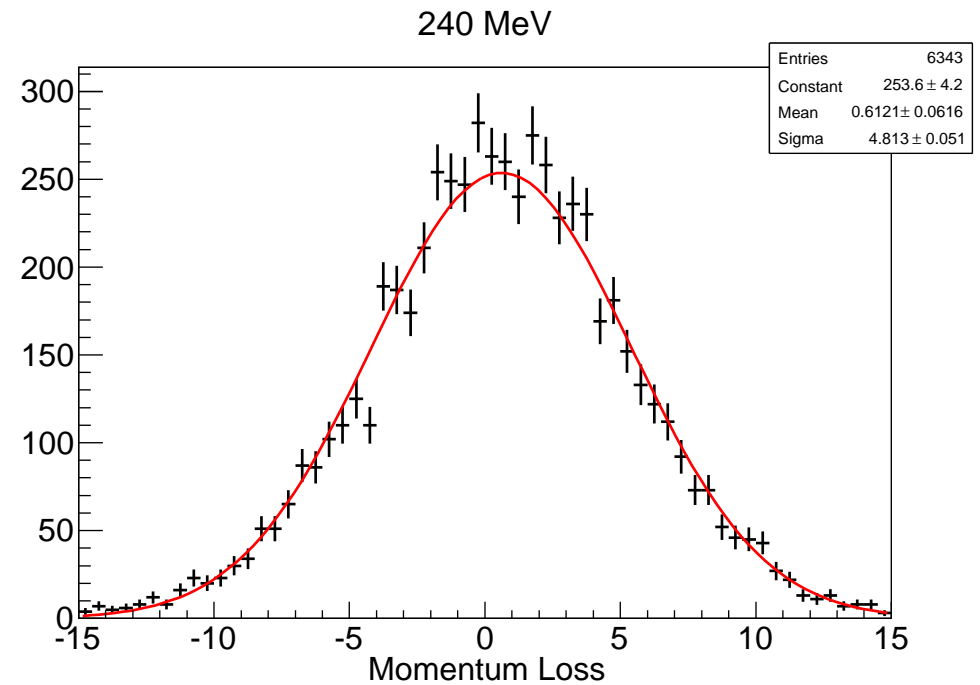
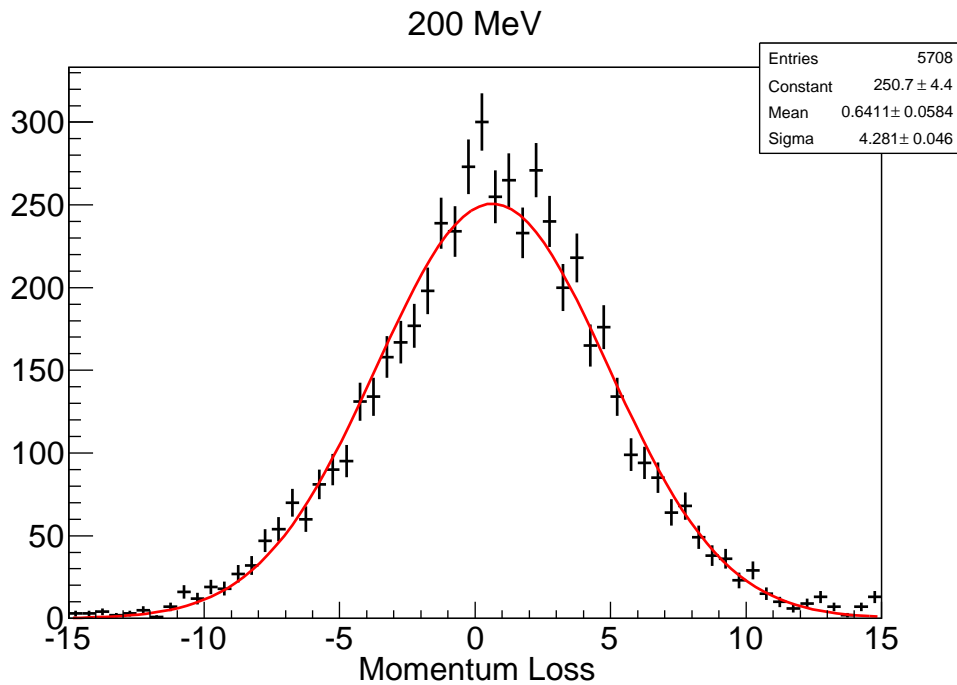
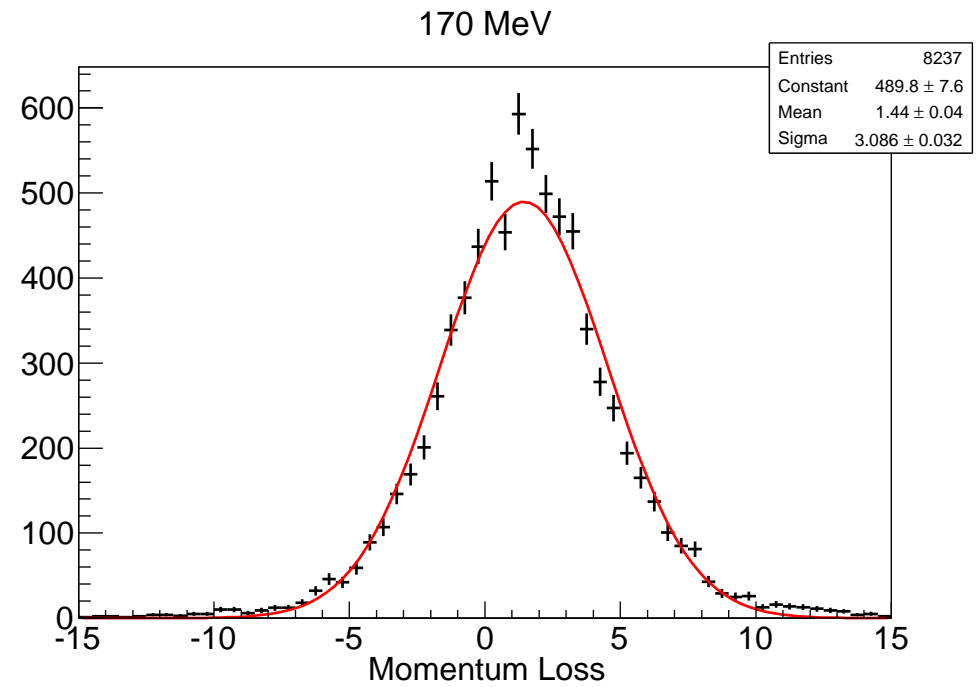
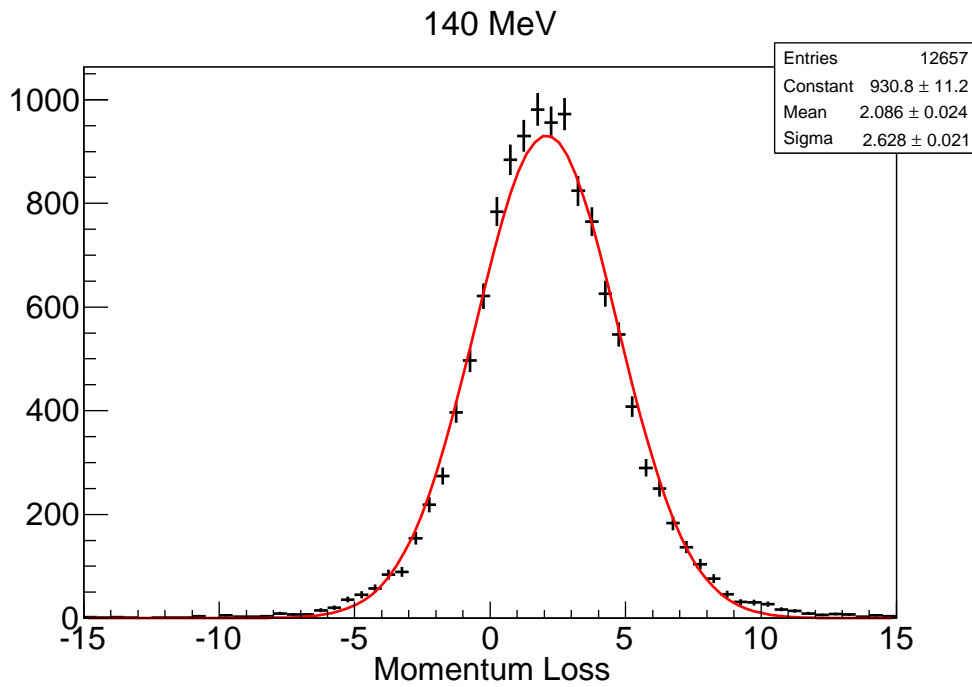
- TOF01 gives a momentum measurement with similar precision to the tracker
- Combining TOF and tracker measurements improves the upstream resolution

# Convolution Fit

- Fit empty absorber data to find resolution
- Fit LiH absorber data to convolution of landau (free parameters) and gaussian (from empty fit)
- Improved results compared to deconvolution

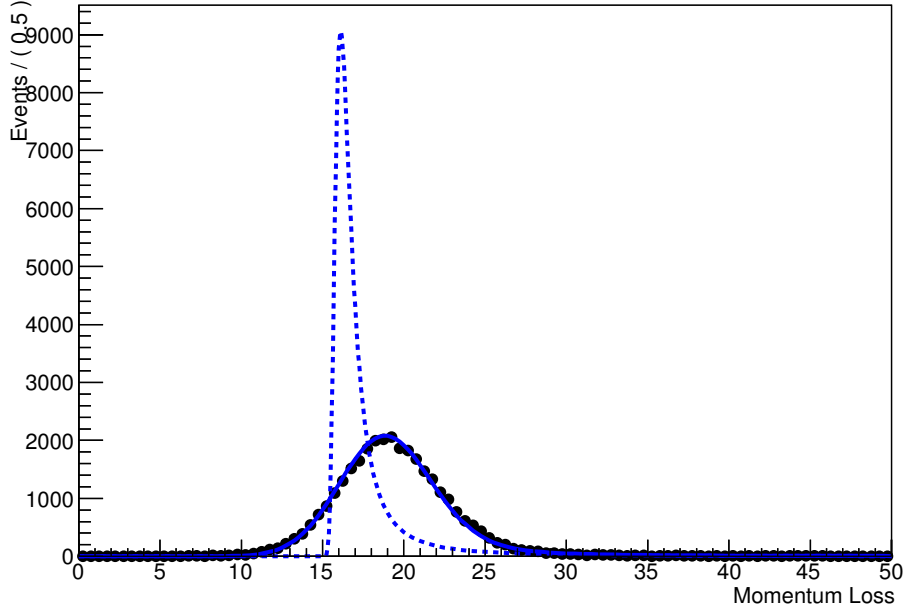


# Empty Absorber Fits

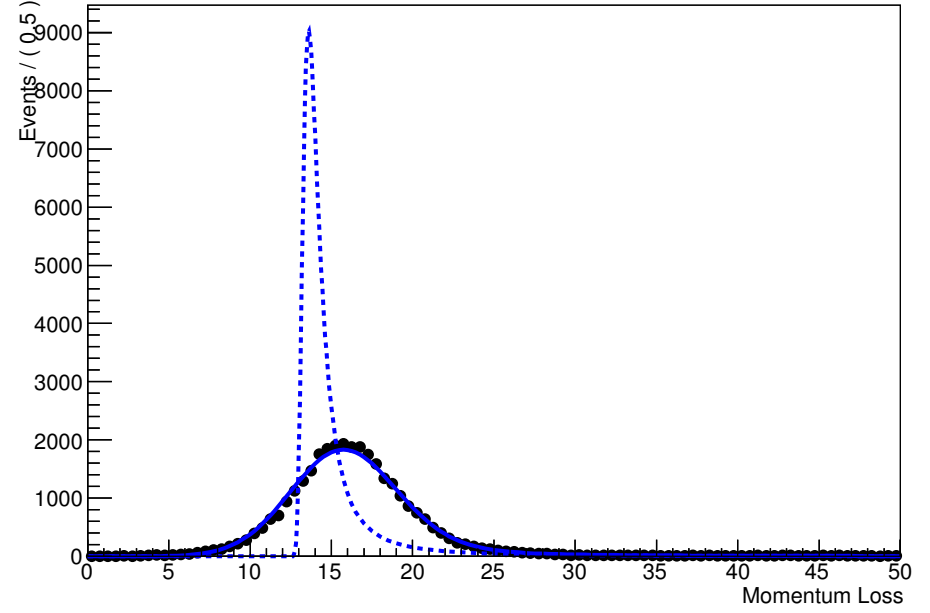


# Convolved Energy Loss Fits

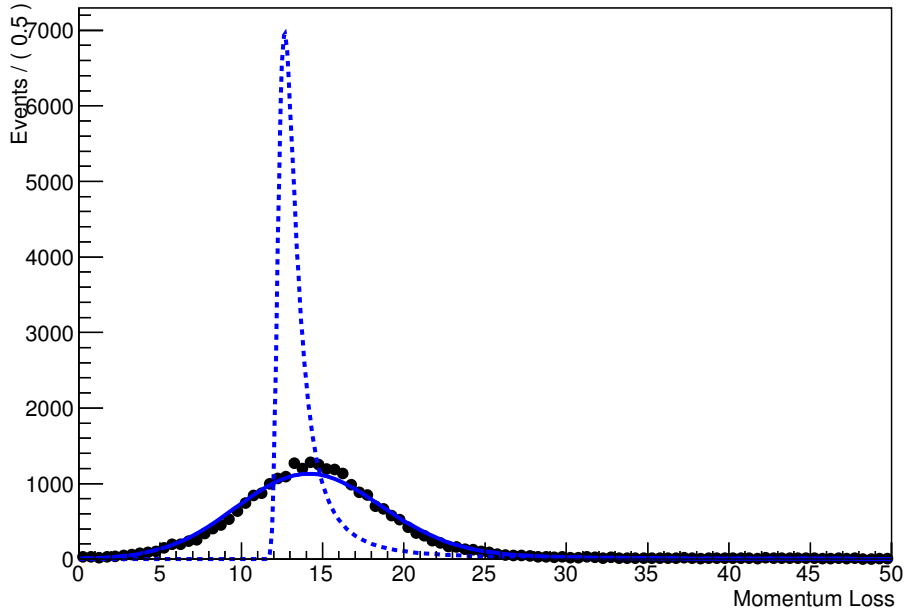
140 MeV



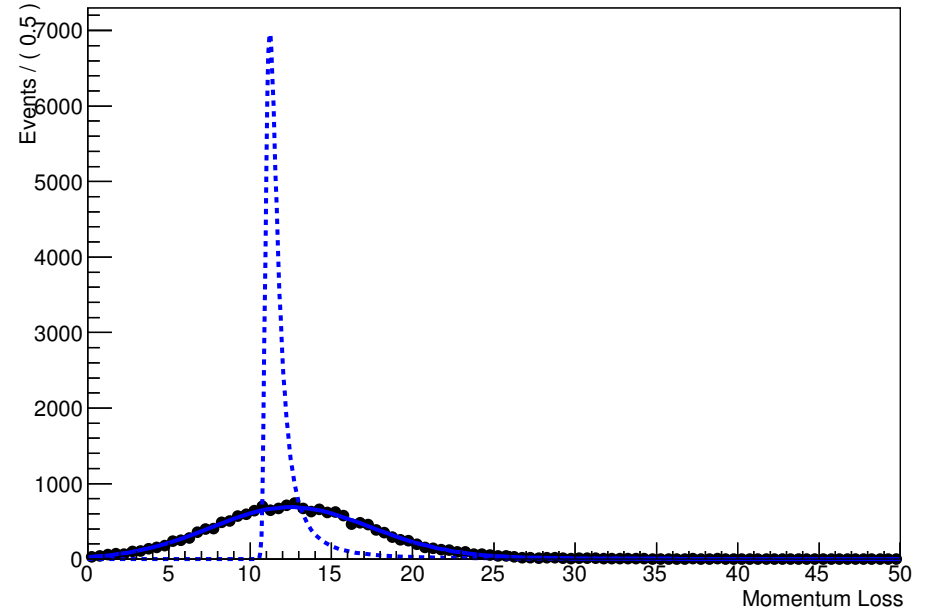
170 MeV



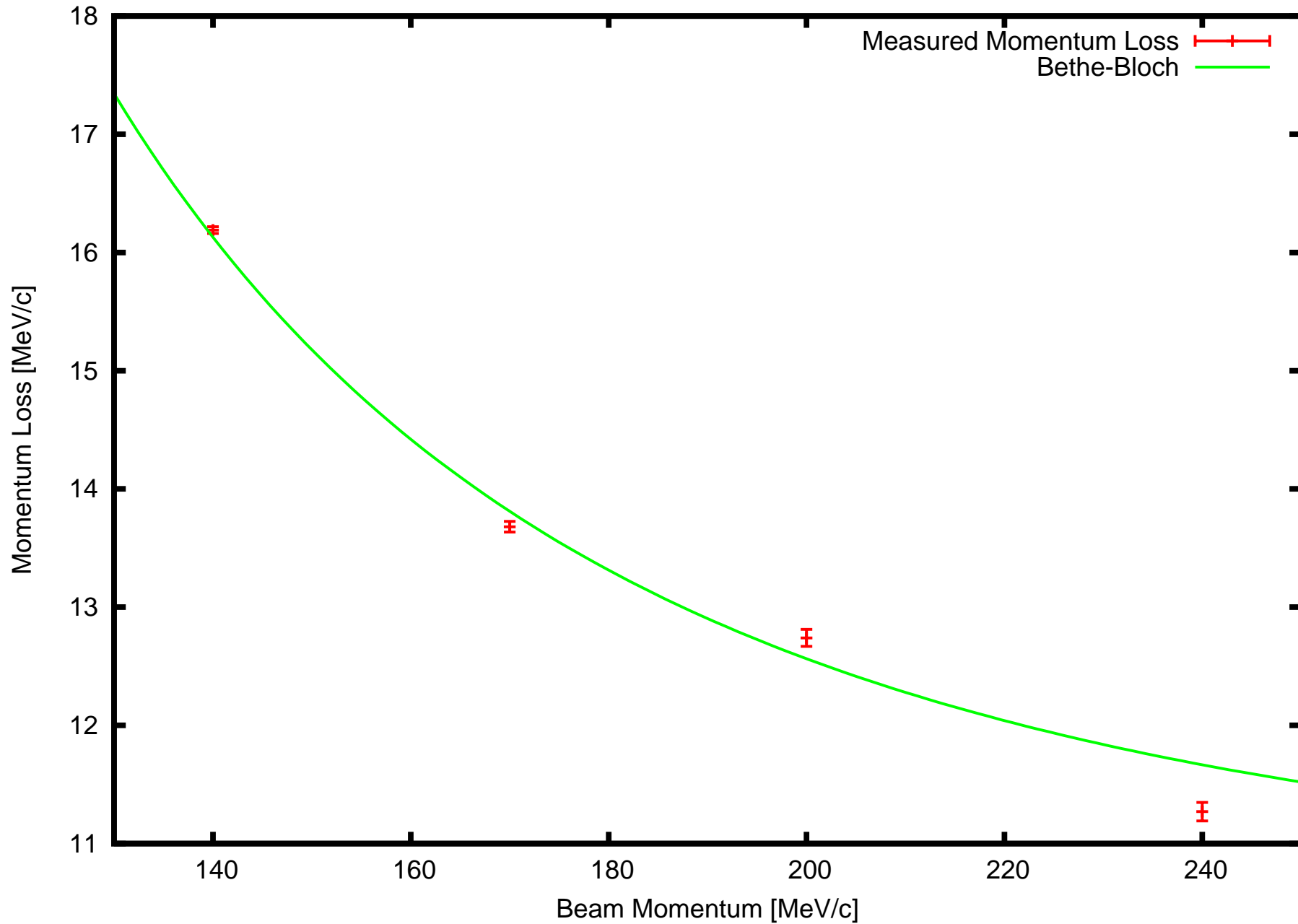
200 MeV



240 MeV



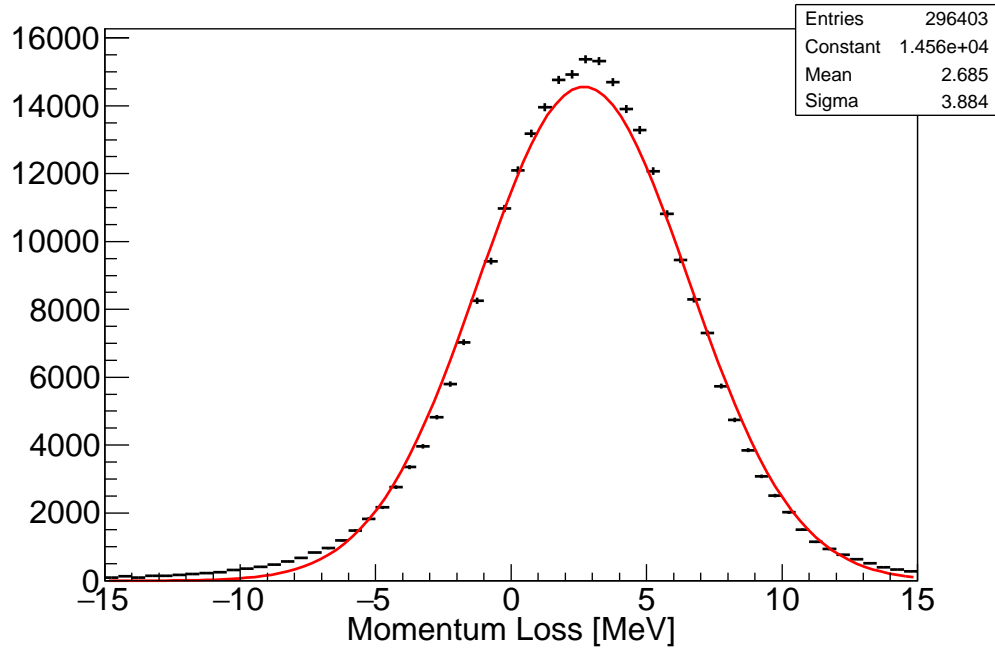
# Comparison to Theory



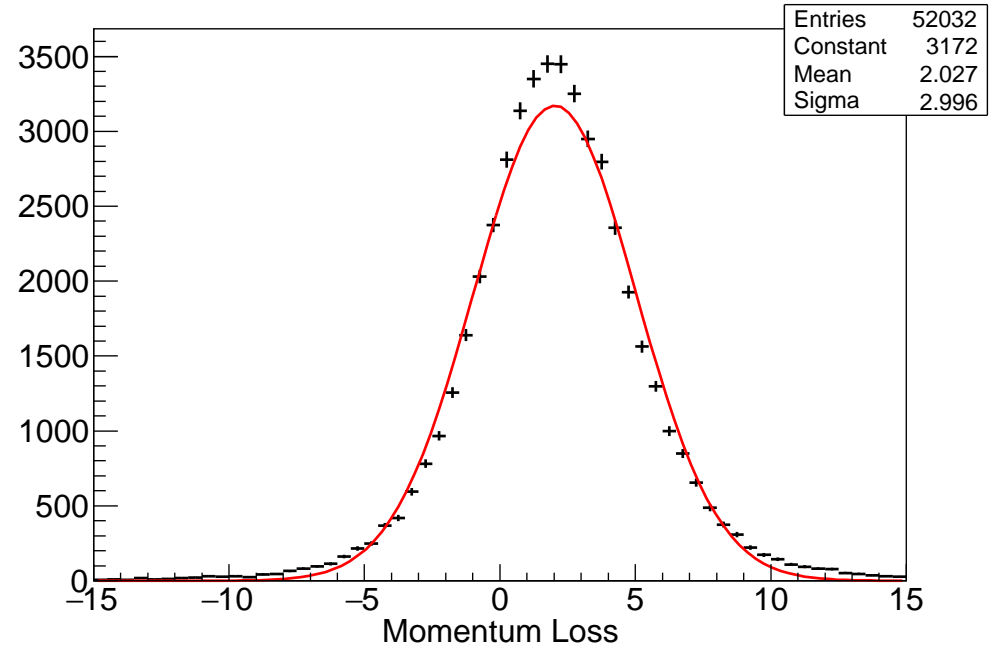


# LH<sub>2</sub> Empty Data

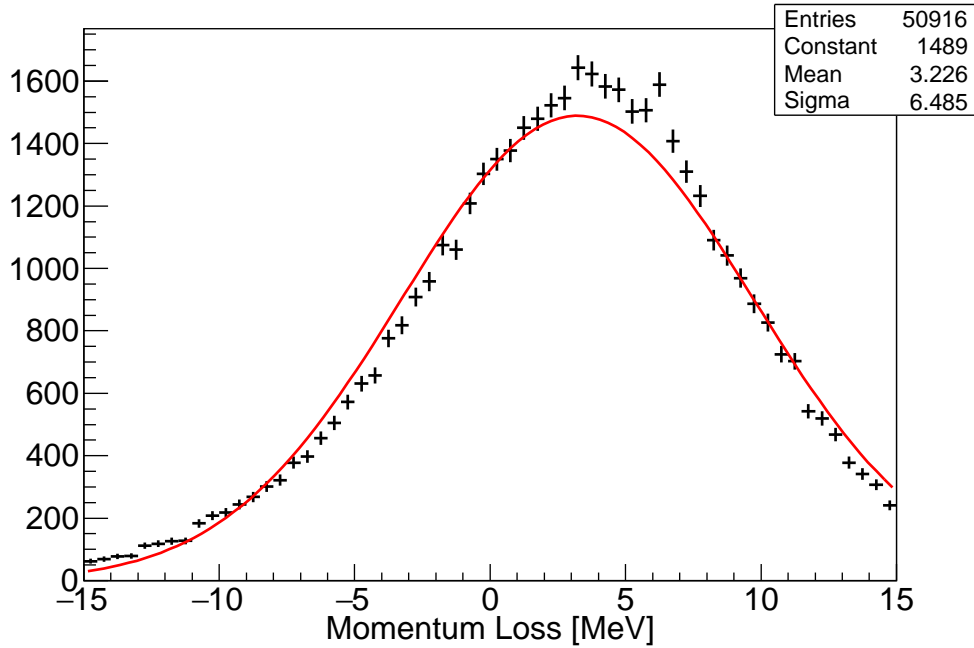
140 MeV



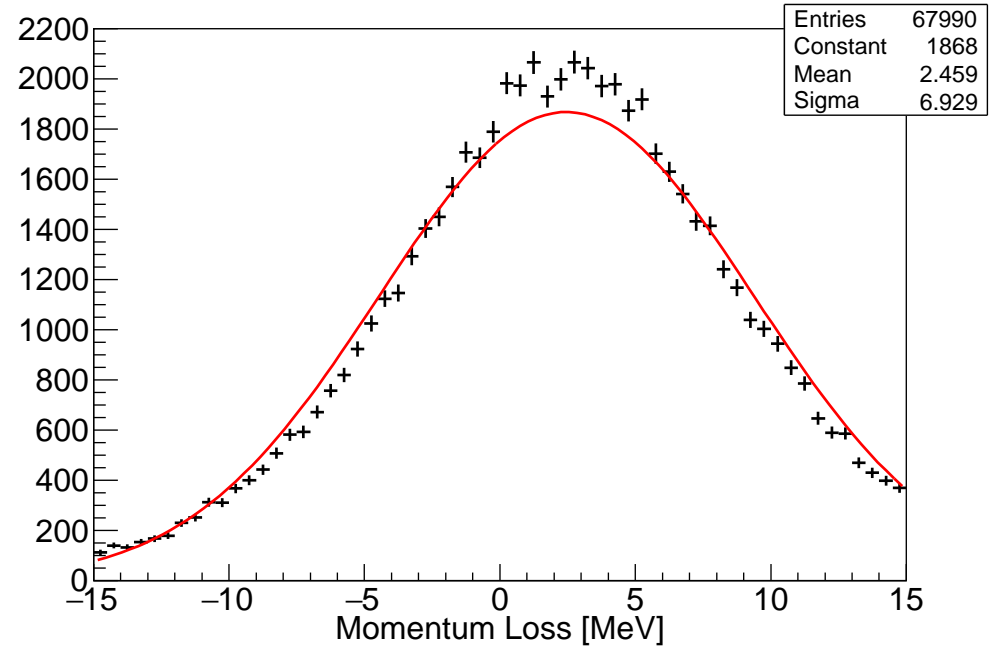
170 MeV



200 MeV

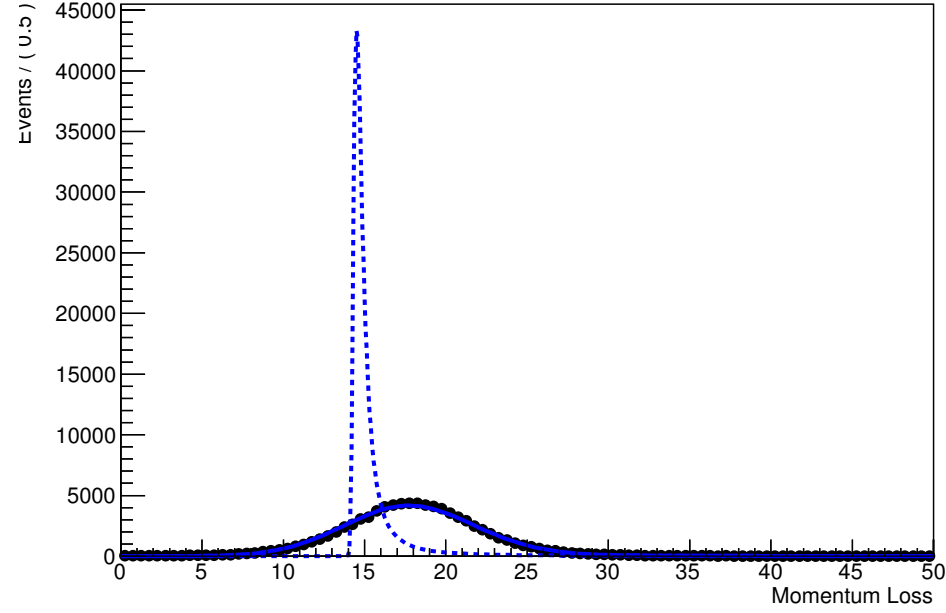


240 MeV

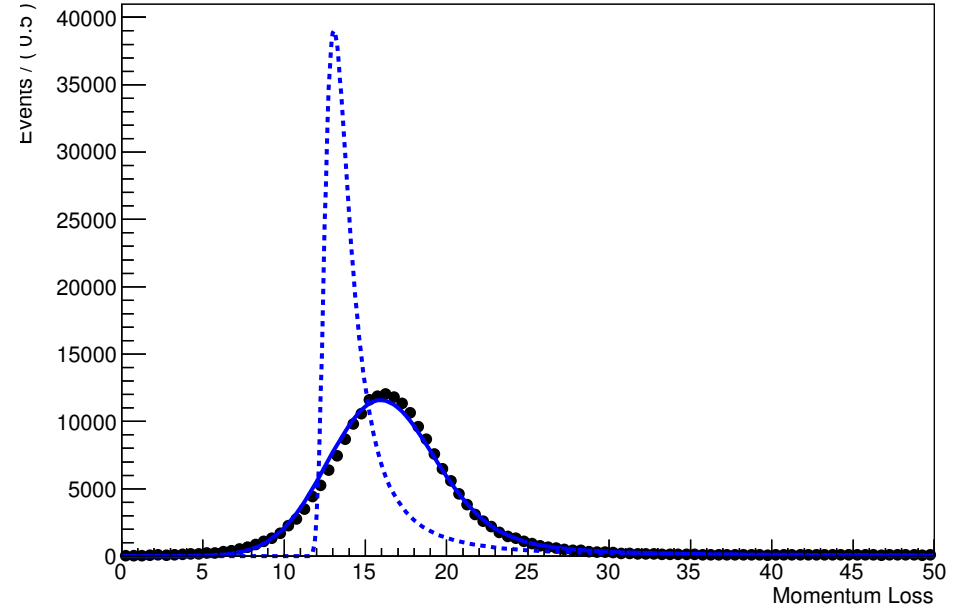


# LH<sub>2</sub> Convolved Fits

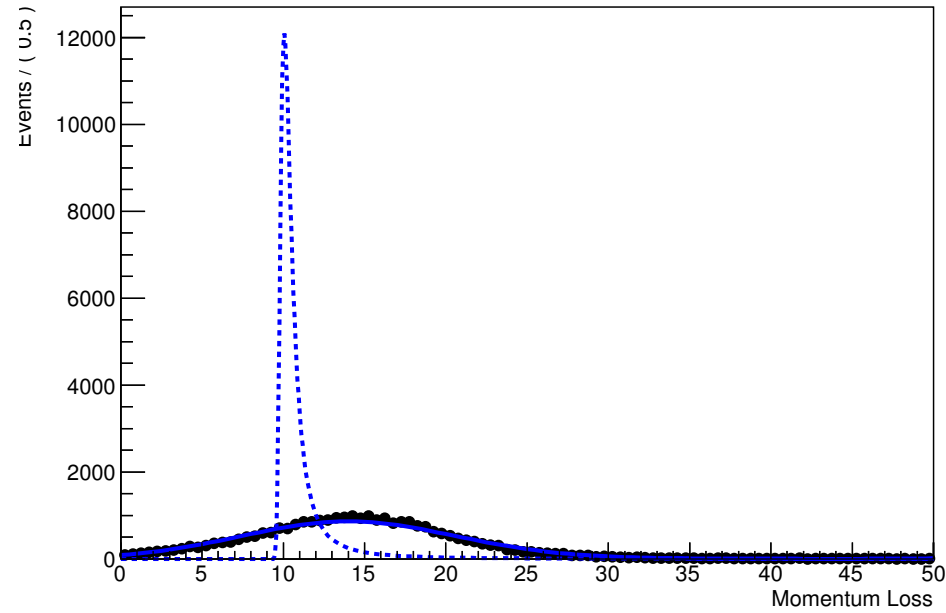
140 MeV



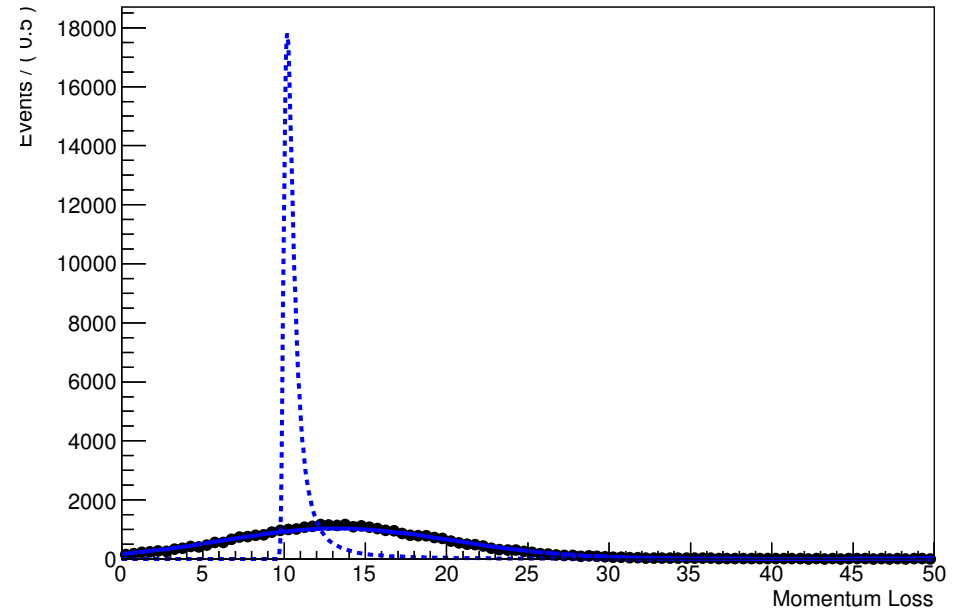
170 MeV



200 MeV



240 MeV



# Comparison to Theory

