Energy Loss Analysis

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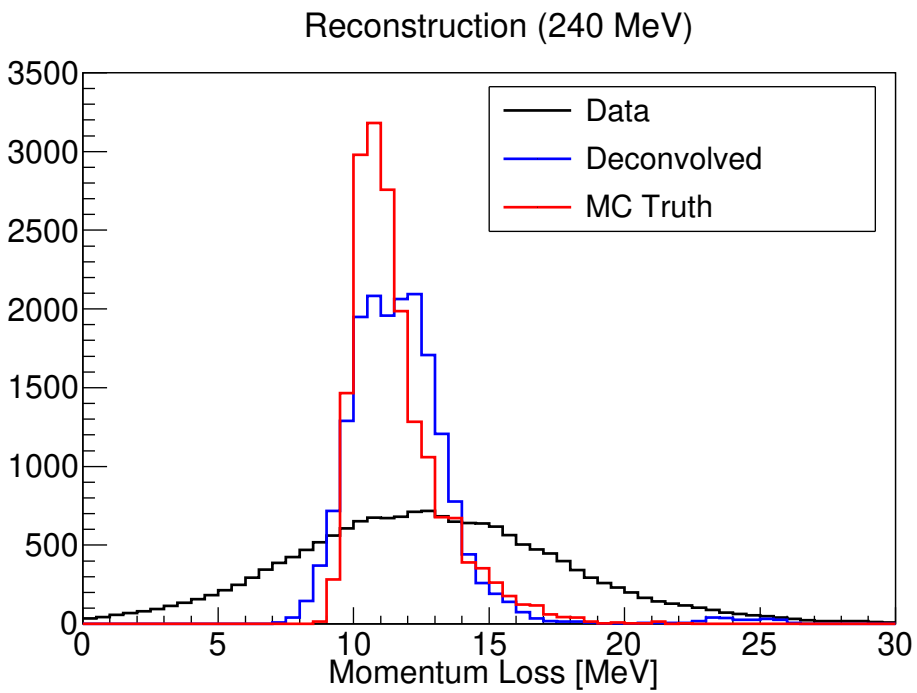
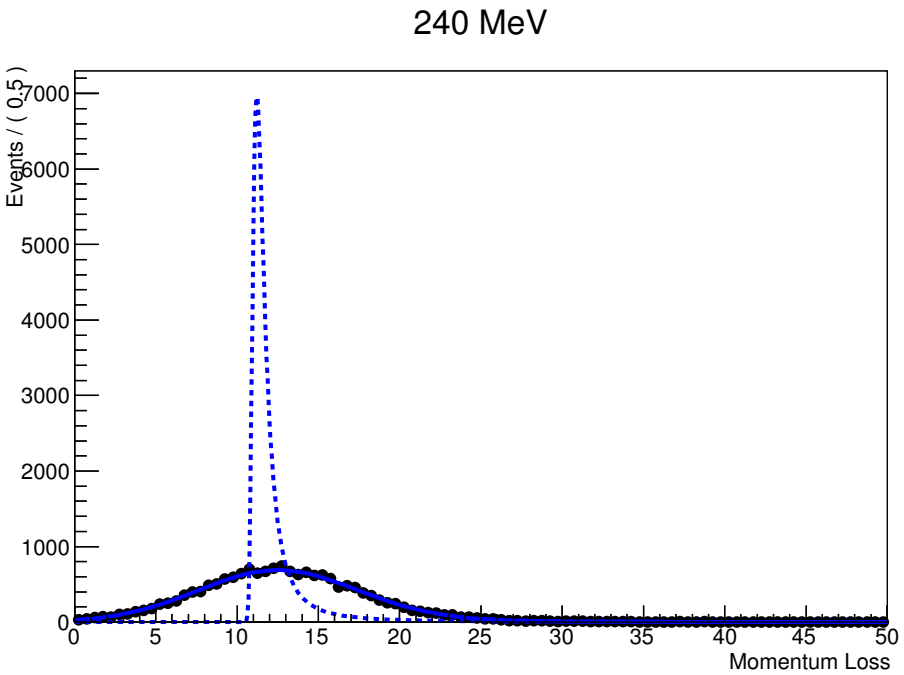
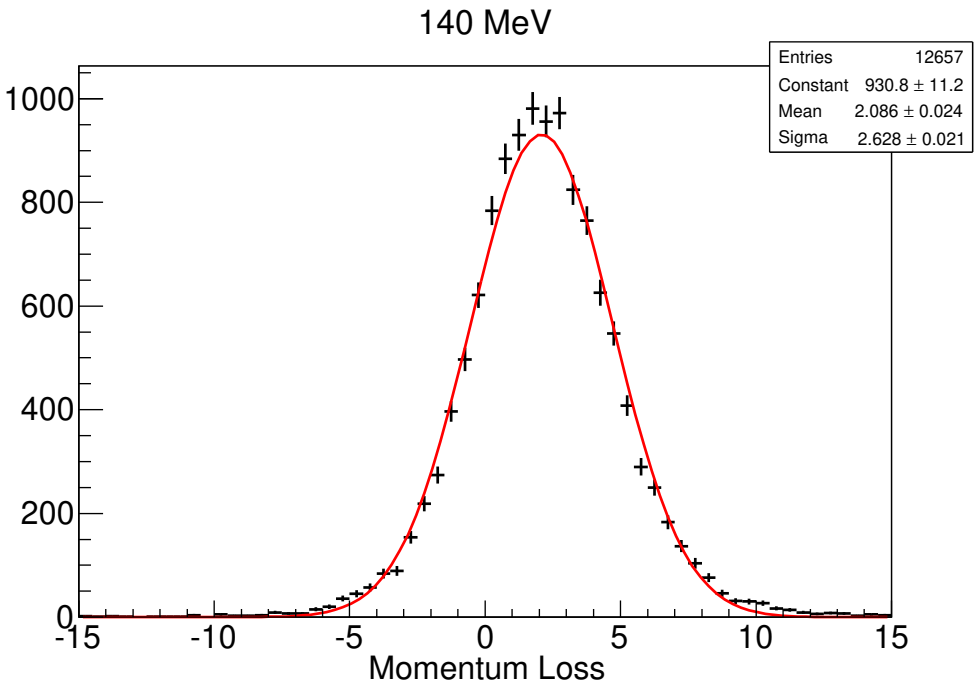
Convolution Fit

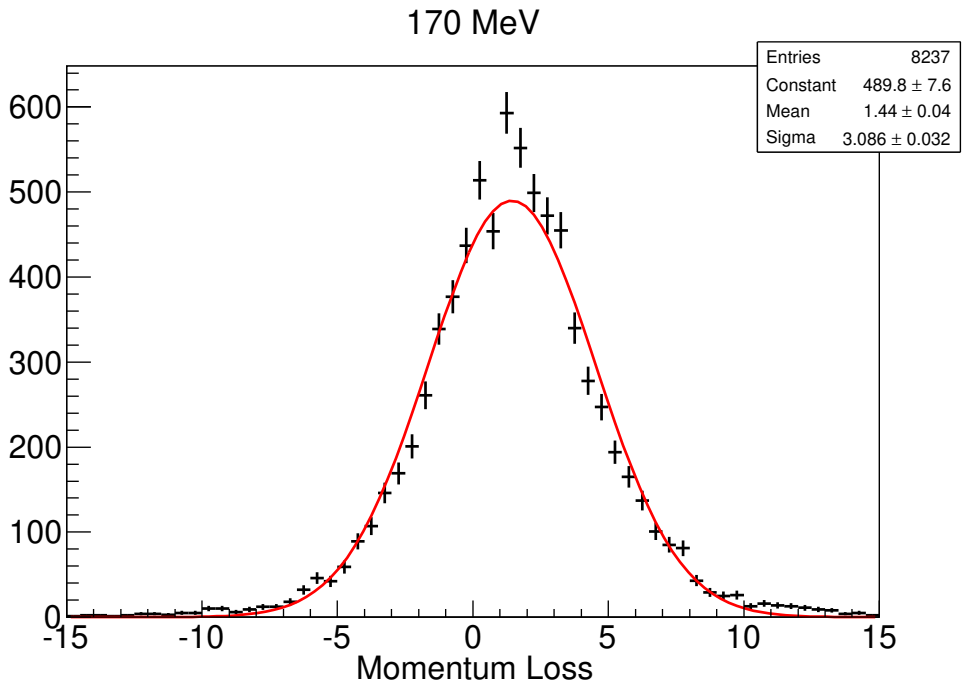
- Upstream momentum measured by TOF and Tracker weighted average
- Downstream momentum measured by Tracker
- Fit empty absorber data to find resolution and detector effects
- Fit full absorber data to convolution of landau (free parameters) and gaussian (from empty fit)
- Fewer artifacts compared to deconvolution, more confidence that mean is correct

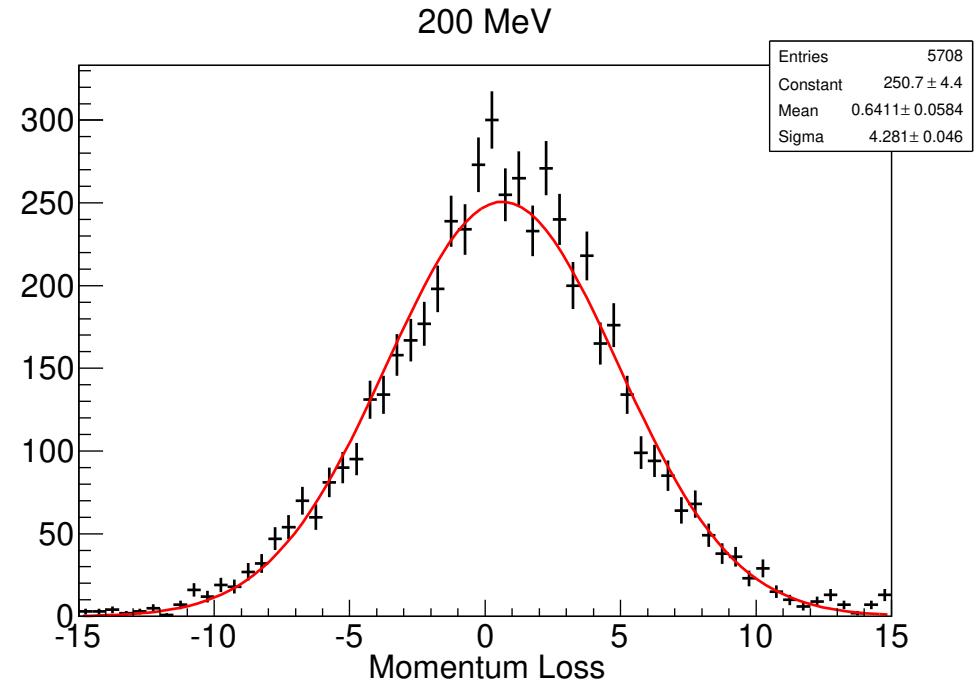


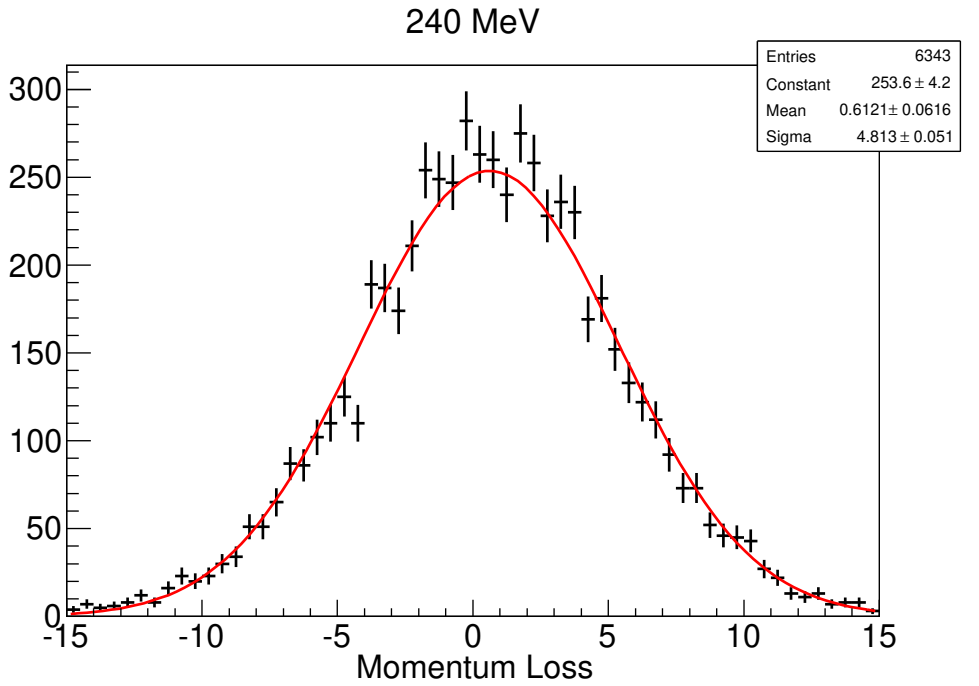


Empty Absorber Fits



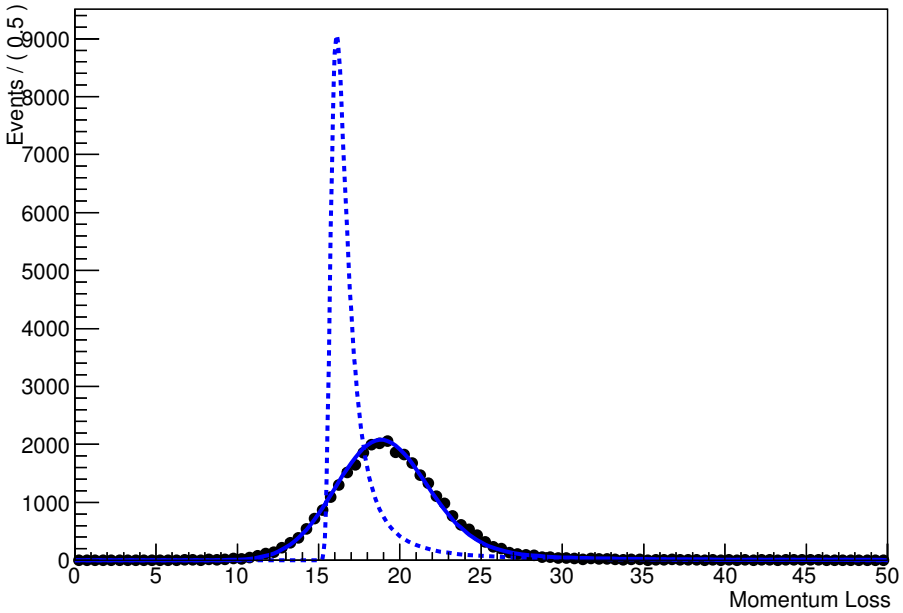




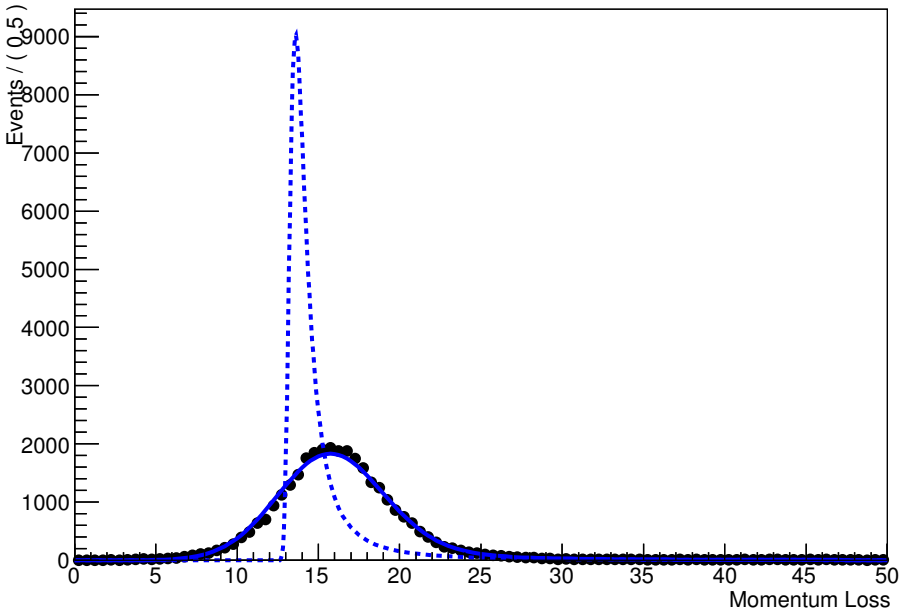


Convolved Energy Loss Fits

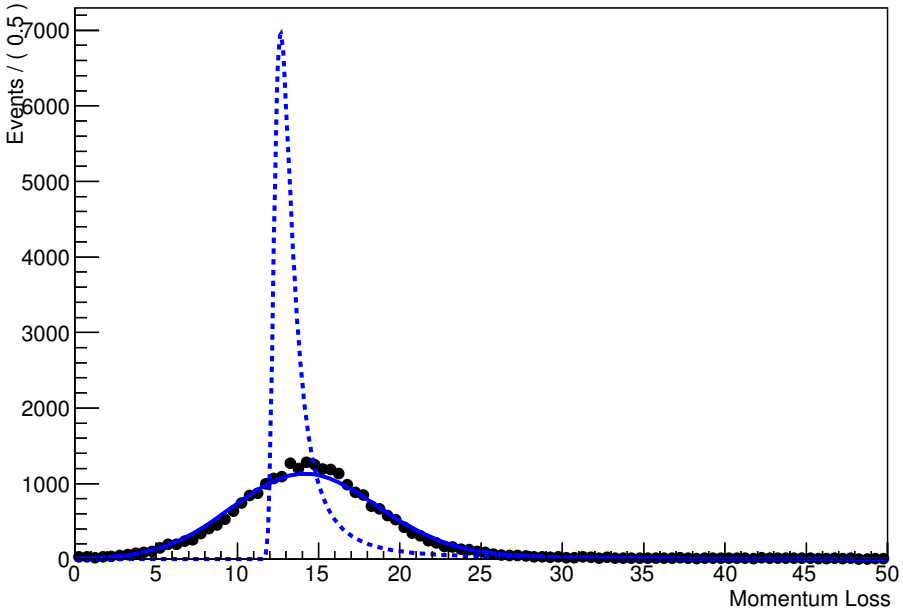
140 MeV



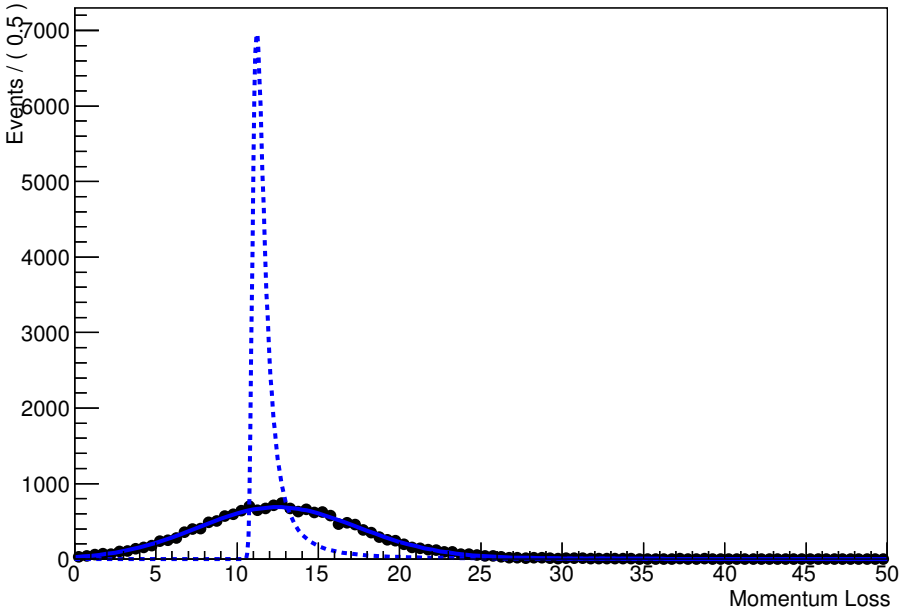
170 MeV



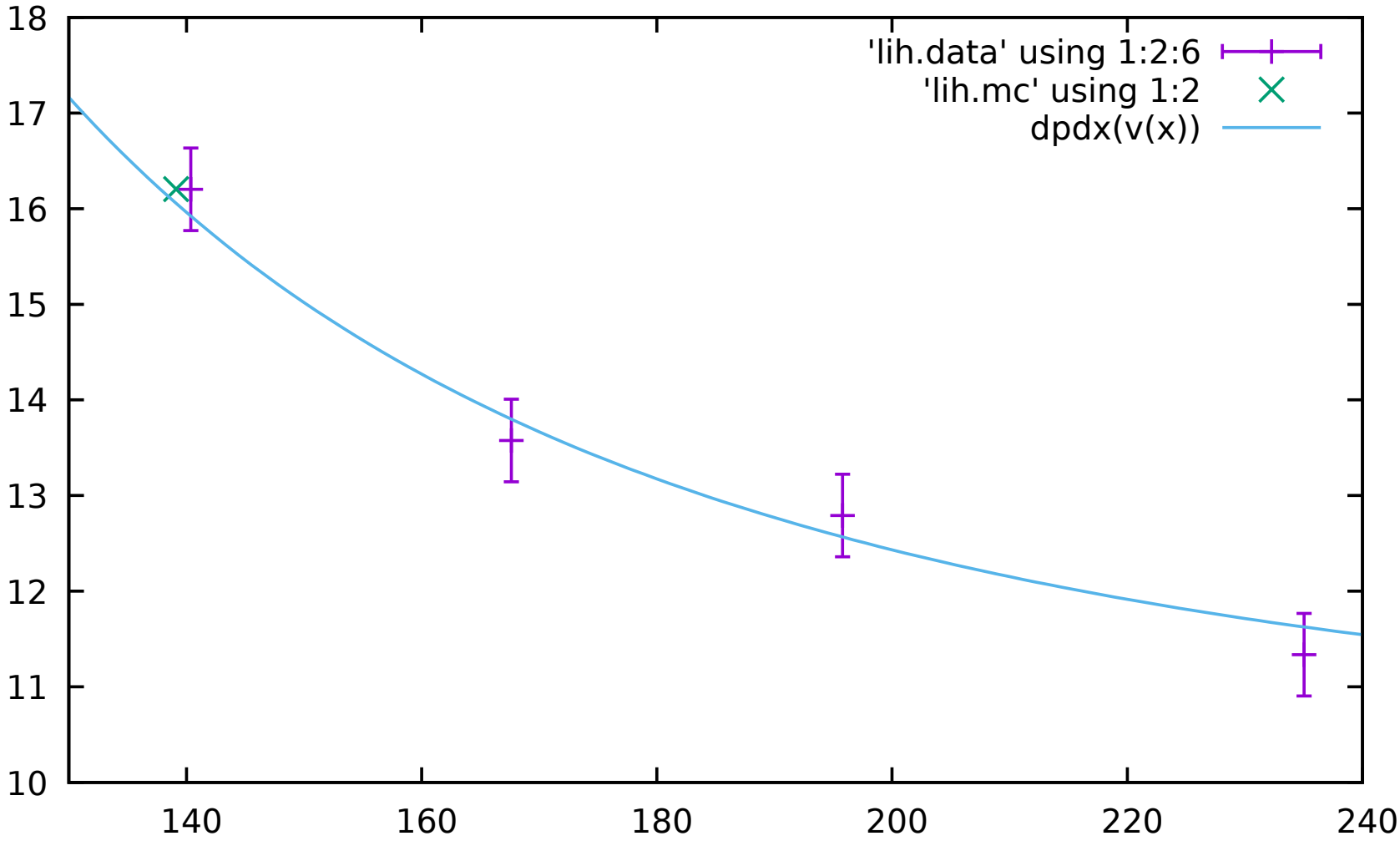
200 MeV



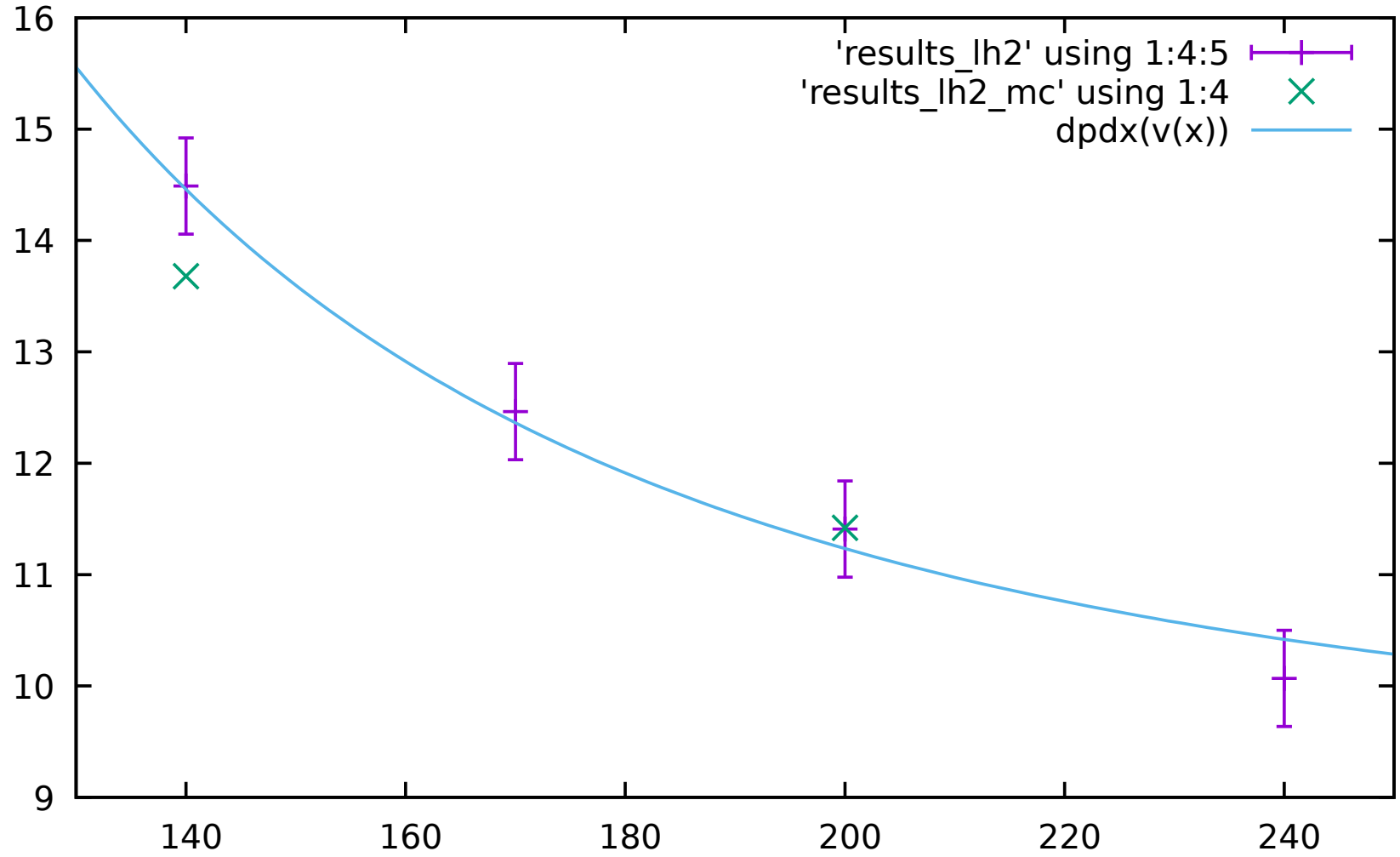
240 MeV



Comparison to Theory - LiH



Comparison to Theory - LH2



Systematics

- Have MC with LH2 parameters varied (small to medium compared to statistical)
- Many systematics should be canceled out by full/empty comparison
  e.g. TOF and tracker calibrations will be only horizontal error

Current Work

- Extrapolate LH2 tracks to measure distance in absorber
- Finish systematics
- Need to request more MC to compare at more momentum points