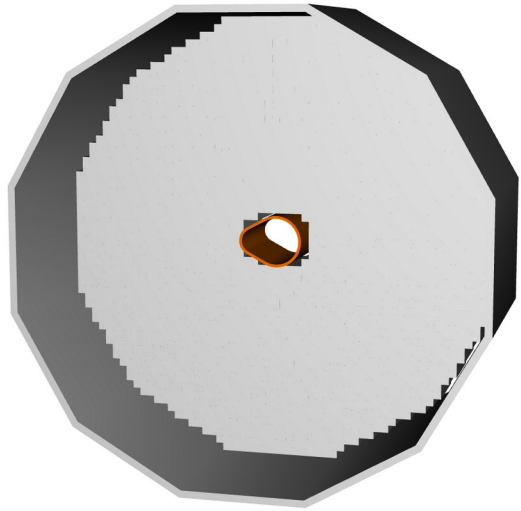


Test Beam Prototype Simulations

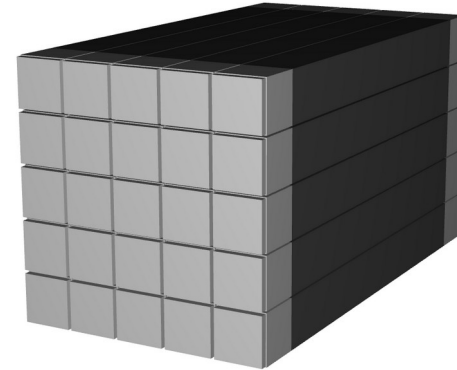
Artur Hoghmrtsyan

Simulation Setup

https://github.com/eic/epic/tree/main/build/epic_eeemcal_only.xml



Prototype Simulations



Particle Gun

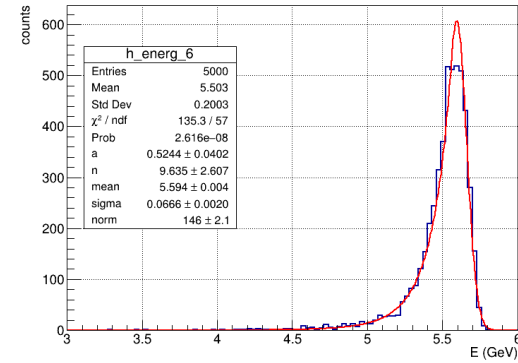
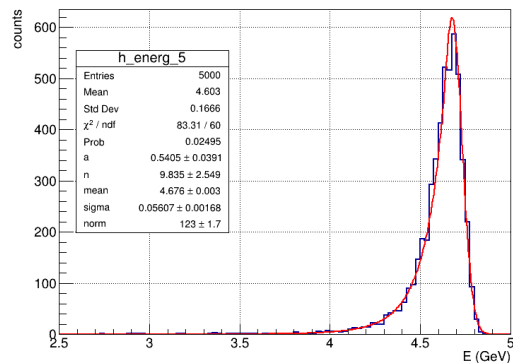
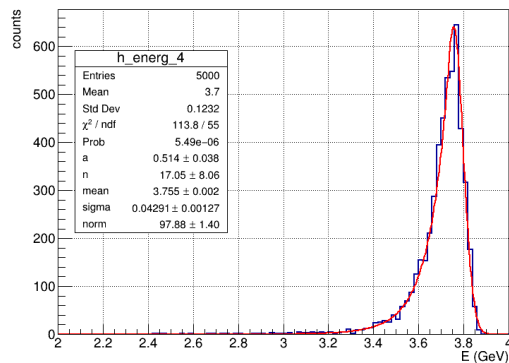
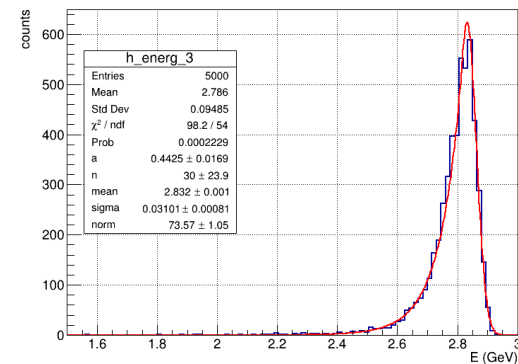
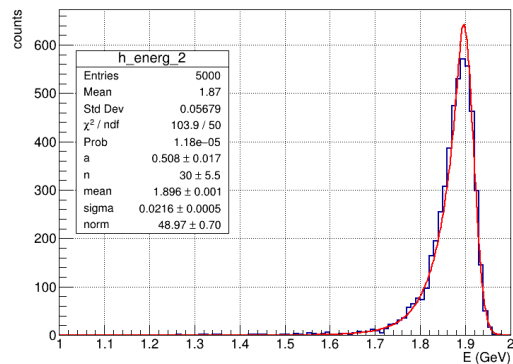
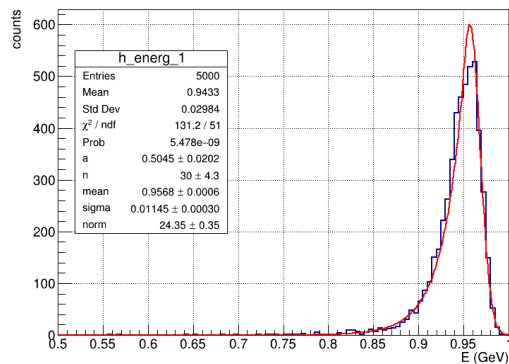
Position (0,0,-40mm)

Particle - e^-

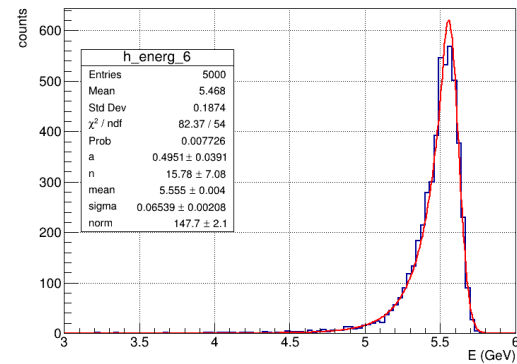
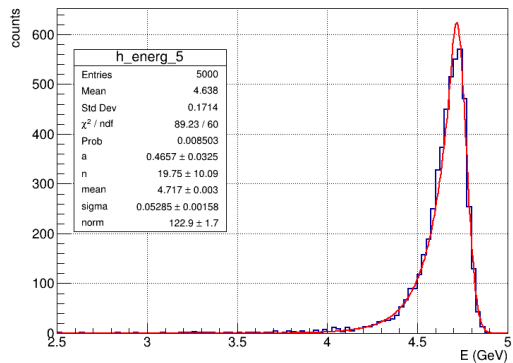
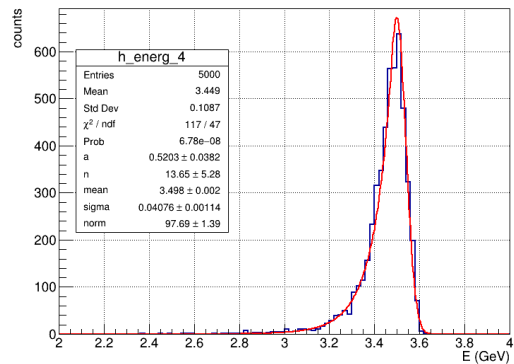
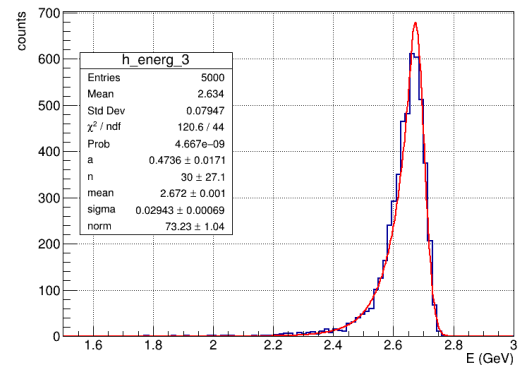
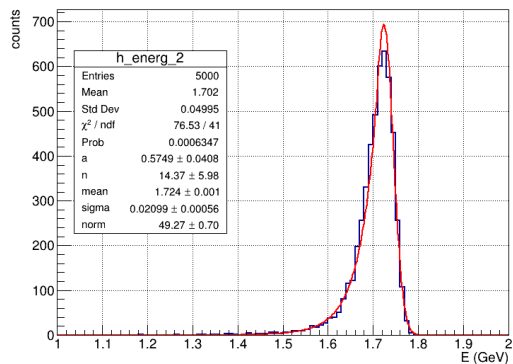
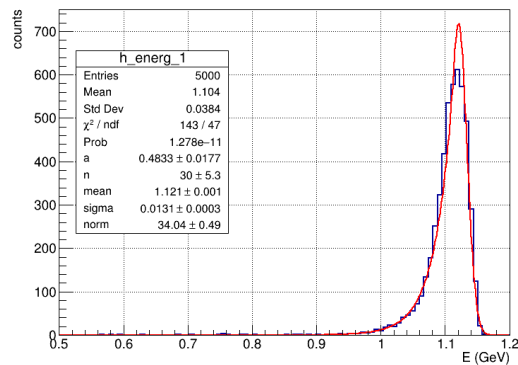
Energies - 1,2,3,4,6 (Gev)

Energy Spread - 158 (MeV)

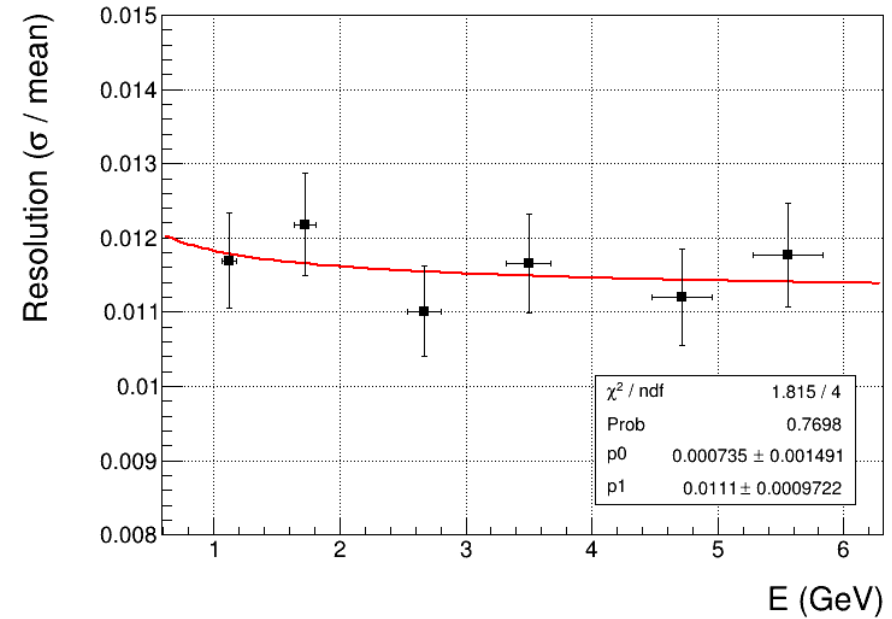
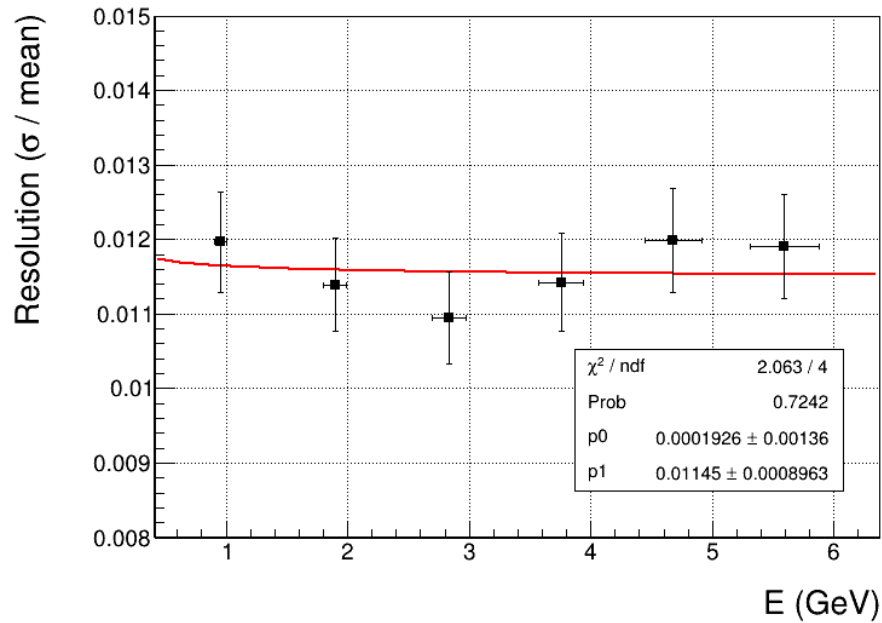
Deposited energy in Mono energetic case



Deposited energy with DESY beam energy spread

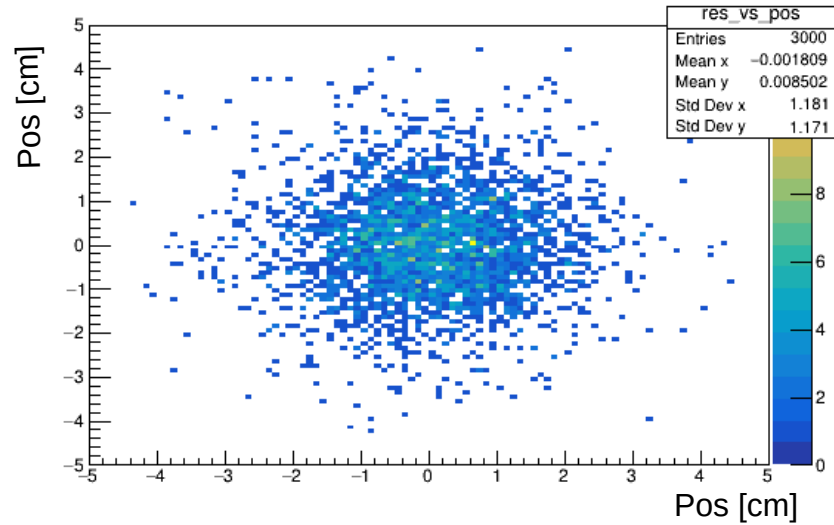


Energy Resolution for Mono energetic vs Desy energy spread



Position Resolution analysis

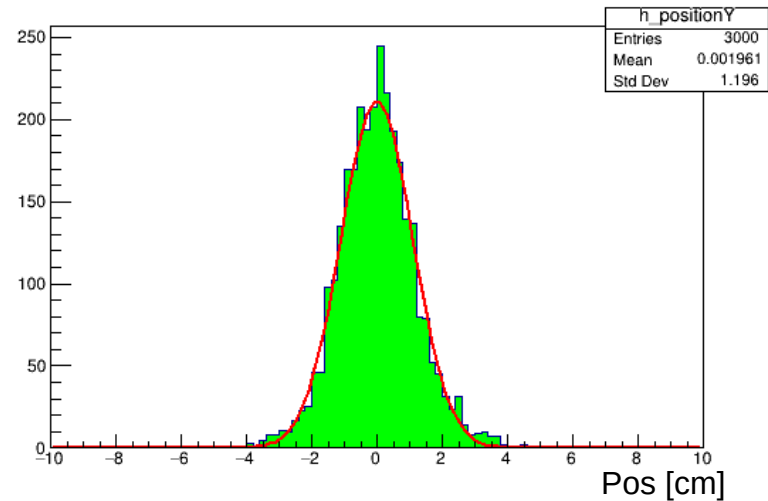
Reconstructed X vs Y positions



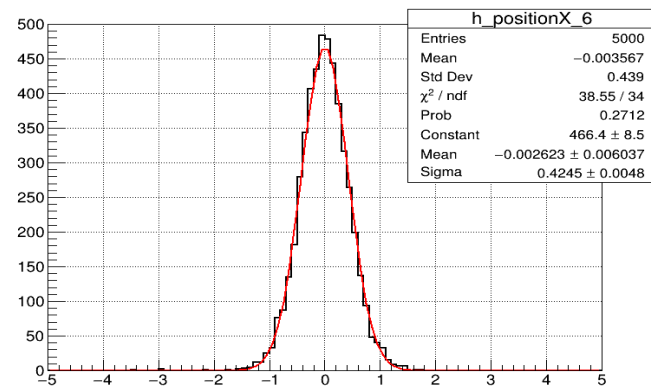
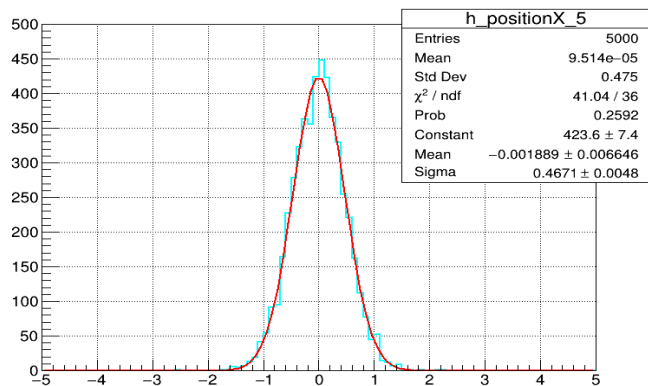
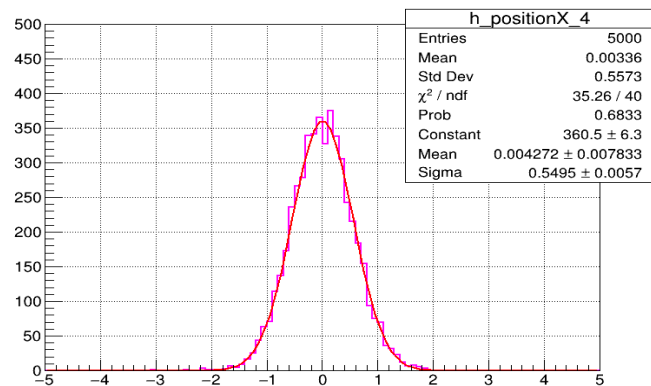
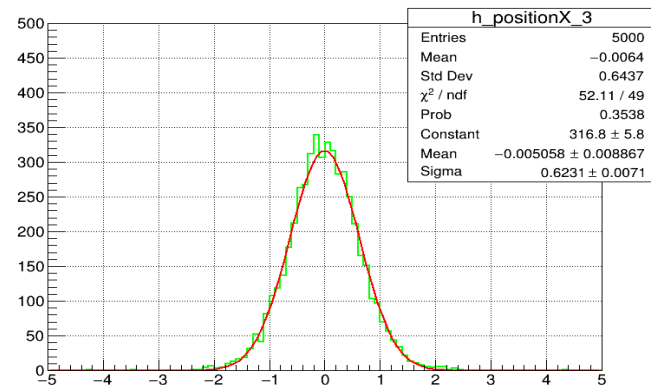
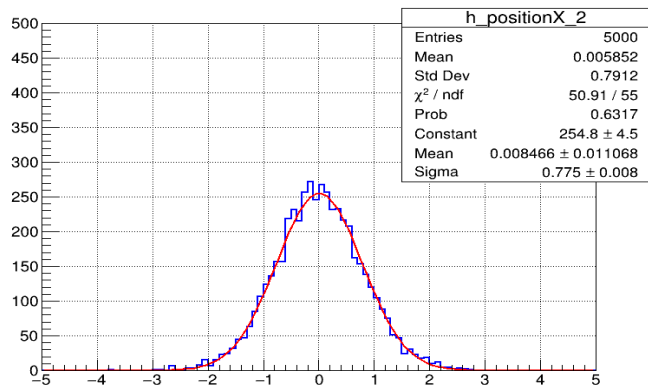
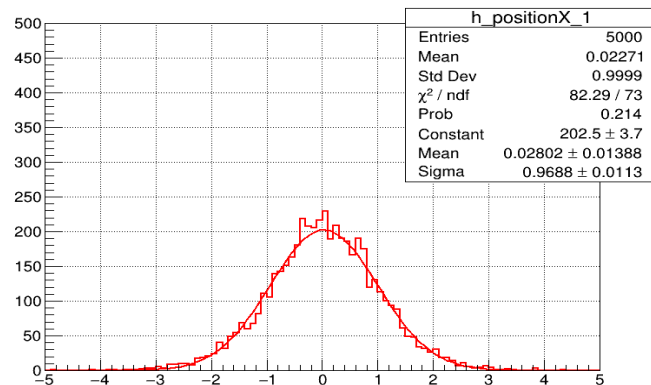
Barycenter Method

$$x_{\text{reconstructed}} = \frac{\sum E_i x_i}{\sum E_i}$$

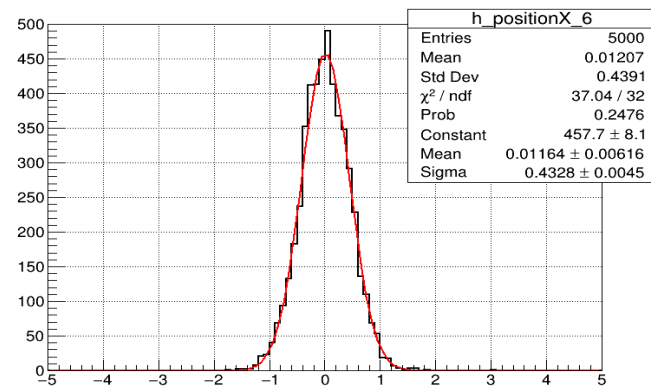
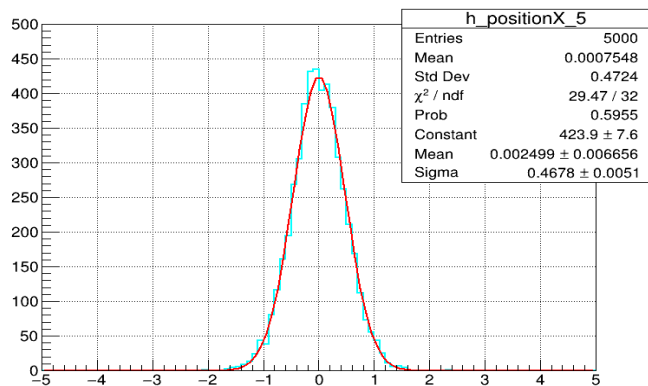
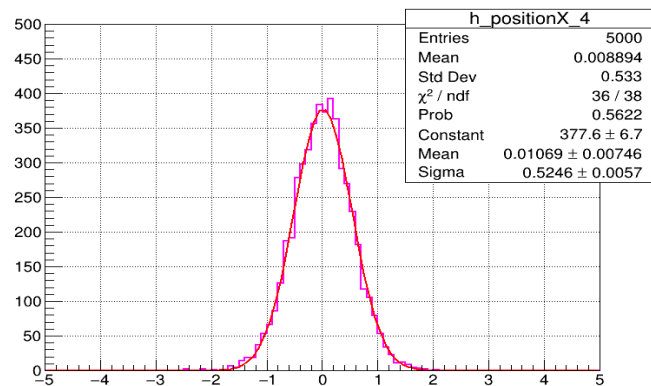
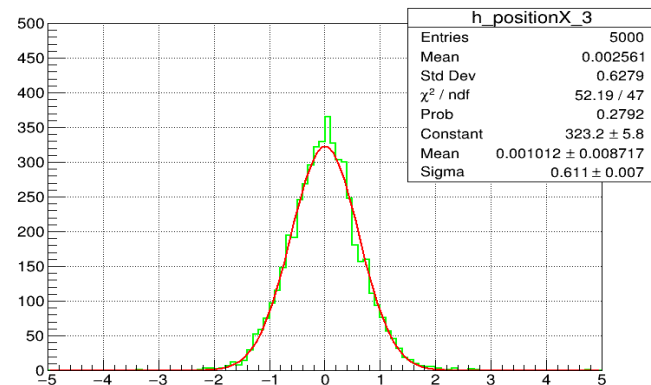
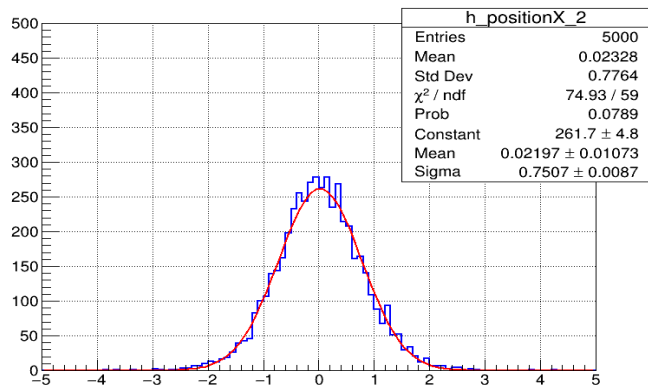
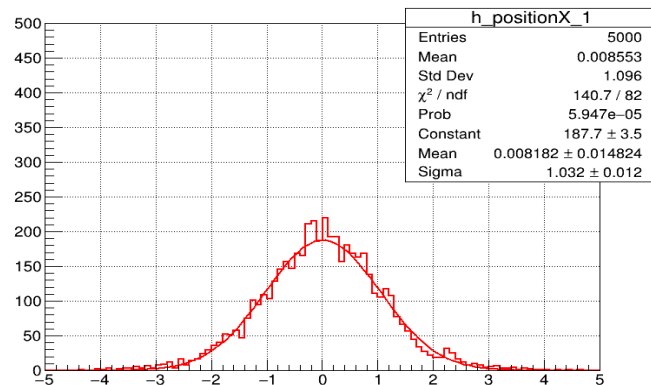
$$y_{\text{reconstructed}} = \frac{\sum E_i y_i}{\sum E_i}$$



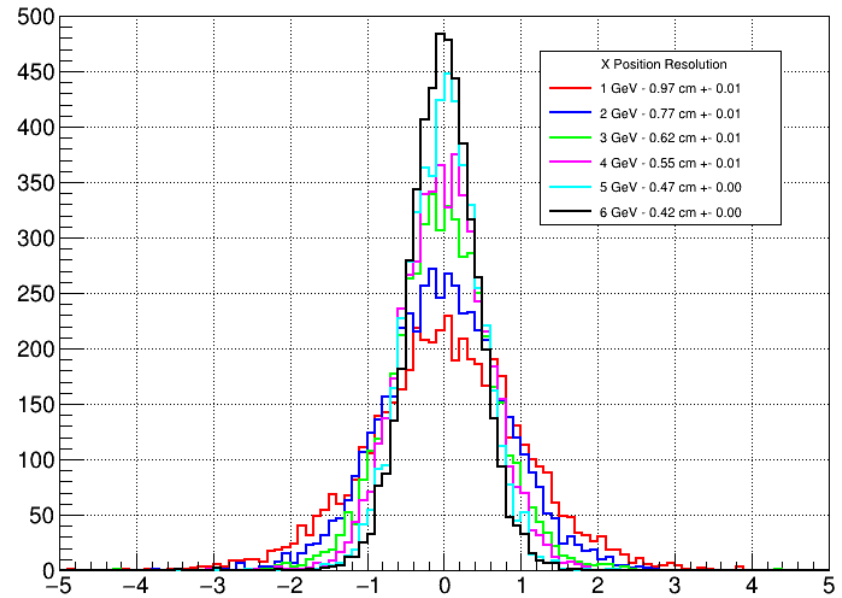
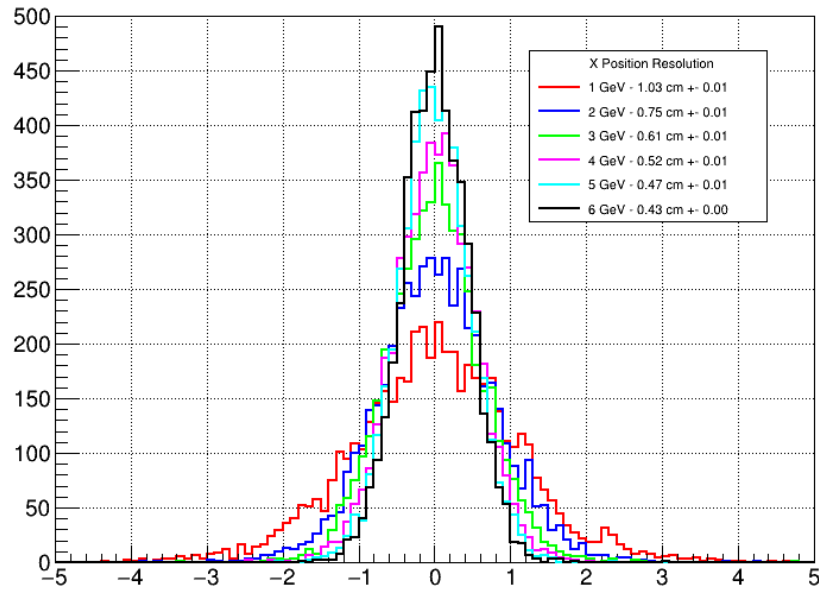
X Position Resolution Mono energetic



X Position Resolution DESY energies



X Position Resolution Mono energetic vs DESY energies



X Position Resolution Mono energetic vs DESY energies

