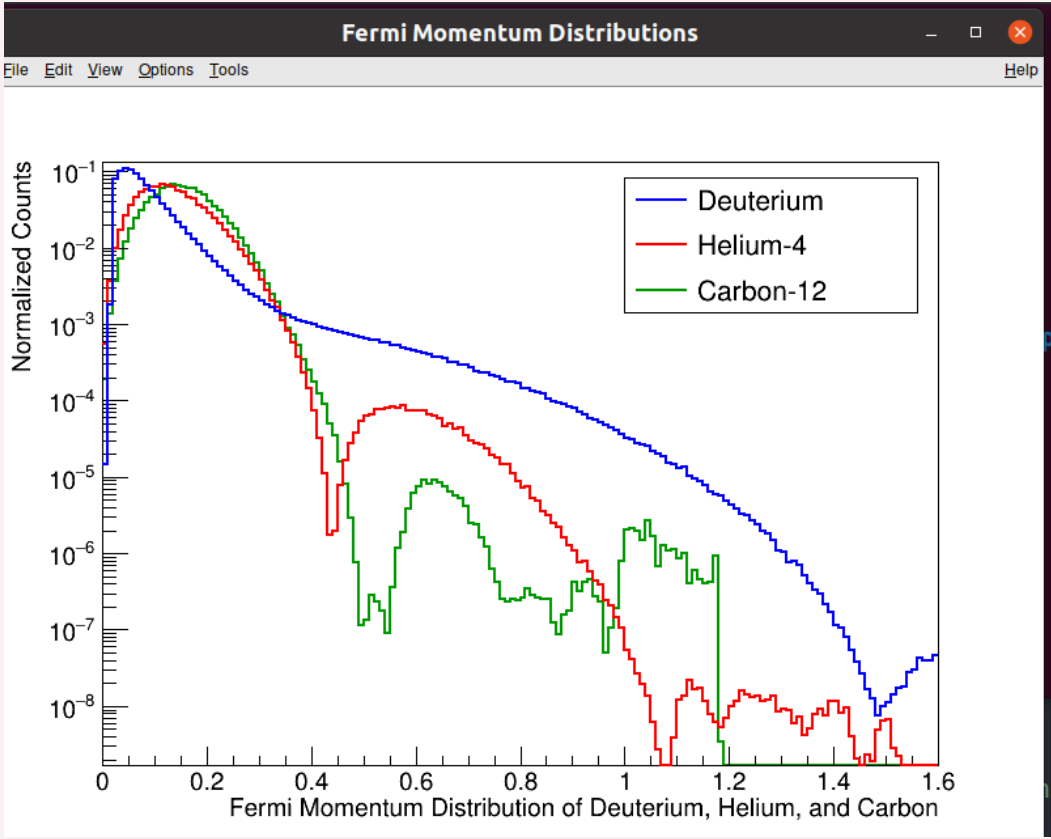
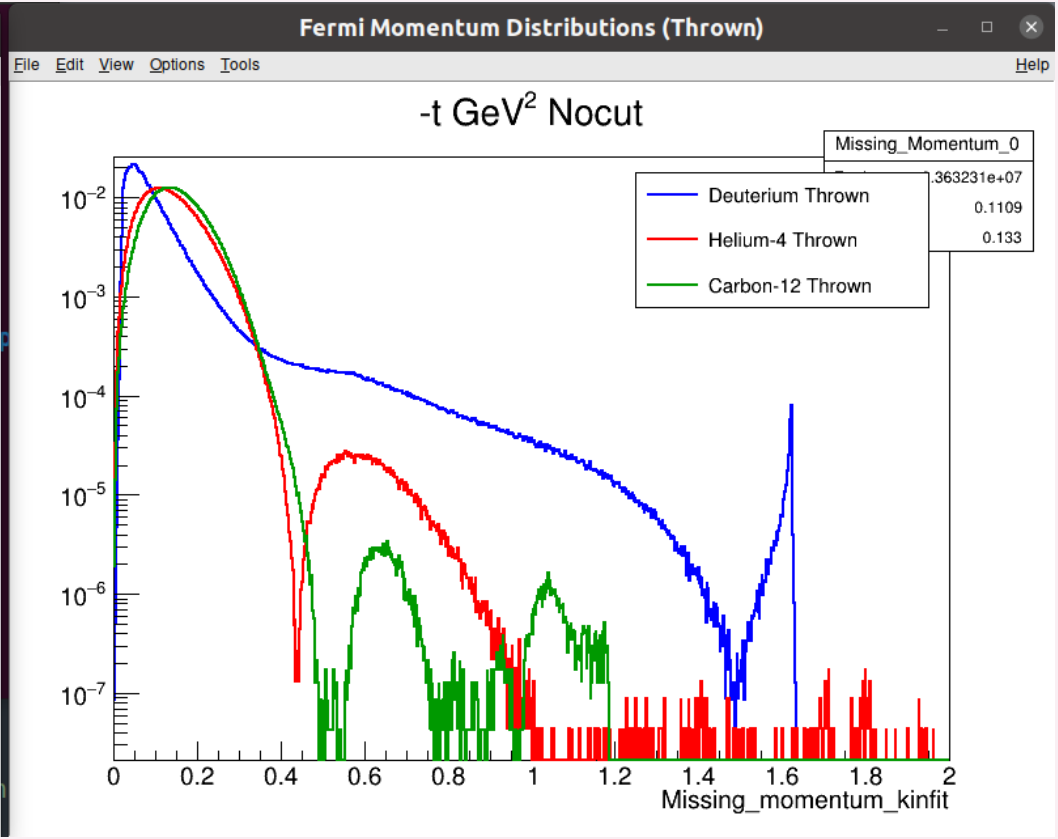
Fermi Momentum

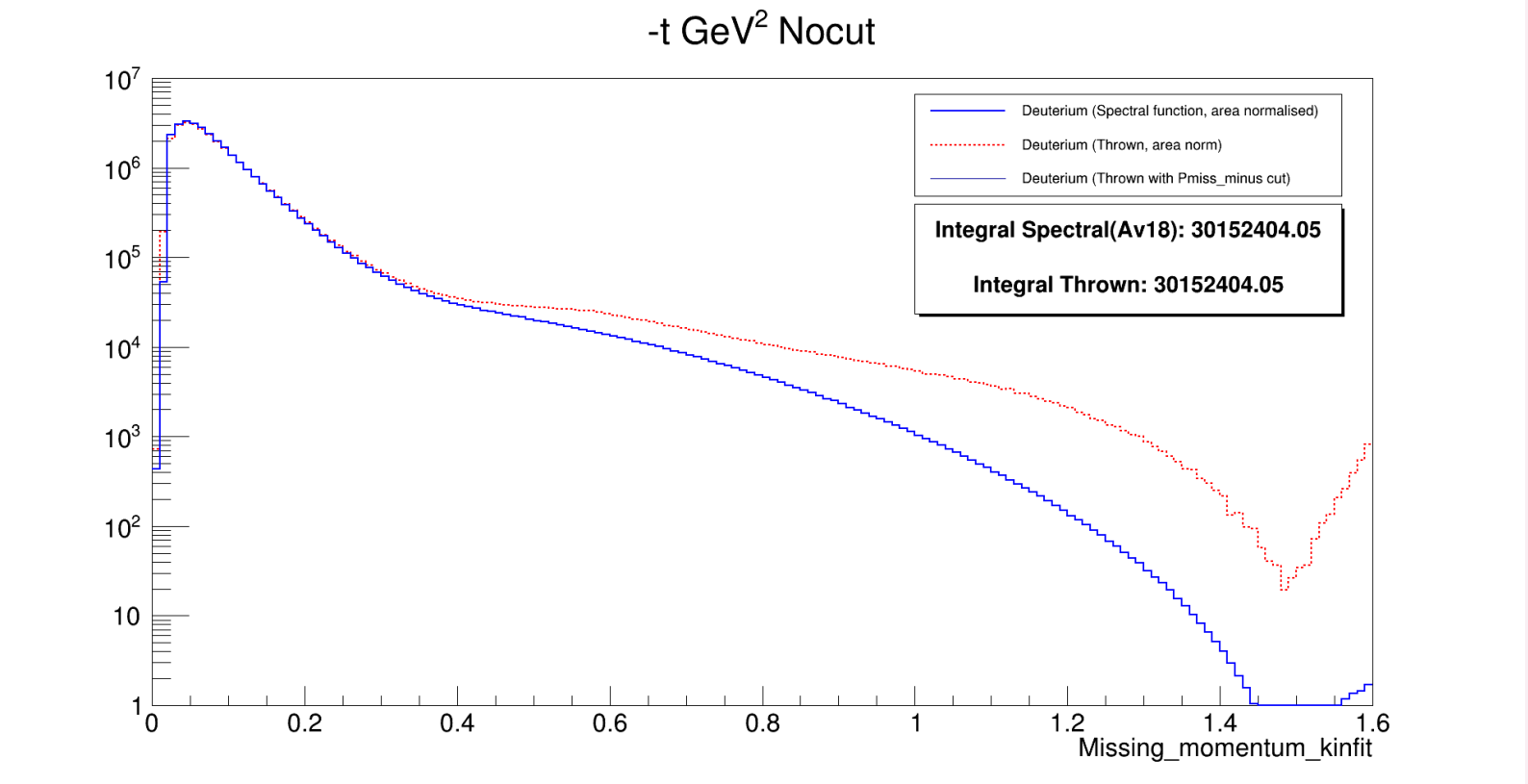




Calculated Fermi momentum locally using the AV18 spectral function from the MF generator. The spectral function was obtained from the HallD Sim GitHub repository. (Event generated 1 million)

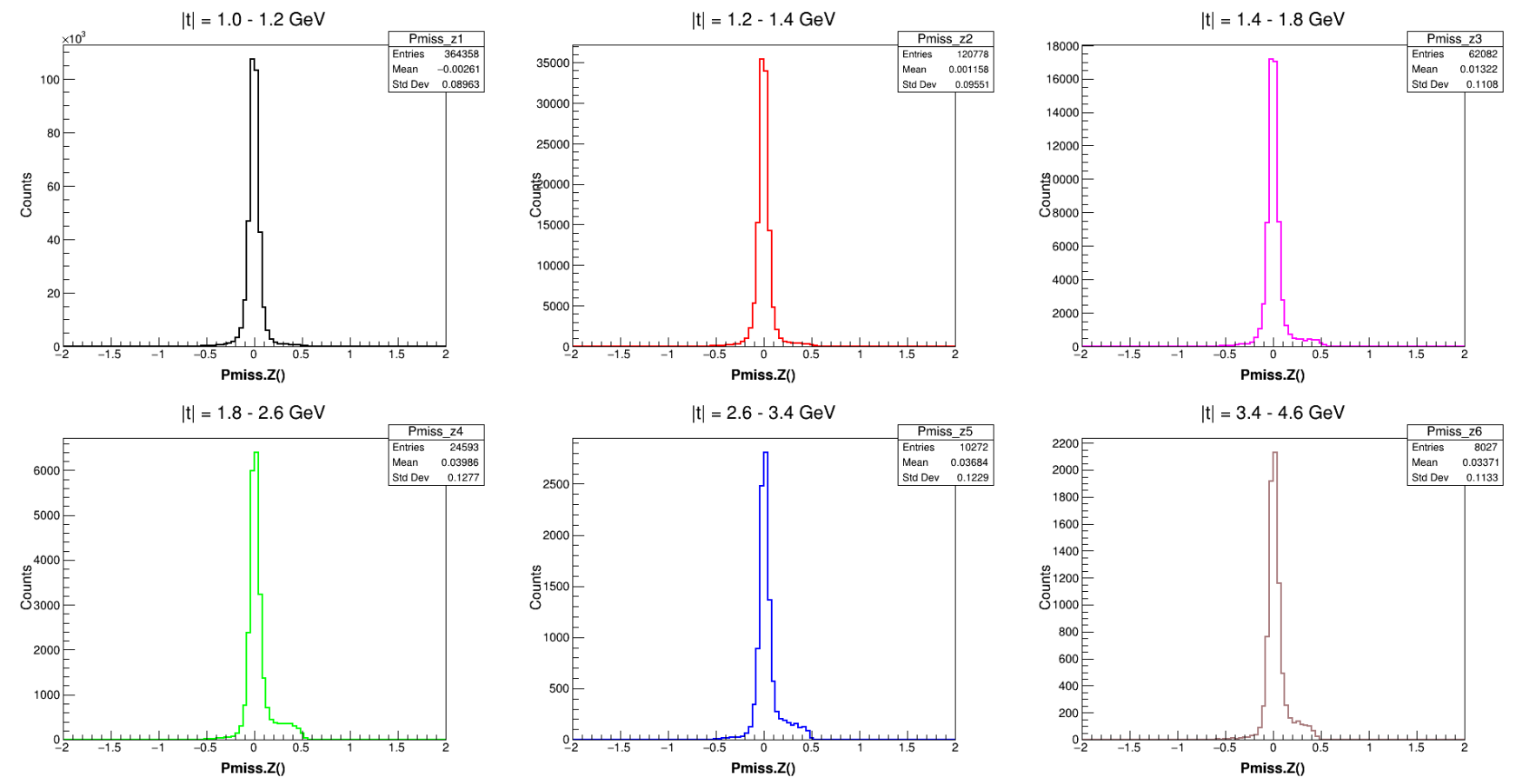
Thrown simulation passed through Hall D Geant4 (Fermi momentum). No further cut applied on |t|

Click to add Title

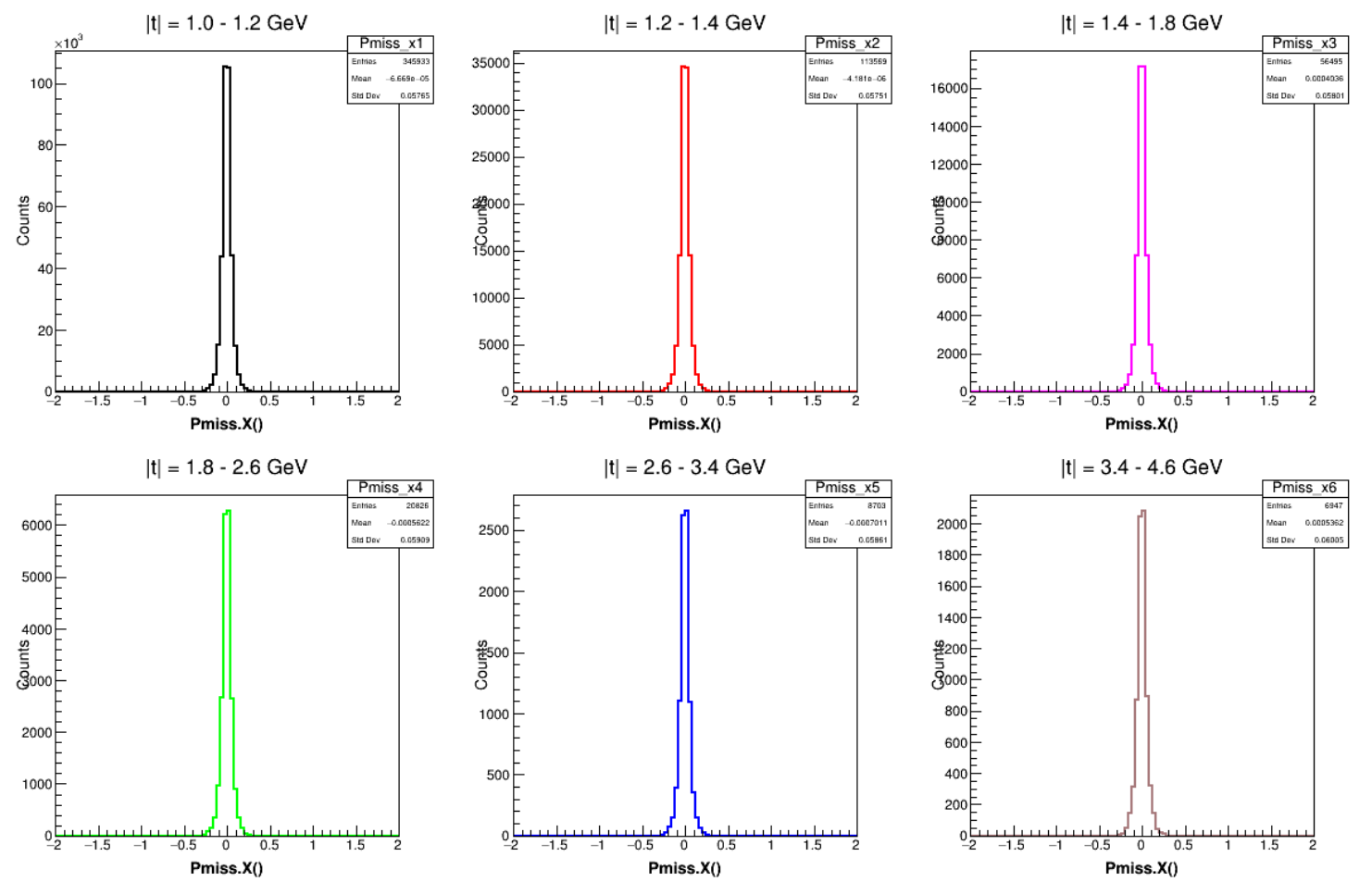


Scaled the Fermi momentum of deuterium for comparison: blue — spectral function, Red: Thrown simulation

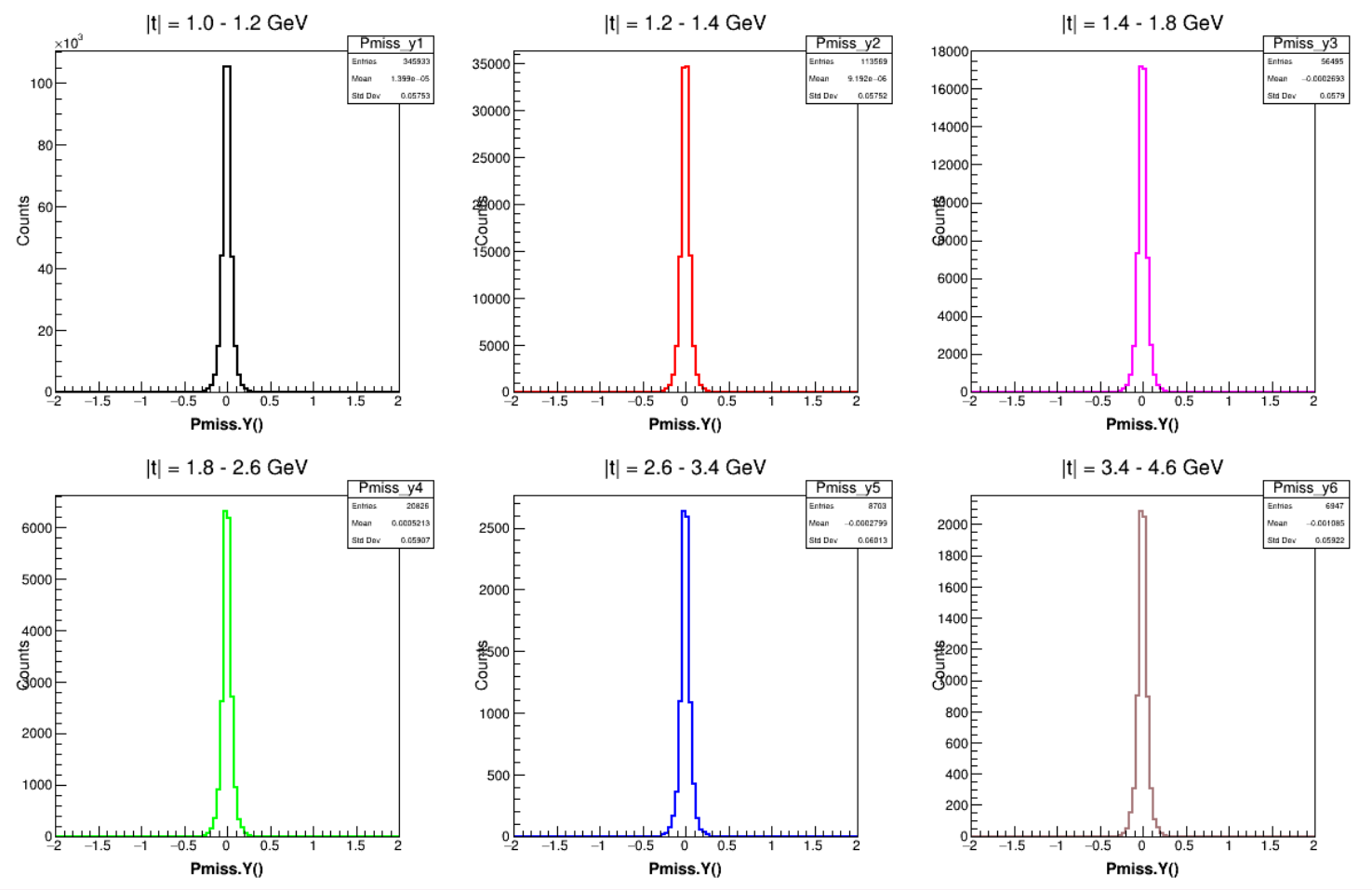
Z component of Fermi Momentum (Total)



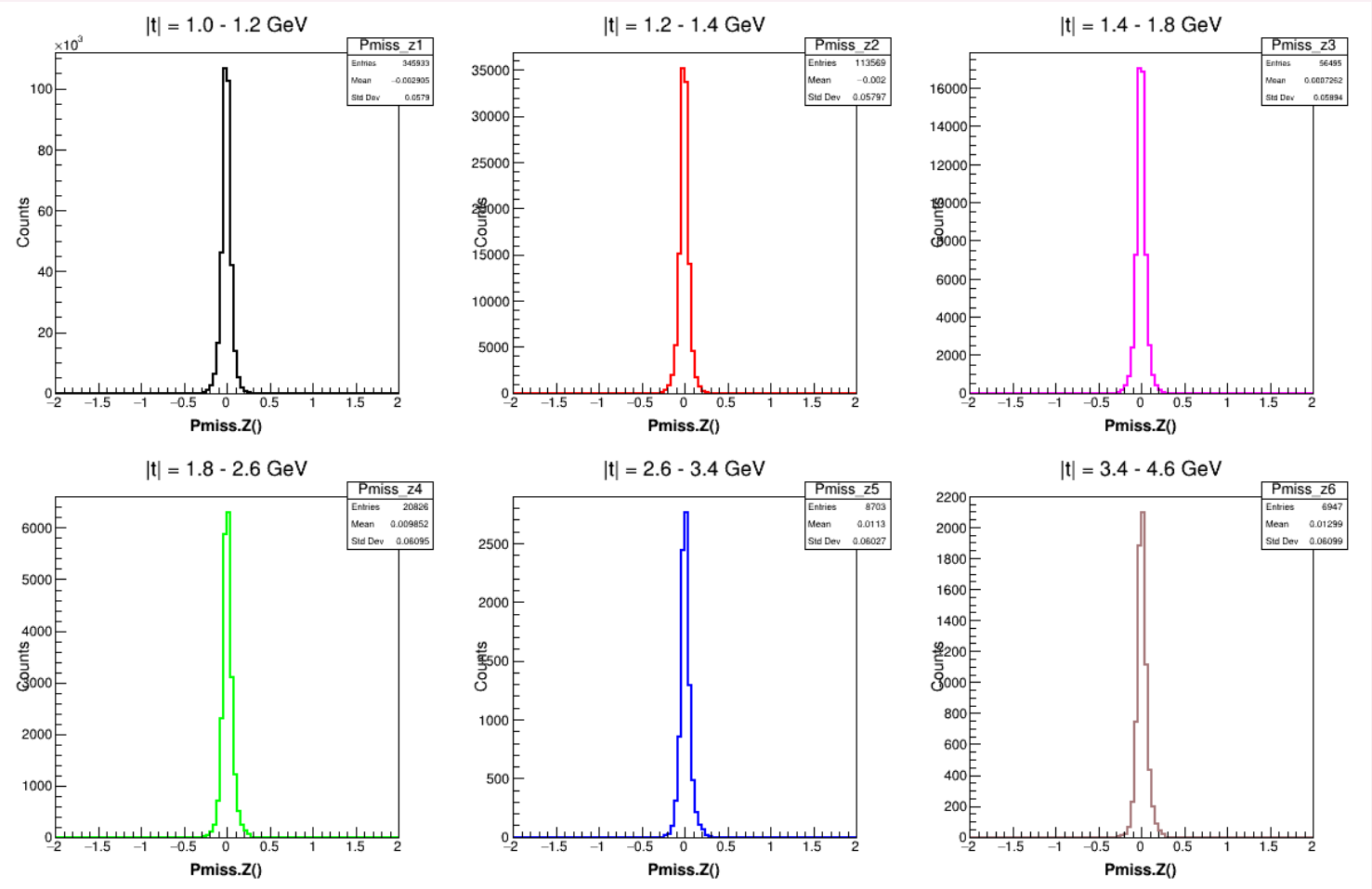
X component of Fermi Momentum (< 300 MeV)



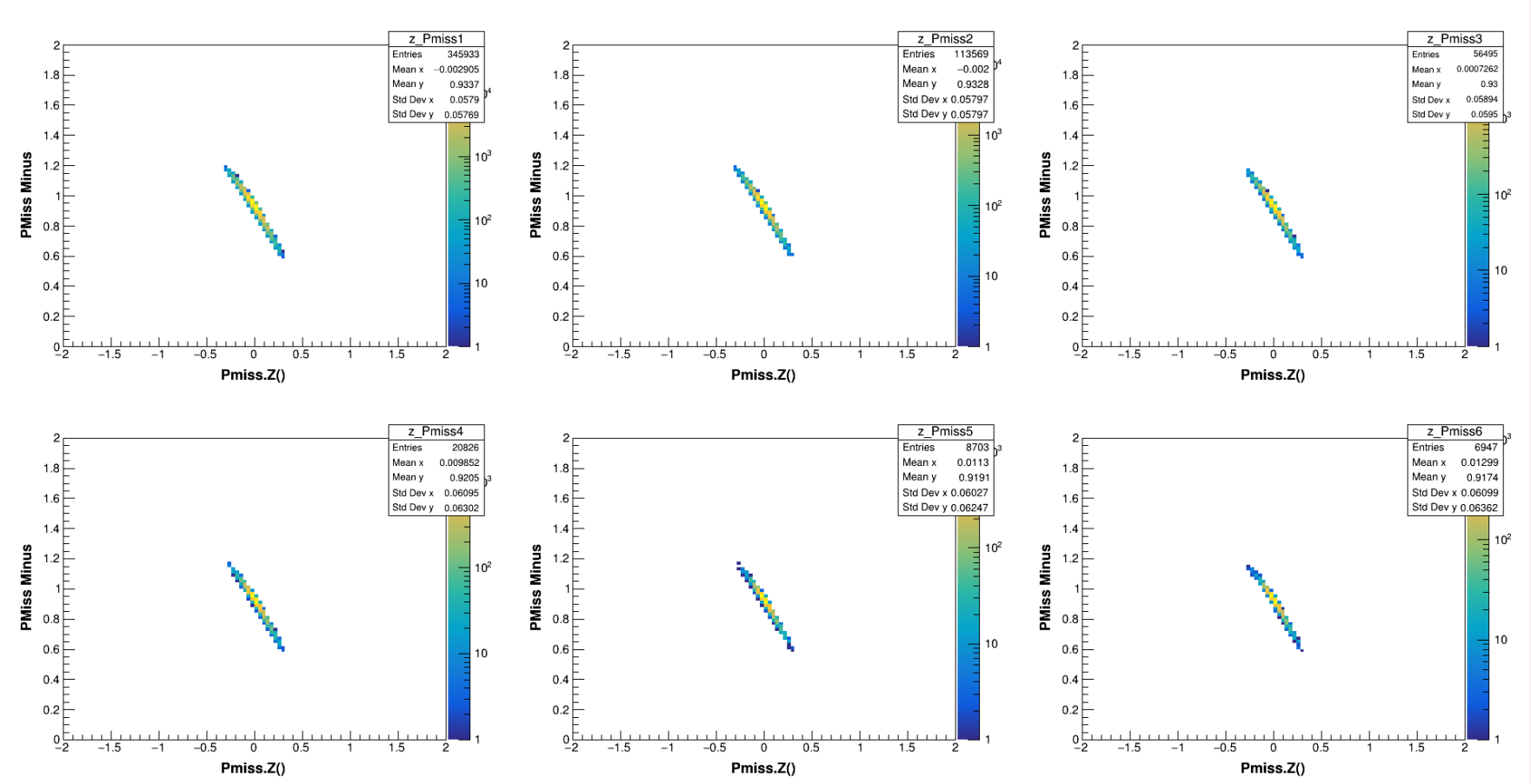
Y component of Fermi Momentum (Pmiss < 300 MeV)



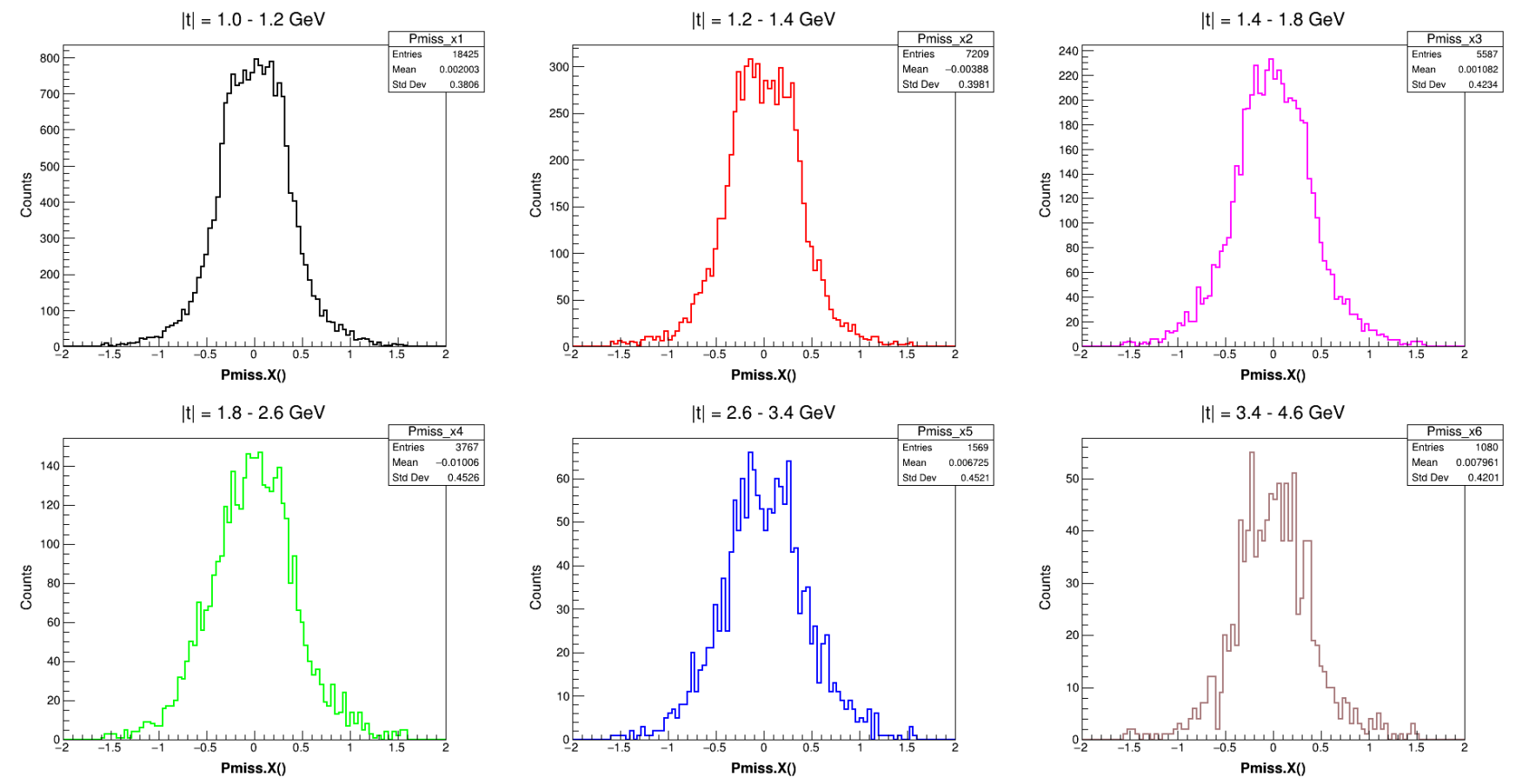
Z component of Fermi Momentum (Pmiss < 300 MeV)



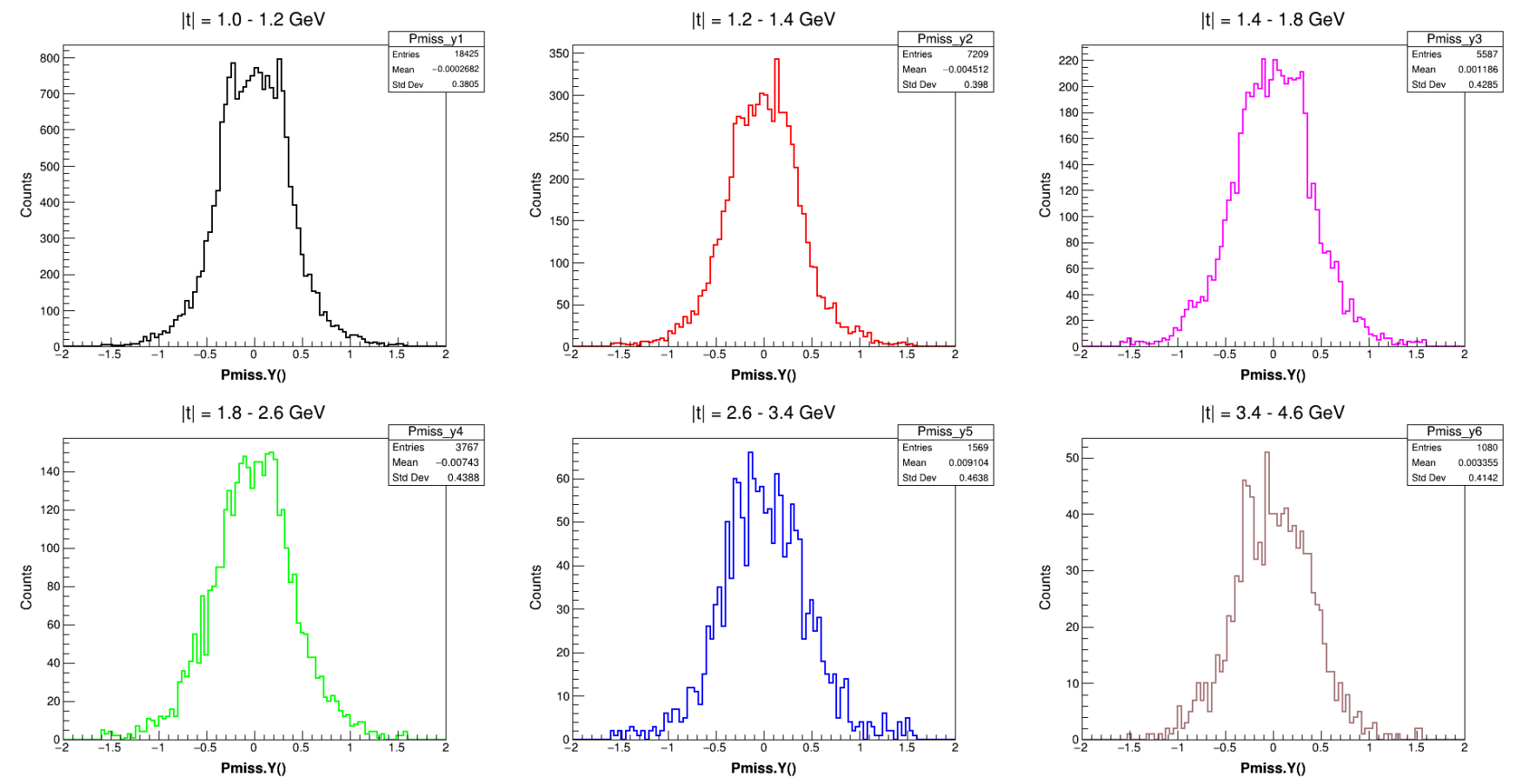
Pmiss_minus vs Pmiss.Z() for Pmiss < 300 MeV



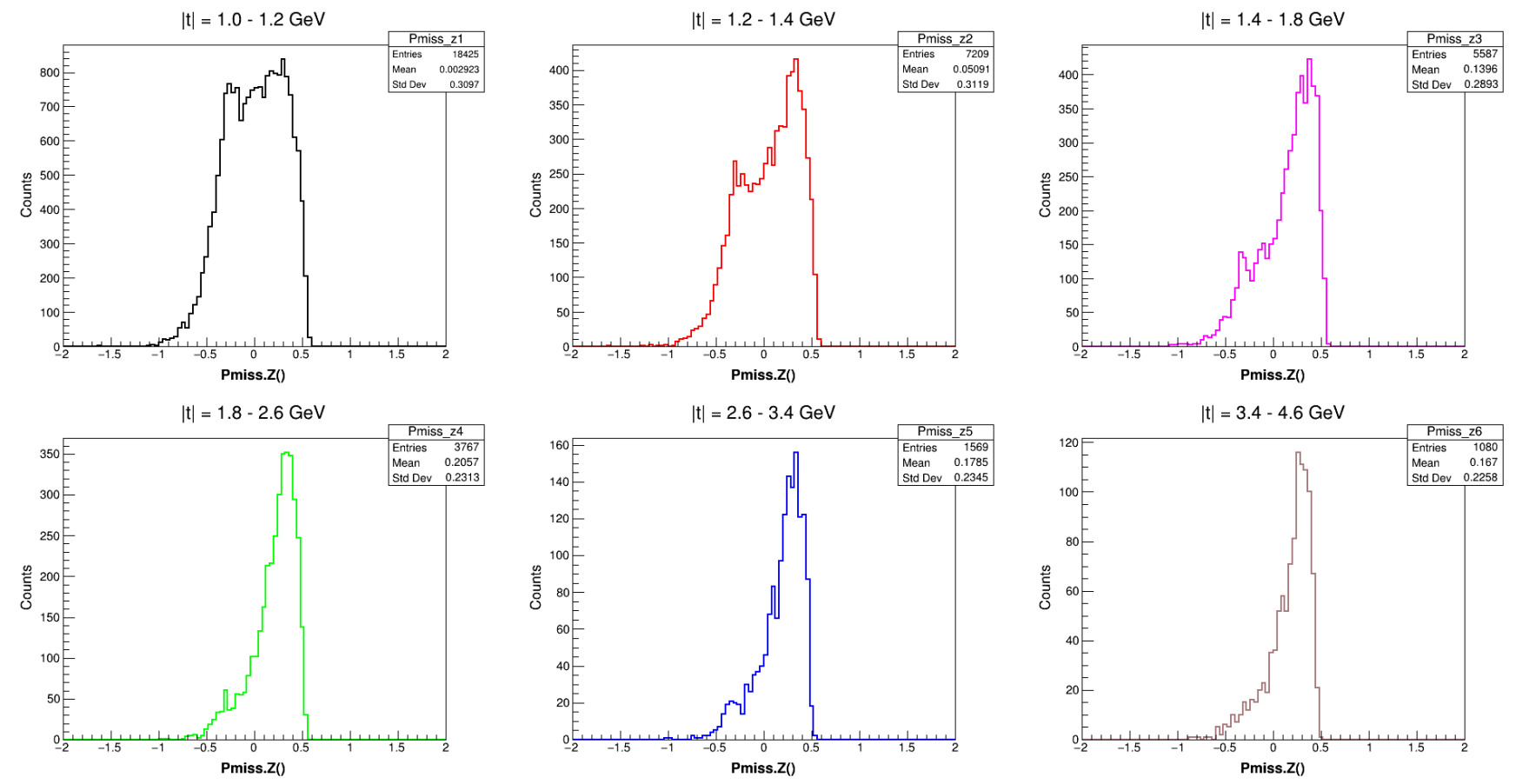
X component of Missing Momentum(Pmiss > 300 MeV)



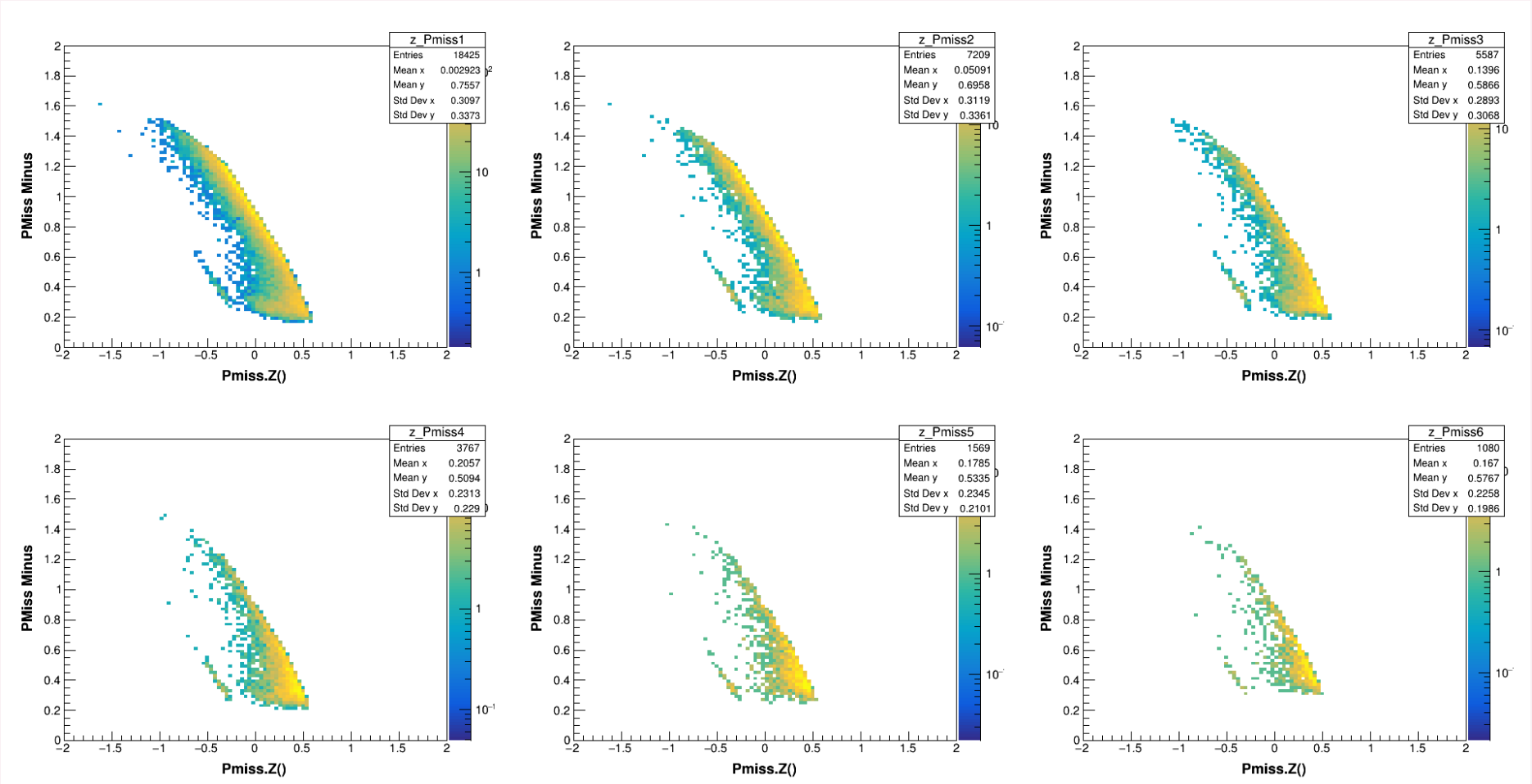
Y component of Missing Momentum(Pmiss > 300 MeV)



Z component of Missing Momentum(Pmiss > 300 MeV)



Pmiss_minus vs Pmiss.Z() for Pmiss > 300 MeV



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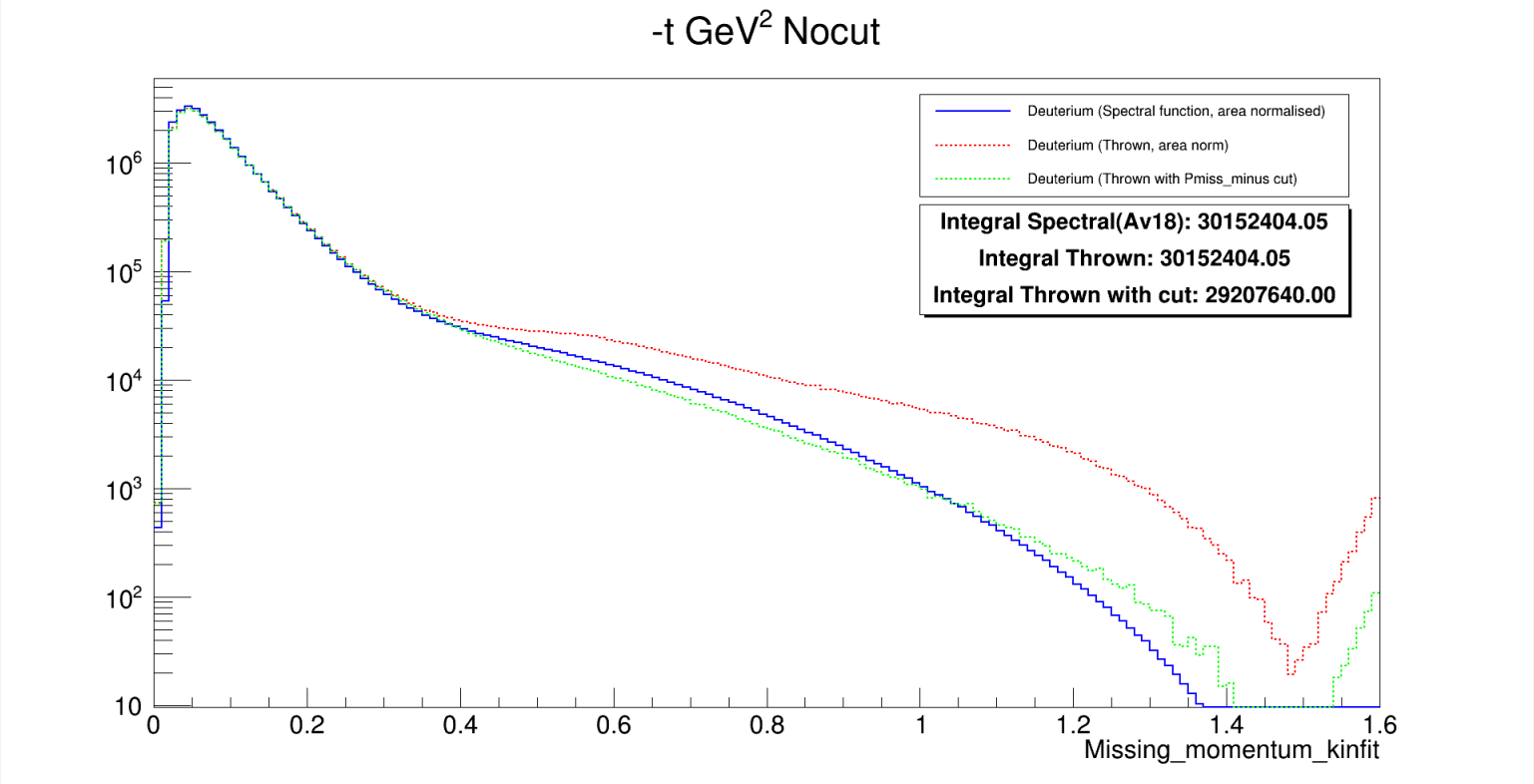


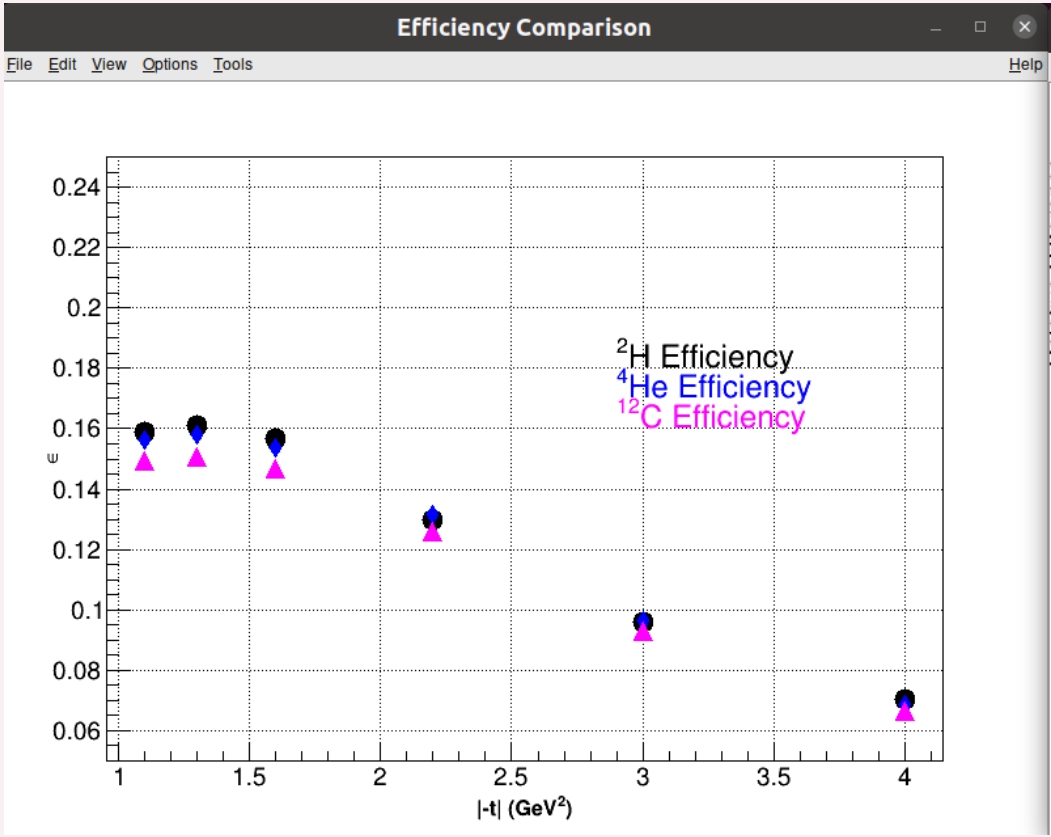
Scaled the Fermi momentum of deuterium for comparison: blue — spectral function,
Red: Thrown simulation
Green — thrown simulation with cut on Pmiss_minus. (0.5 < Pmiss_minus < 1.2)

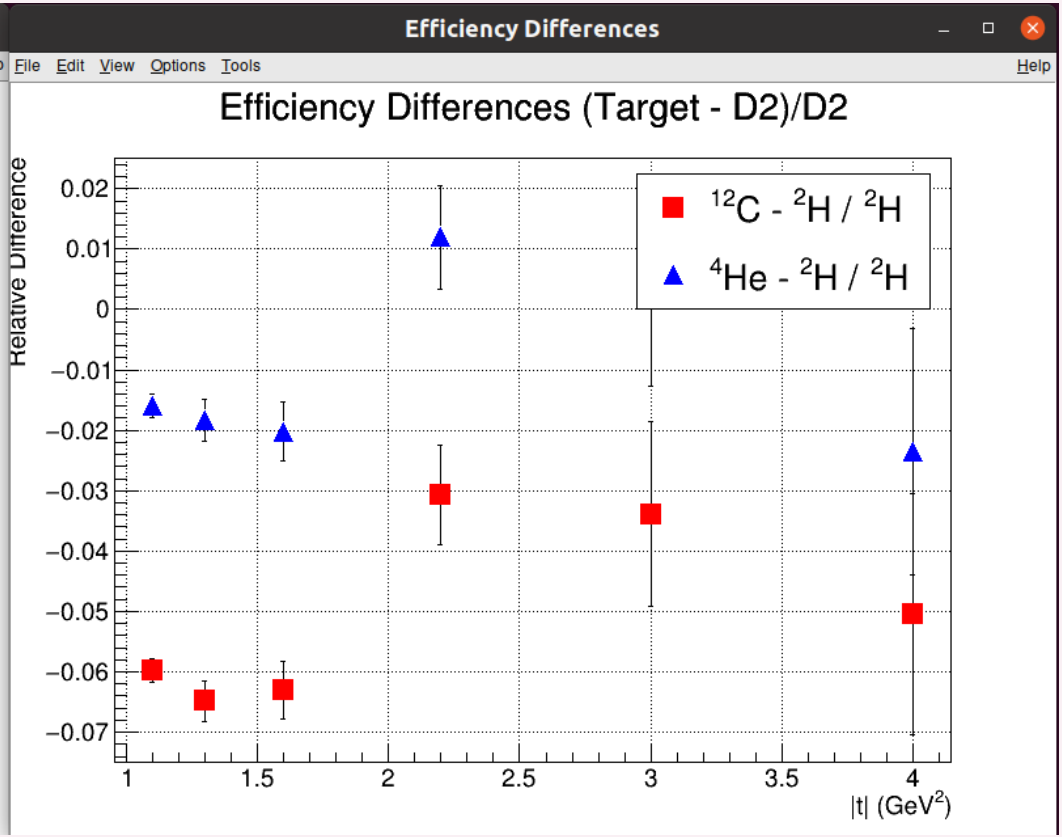
Thrown simulation : 30M with |t| > 0.8GeV^2 and E_beam > 6.5 GeV

Backup

First Method of Calculating Efficiency

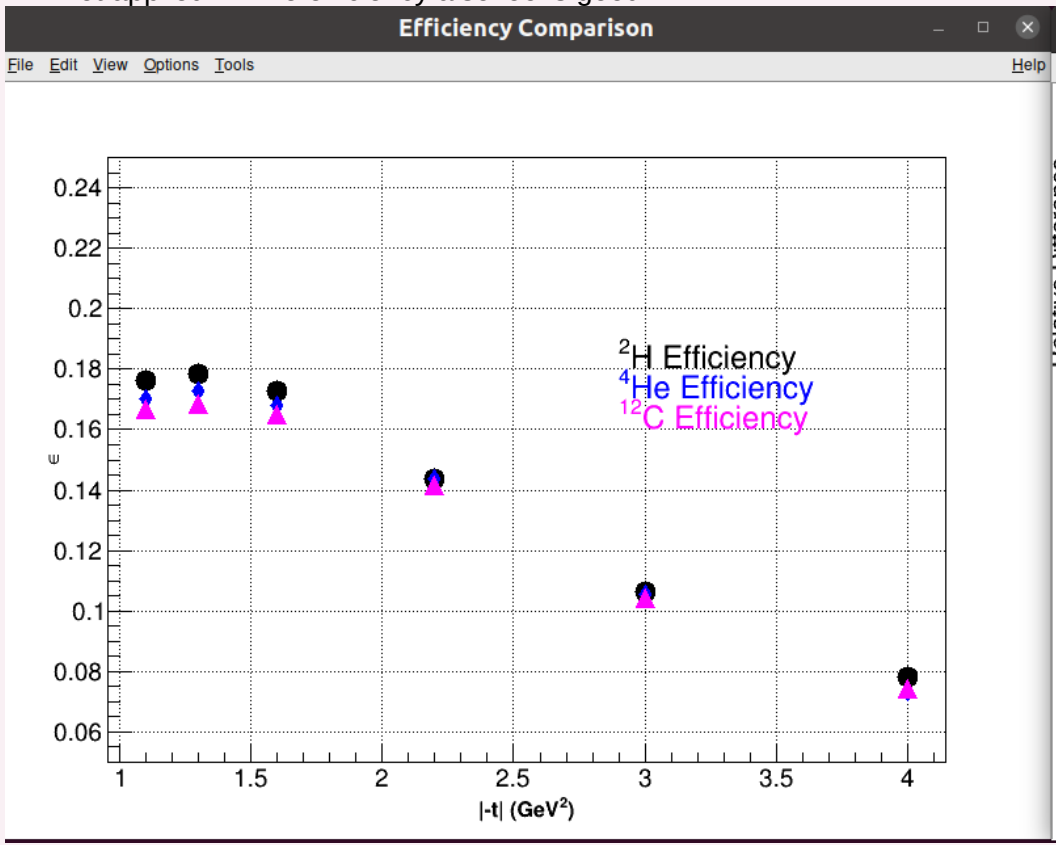
Apply 0.5 < Pmiss_Minus < 1.2 for thrown and Missing Momentum cut of Pmiss < 250 for D2 and Pmiss <350 for He4 and C12. Also apply spectroscopic correction of 0.81 for C12 and 0.83 for helium. "The efficiency looks good"

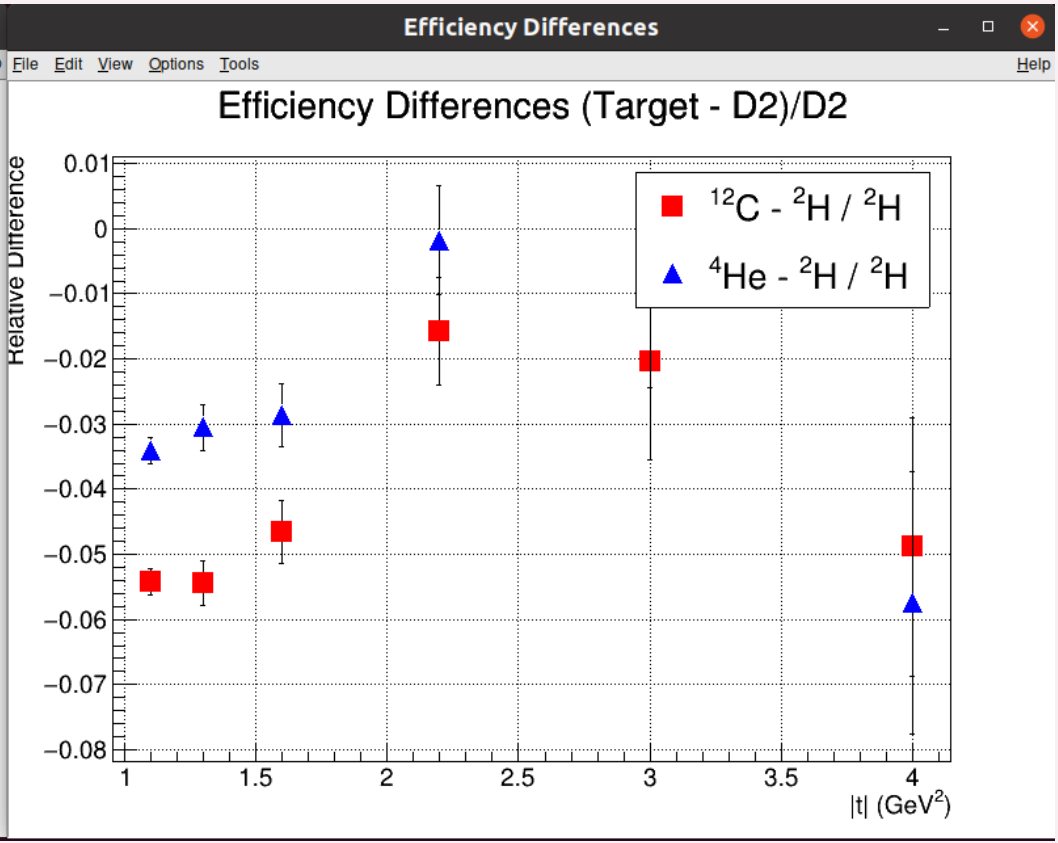




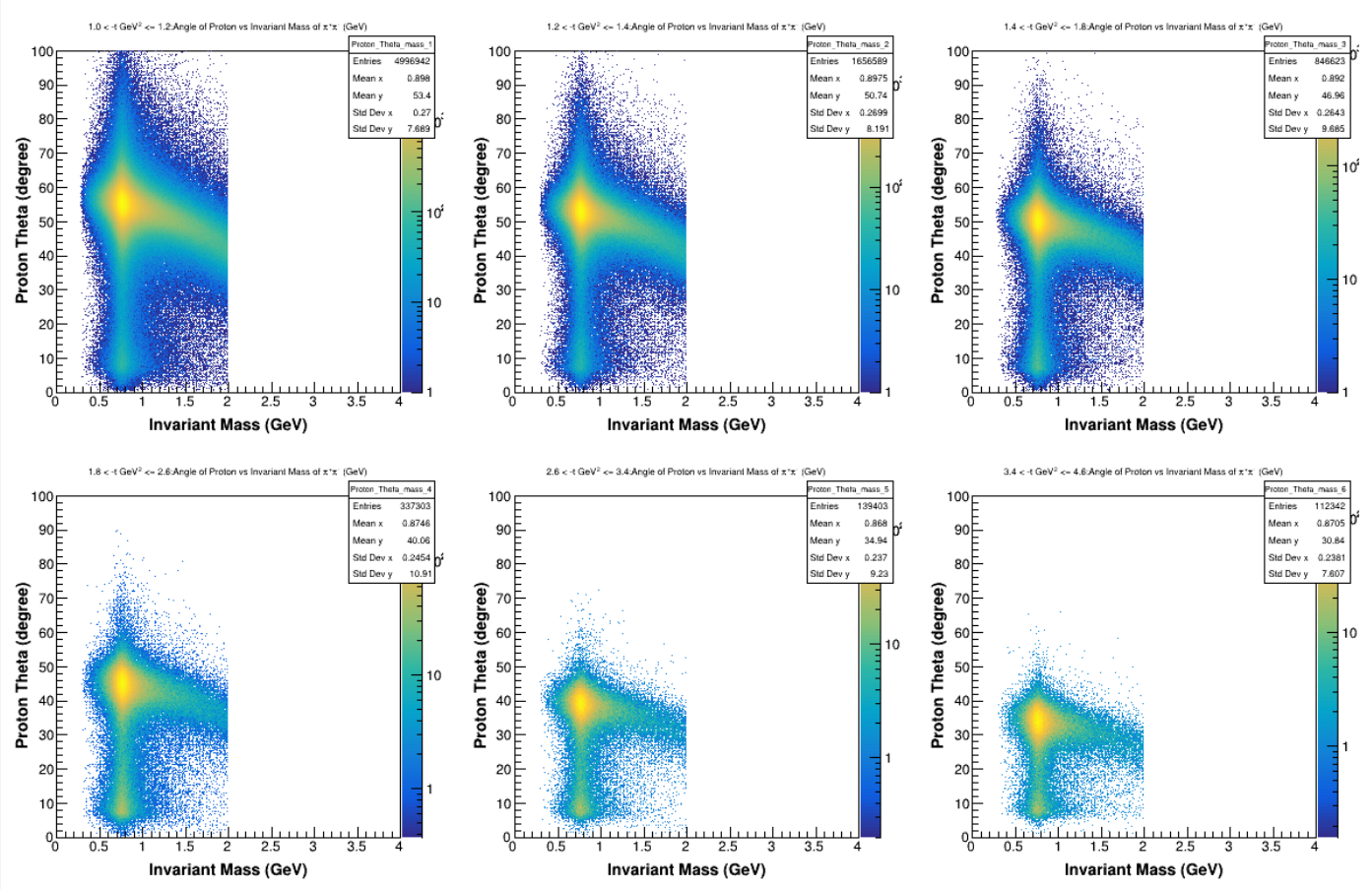
2nd ways of calculating efficiency

Apply 0.5 < Pmiss_Minus < 1.2 for thrown and Missing Momentum cut of Pmiss < 300 for D2, He4 and C12. Here spectroscopic correction is not applied "The efficiency also looks good"

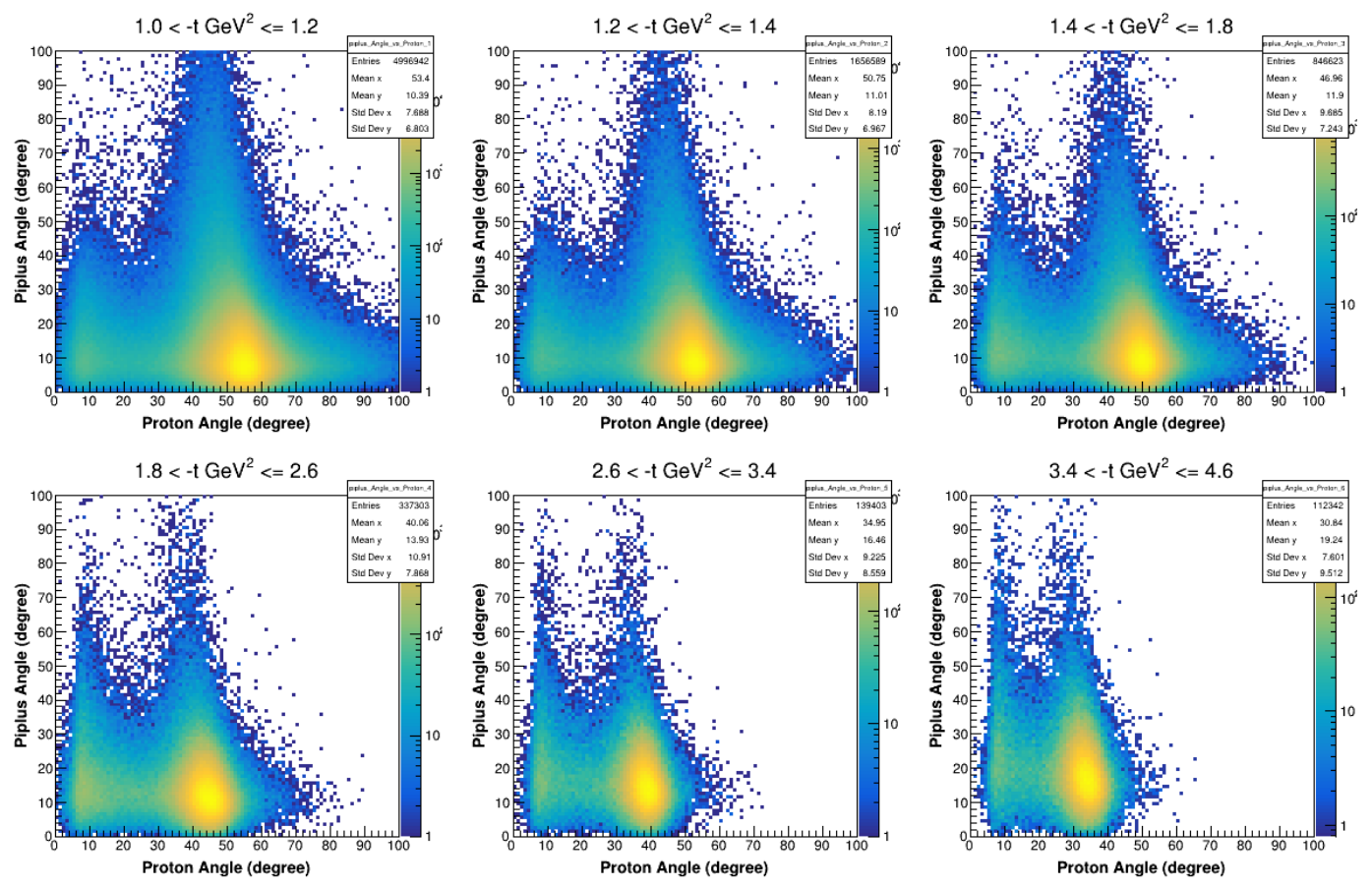




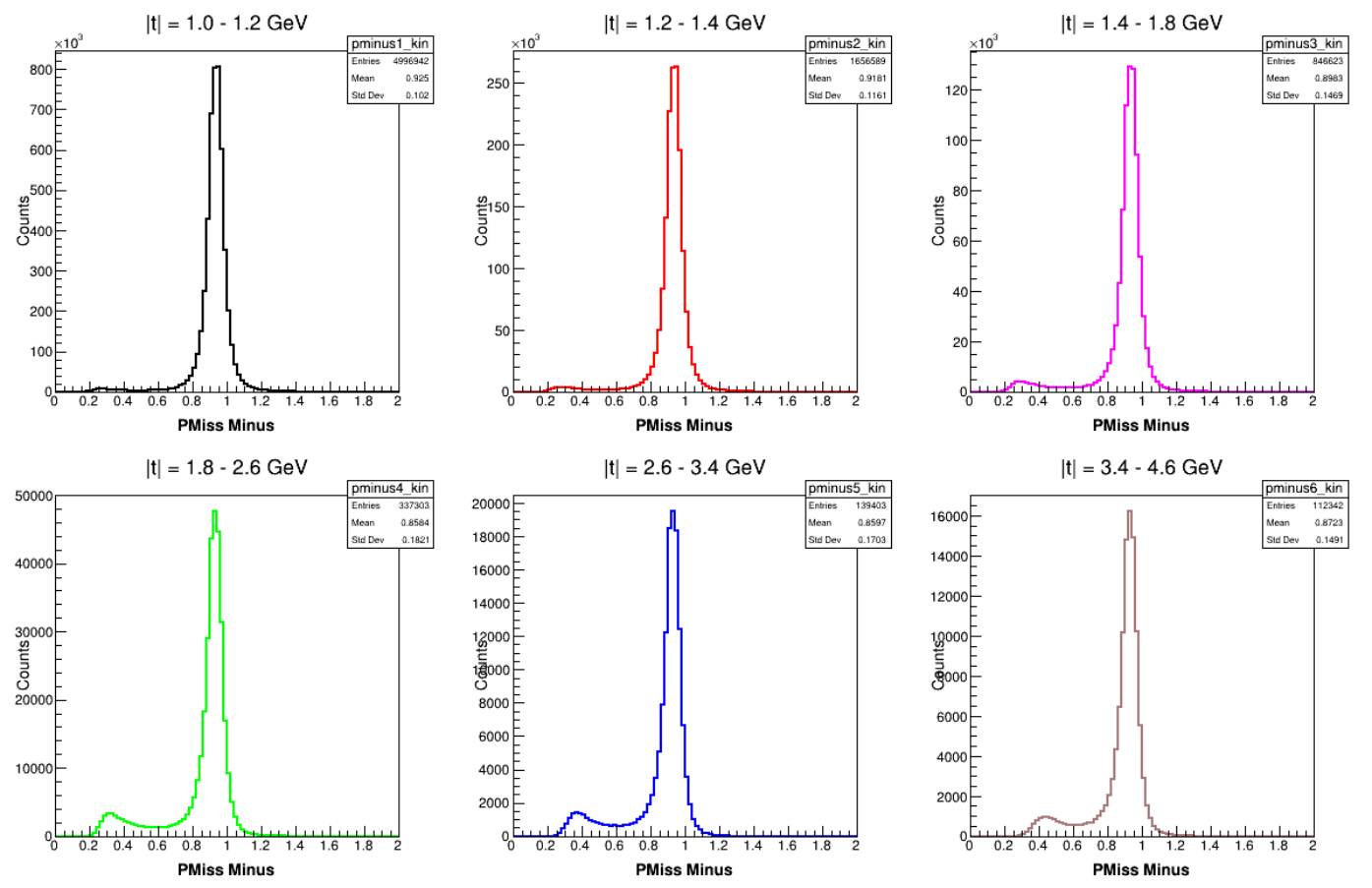
Thrown Deuterium



Thrown Deuterium



Thrown Deuterium



Thrown Deuterium