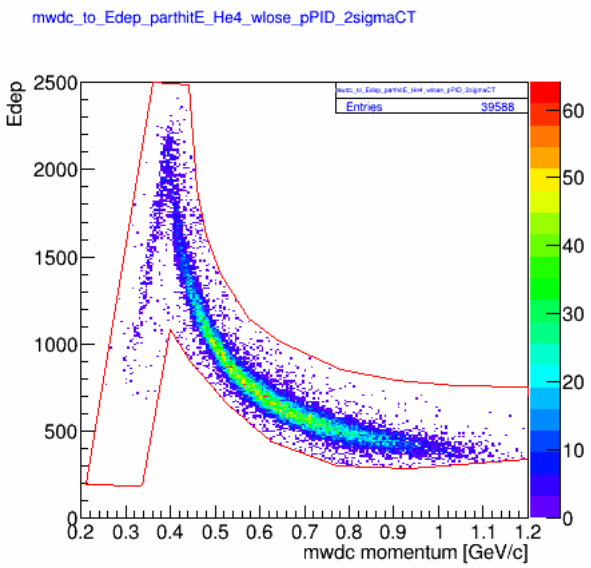
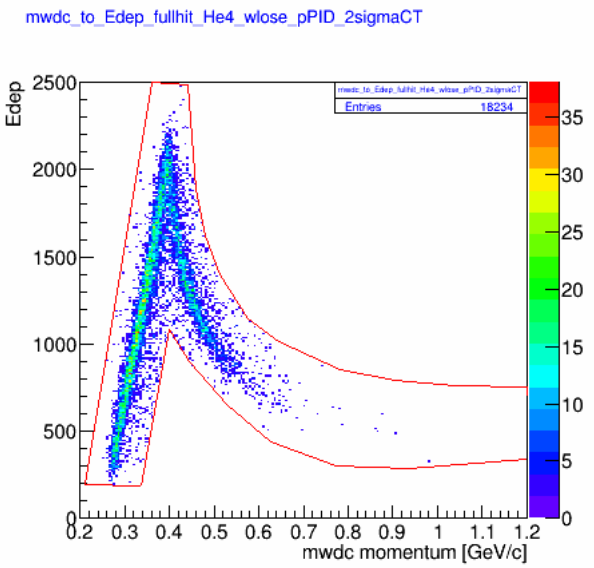
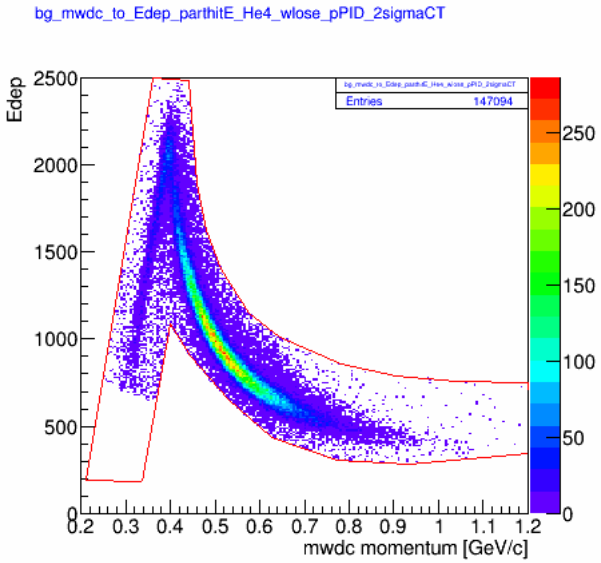
With loosen up the proton PID, we separate data into fullhit and parthit where the background are differ in each case.
The fullhit have the deuteron mix in the background. The parthit have the unknown section which we believe is the pion.
The parthitE data require: Edep>=1000-1000*p_mwdc
The fulllhit data require: the region of p = 0.4-0.6 GeV/c for exclude the deuteron above dE>= -2000*p_mwdc+1600

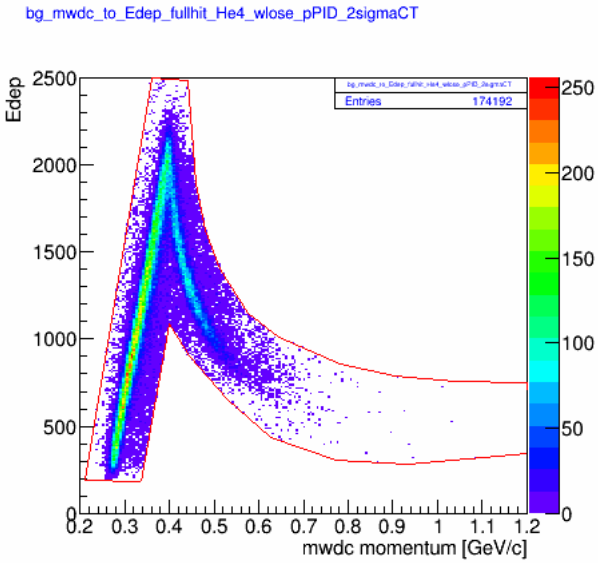
The very lose cut was make in term of proton PID in both CT peak and bg spectrum. With the lose cut the momentum distribution shown smooth distribution.

However, the same thing is not for the deuteron and carbon.

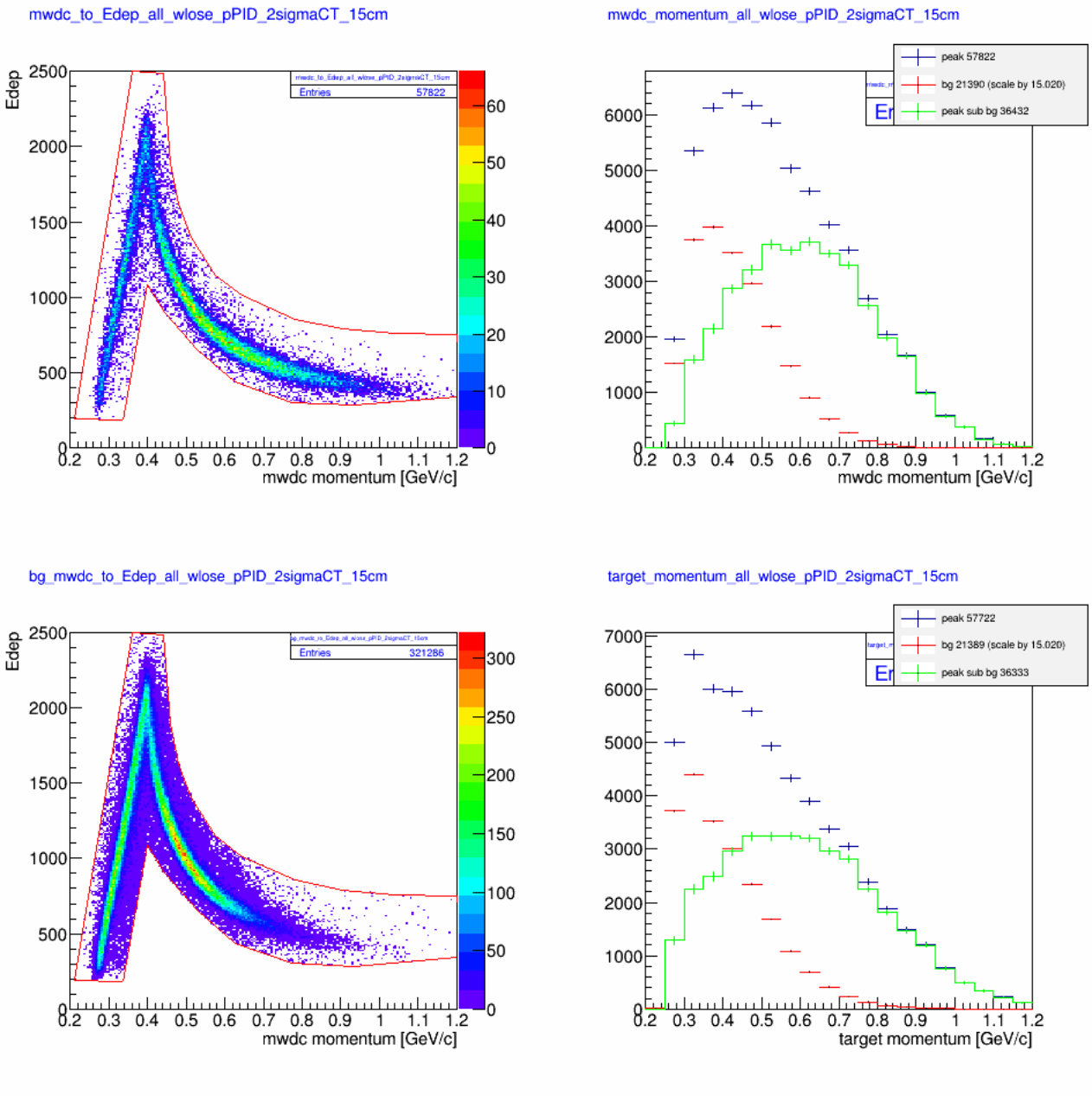




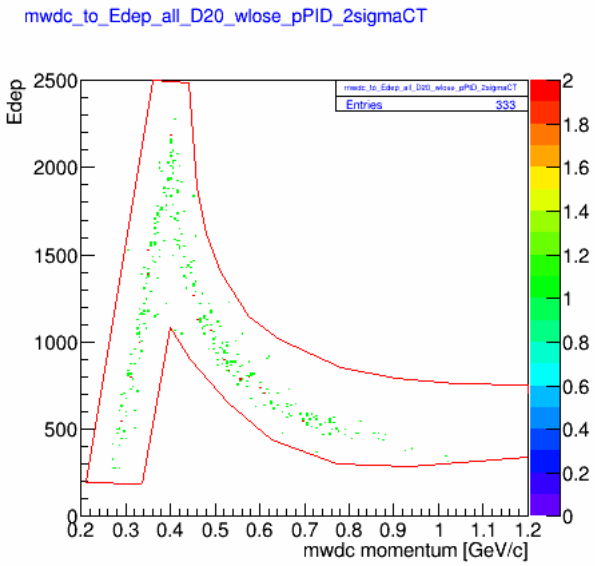


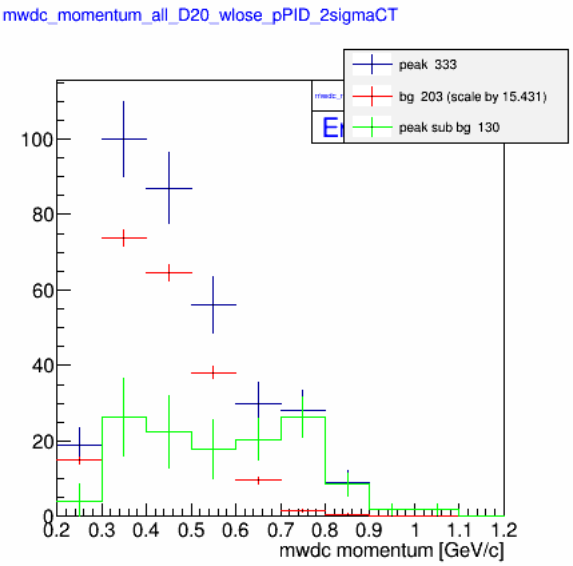


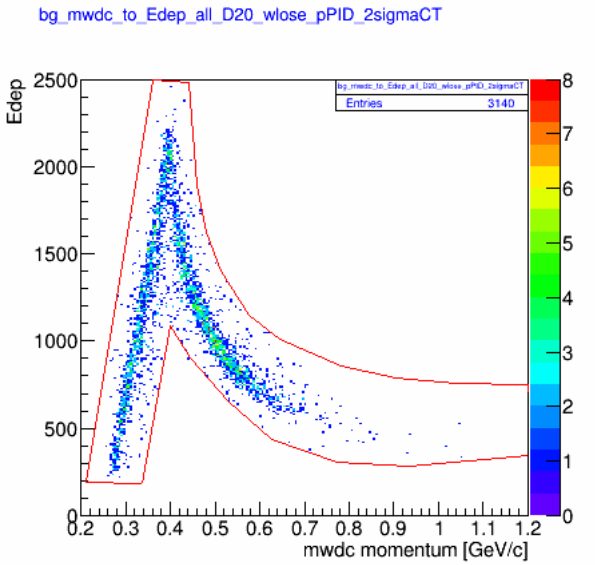
F1. He data
Top Left: CT peak for parthit
Bottom Left: background spectrum for parthit
Top Right: CT peak for fullhit
Bottom Right: background spectrum for fullhit

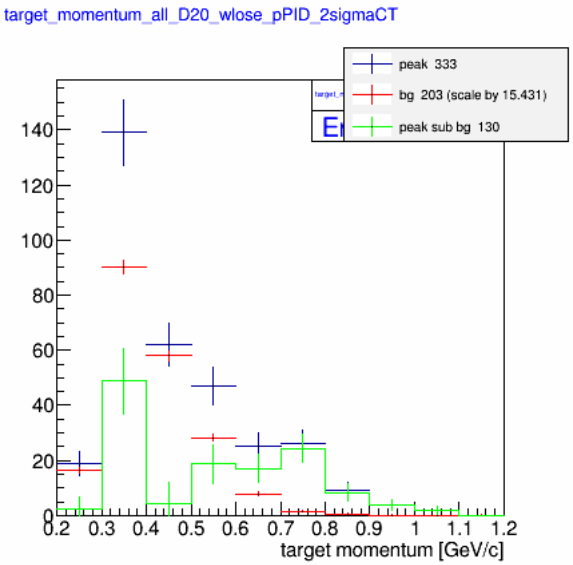


F2. He data
Wtih the lose proton PID and with the maximum cut of vertex :15 cm in 2 sigma: He4
Top Left: with CT for both data
Bottom Left: Bg (from CT spectrum)
Top Right: momentum at MWDC
Bottom Right: the target momentum

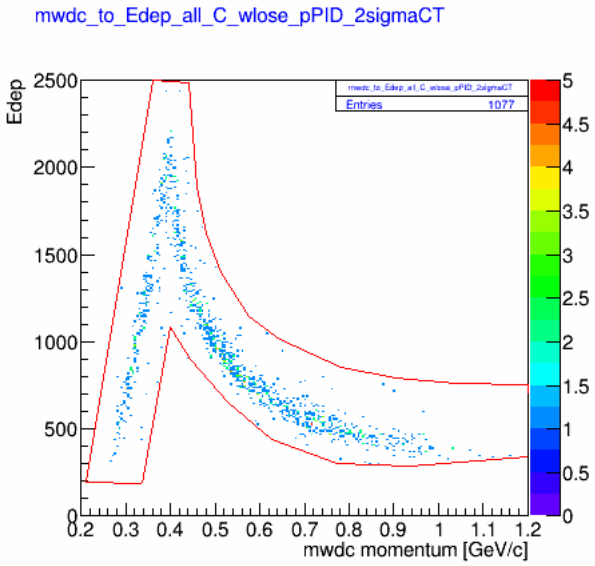


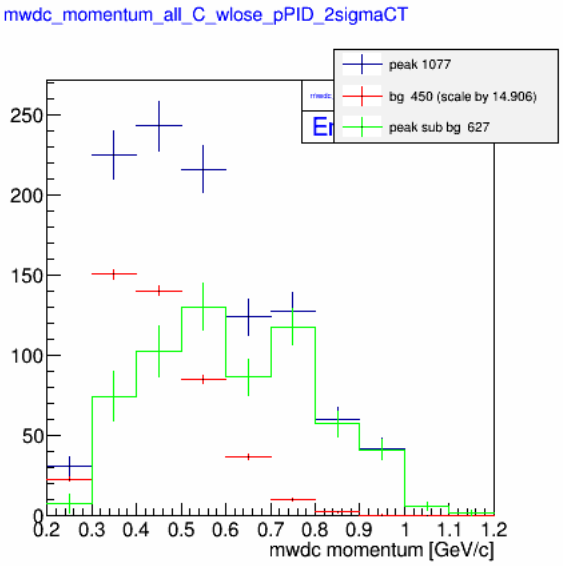


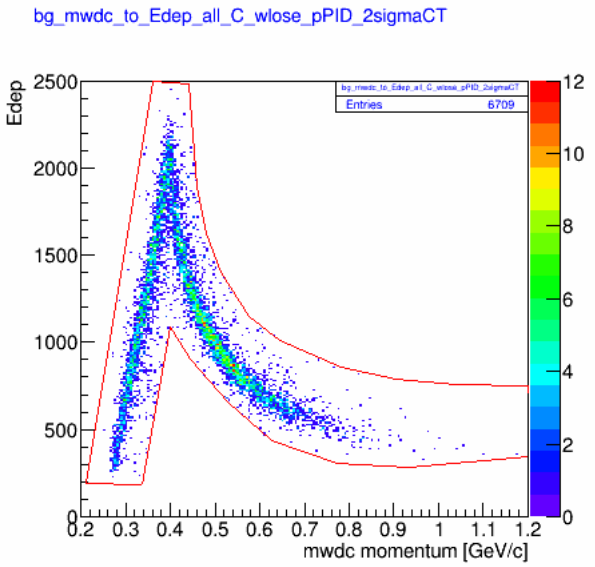


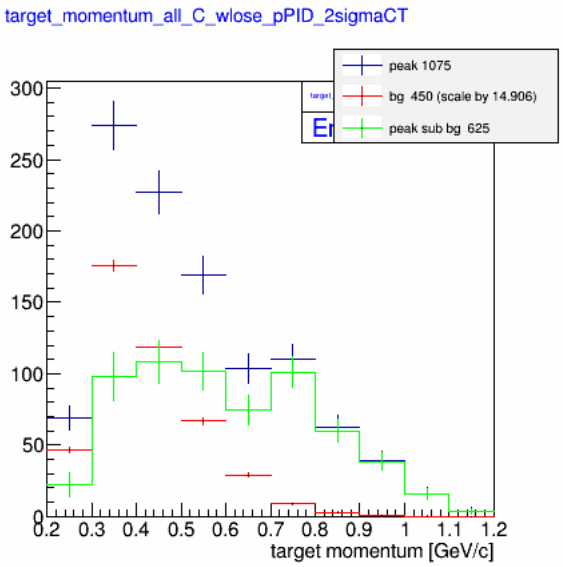


F3 Deuteron data
Wtih the lose proton PID and with the maximum cut of vertex :15 cm in 2 sigma
Top Left: with CT for both data
Bottom Left: Bg (from CT spectrum)
Top Right: momentum at MWDC
Bottom Right: the target momentum









F4 Carbon data
Wtih the lose proton PID and in 2 sigma: Carbon
Top Left: with CT for both data
Bottom Left: Bg (from CT spectrum)
Top Right: momentum at MWDC
Bottom Right: the target momentum