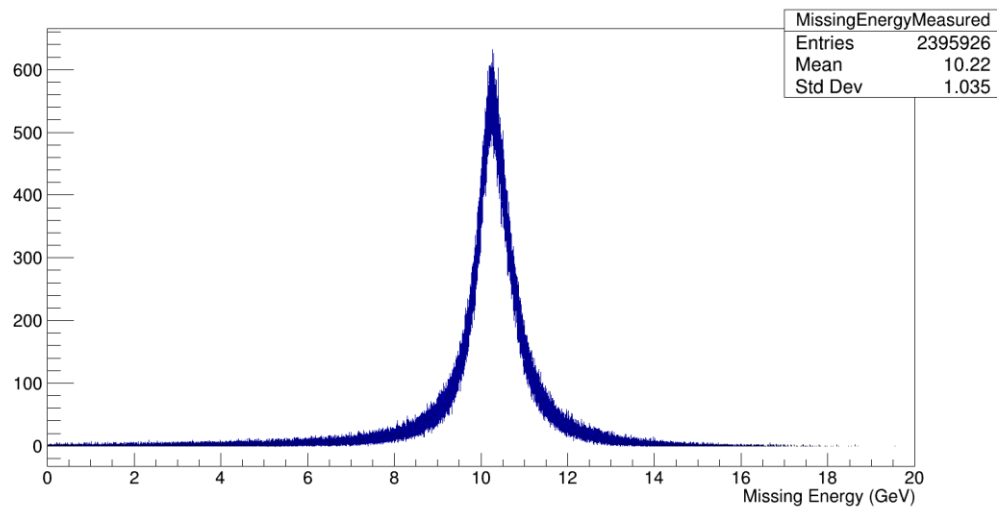


Prelim Analysis for Rho0 channel in Carbon12

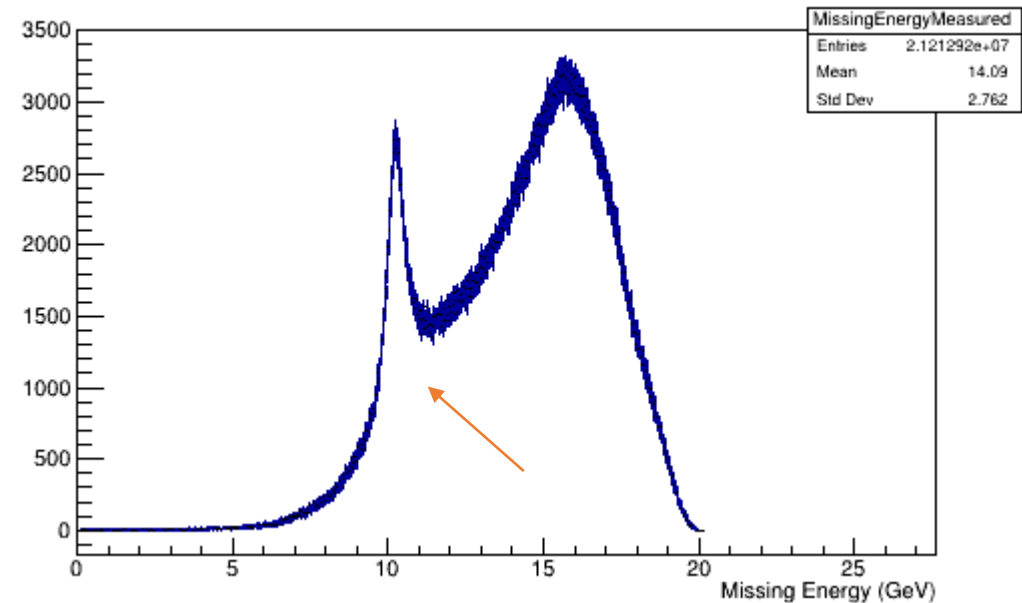
- ReactionFilter plugin is used to find the events for Rho0 channels to make Analysis Trees.
- $\gamma + \text{C12} \longrightarrow \pi^+ + \pi^- + p + (\text{Boron11})$
- Reaction : 1_67__8_9_14_m66
- Flags : F4_B4_T2_S5
- F4 = 4Momentum and Vertex constraint Kinfit
- B4 = includes beam photon from 4 beam bunches on either side of prompt peak(B1default)
- T2 = Exclude events with more than 2 additional tracks (T3 default)
- S5 = Exclude events with more than 5 additional shower (999 default)
- $\gamma + \text{C12} \longrightarrow \pi^+ + \pi^- + p + (\text{unknown})$
- Reaction : 1_67__8_9_14_m0
- Flags : F4_B4_T2_S5
- Dselector is used for analyzing of “Analysis Trees” produced from Reaction Filter Plugin.

Missing Energy of Rho Before applying cut on $|t|$ and $|u|$

Missing Boron



Missing Unknown



C.L > 0.001

BeamEnergy > 6.5 GeV

52 cm < Zvertex < 78 cm

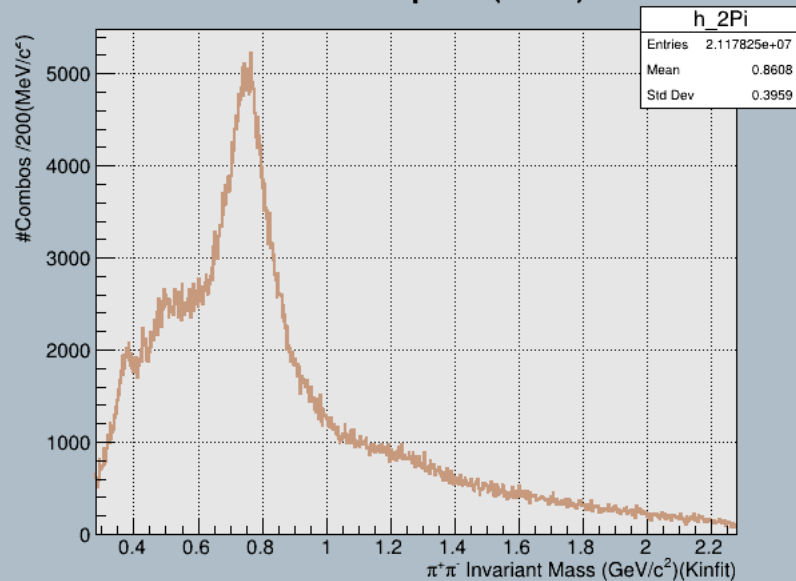
Coplanarity between Rho0 and Proton(165,195)

PipProt Invariant Mass > 1.3 && PimProt Invariant Mass > 1.2

0.8 < pMinus < 1.1

Missing Unknown (Final particle) : Carbon

Invariant mass of PipPim (Kinfit)



List of Cuts applied

C.L > 0.001

BeamEnergy > 6.5 GeV

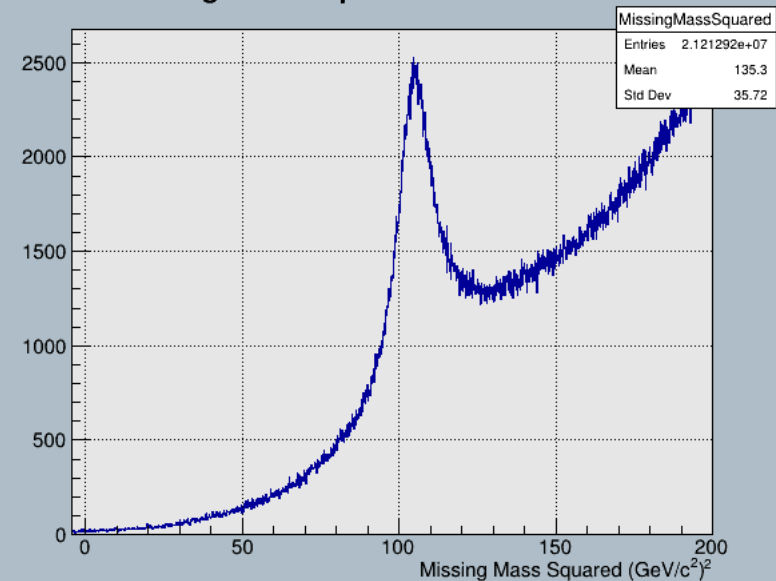
52 cm < Zvertex < 78 cm

Coplanarity between Rho0 and Proton(165,195)

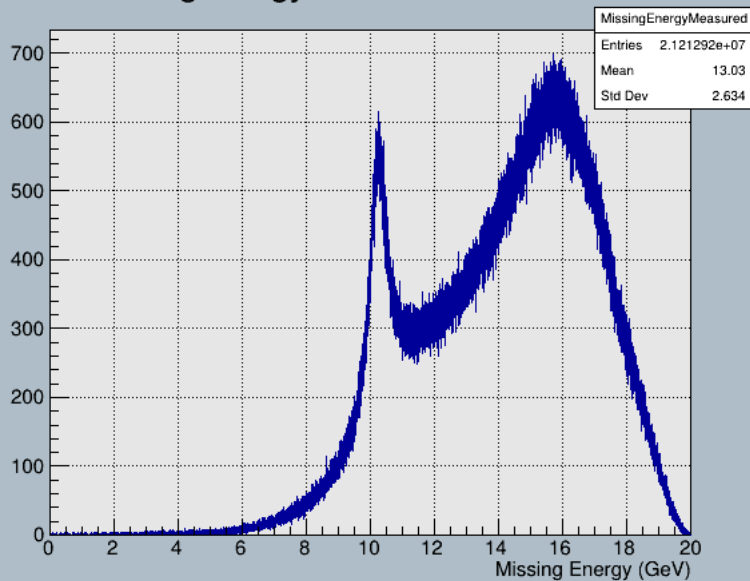
PipProt Invariant Mass > 1.3 & PimProt Invariant Mass > 1.2

pMinus = E(rho+ proton) - Pz(rho+proton) (0.8 < pMinus < 1.1)

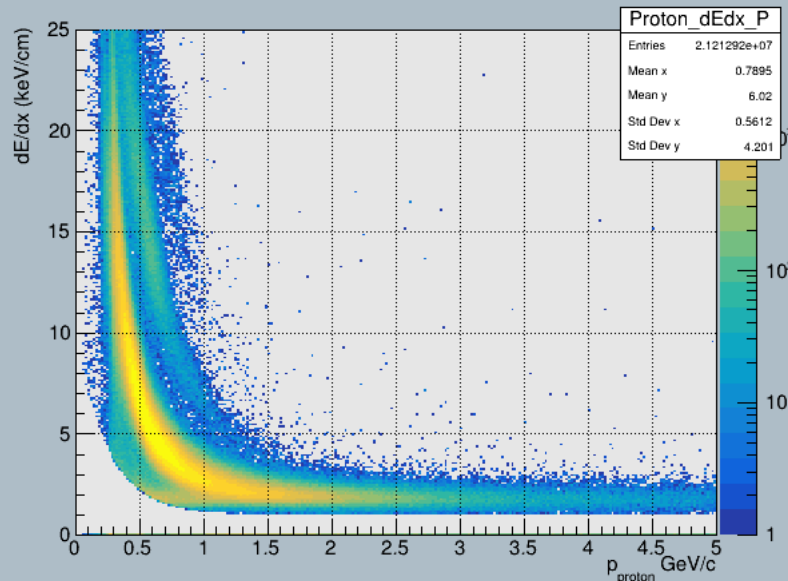
Missing Mass Squared



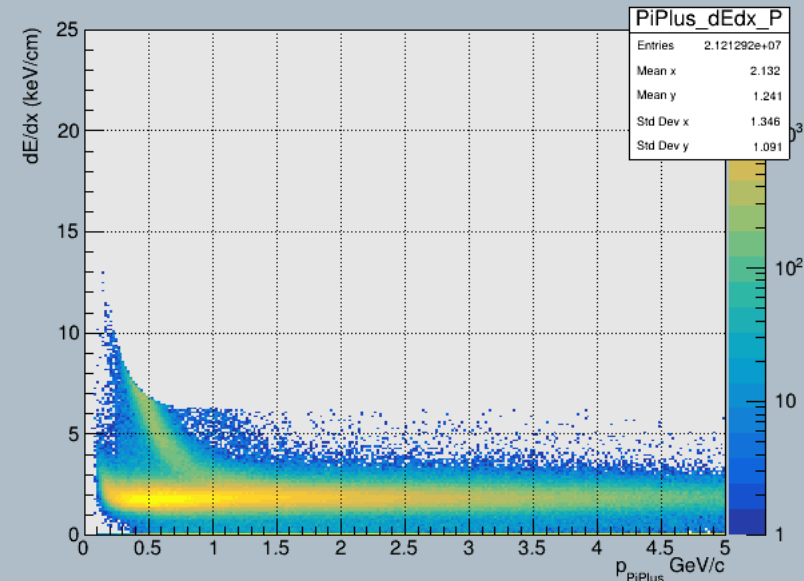
Missing Energy



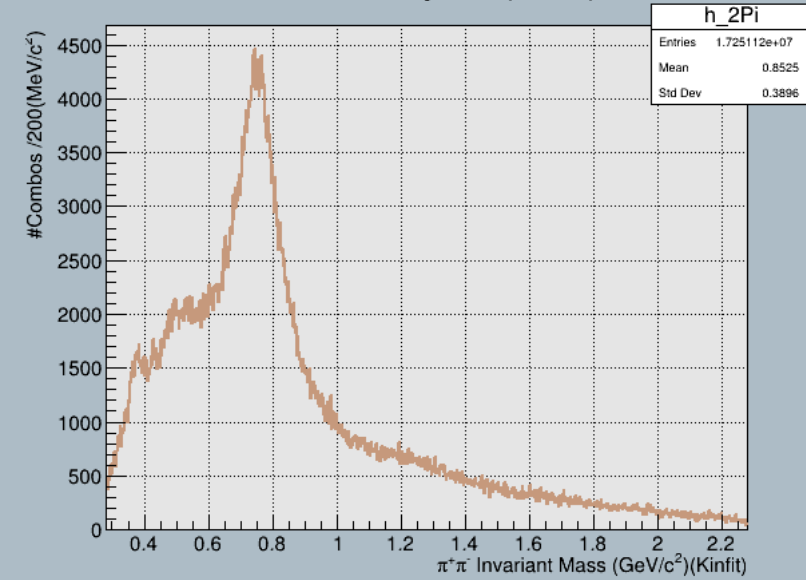
dE/dx Proton



dE/dx PiPlus



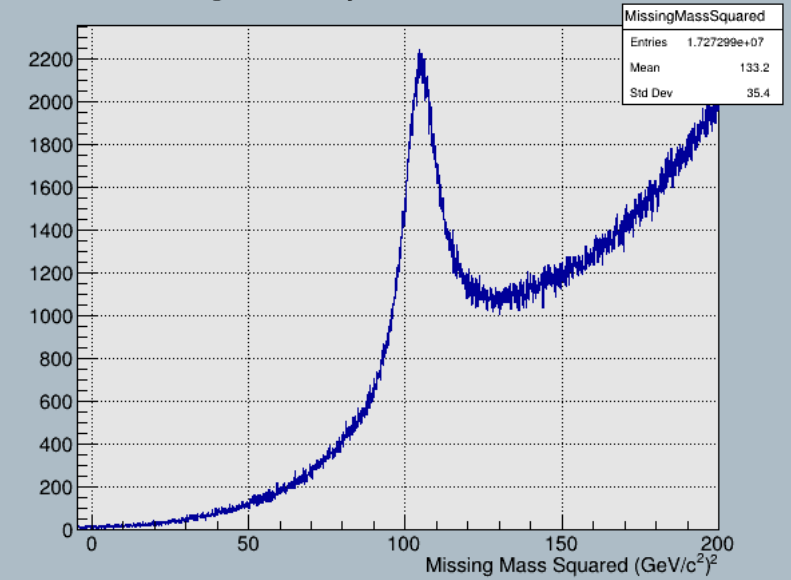
Invariant mass of PipPim (Kinfit)



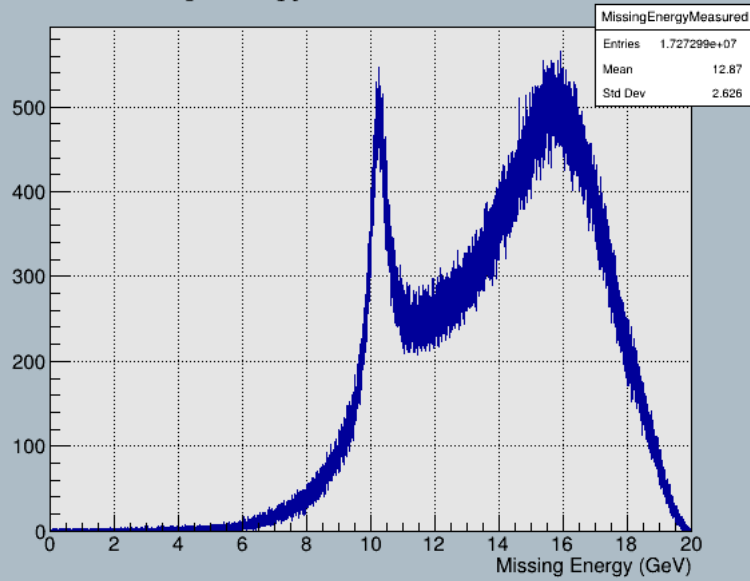
List of Cuts applied

C.L > 0.001
BeamEnergy > 6.5 GeV
52 cm < Zvertex < 78 cm
Coplanarity between Rho0 and Proton(165,195)
PipProt Invariant Mass > 1.3 && PimProt Invariant Mass > 1.2
pMinus = E(rho+ proton) - Pz(rho+proton) (0.8 <pMinus < 1.1)
PIDFOM > 0.001

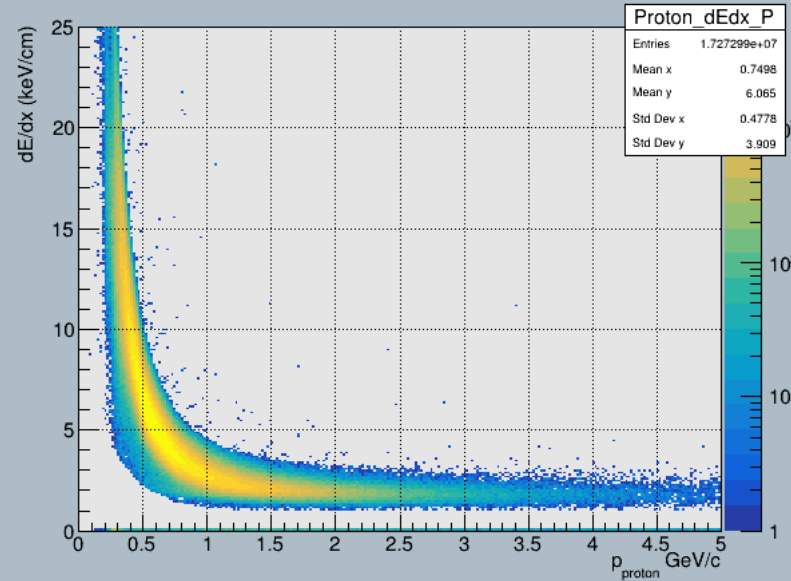
Missing Mass Squared



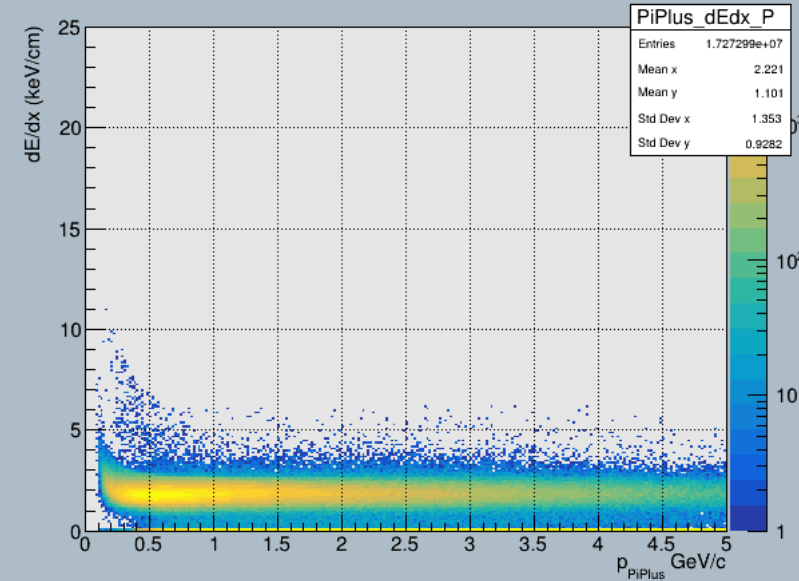
Missing Energy



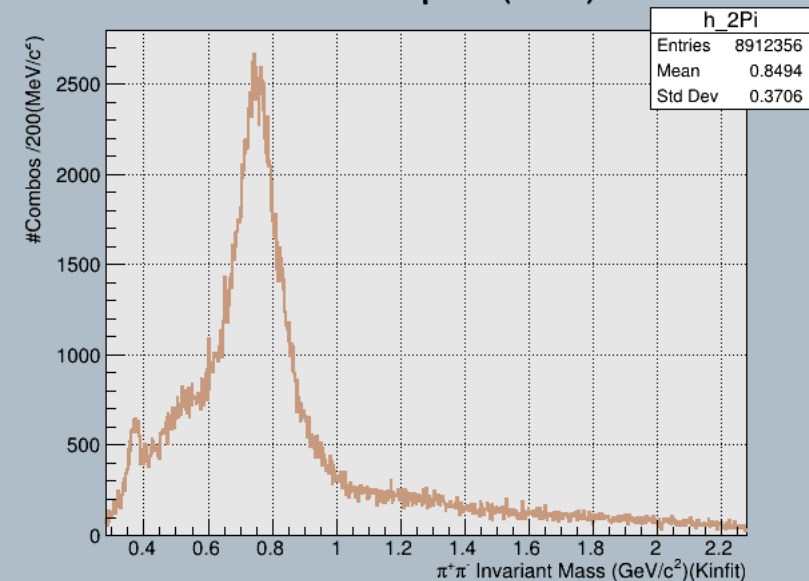
dE/dx Proton



dE/dx PiPlus



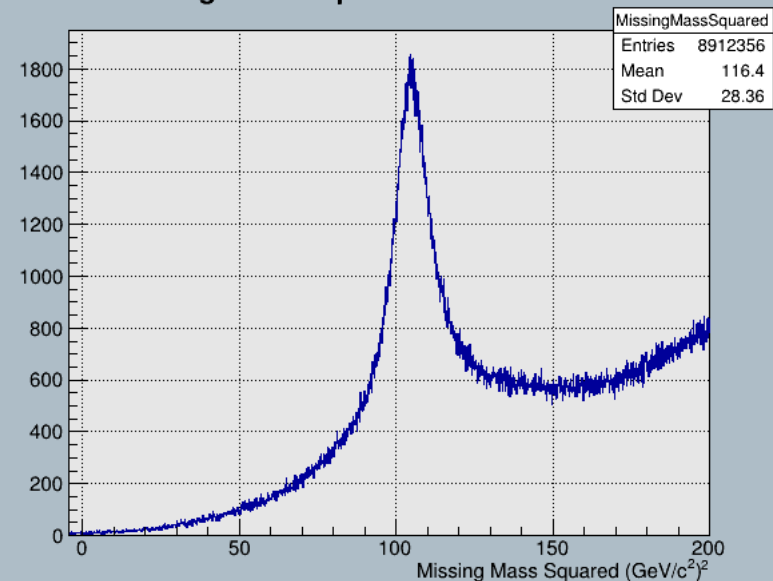
Invariant mass of PipPim (Kinfit)



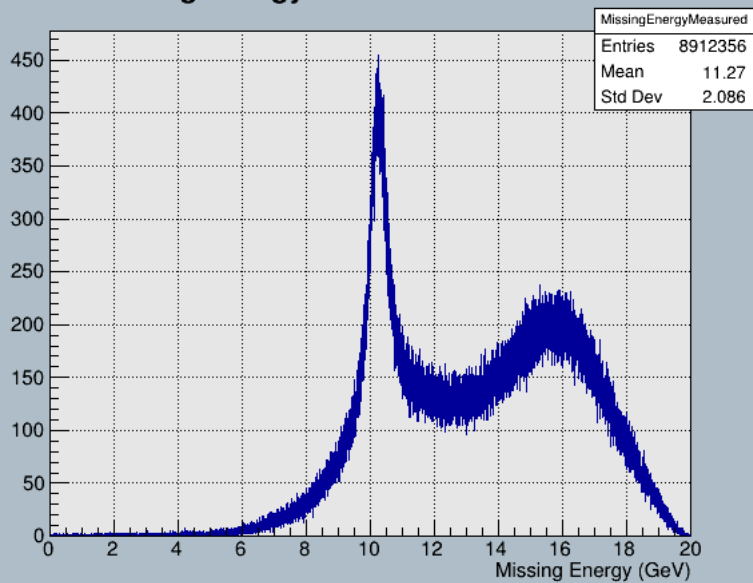
List of Cuts applied

C.L > 0.001
BeamEnergy > 6.5 GeV
52 cm < Zvertex < 78 cm
Coplanarity between Rho0 and Proton(165,195)
PipProt Invariant Mass > 1.3 && PimProt Invariant Mass >1.2
pMinus = E(rho+ proton) - Pz(rho+proton) (0.8 <pMinus < 1.1)
PIDFOM > 0.001
No of extra tracks = 0.0 (Before: T =3)

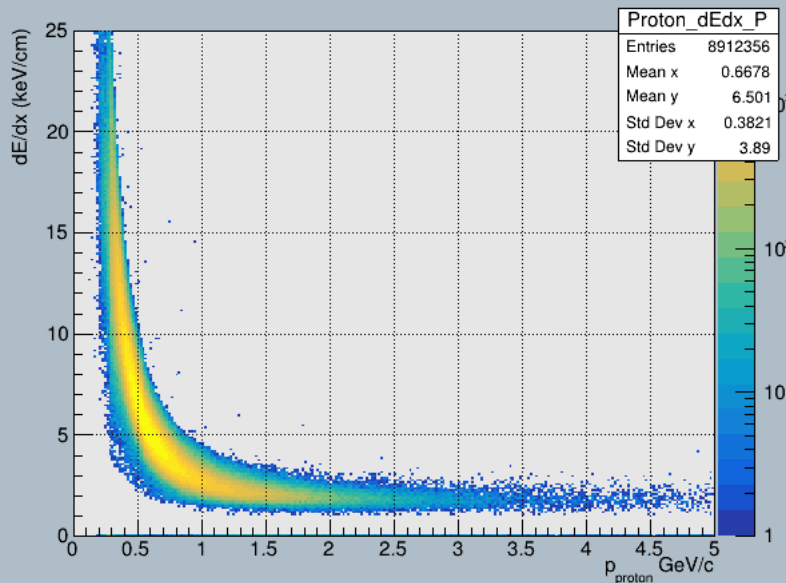
Missing Mass Squared



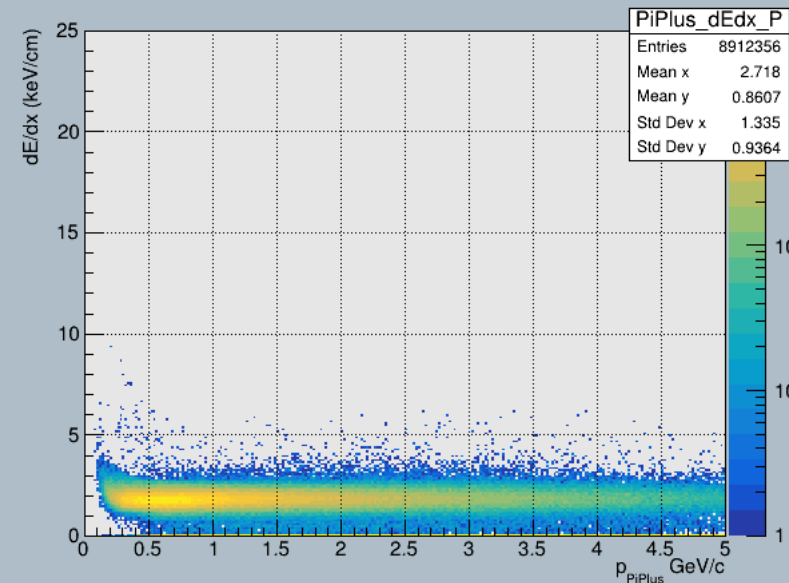
Missing Energy



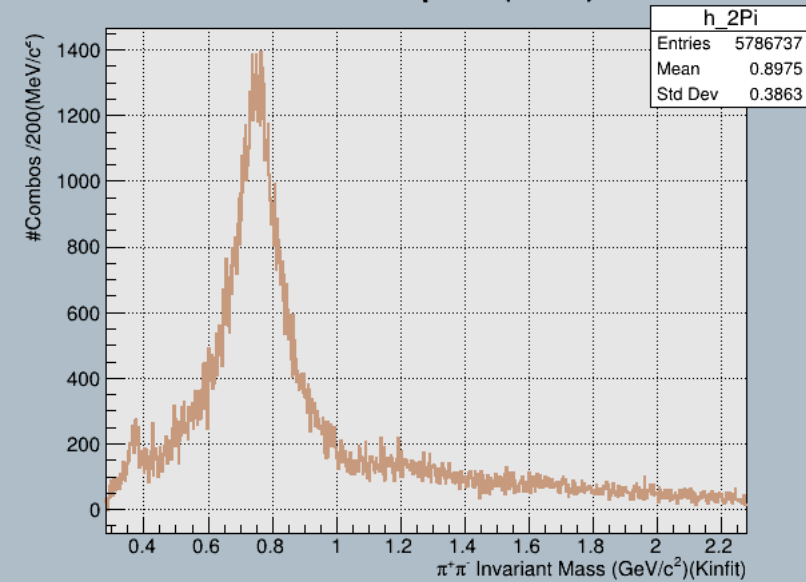
dE/dx Proton



dE/dx PiPlus



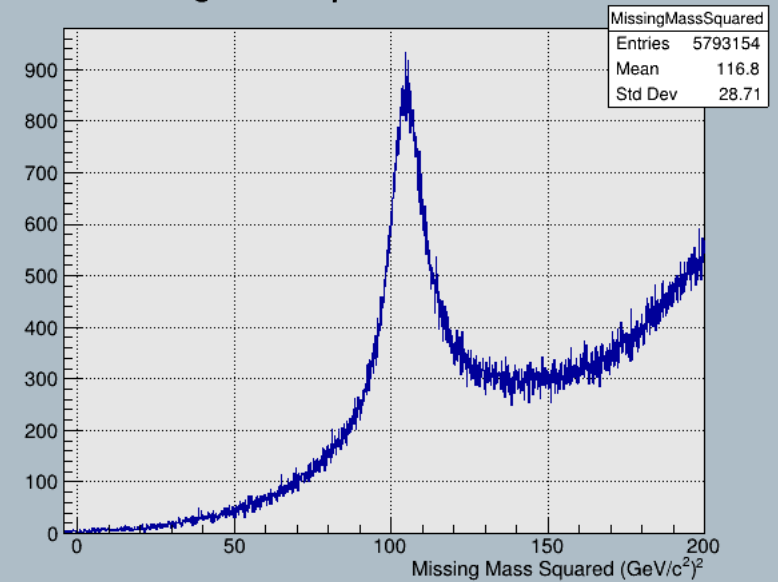
Invariant mass of PipPim (Kinfit)



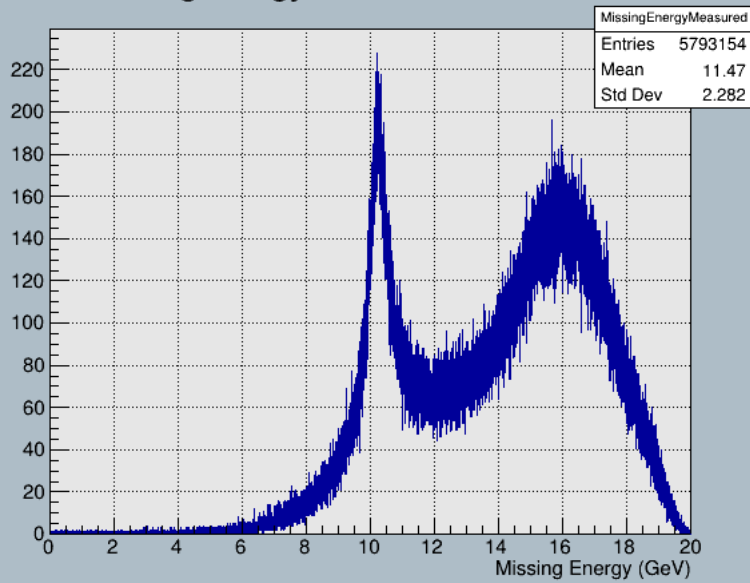
List of Cuts applied

C.L > 0.001
BeamEnergy > 6.5 GeV
52 cm < Zvertex < 78 cm
Coplanarity between Rho0 and Proton(165,195)
PipProt Invariant Mass > 1.3 && PimProt Invariant Mass > 1.2
pMinus = E(rho+ proton) - Pz(rho+proton) (0.8 <pMinus < 1.1)
PIDFOM > 0.001
No of unused shower = 0.0 (Before: S =5)

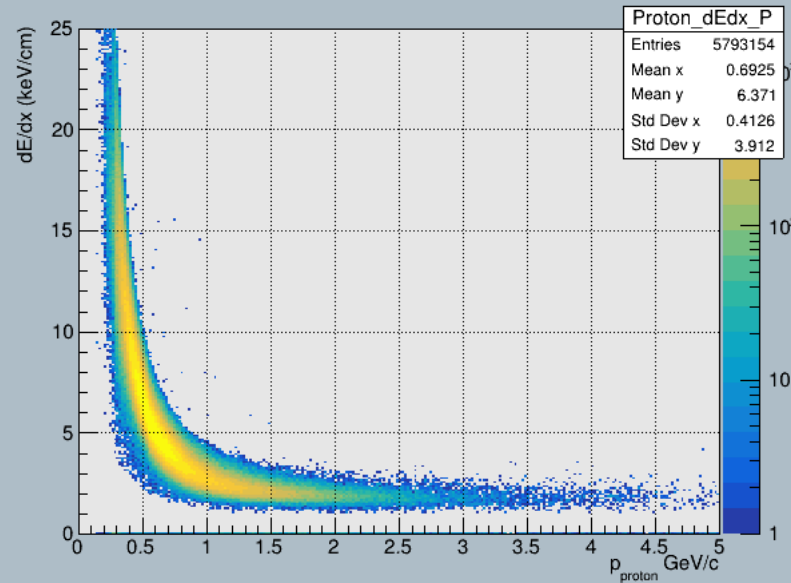
Missing Mass Squared



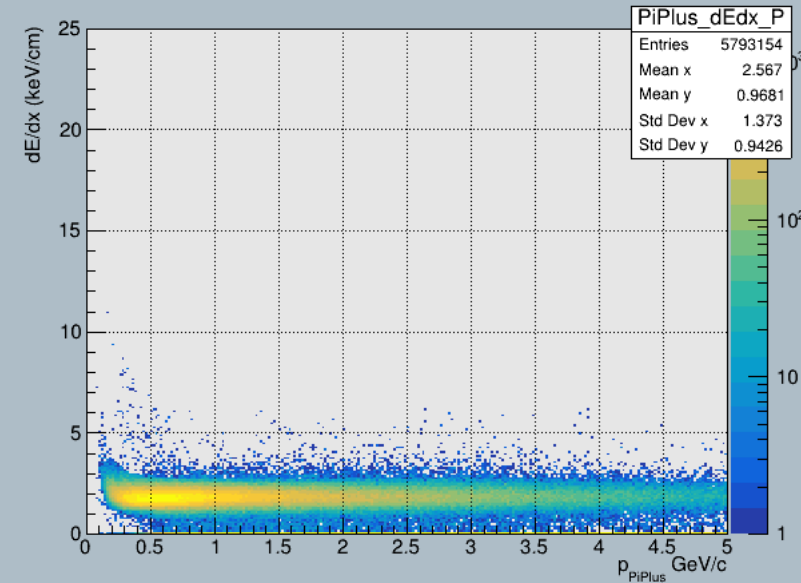
Missing Energy



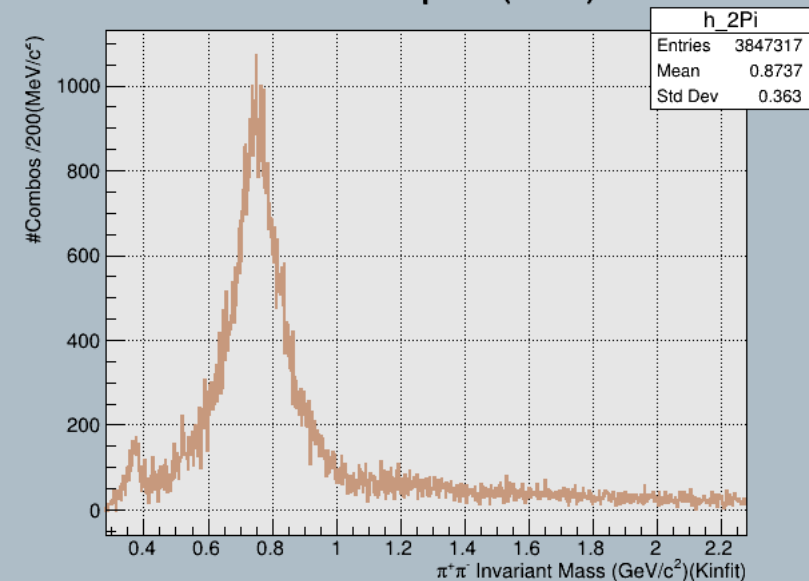
dE/dx Proton



dE/dx PiPlus



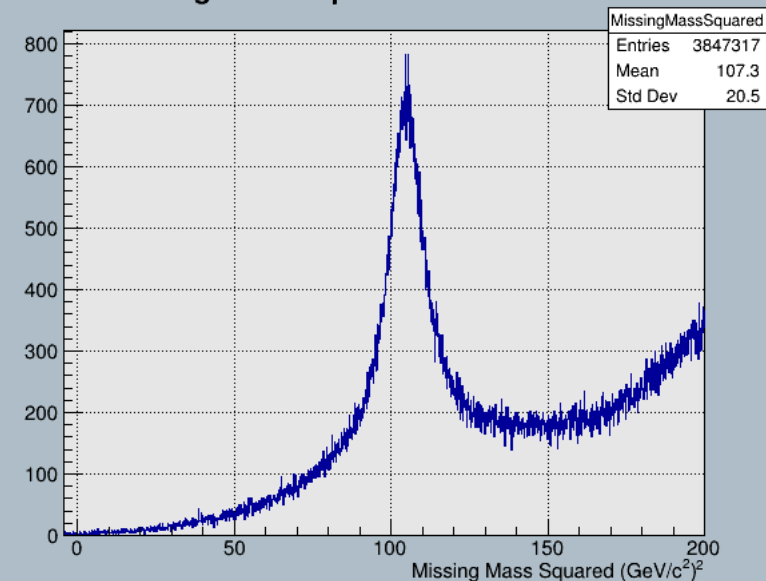
Invariant mass of PipPim (Kinfit)



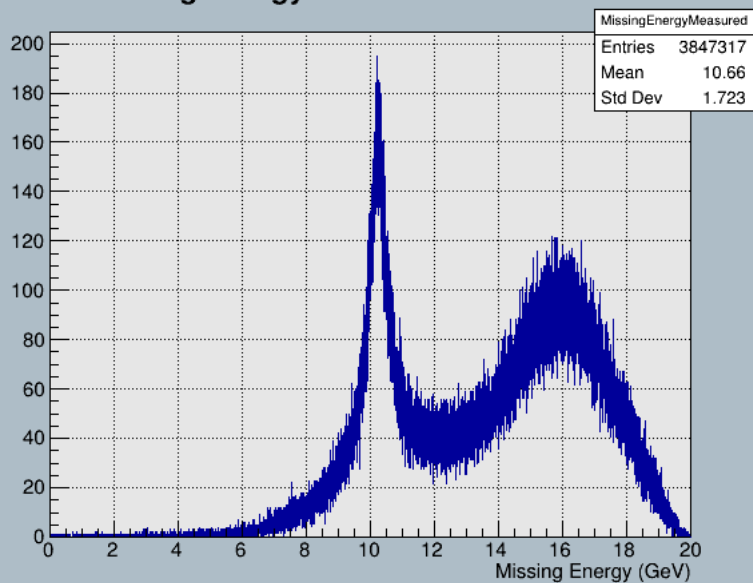
List of Cuts applied

C.L. > 0.001
BeamEnergy > 6.5 GeV
52 cm < Zvertex < 78 cm
Coplanarity between Rho0 and Proton(165,195)
PipProt Invariant Mass > 1.3 && PimProt Invariant Mass > 1.2
pMinus = E(rho+ proton) - Pz(rho+proton) (0.8 < pMinus < 1.1)
PIDFOM > 0.001
No of unused shower = 0.0 (Before: S =5)
No of extra tracks = 0.0 (Before: T =3)

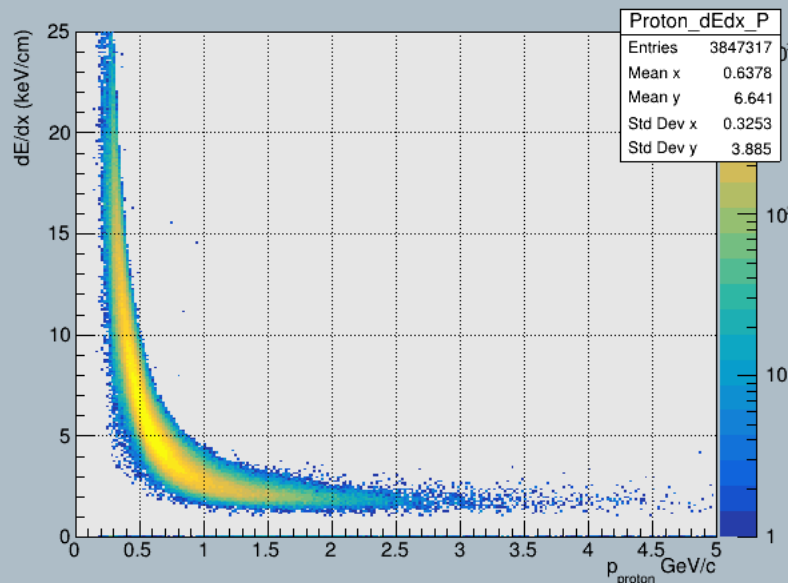
Missing Mass Squared



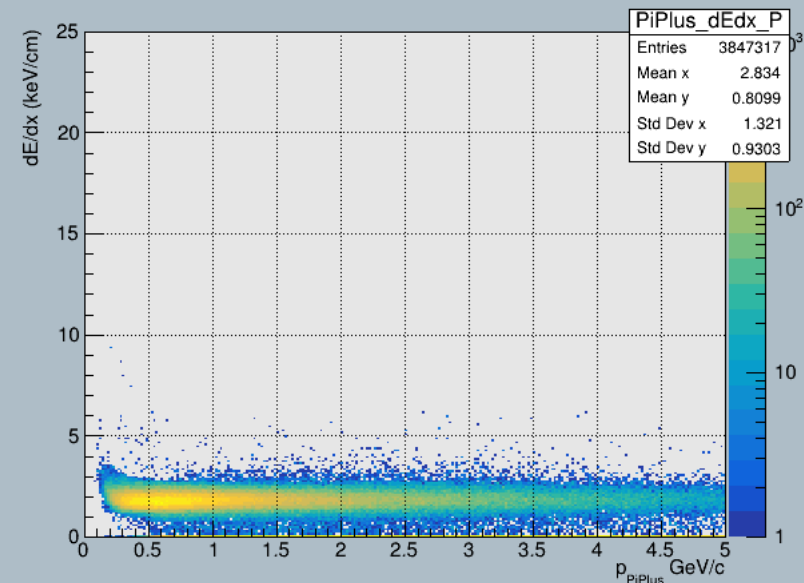
Missing Energy



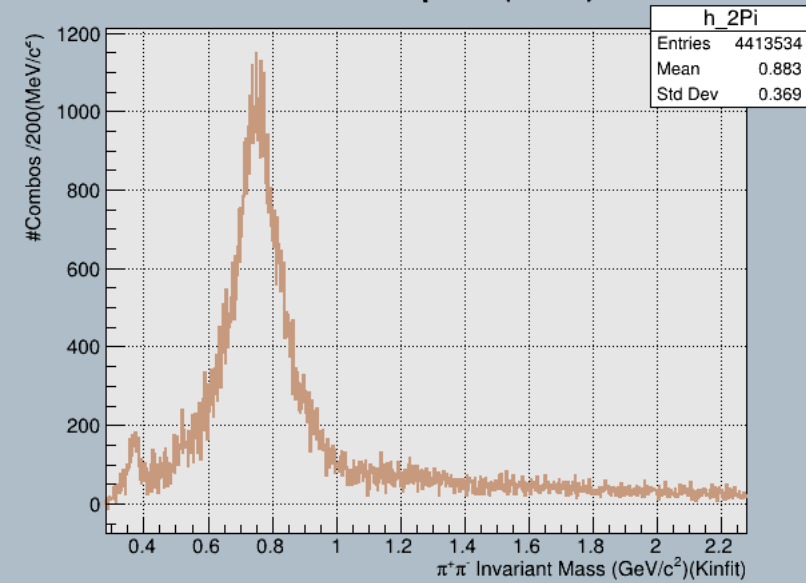
dE/dx Proton



dE/dx PiPlus



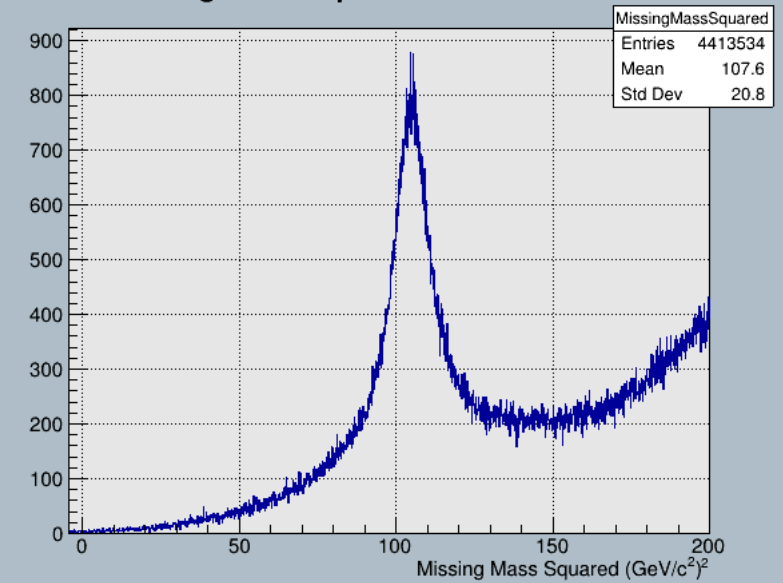
Invariant mass of PipPim (Kinfit)



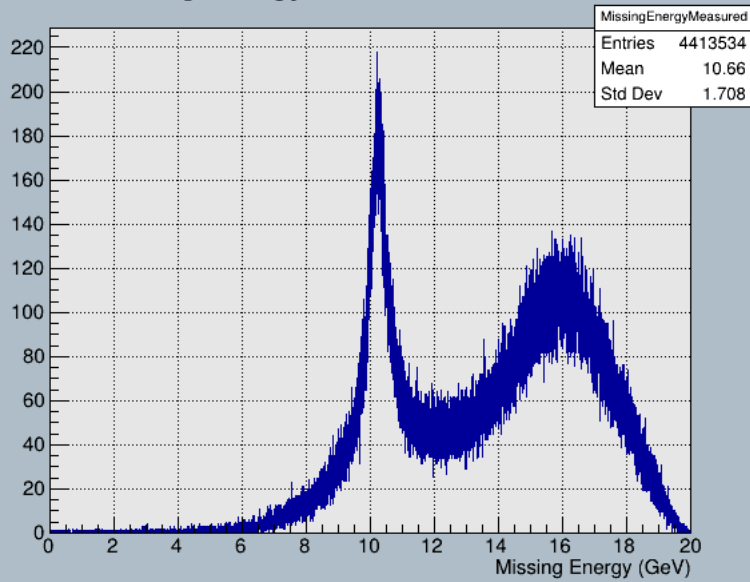
List of Cuts applied

C.L > 0.001
BeamEnergy > 6.5 GeV
52 cm < Zvertex < 78 cm
Coplanarity between Rho0 and Proton(165,195)
PipProt Invariant Mass > 1.3 && PimProt Invariant Mass >1.2
pMinus = E(rho+ proton) - Pz(rho+proton) (0.8 <pMinus < 1.1)
No of unused shower = 0.0 (Before: S =5)
No of extra tracks = 0.0 (Before: T =3)

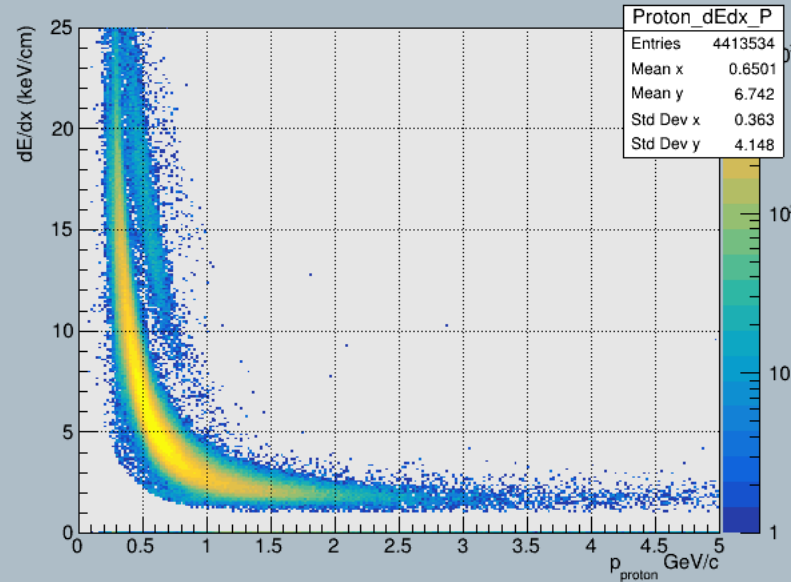
Missing Mass Squared



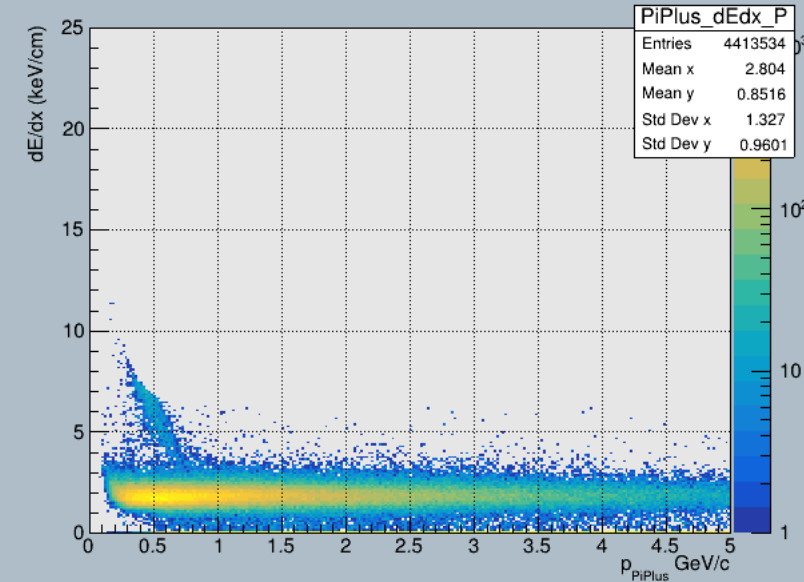
Missing Energy



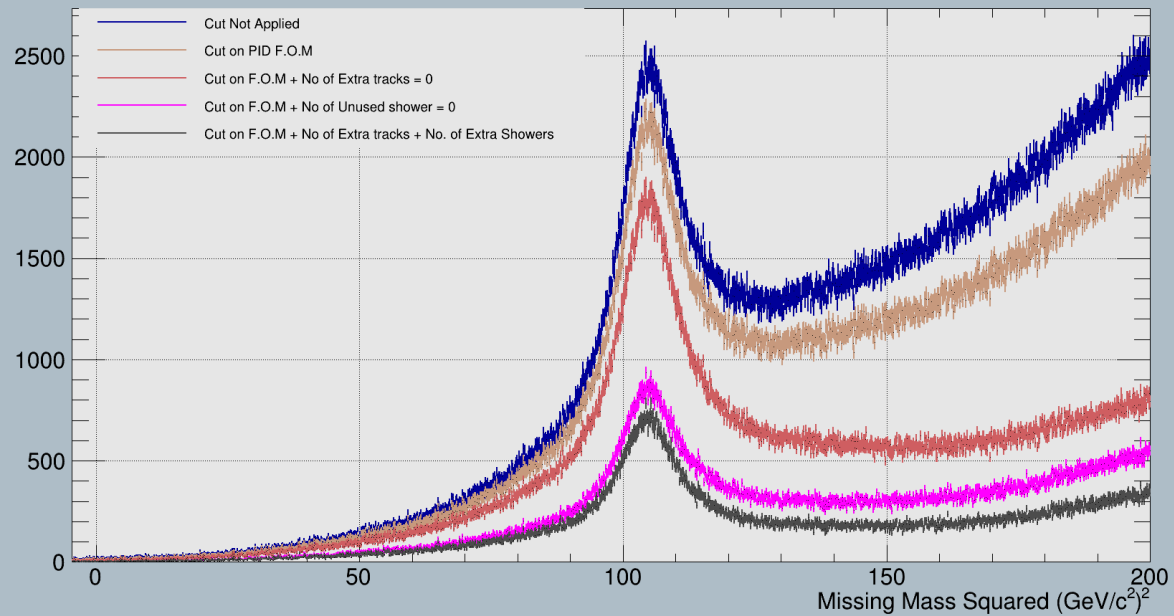
dE/dx Proton



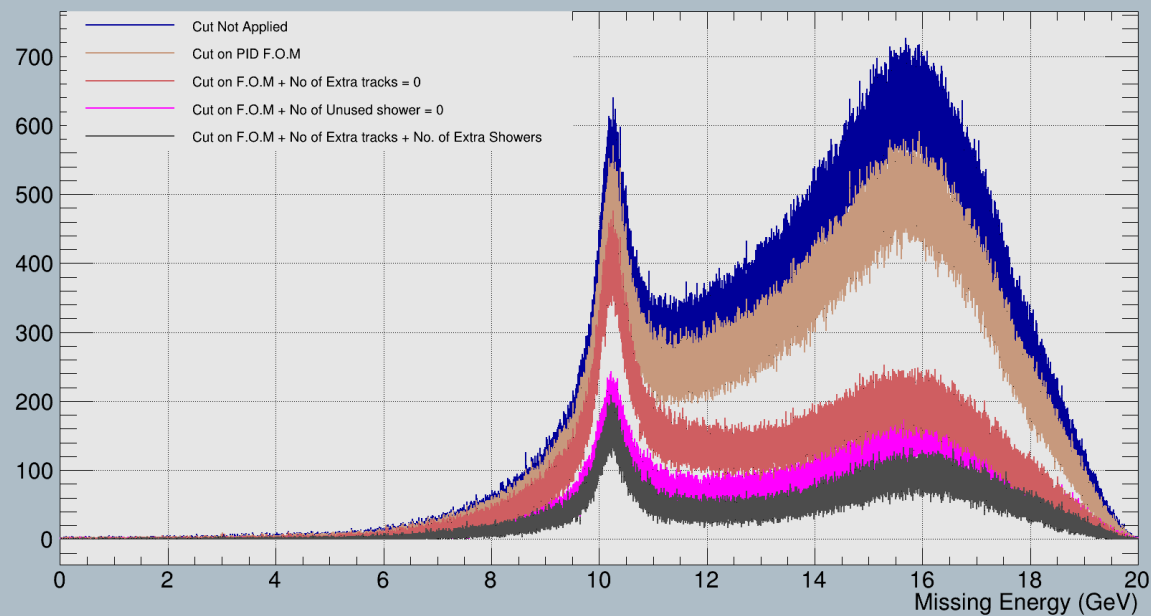
dE/dx PiPlus



$\pi^+\pi^-$ Missing Mass Squared



$\pi^+\pi^-$ Missing Energy



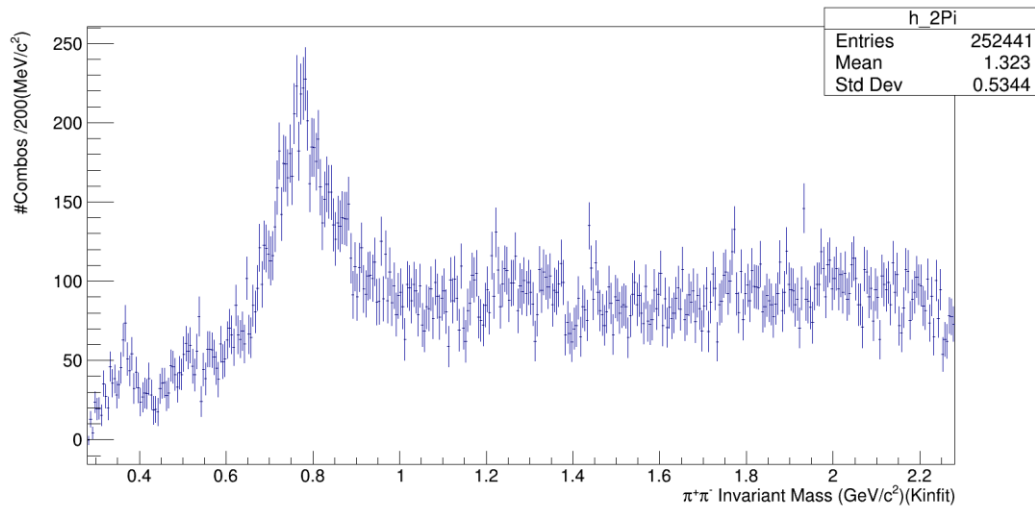
Cuts for removing excessive background.

- PIDFOM > 0.001,
- Extra No of Unused Shower = 0
- No of Extra Tracks = 0

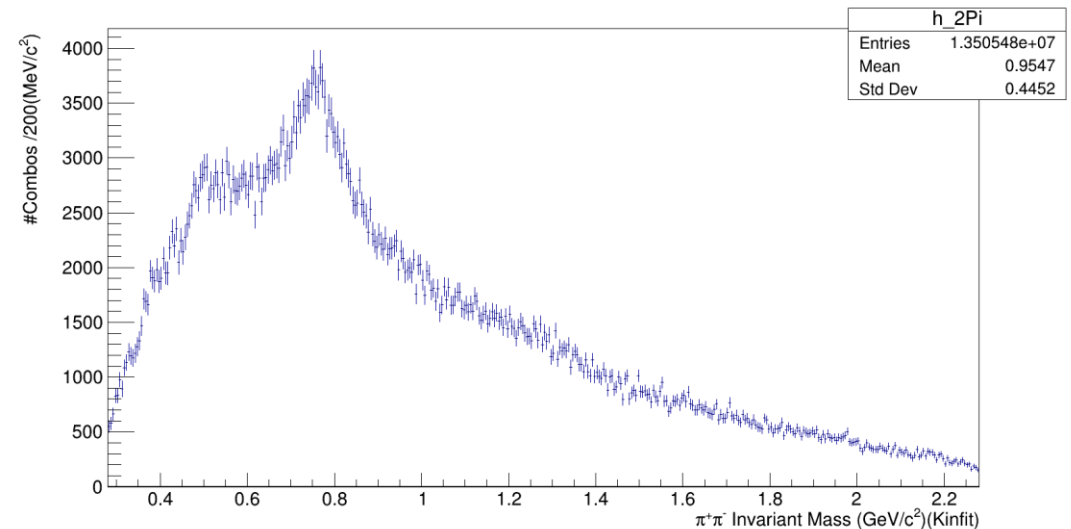
ME cut to be figured out from simulation.
MM2 cut to be figured out from simulation.

Invariant Mass of Rho After applying cut on $|t| > 1, |u| > 1$

Missing Boron



Missing Unknown



C.L > 0.001

BeamEnergy > 6.5 GeV

52 cm < Zvertex < 78 cm

Coplanarity between Rho0 and Proton(165,195)

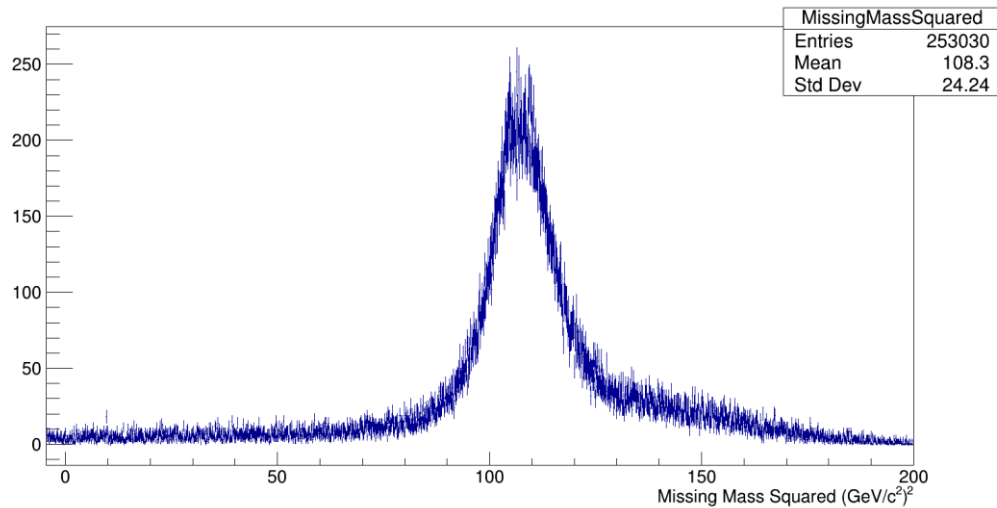
PipProt Invariant Mass > 1.3 && PimProt Invariant Mass > 1.2

0.8 < pMinus < 1.1

Cuts on PIDFOM, No of
Extra tracks, Extra showers not applied.

MM2 of Rho After applying cut on $|t| > 1, |u| > 1$ (Carbon)

Missing Boron



C.L > 0.001

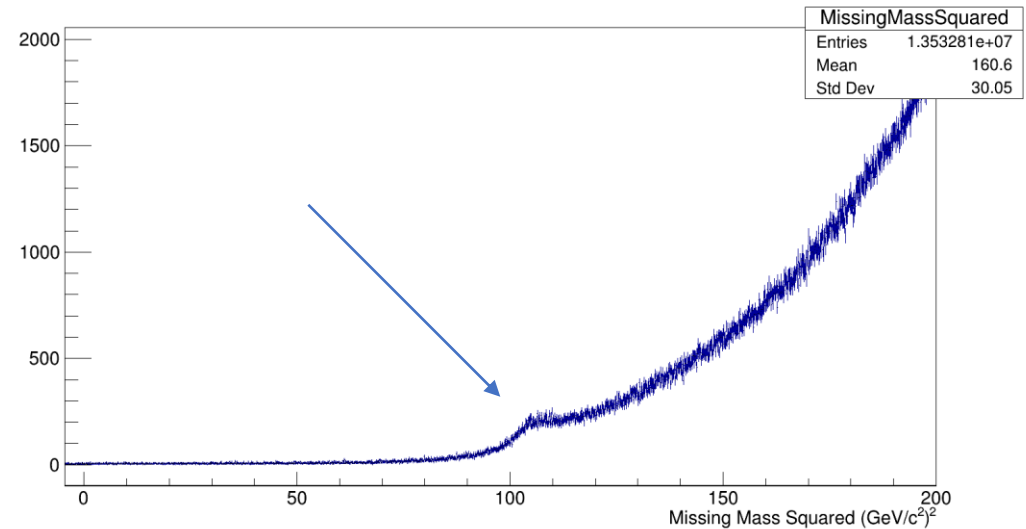
BeamEnergy > 6.5 GeV

52 cm < Zvertex < 78 cm

Coplanarity between Rho0 and Proton(165,195)

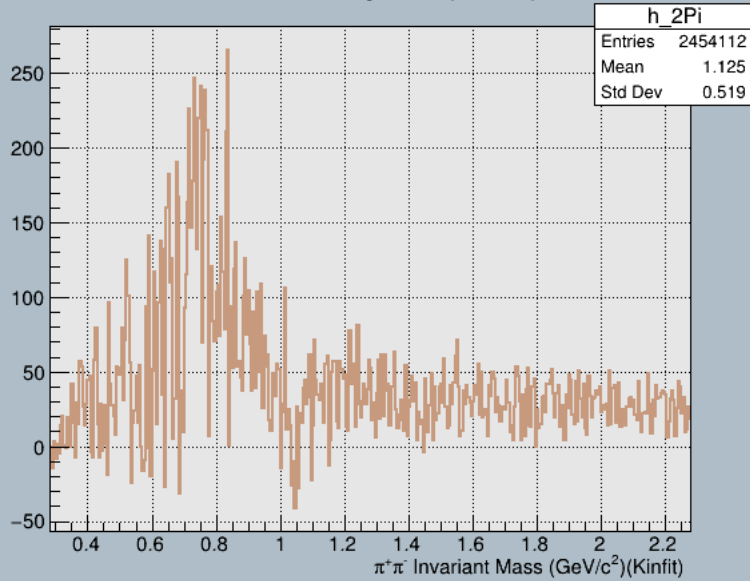
PipProt Invariant Mass > 1.3 && PimProt Invariant Mass > 1.2

Missing Unknown



Cuts on PIDFOM, No of
Extra tracks, Extra showers not applied.

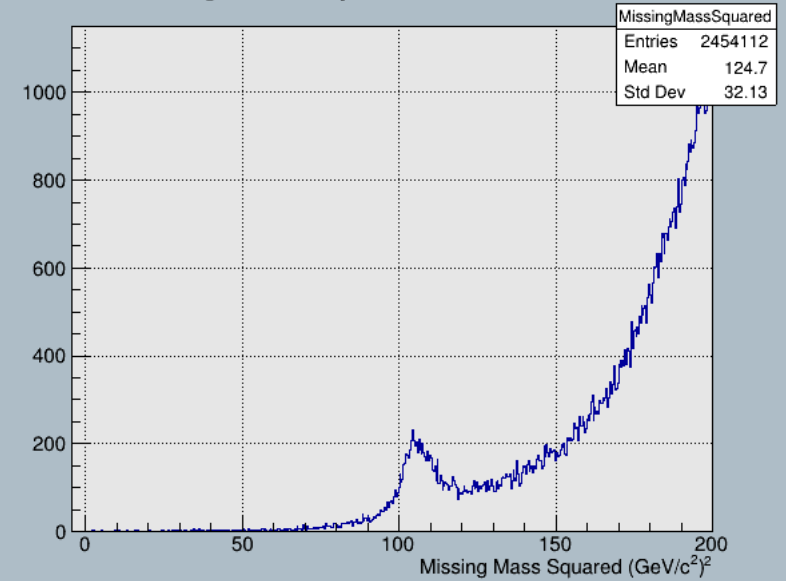
Invariant mass of PipPim (Kinfit)



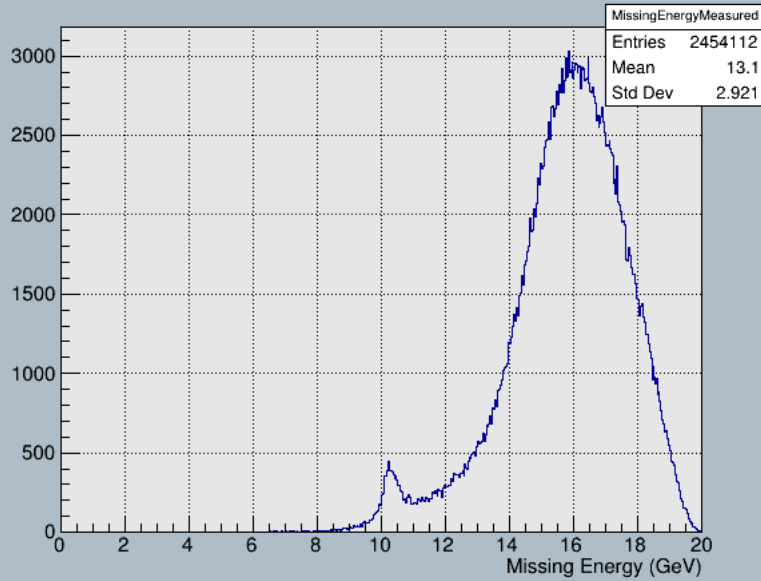
List of Cuts applied

C.L > 0.001
BeamEnergy > 6.5 GeV
52 cm < Zvertex < 78 cm
Coplanarity between Rho0 and Proton(165,195)
PipProt Invariant Mass > 1.3 && PimProt Invariant Mass > 1.2
 $p_{\text{Minus}} = E(\text{rho} + \text{proton}) - P_z(\text{rho} + \text{proton})$ ($0.8 < p_{\text{Minus}} < 1.1$)
: $|t| > 1$ and $|u| > 1$
PIDFOM > 0.001
No of unused shower = 0.0 (Before: S =5)
No of extra tracks = 0.0 (Before: T =3)

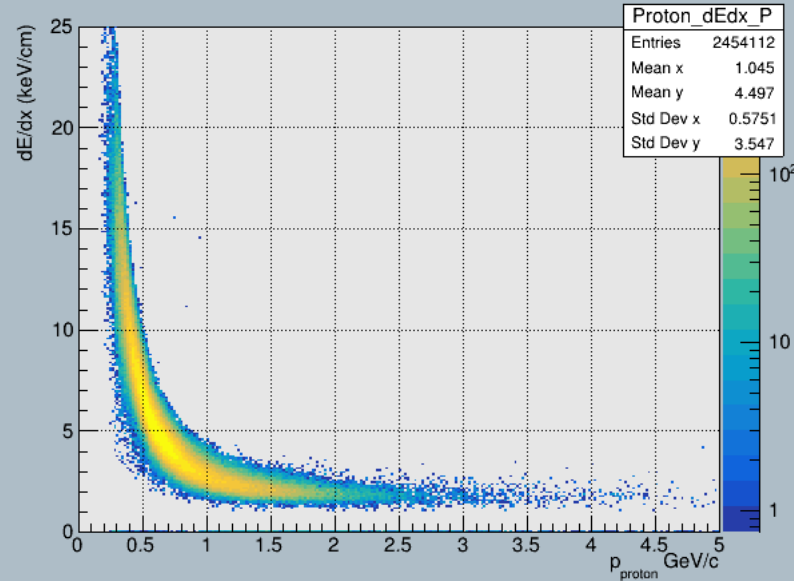
Missing Mass Squared



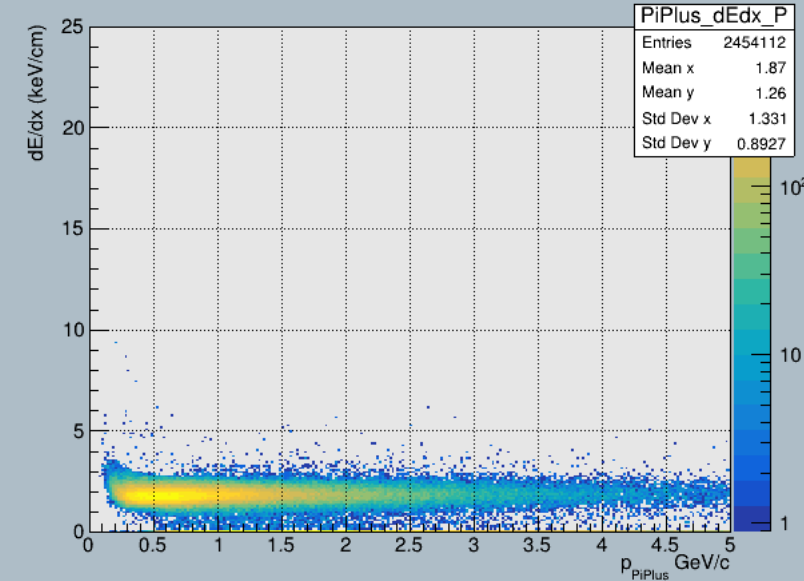
Missing Energy

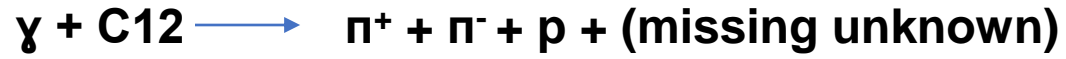


dE/dx Proton

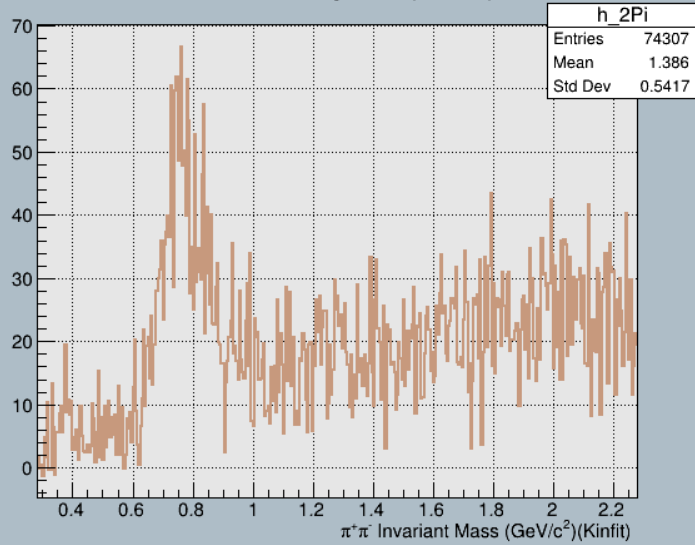


dE/dx PiPlus





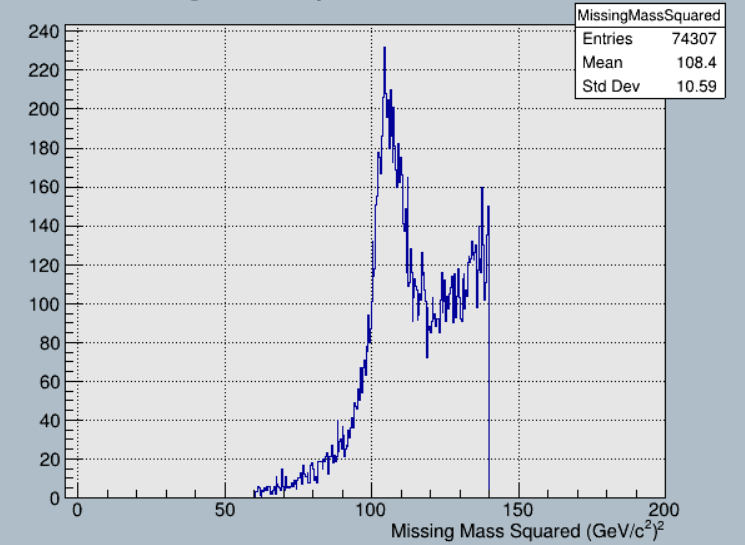
Invariant mass of PipPim (Kinfit)



List of Cuts applied in C12 target

C.L > 0.001
 BeamEnergy > 6.5 GeV
 52 cm < Zvertex < 78 cm
 Coplanarity between Rho0 and Proton(165,195)
 PipProt Invariant Mass > 1.3 && PimProt Invariant Mass >1.2
 $p_{\text{Minus}} = E(\text{rho} + \text{proton}) - P_z(\text{rho} + \text{proton})$ (0.8 < p_{Minus} < 1.1)
 : |t| > 1 and |u| > 1
 PIDFOM > 0.001
 No of unused shower = 0.0 (Before: S =5)
 No of extra tracks = 0.0 (Before: T =2)
 60 < MM2 < 140
 8 < ME < 14

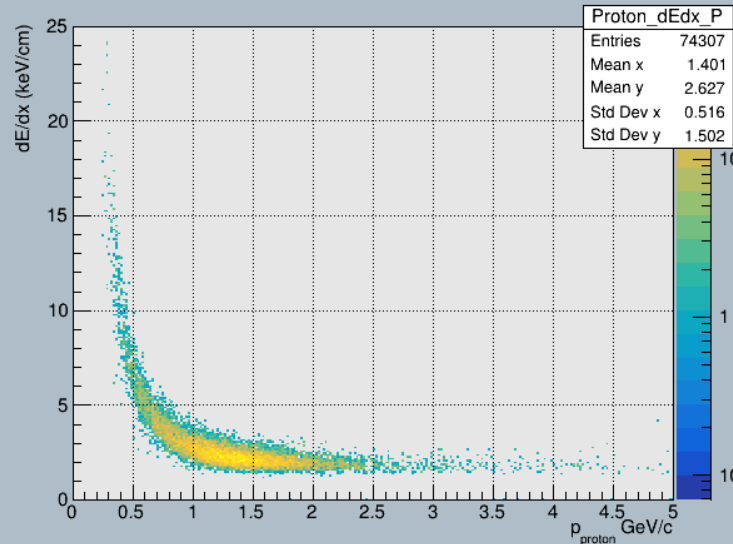
Missing Mass Squared



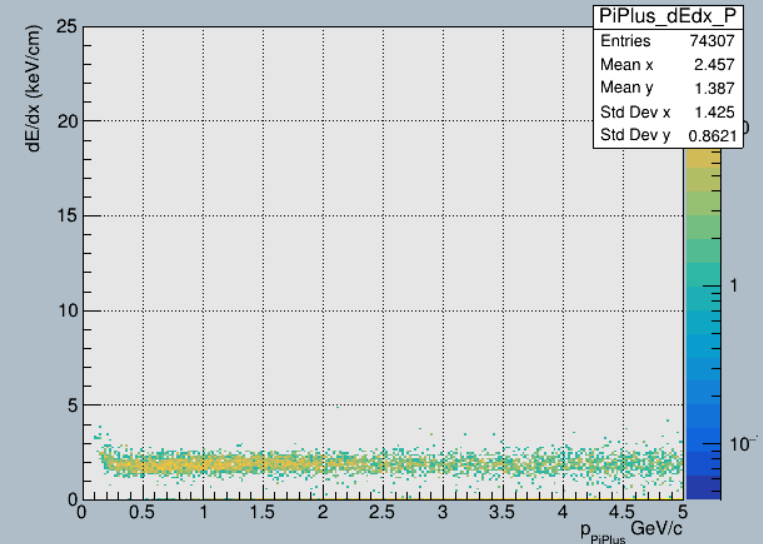
Missing Energy



dE/dx Proton

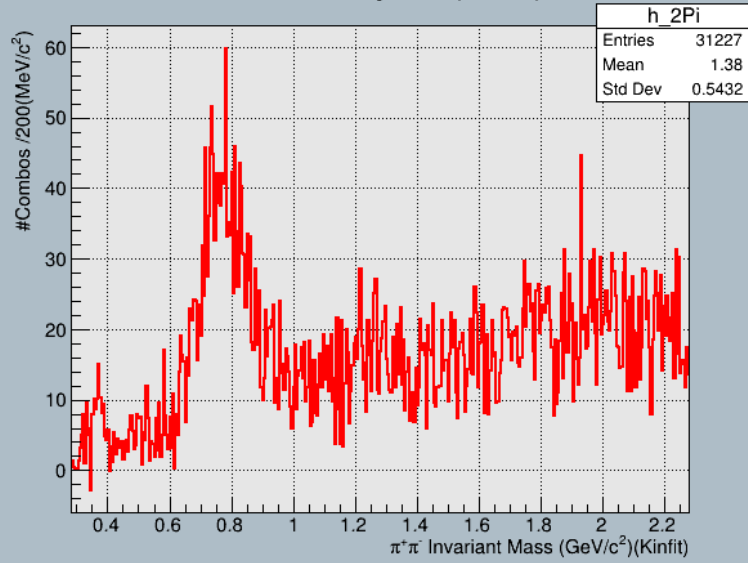


dE/dx PiPlus





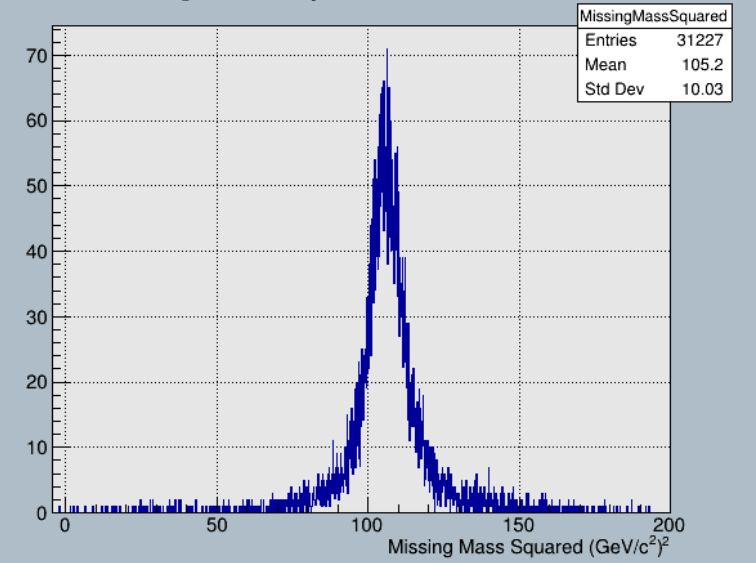
Invariant mass of PipPim (Kinfit)



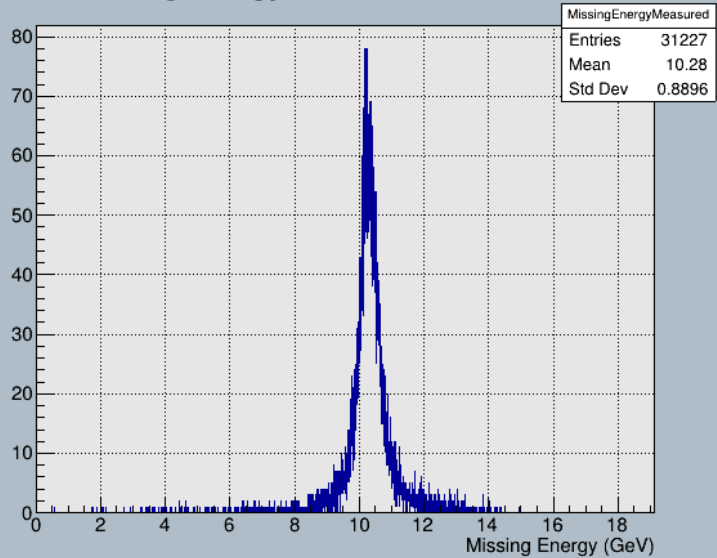
Missing Boron
List of Cuts applied

C.L. > 0.001
 BeamEnergy > 6.5 GeV
 52 cm < Zvertex < 78 cm
 Coplanarity between Rho0 and Proton(165,195)
 PipProt Invariant Mass > 1.3 && PimProt Invariant Mass >1.2
 $p_{\text{Minus}} = E(\text{rho}+ \text{proton}) - P_z(\text{rho}+\text{proton})$ (0.8 < p_{Minus} < 1.1)
PIDFOM > 0.001
No of unused shower = 0.0 (Before: S =5)
No of extra tracks = 0.0 (Before: T =2)

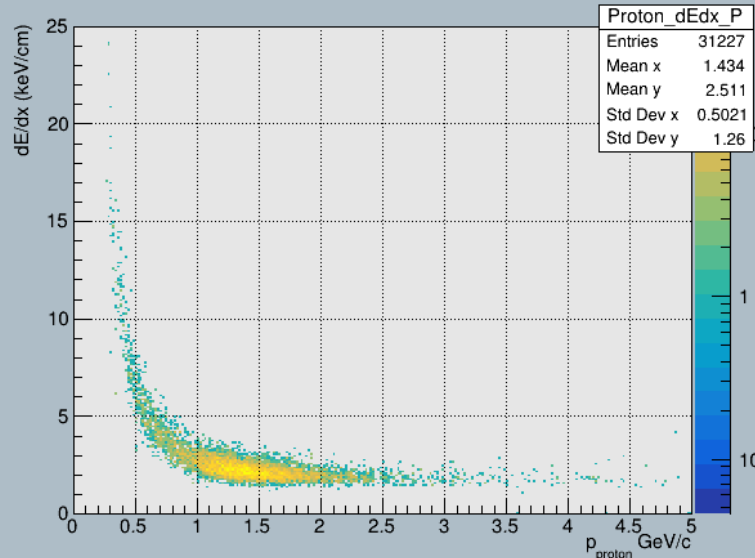
Missing Mass Squared



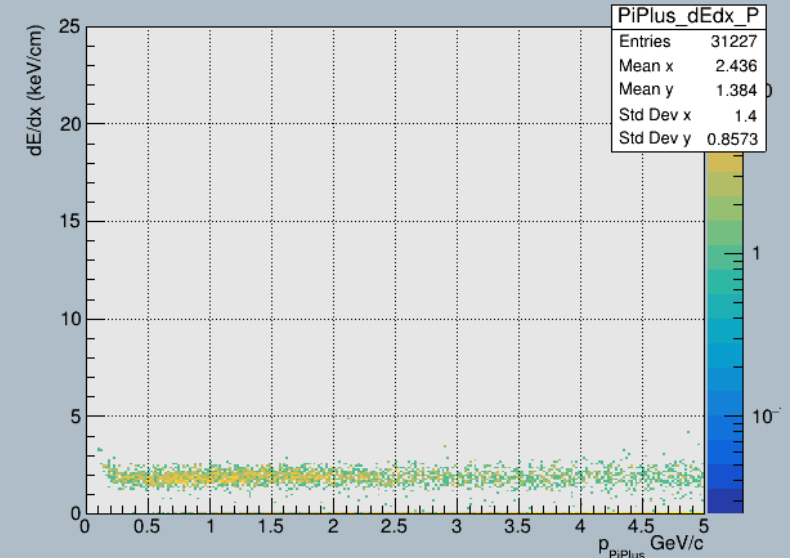
Missing Energy



dE/dx Proton



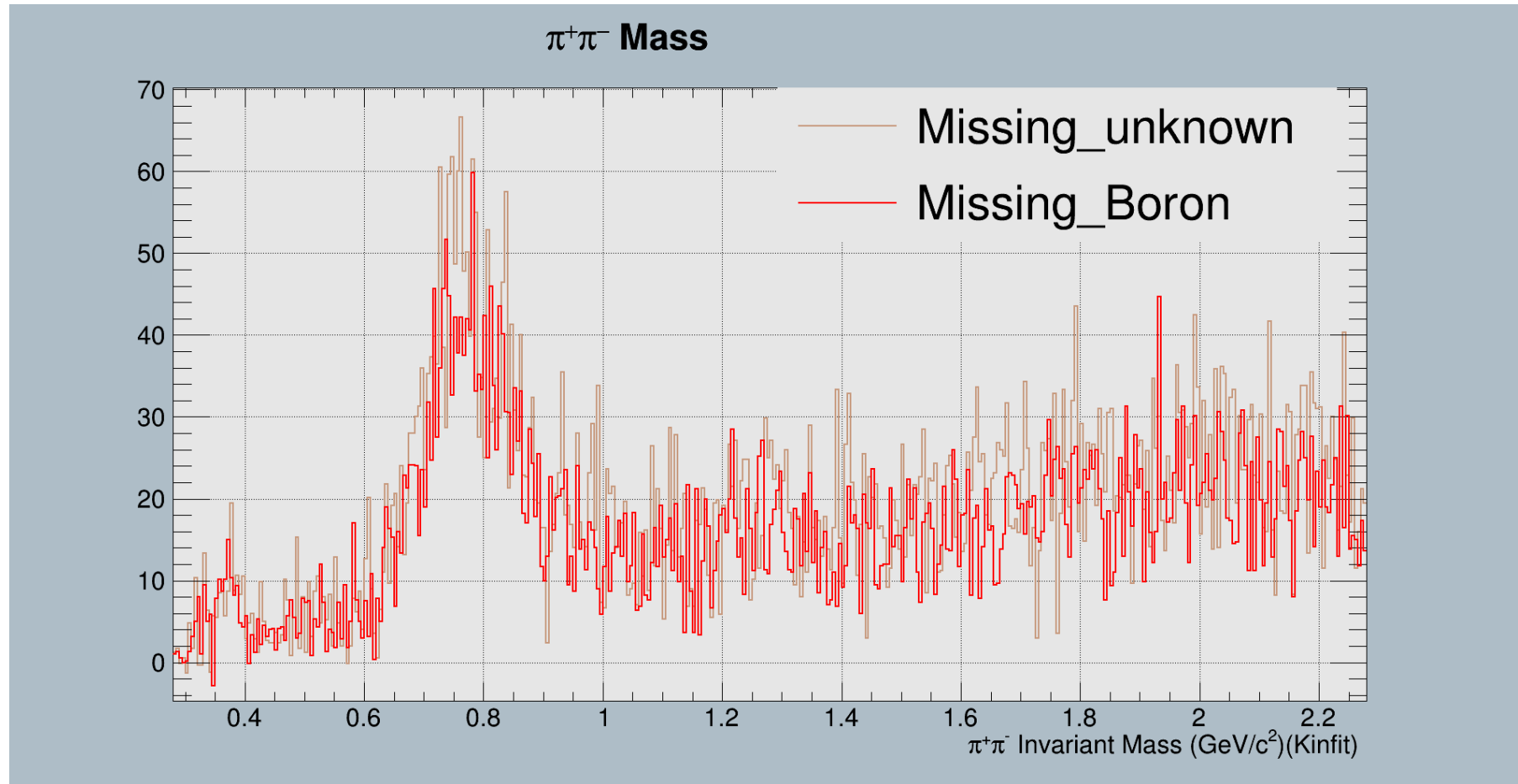
dE/dx PiPlus



$\gamma + \text{C12}$ \rightarrow

$\pi^+ + \pi^- + p + (\text{Boron11})$

$\gamma + \text{C12}$ \rightarrow $\pi^+ + \pi^- + p + (\text{missing unknown})$



Extra cut Applied on ME(8, 14) GeV and MM2 (60,140) $((\text{GeV}/C^2))^2$ for Missing_unknown.