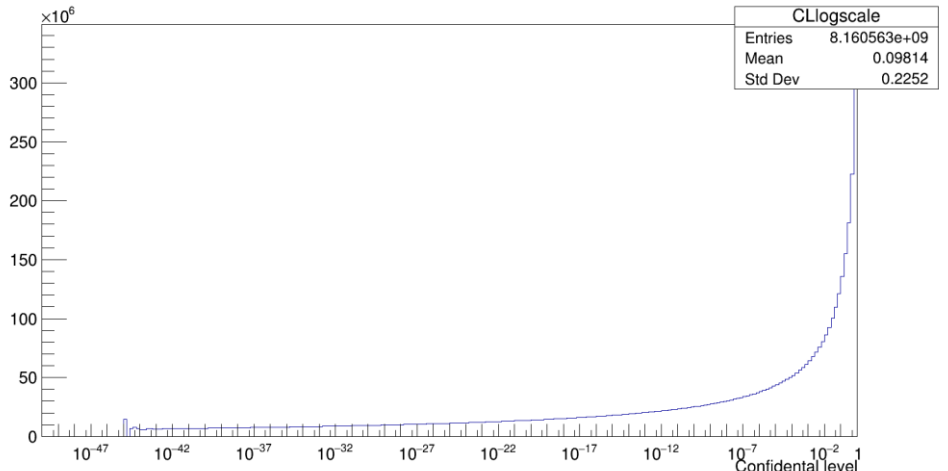
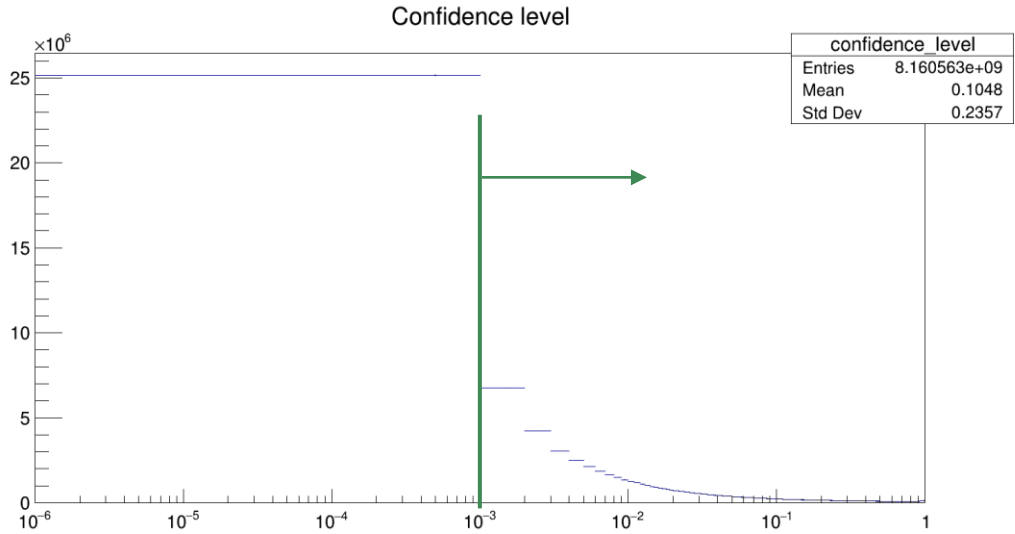
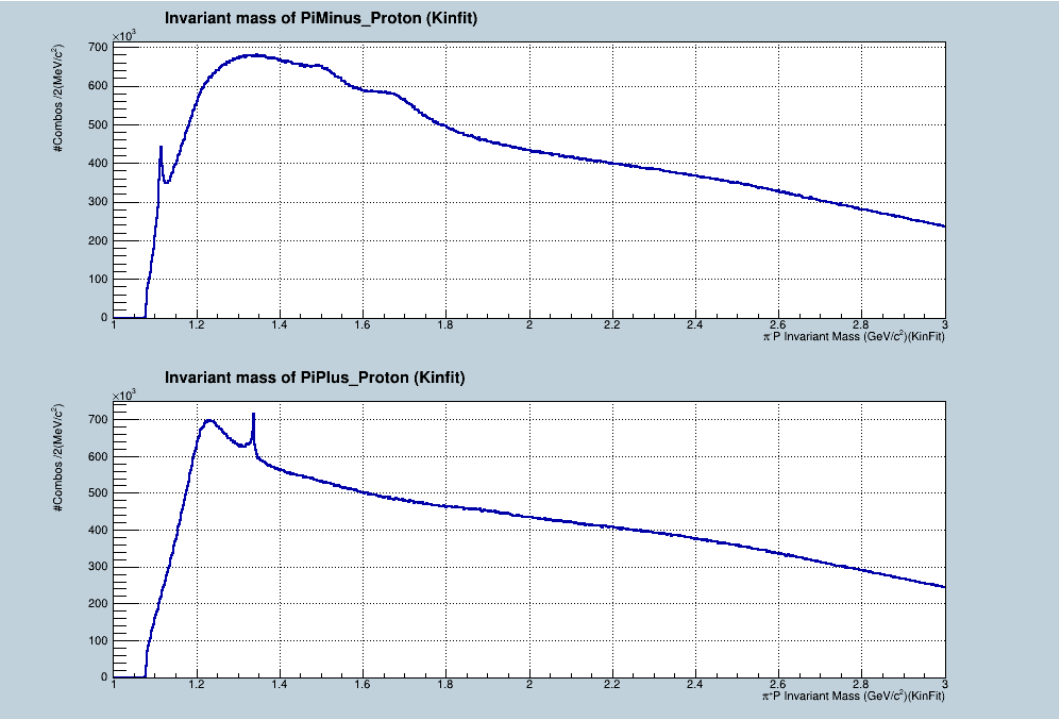
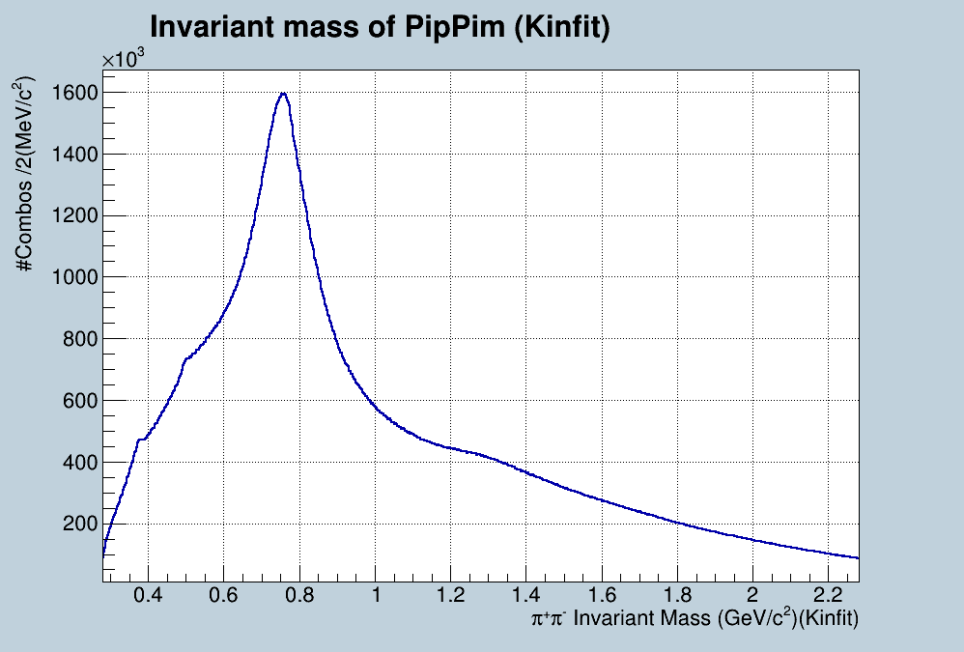


$$\gamma + d = P_{ip} + P_{im} + miss(n)$$

Reconstruction version 1

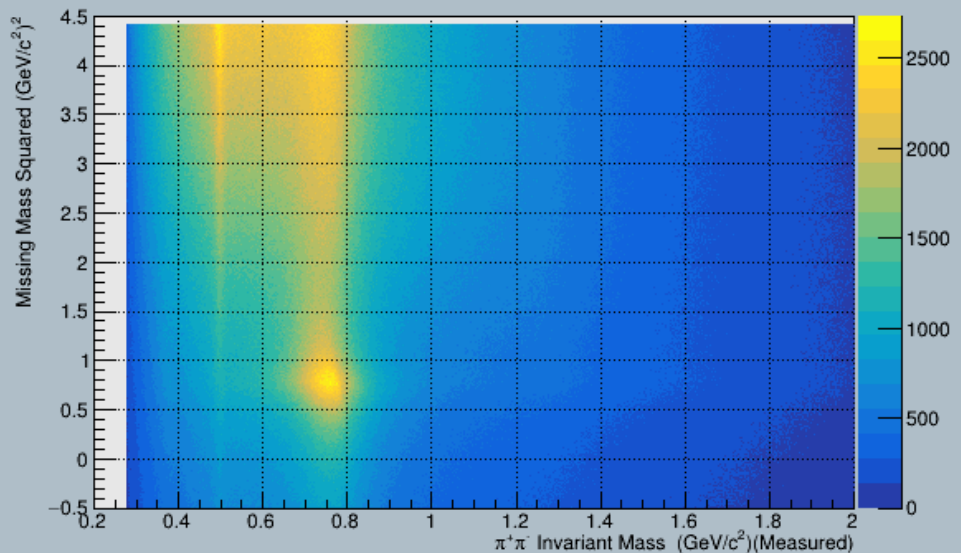
- A. No Cut applied. (Full data)
- B. Cut on Confidence Level, Missing Energy, Missing Mass Squared, Vertex cut (beam), Beam Energy. (12 % of data)
- C. Cut B + Coplanarity cut (12 % of data)
- D. Cut B + Coplanarity cut + Invariant mass of pipiproton and pimiproton (12 % of data)
- E. Cut B + Coplanarity cut + Invariant mass of pipiproton and pimiproton + |t| cut (Full data of Deuteron)
- F. Cut B + Coplanarity cut + Invariant mass of pipiproton and pimiproton + |t| cut + |u| cut (Full data of Deuteron)
- G. Cut B + Coplanarity cut + Invariant mass of pipiproton and pimiproton + |t| cut + ucut+ dE/dx cut (Full data of Deuteron)

# A) Without any Cuts

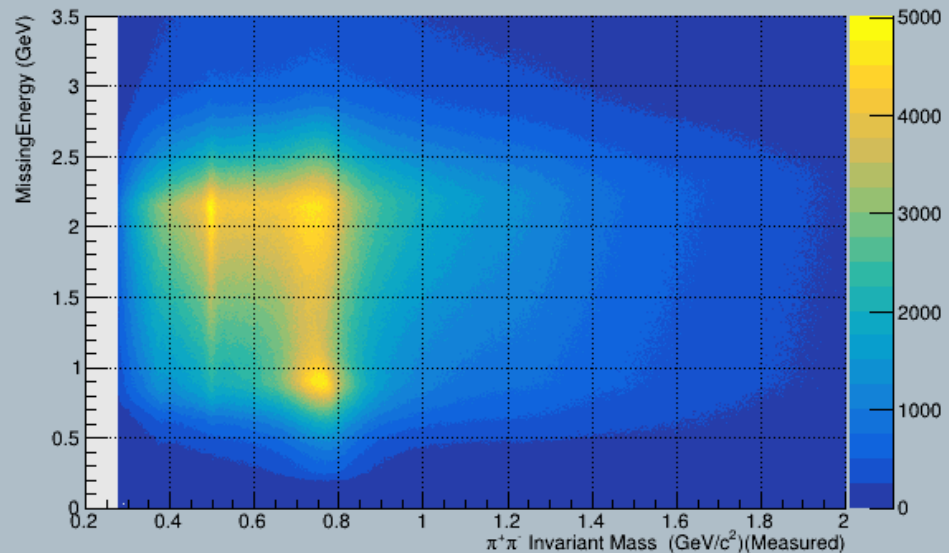


# A) Without any Cuts

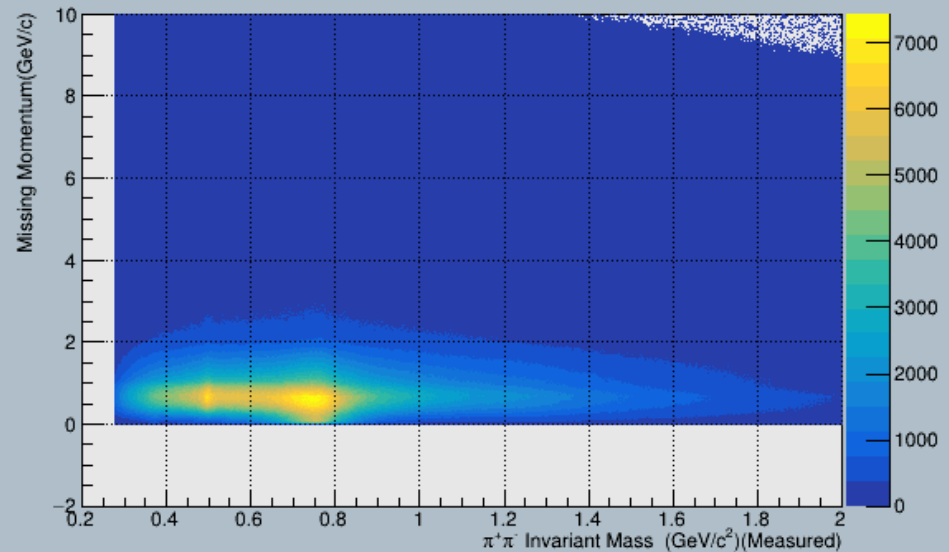
## Missing Mass Squared vs 2Pi



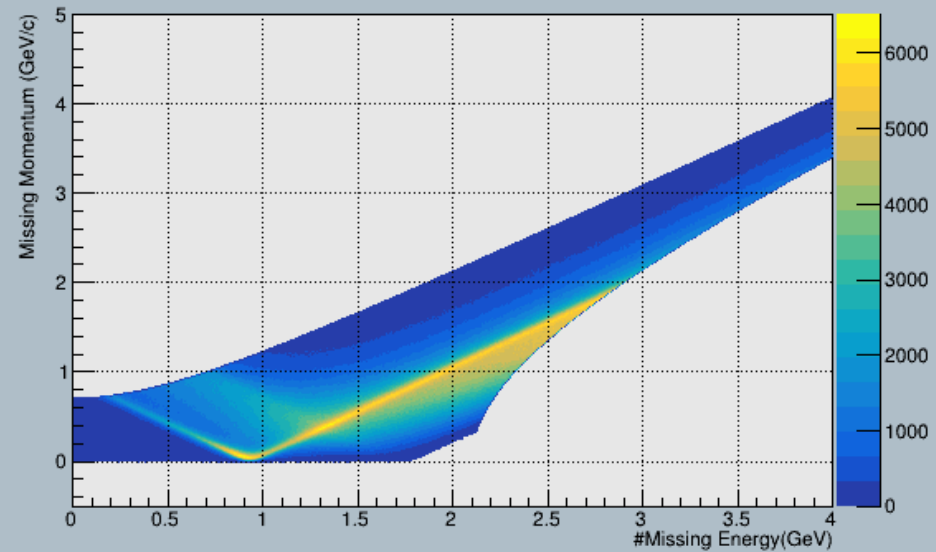
## Missing Energy vs 2Pi



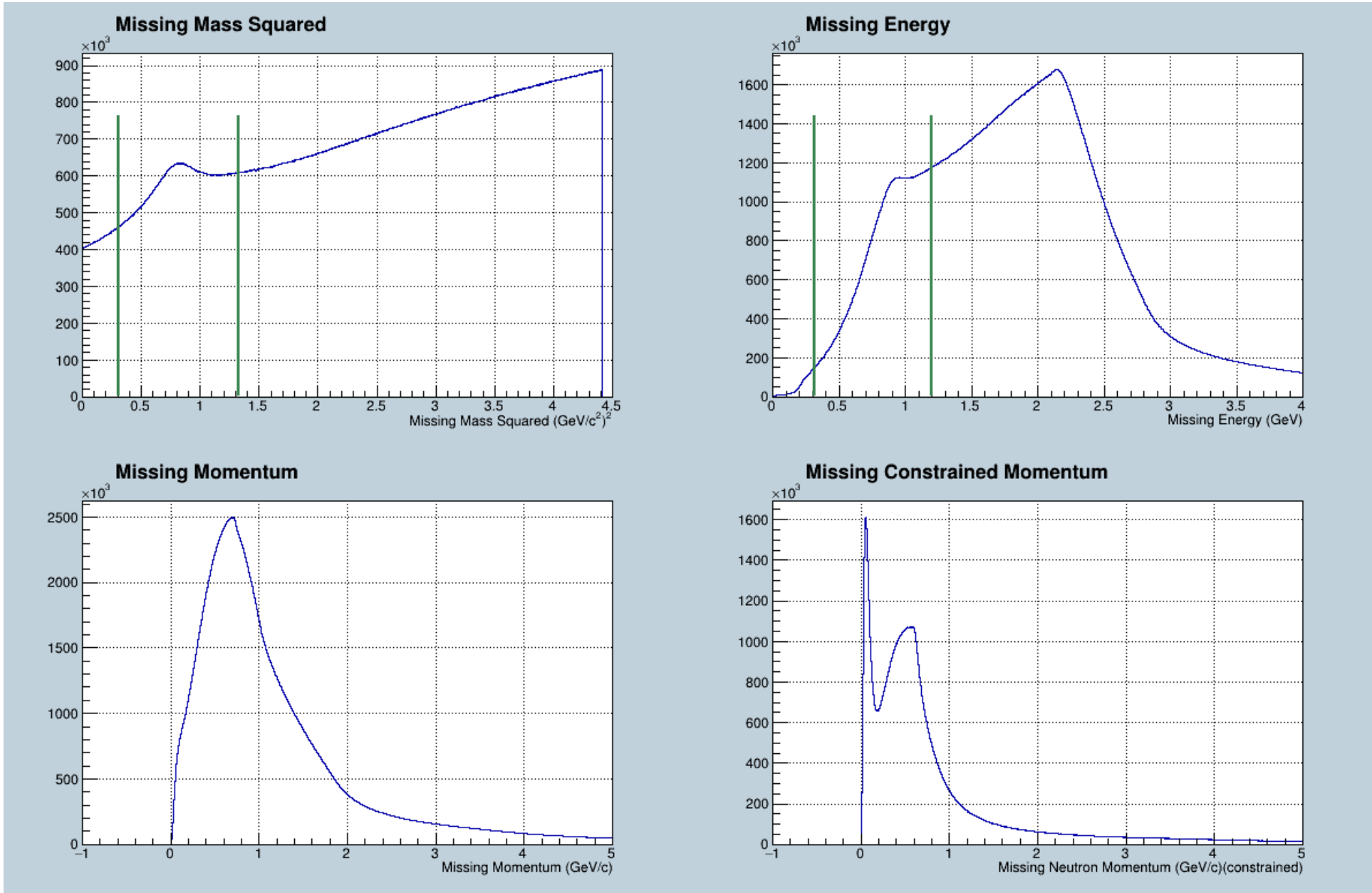
## Missing Mass Momentum vs 2Pi



## Missing Momentum vs Missing Energy



# A) Without any Cuts



## B) Cuts on CL ,ME ,MM2,BE,Vertex

### List of Cuts applied

**$0.3 < \text{MM2} < 1.3$ (Missing Mass Squared)**

**$0.3 < \text{ME} < 1.3$ (Missing Energy)**

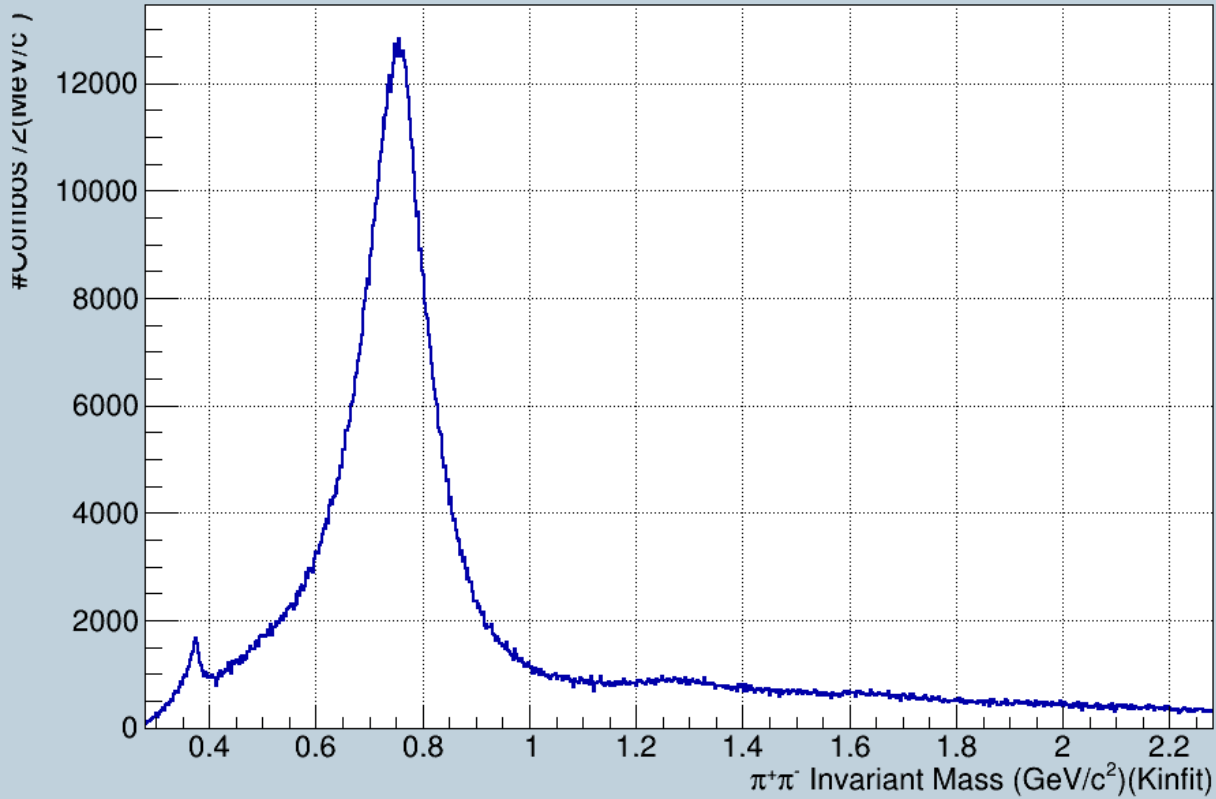
**$\text{C.L} > 0.001$**

**BeamEnergy > 6.5 GeV**

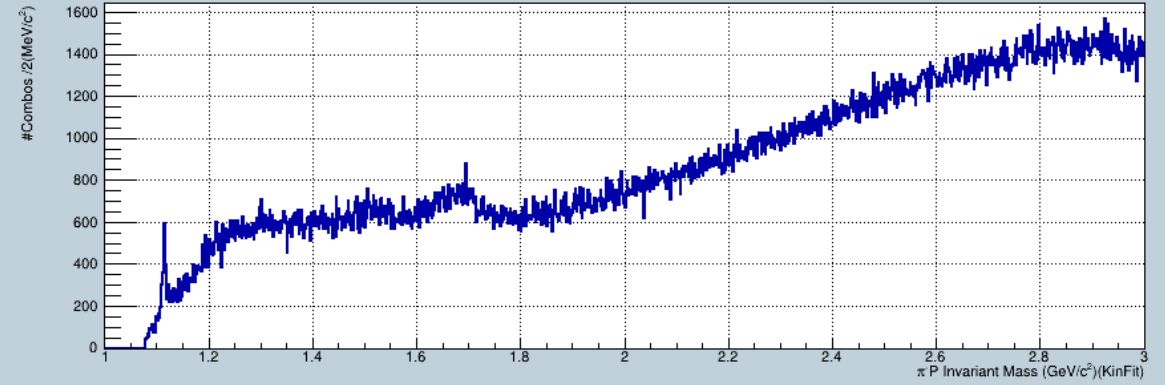
**$52 \text{ cm} < \text{Zvertex} < 78 \text{ cm}$**

## B) Cuts on CL,ME,MM2,BE,Vertex

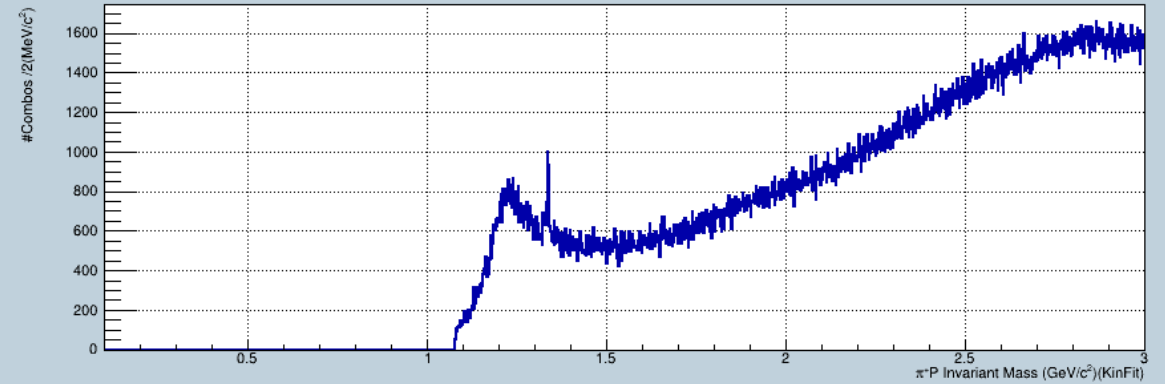
### Invariant mass of PipPim (Kinfit)



### Invariant mass of PiMinus\_Proton (Kinfit)

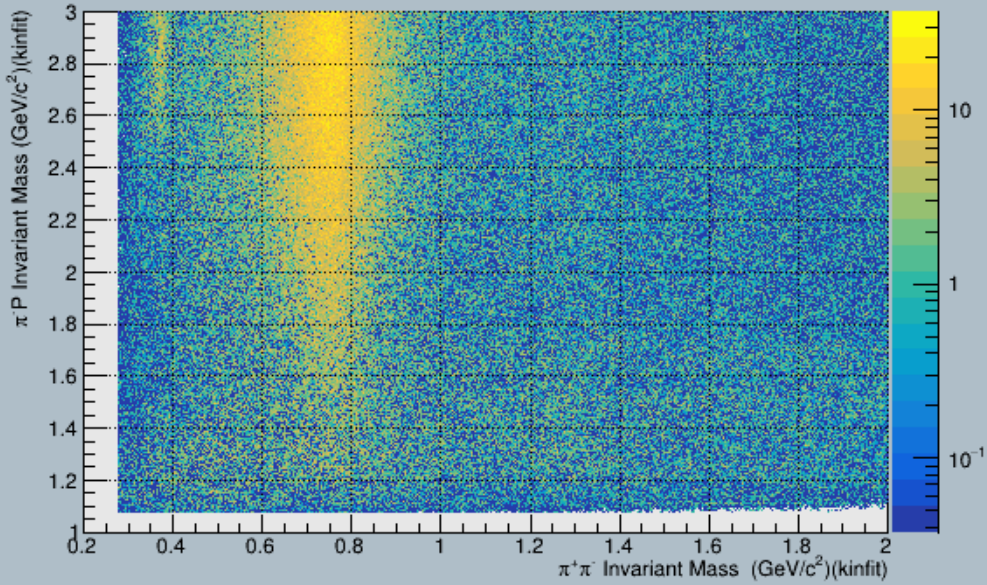


### Invariant mass of PiPlus\_Proton (Kinfit)

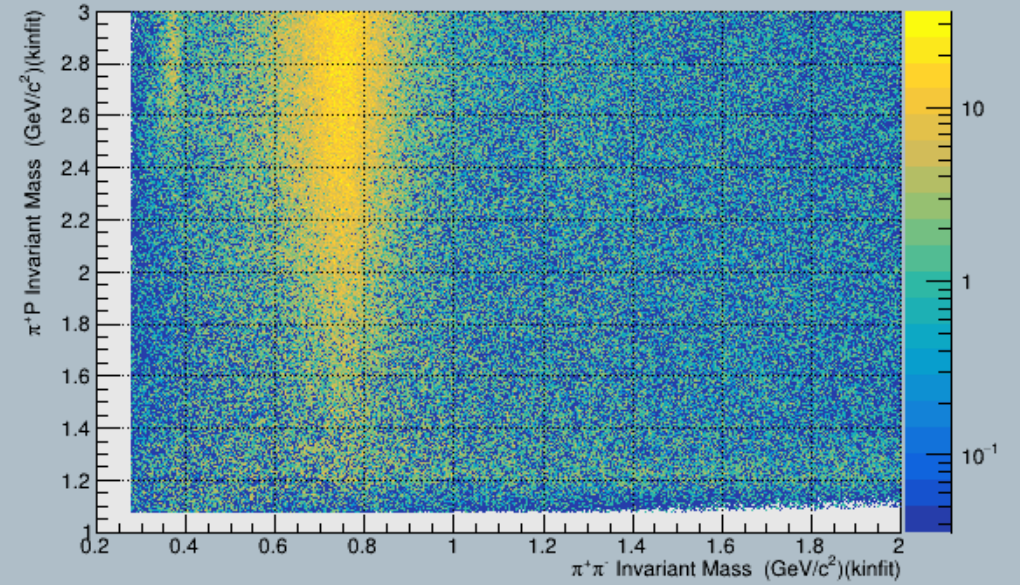


## B) Cuts on CL,ME,MM2,BE,Vertex

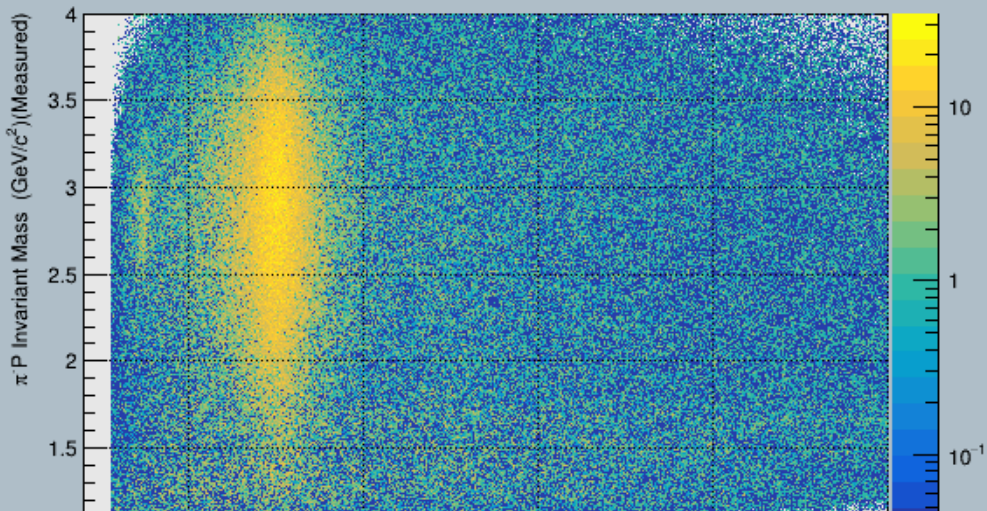
PipPim vs PimProt (Kinfit)



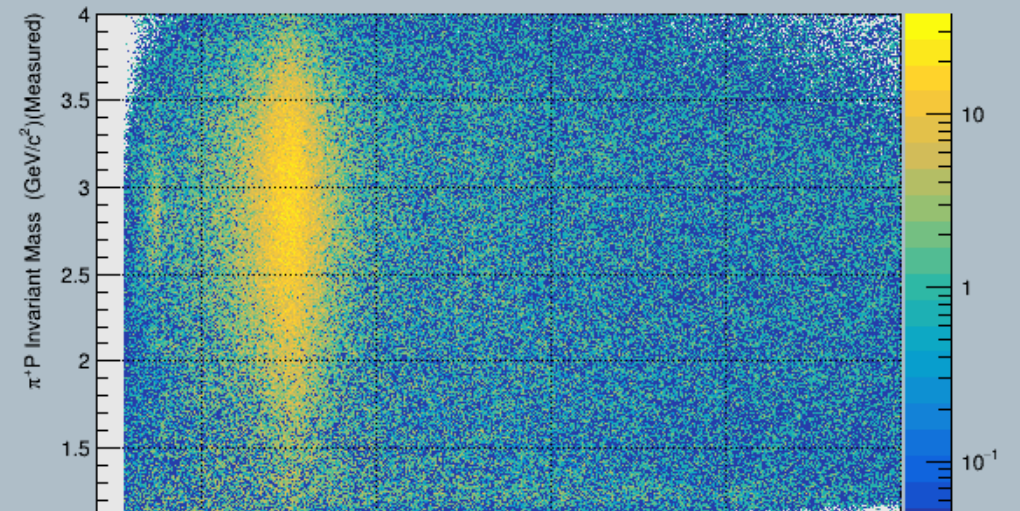
PipPim vs PipProt (Kinfit)



PipPim vs PimProt (Measured)

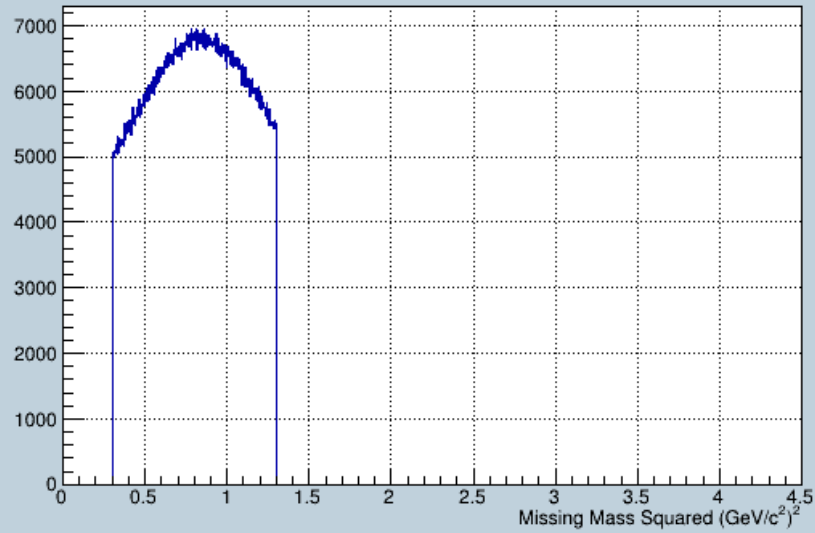


PipPim vs PipProt (Measured)

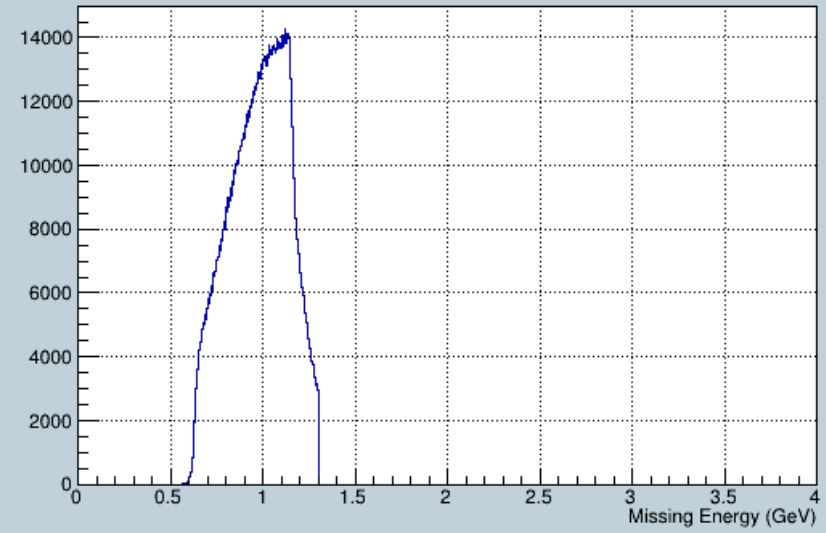


## B) Cuts on CL ,ME ,MM2,BE,Vertex

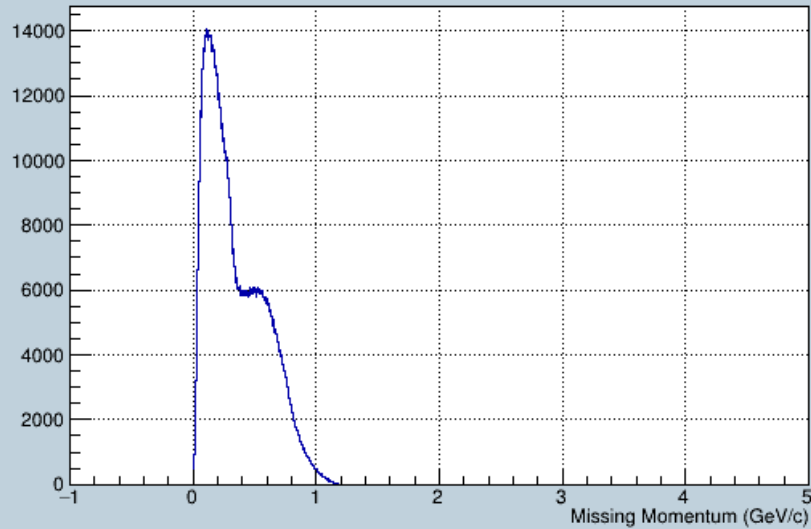
Missing Mass Squared



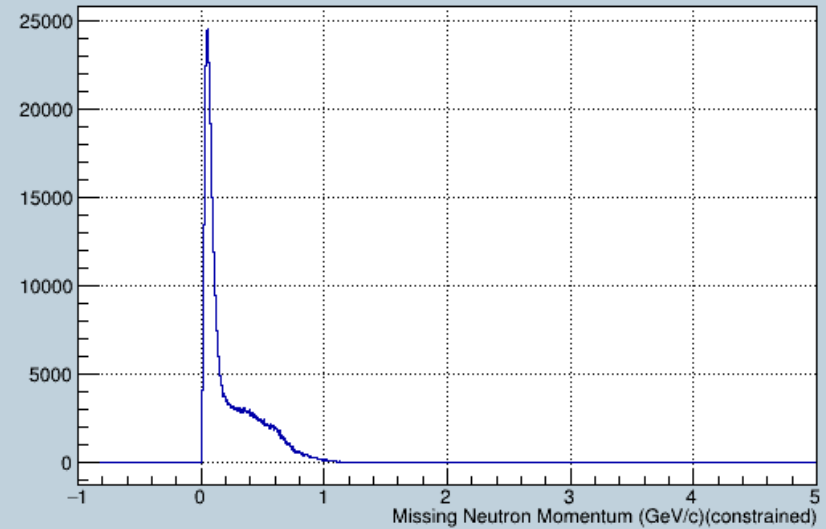
Missing Energy



Missing Momentum

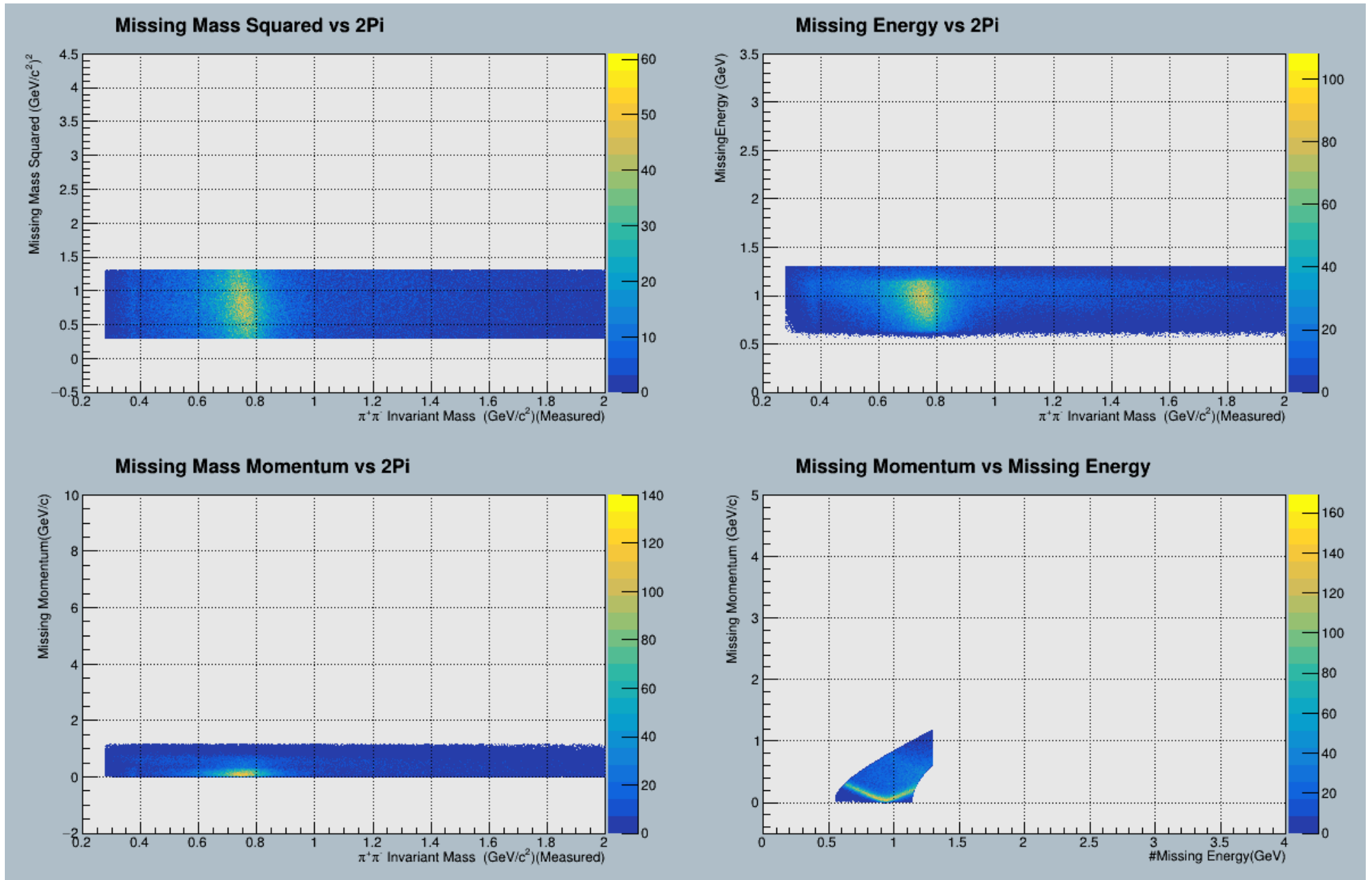


Missing Constrained Momentum

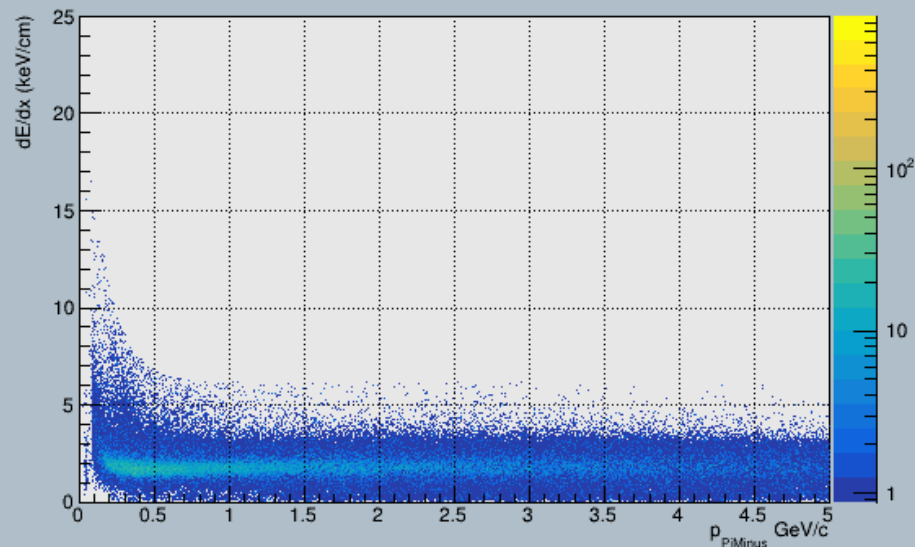
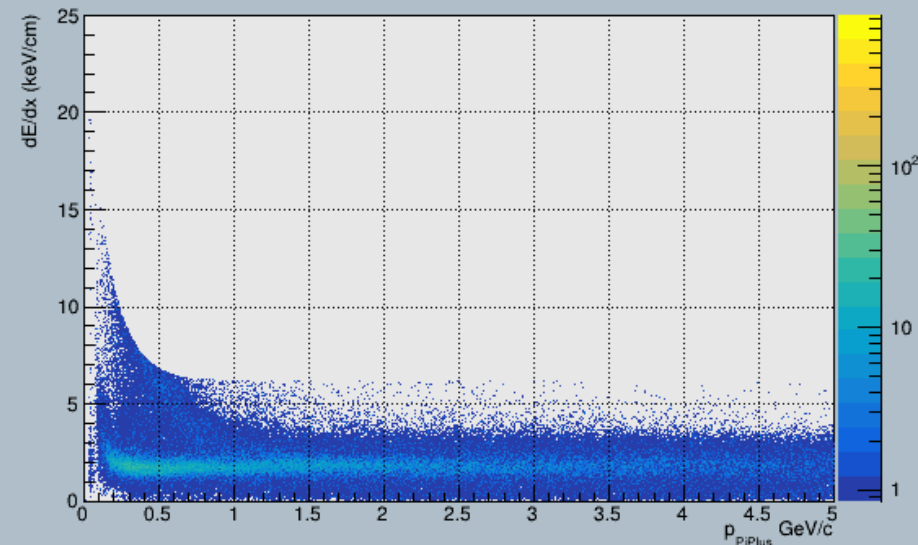
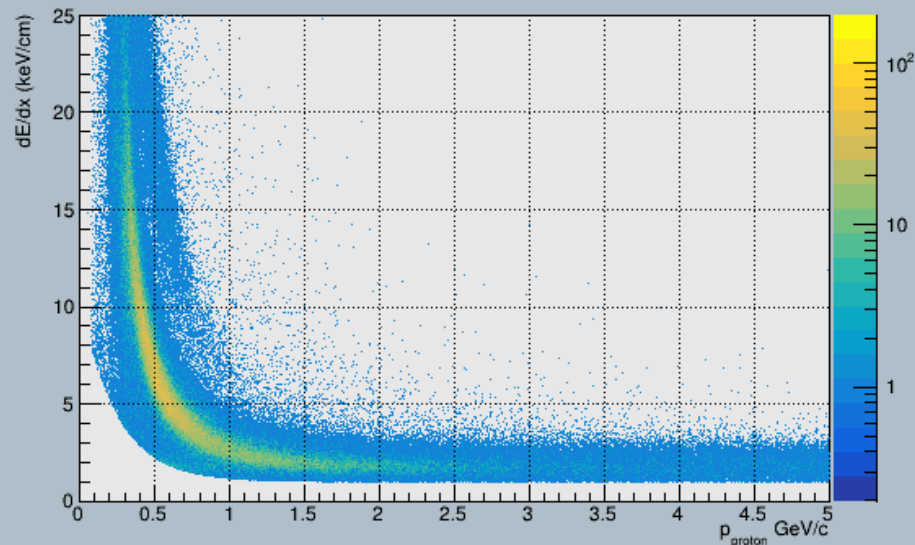




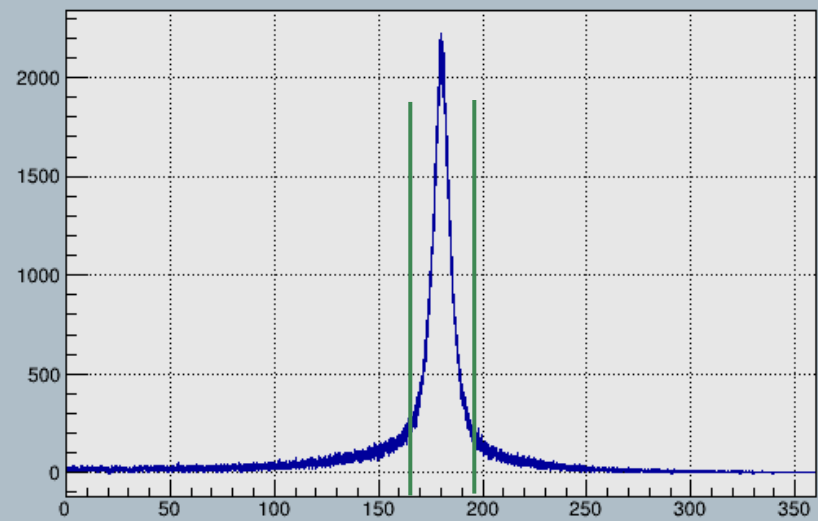
## B) Cuts on CL ,ME ,MM2,BE,Vertex



## B) Cuts on CL,ME,MM2,BE,Vertex



Coplanarity angle between Rho0 and Proton



## C) Cuts B + Coplanarity

### List of Cuts applied

**$0.3 < MM2 < 1.3$ (Missing Mass Squared)**

**$0.3 < ME < 1.3$ (Missing Energy)**

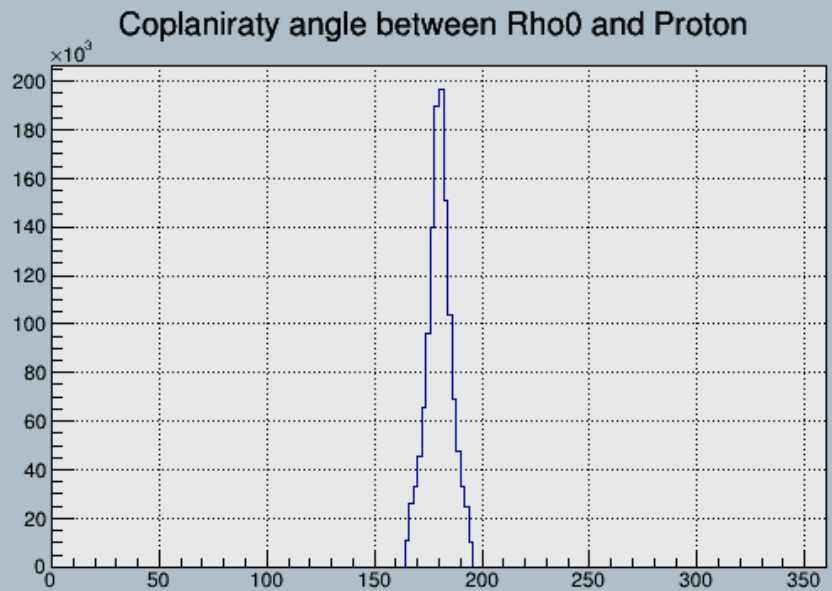
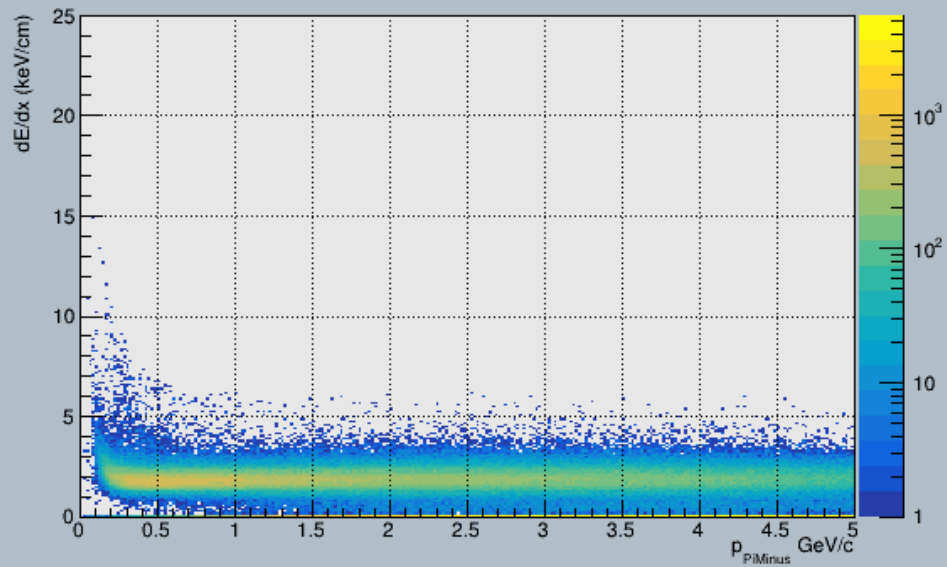
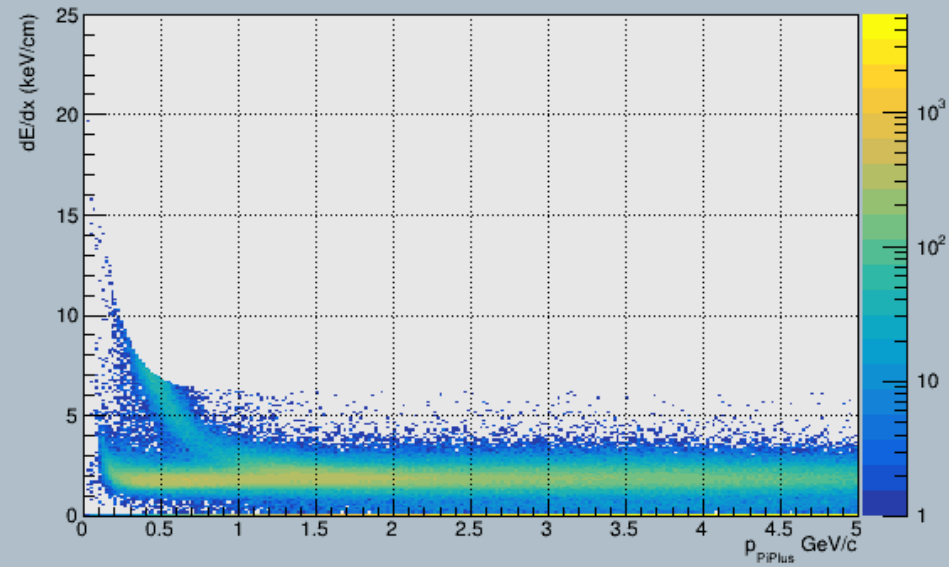
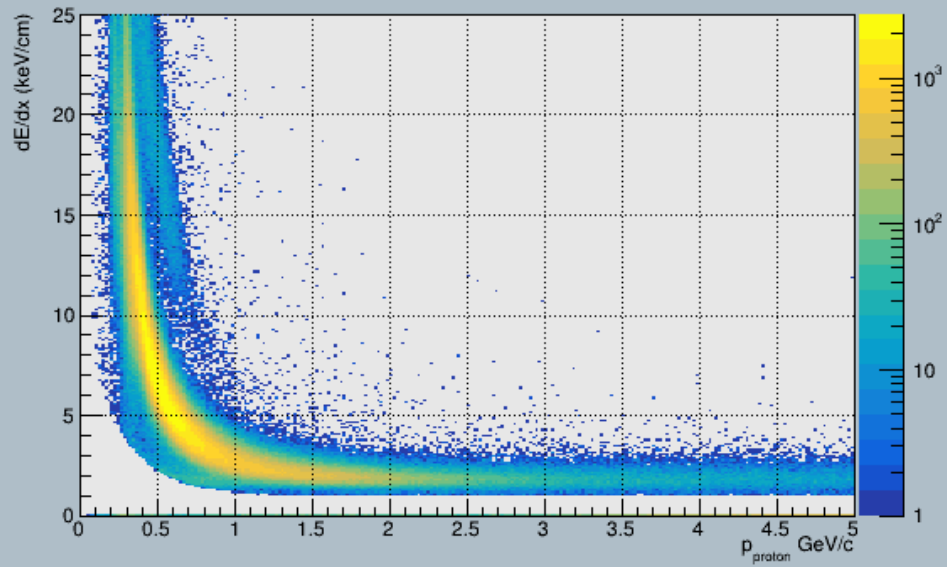
**$C.L > 0.001$**

**BeamEnergy  $> 6.5$  GeV**

**$52 \text{ cm} < Z_{\text{vertex}} < 78 \text{ cm}$**

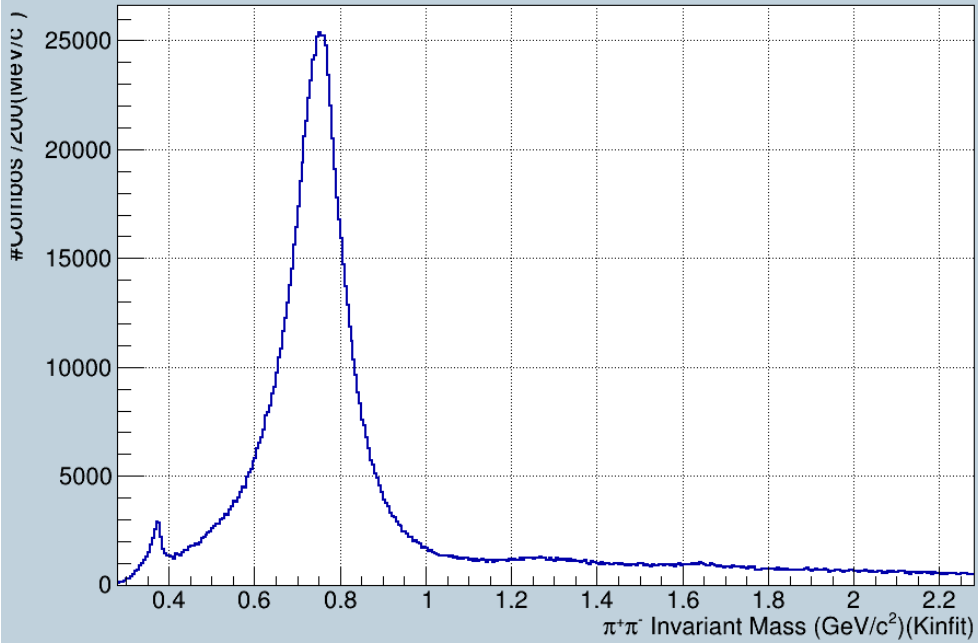
**Coplanarity between Rho0 and Proton(165,195)**

# C) Cuts B + Coplanarity

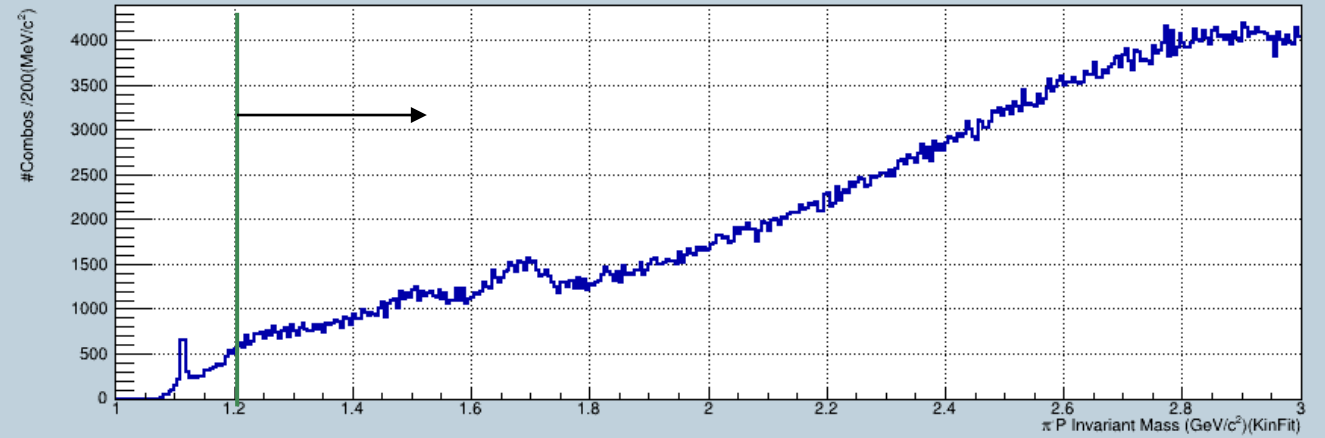


### C) Cuts on CL,ME,MM2,BE,Vertex

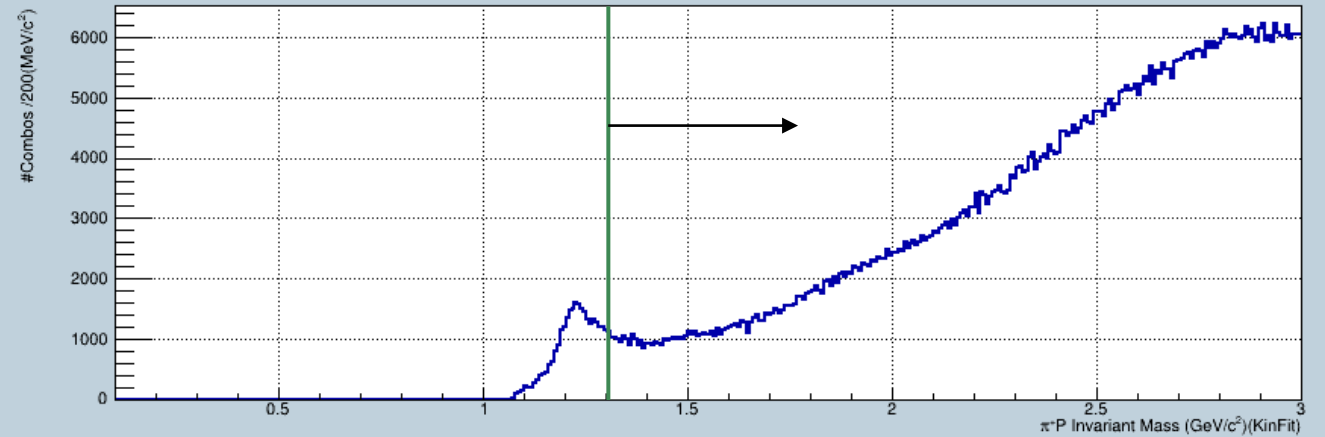
Invariant mass of PipPim (Kinfit)



Invariant mass of PiMinus\_Proton (Kinfit)

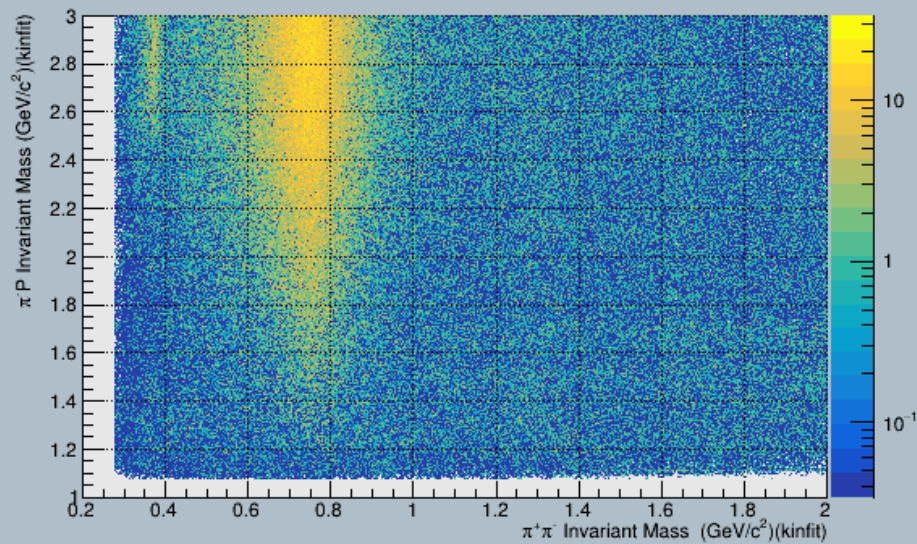


Invariant mass of PiPlus\_Proton (Kinfit)

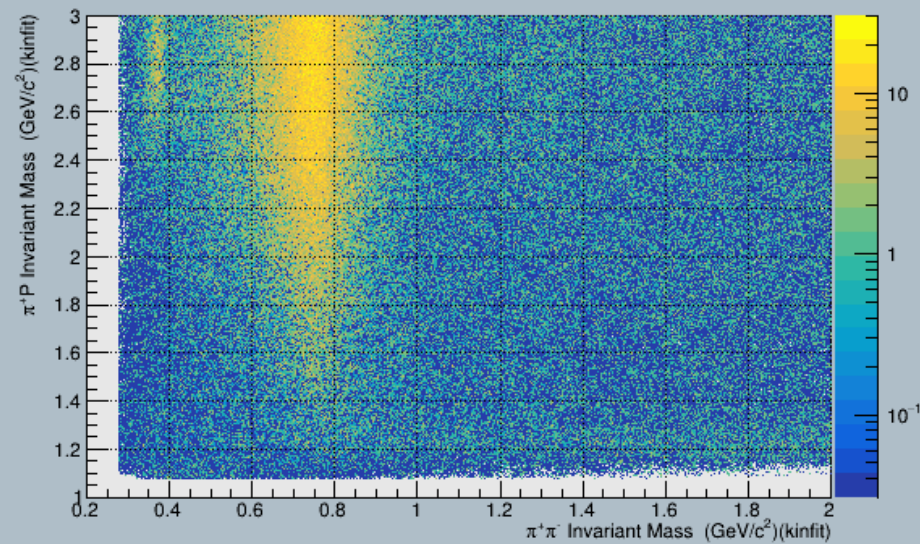


## C) Cuts B + Coplanarity

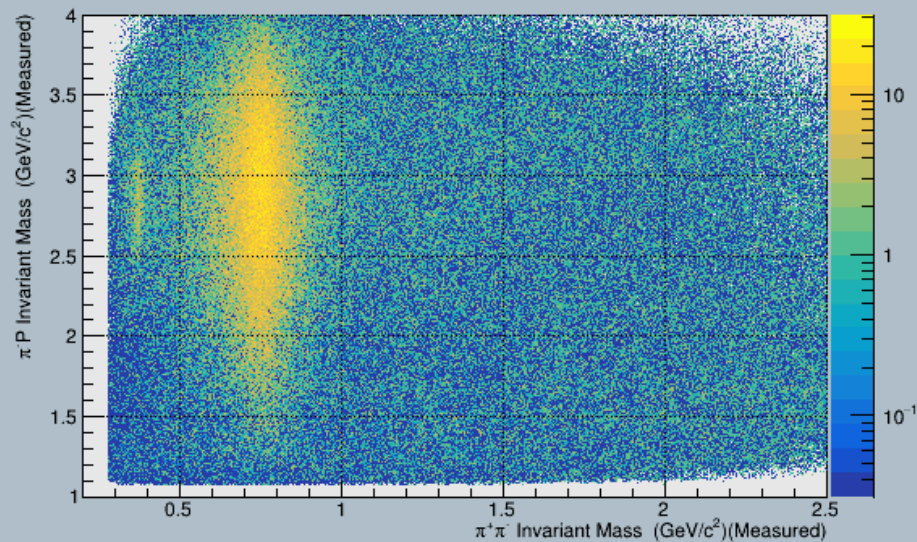
PipPim vs PimProt (Kinfit)



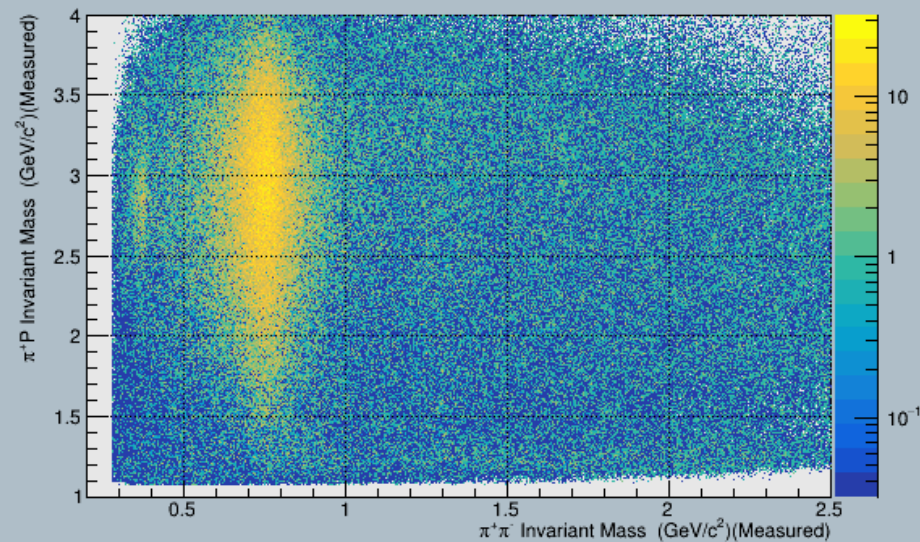
PipPim vs PipProt (Kinfit)



PipPim vs PimProt (Measured)



PipPim vs PipProt (Measured)



## D) Cuts B + Coplanarity + Invariant mass of PipProton and PimProton

### List of Cuts applied

$0.3 < MM2 < 1.3$ (Missing Mass Squared)

$0.3 < ME < 1.3$ (Missing Energy)

$C.L > 0.001$

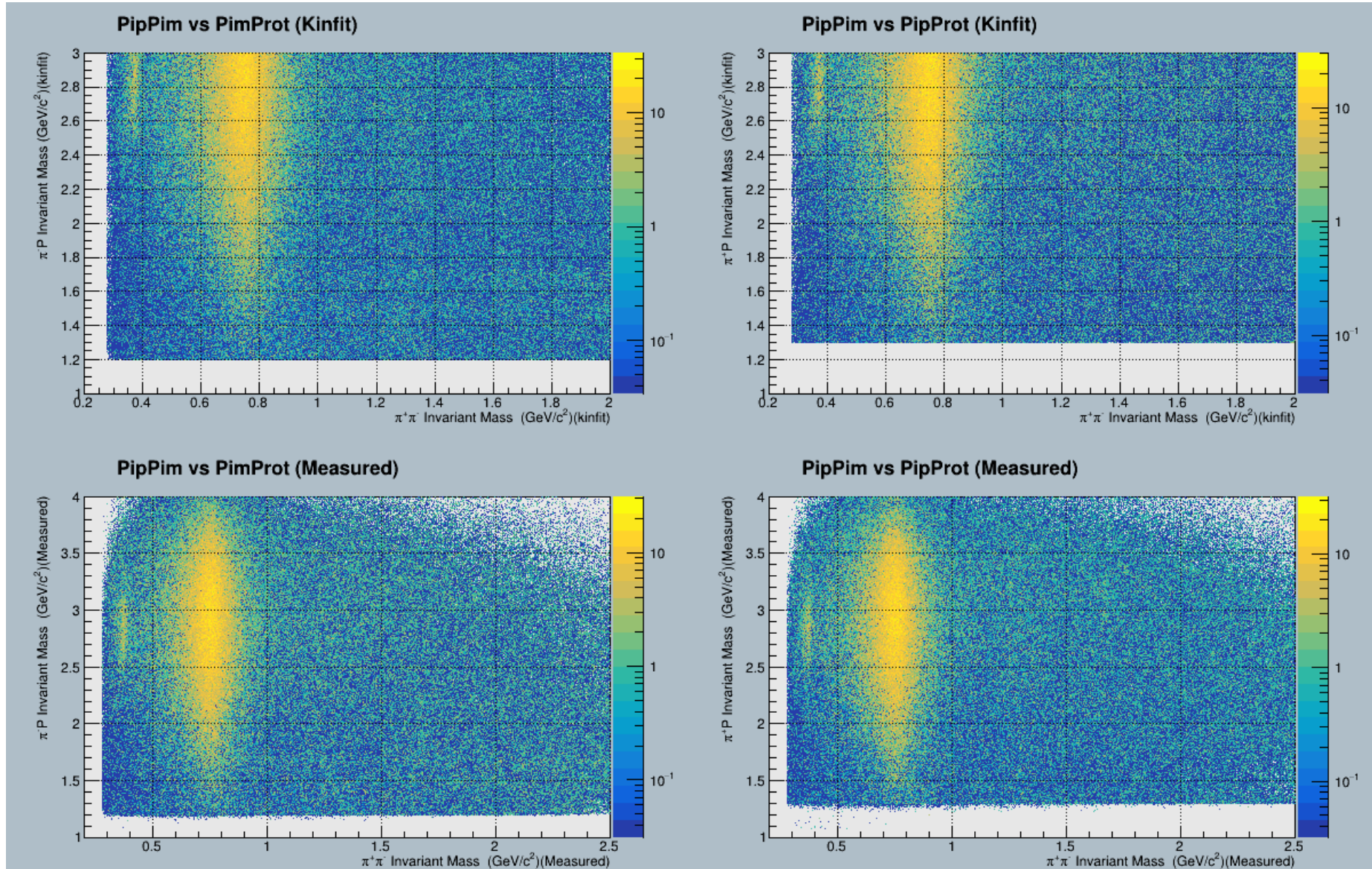
BeamEnergy  $> 6.5$  GeV

$52 \text{ cm} < Z_{\text{vertex}} < 78 \text{ cm}$

Coplanarity between Rho0 and Proton(165,195)

PipProt Invariant Mass  $< 1.3$  && PimProt Invariant Mass  $1.2$

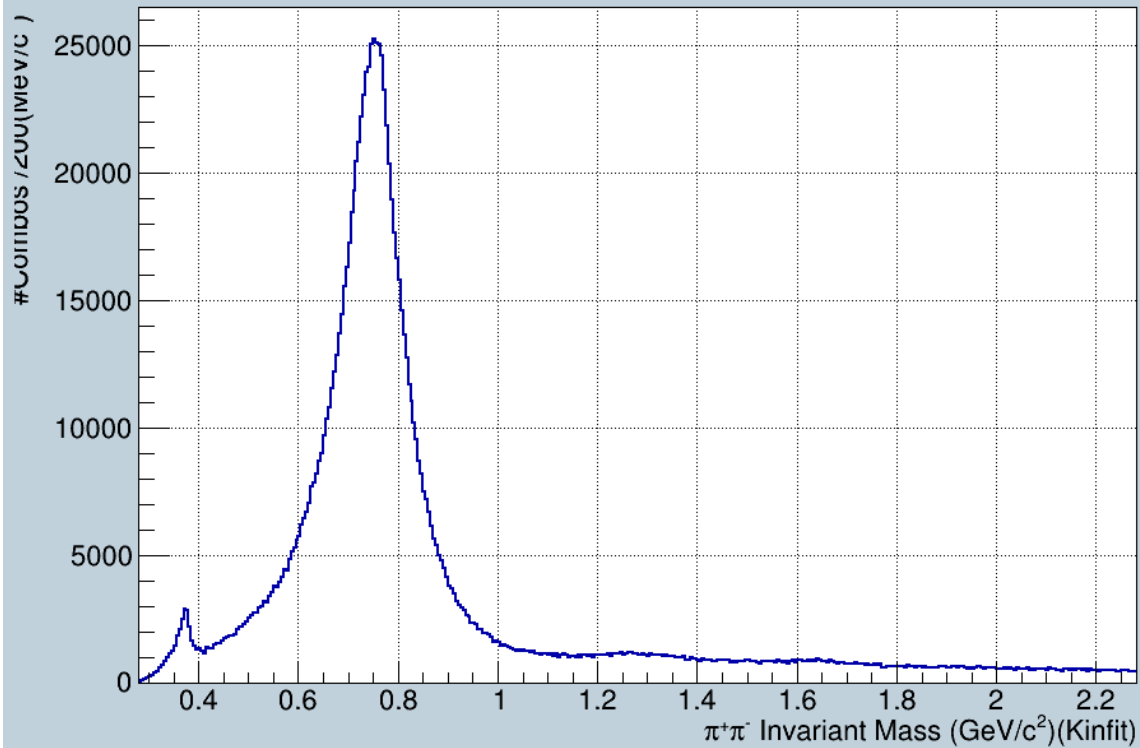
## D) Cuts B + Coplanarity + Invariant mass of PipProton and PimProton



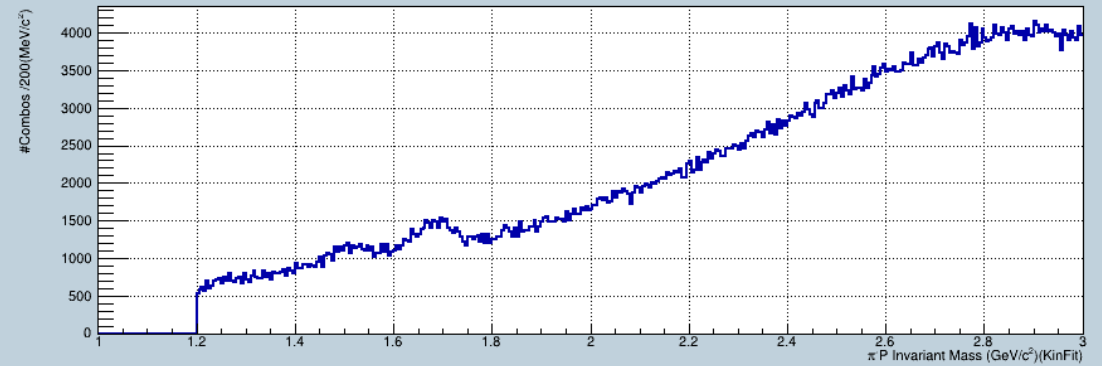


## D) Cuts B + Coplanarity + Invariant mass of PipProton and PimProton

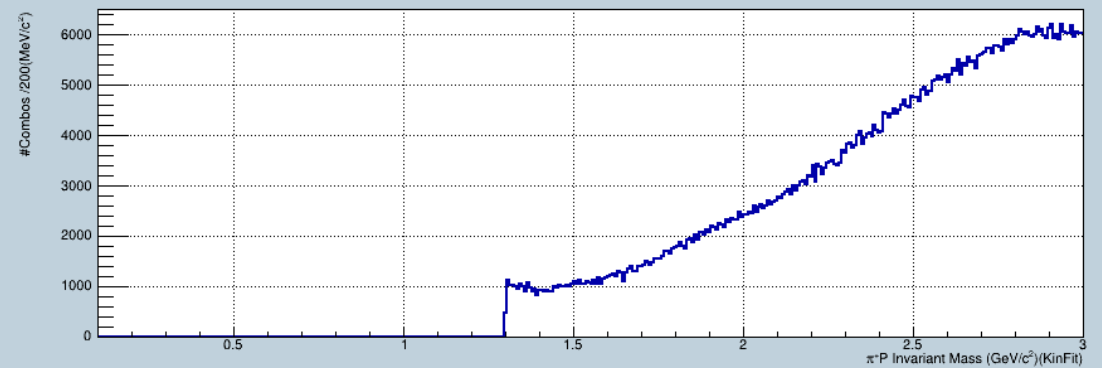
### Invariant mass of PipPim (Kinfit)



### Invariant mass of PiMinus\_Proton (Kinfit)



### Invariant mass of PiPlus\_Proton (Kinfit)



**E) Cuts B + Coplanarity + Invariant mass of  
PipProton and PimProton and |t| cut**

**List of Cuts applied**

**$0.3 < MM2 < 1.3$ (Missing Mass Squared)**

**$0.3 < ME < 1.3$ (Missing Energy)**

**$C.L > 0.001$**

**BeamEnergy > 6.5 GeV**

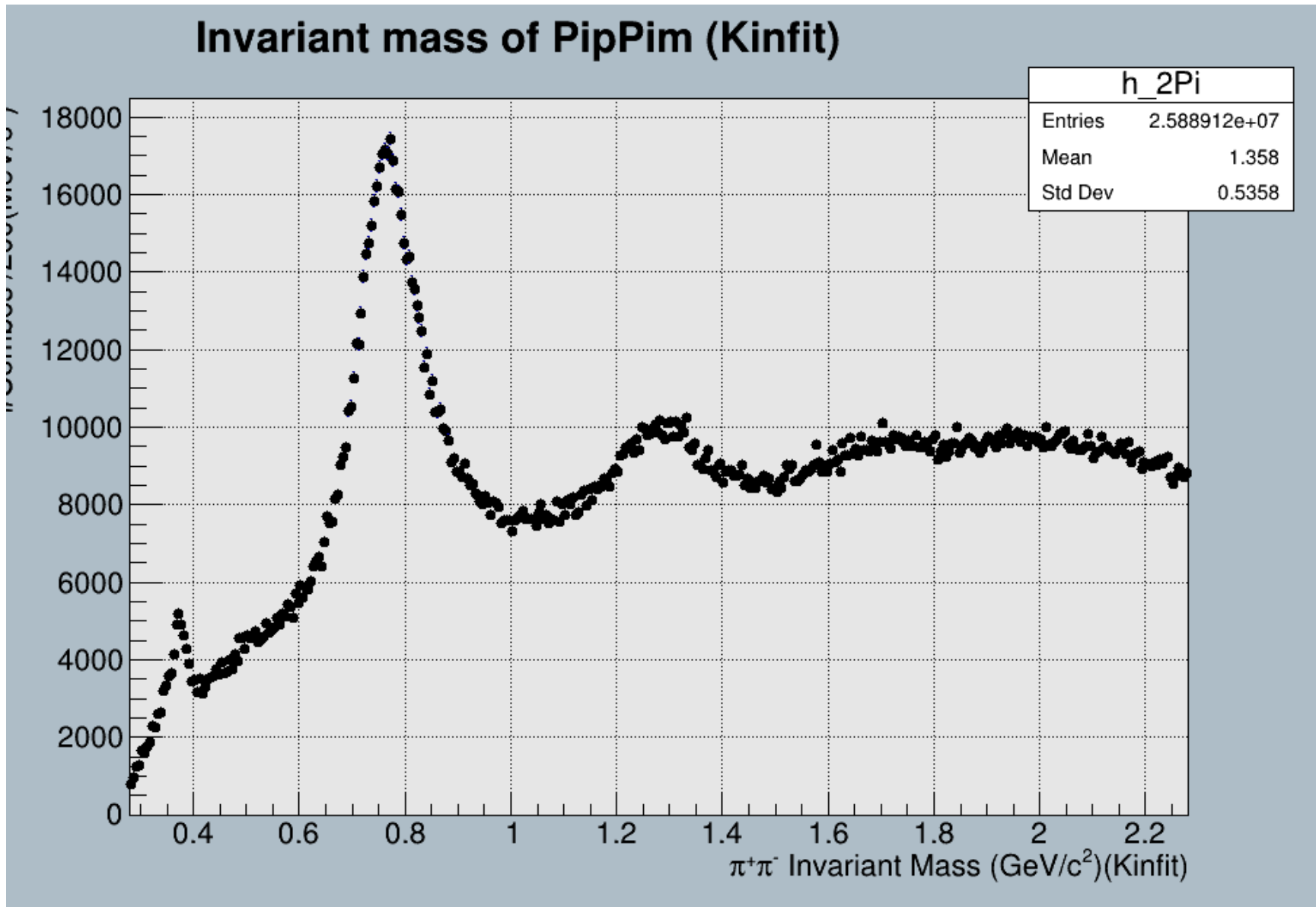
**$52 \text{ cm} < Z\text{vertex} < 78 \text{ cm}$**

**Coplanarity between Rho0 and Proton(165,195)**

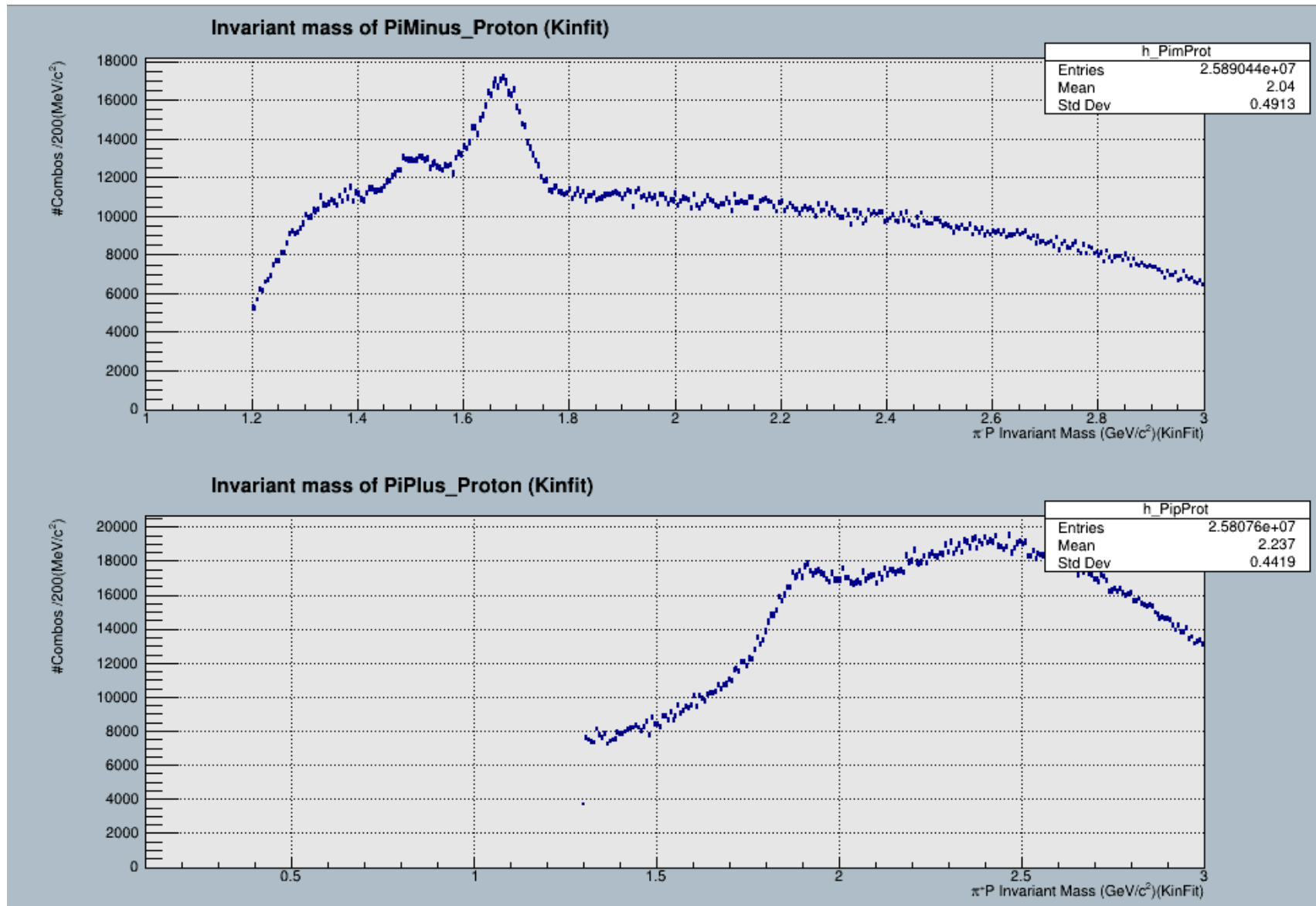
**PipProt Invariant Mass < 1.3 && PimProt Invariant Mass 1.2**

**$|t| > 1$**

# E) Cuts B + Coplanarity + Invariant mass of PipProton and PimProton and |t| cut

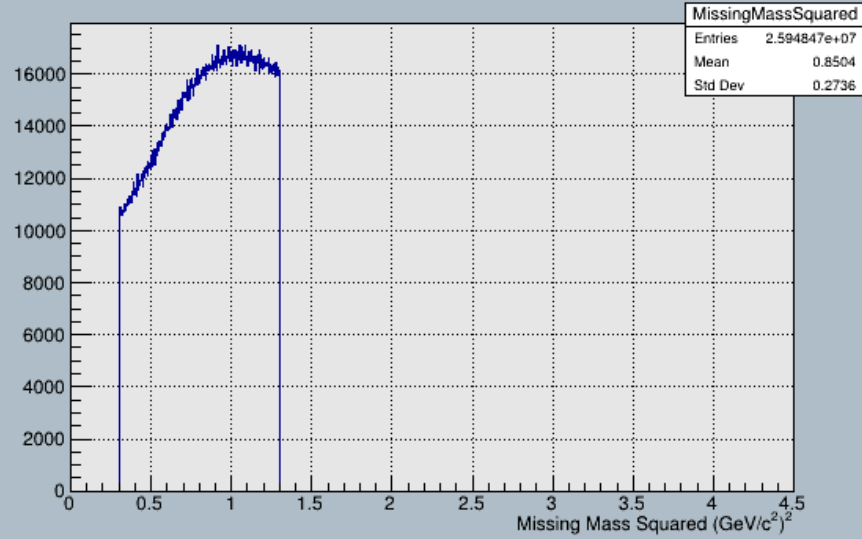


# E) Cuts B + Coplanarity + Invariant mass of PiProton and PimProton and $|t|$ cut

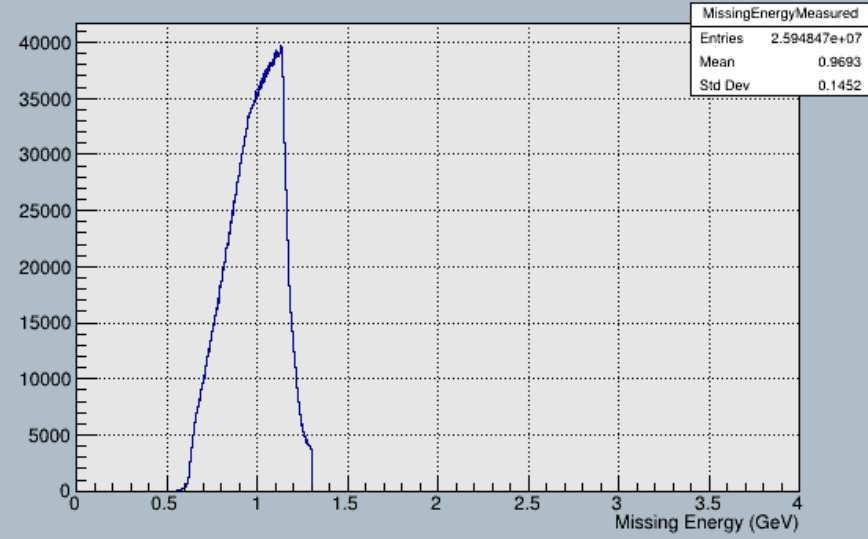


# E) Cuts B + Coplanarity + Invariant mass of PipProton and PimProton and $|t|$ cut

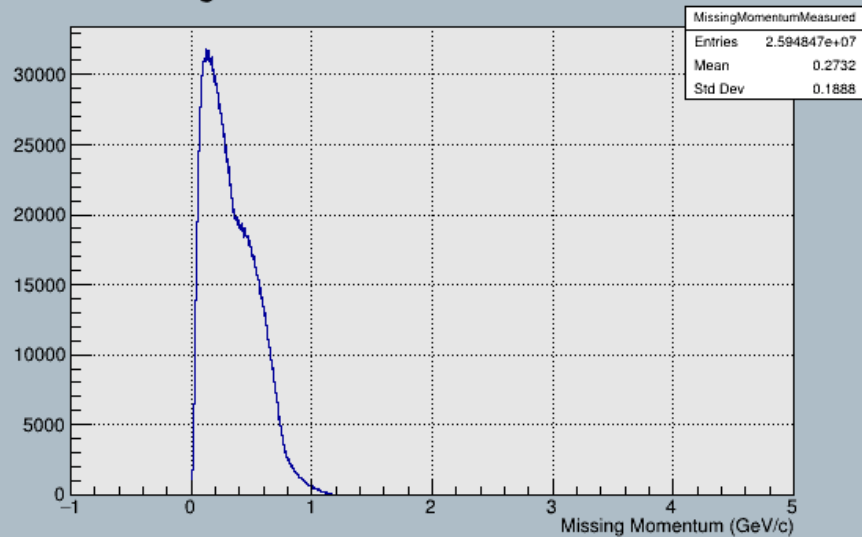
### Missing Mass Squared



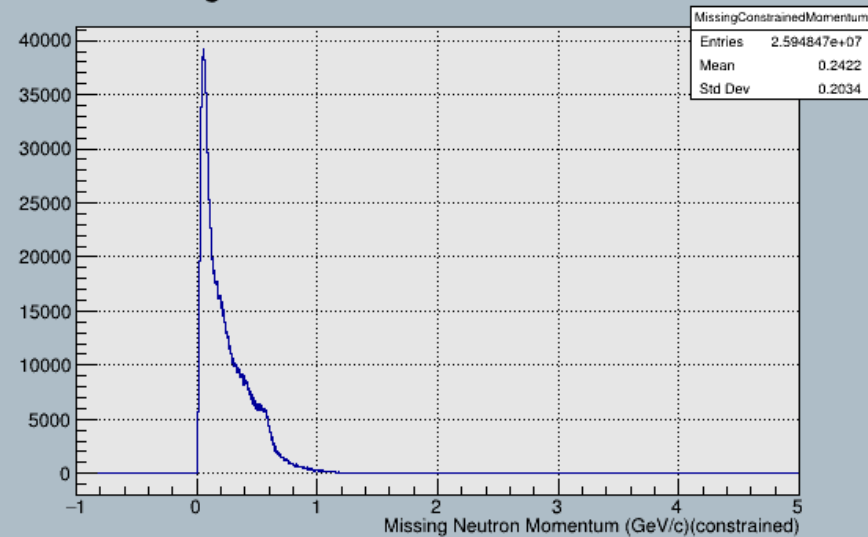
### Missing Energy



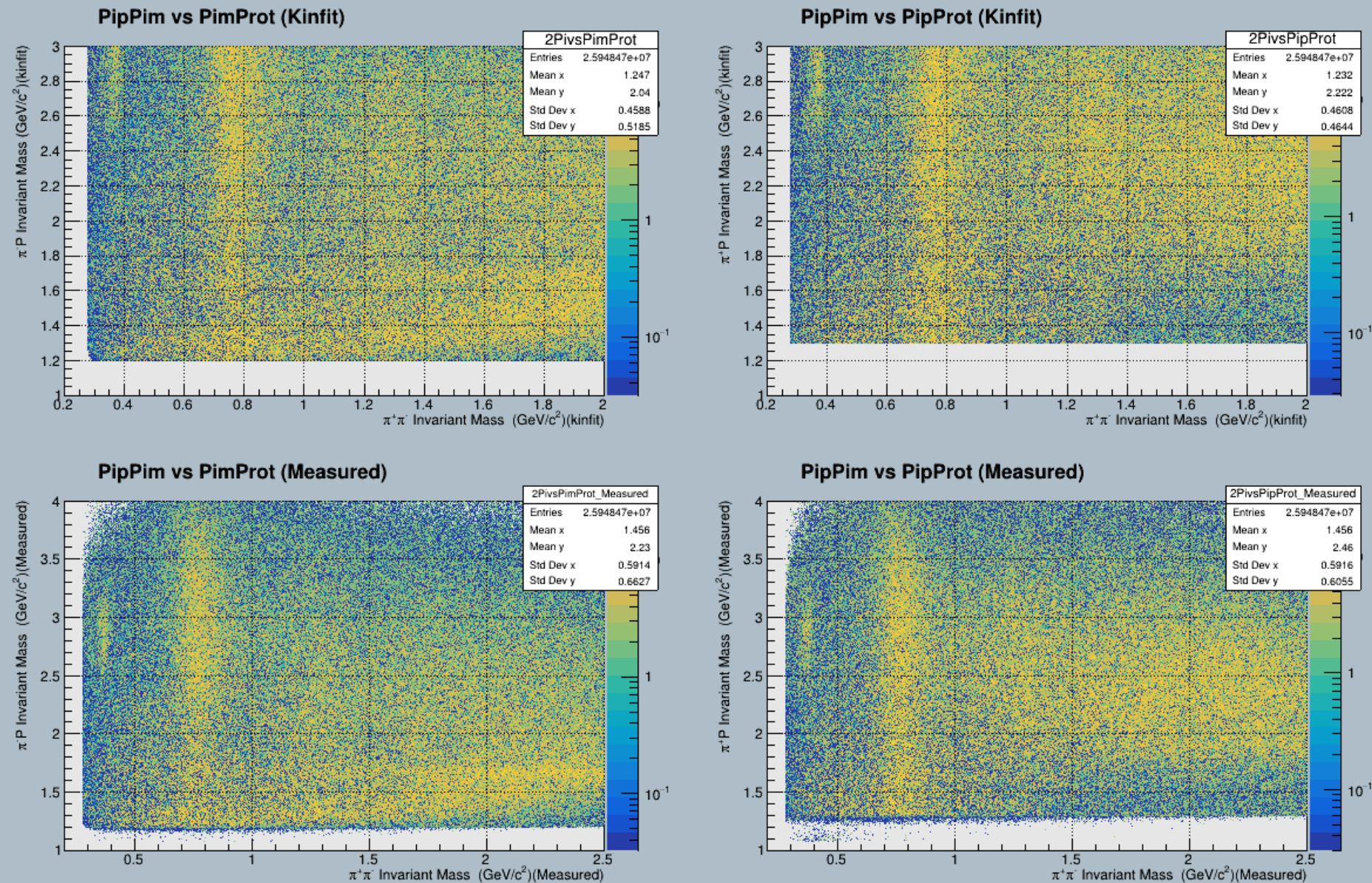
### Missing Momentum



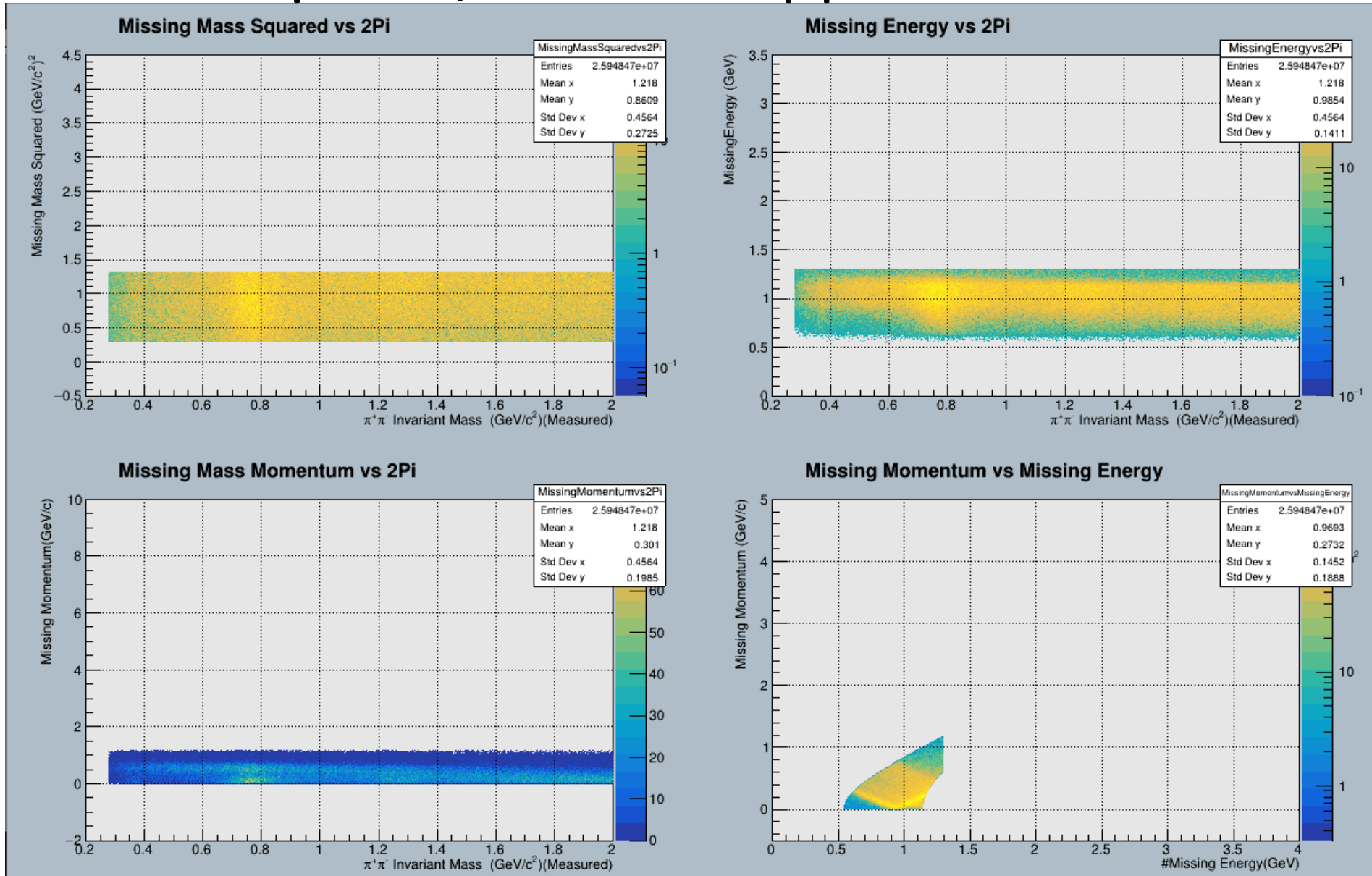
### Missing Constrained Momentum



# E) Cuts B + Coplanarity + Invariant mass of PipProton and PimProton and $|t|$ cut



# E) Cuts B + Coplanarity + Invariant mass of PipProton , PimProton and |t| cut



**F) Cuts B + Coplanarity + Invariant mass of  
PipProton , PimProton , |t| cut and |u| cut**

**List of Cuts applied**

**0.3 < MM2 < 1.3(Missing Mass Squared)**

**0.3 < ME < 1.3(Missing Energy)**

**C.L > 0.001**

**BeamEnergy > 6.5 GeV**

**52 cm < Zvertex < 78 cm**

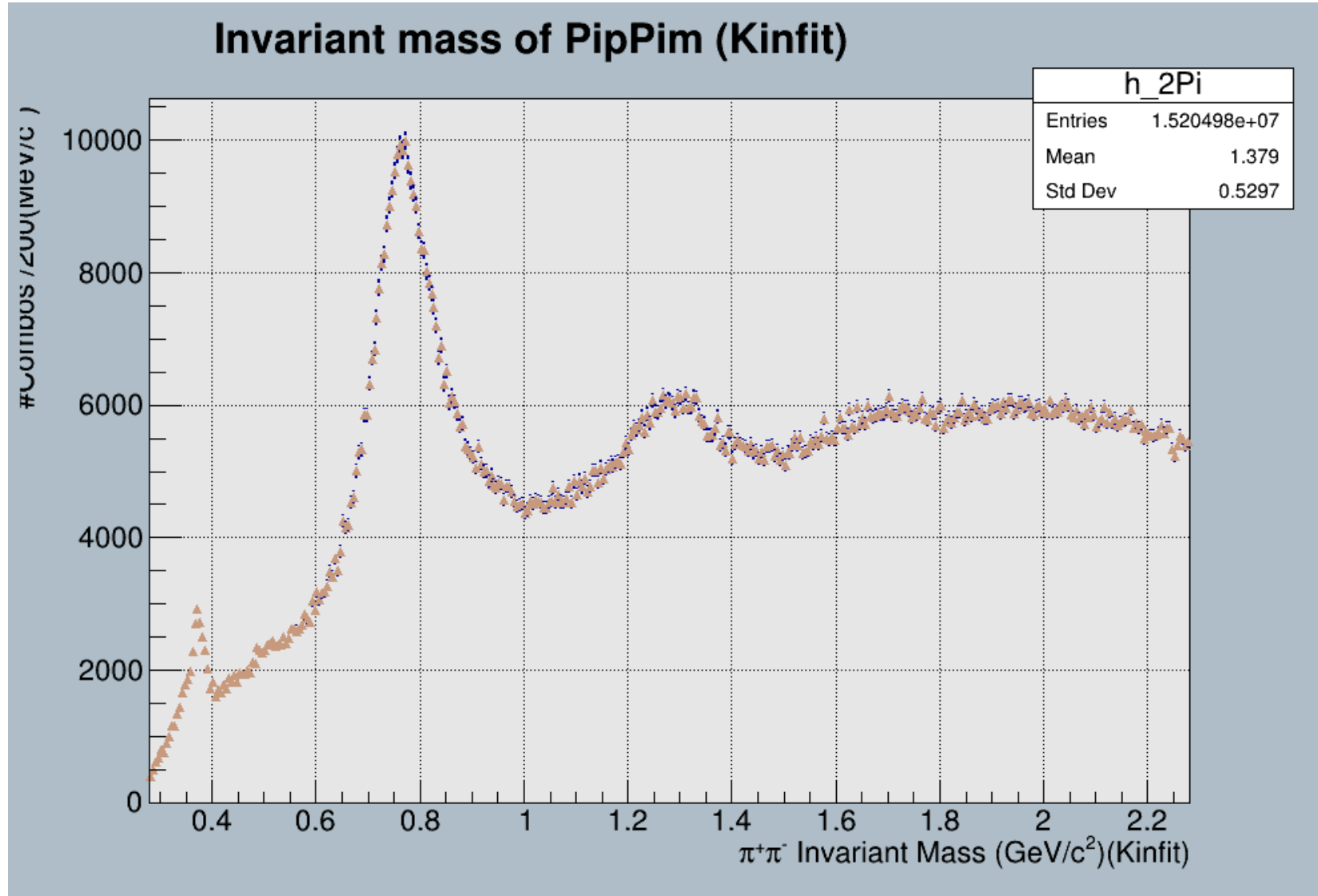
**Coplanarity between Rho0 and Proton(165,195)**

**PipProt Invariant Mass < 1.3 && PimProt Invariant Mass 1.2**

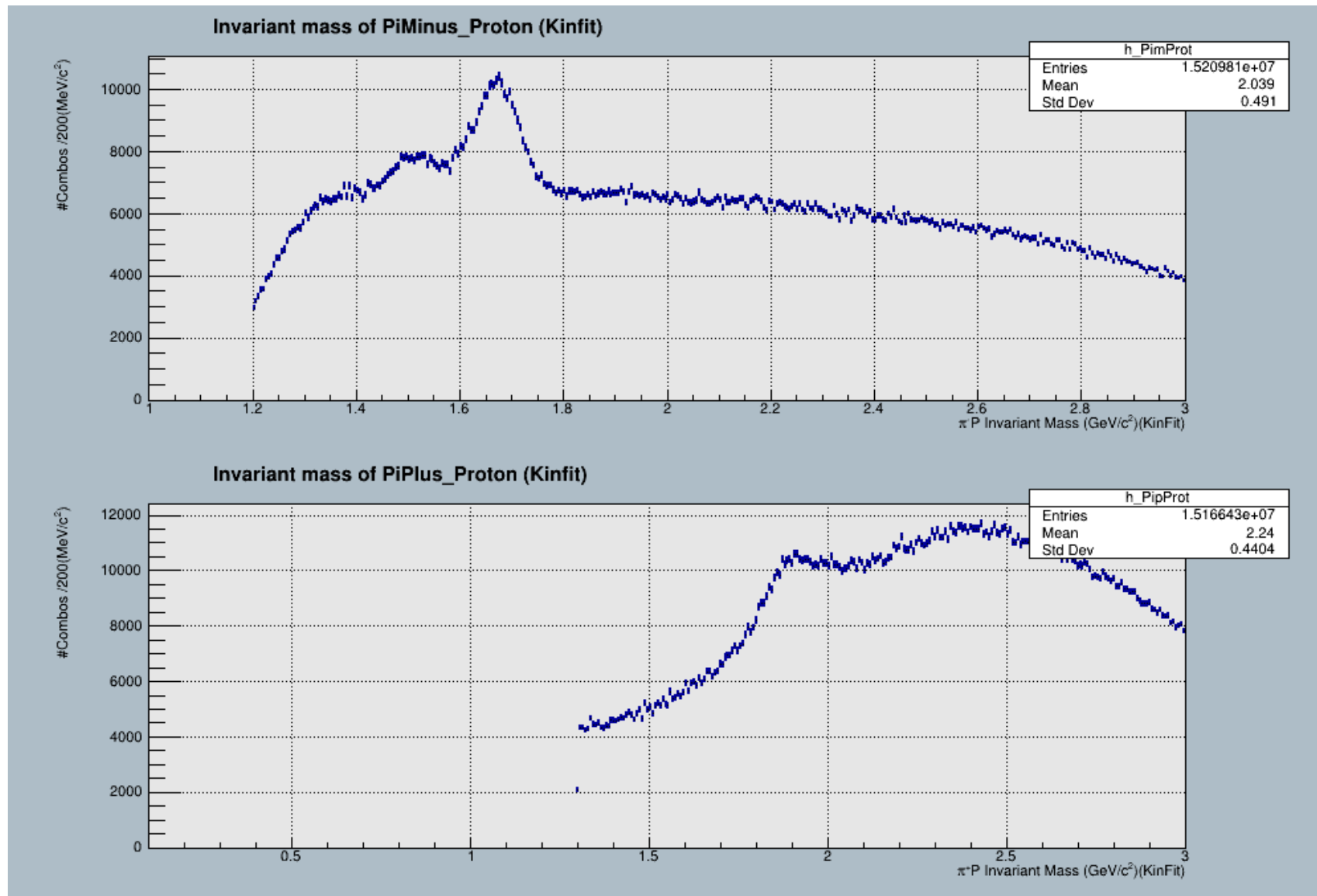
**|t| > 1 and |u| > 1**



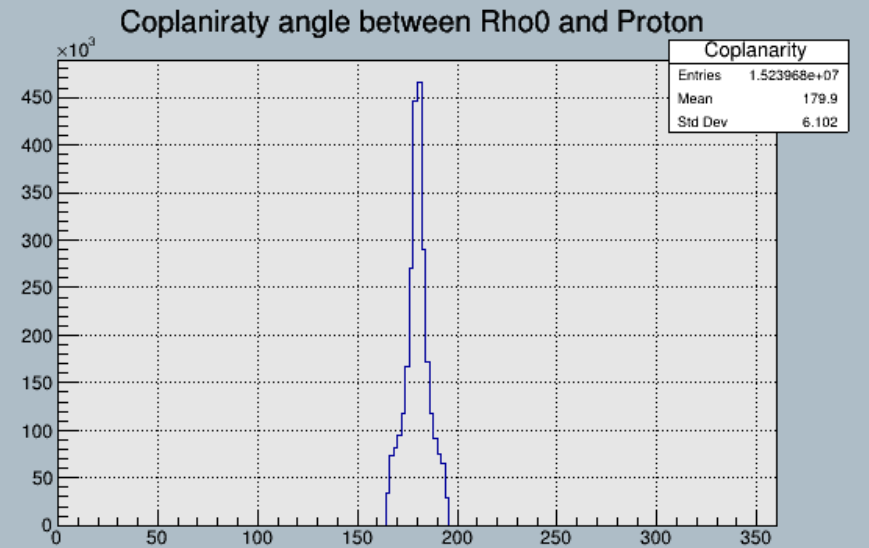
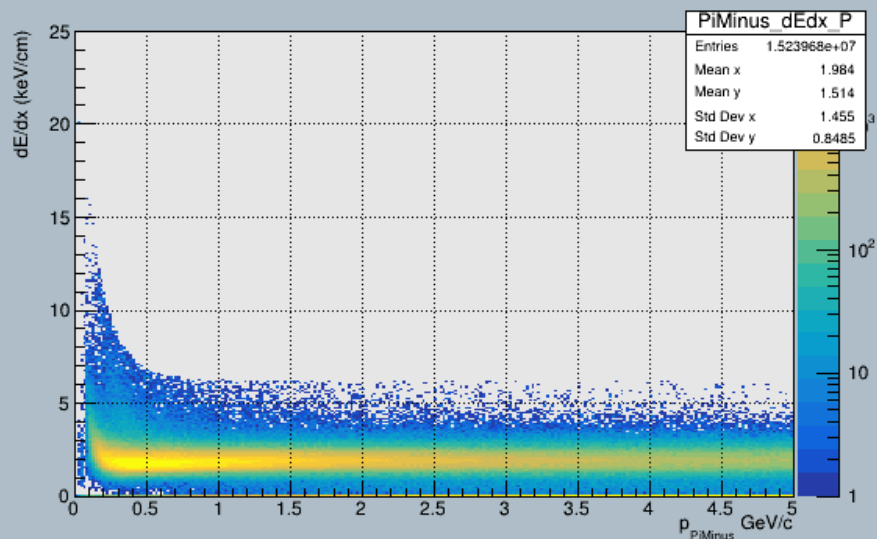
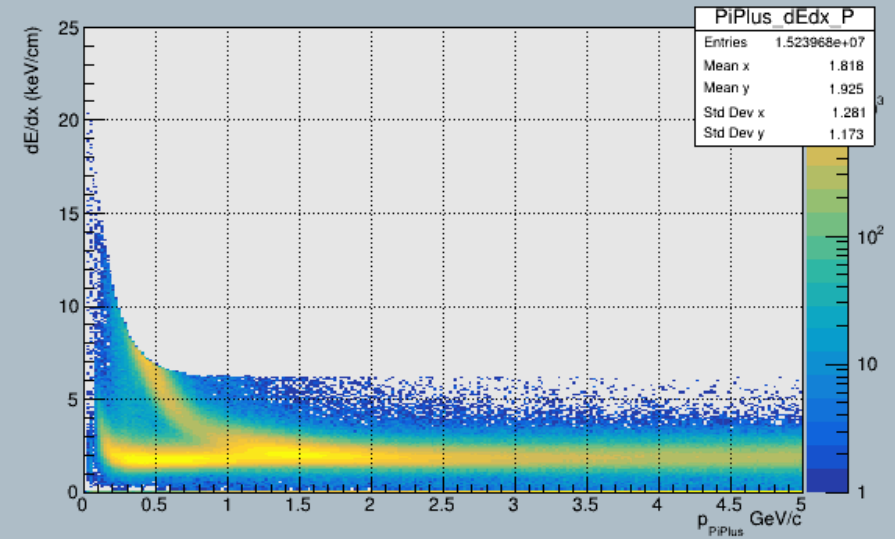
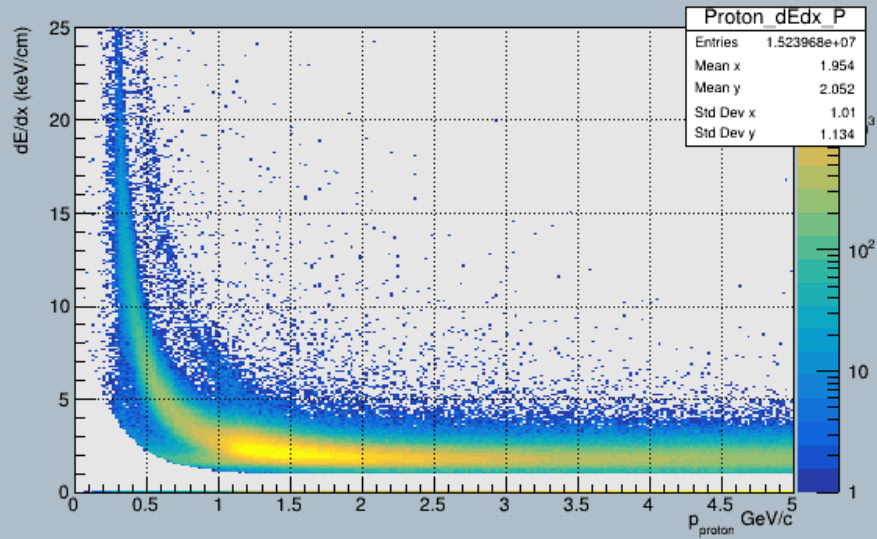
# F) Cuts B + Coplanarity + Invariant mass of PipProton , PimProton , |t| cut and |u| cut



## F) Cuts B + Coplanarity + Invariant mass of PipProton , PimProton , |t| cut and |u| cut



# F) Cuts B + Coplanarity + Invariant mass of PipProton , PimProton , |t| cut and |u| cut



**G) Cuts B + Coplanarity + Invariant mass of PipProton , PimProton ,|t| cut , |u| cut and dE/dx cut for pions**

**List of Cuts applied**

**0.3 < MM2 < 1.3(Missing Mass Squared)**

**0.3 < ME < 1.3(Missing Energy)**

**C.L > 0.001**

**BeamEnergy > 6.5 GeV**

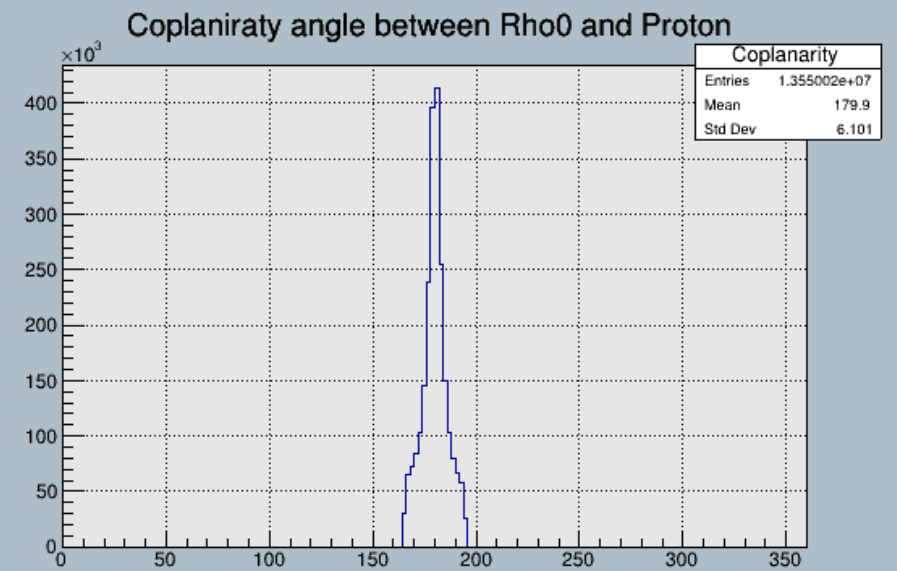
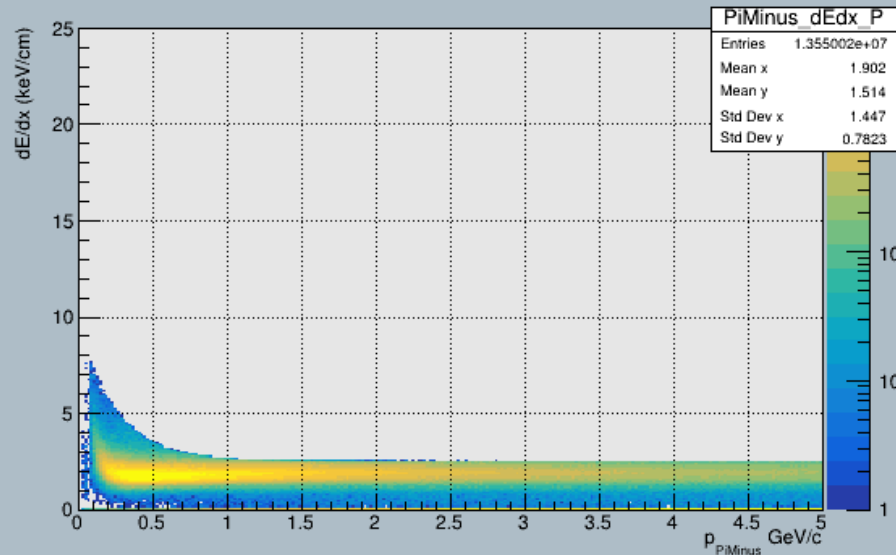
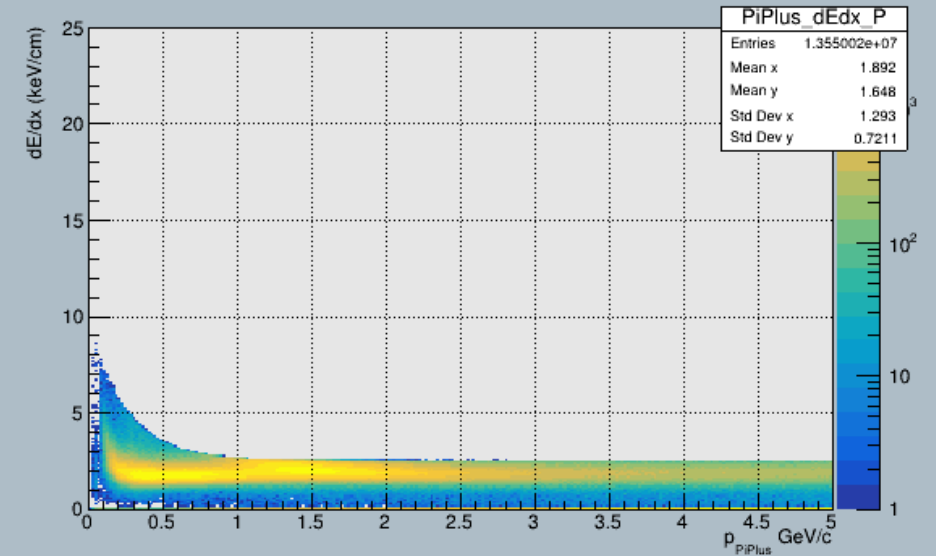
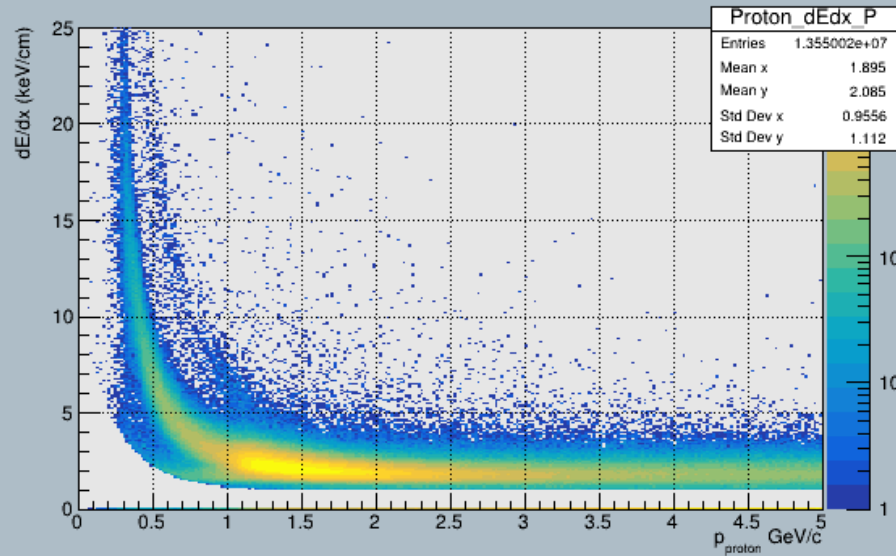
**52 cm < Zvertex < 78 cm**

**Coplanarity between Rho0 and Proton(165,195)**

**PipProt Invariant Mass < 1.3 && PimProt Invariant Mass 1.2**

**|t| > 1 ,|u| > 1 and tight cut on dE/dx of pions**

# G) Cuts B + Coplanarity + Invariant mass of PipProton , PimProton , |t| cut , |u| cut and dE/dx cut for pions



## H) CutsE , Cut F and cut G comparison for Inv. mass

