

Comparison with  $\tau$  trigger &  $\mu$  *or*  $\tau$  trigger

by  $\tau$  ID &  $P_T$

signal sample  $W_R$  1000 GeV-6500 GeV &  $N$  100 GeV ~

# Cut

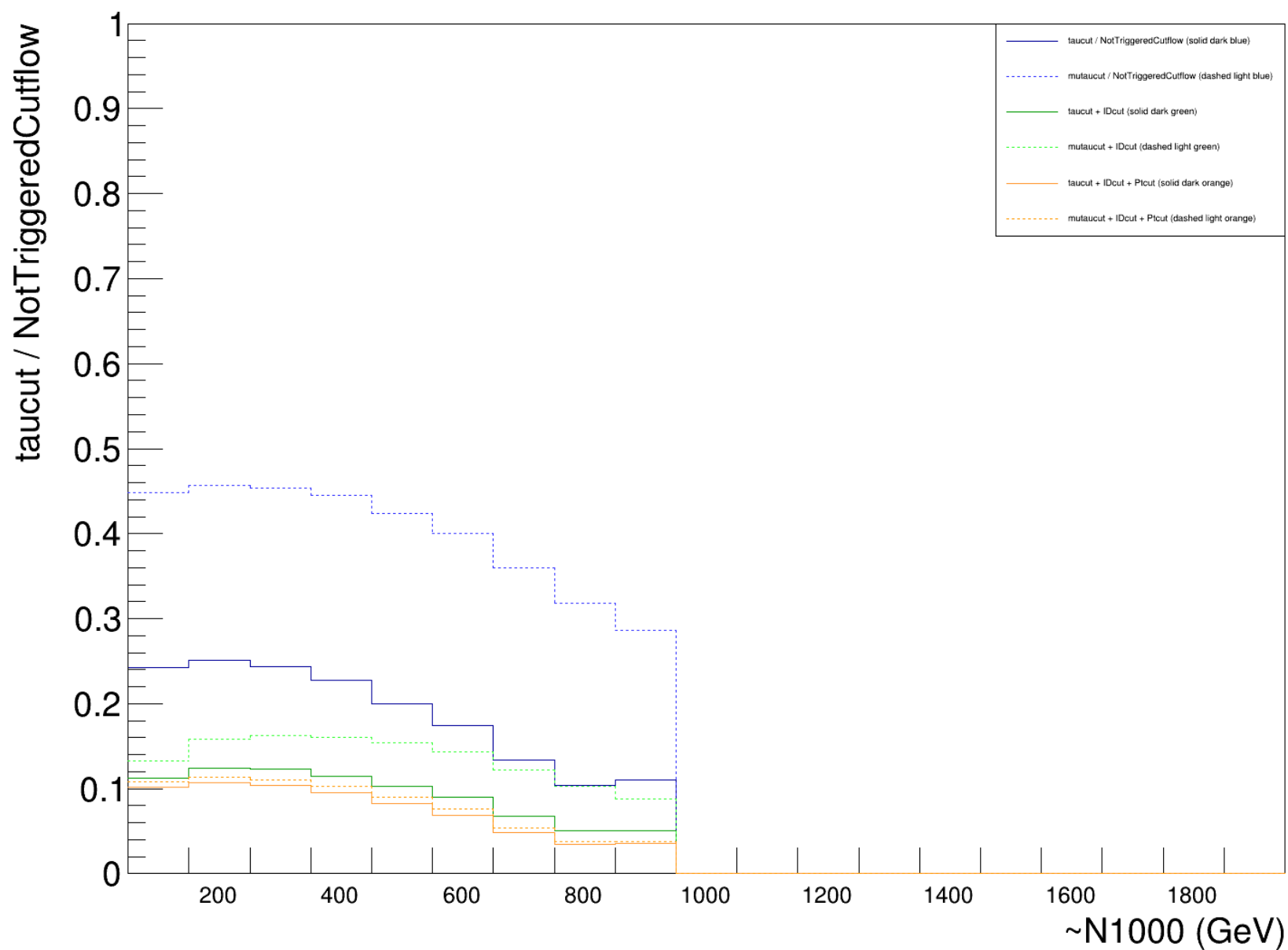
- $\tau$  ID
  - j\_decaymode = 0 , 1 , 10 , 11
  - DecayModeNewDM
  - $|\Delta z| < 0.2$
  - passTIDvJet , passTIDvMu , passTIDvEl
  - $\eta < 2.1$
- $P_T$  selection
  - $P_T > 190$  GeV

# $\mu$ or $\tau$ trigger & $\tau$ trigger

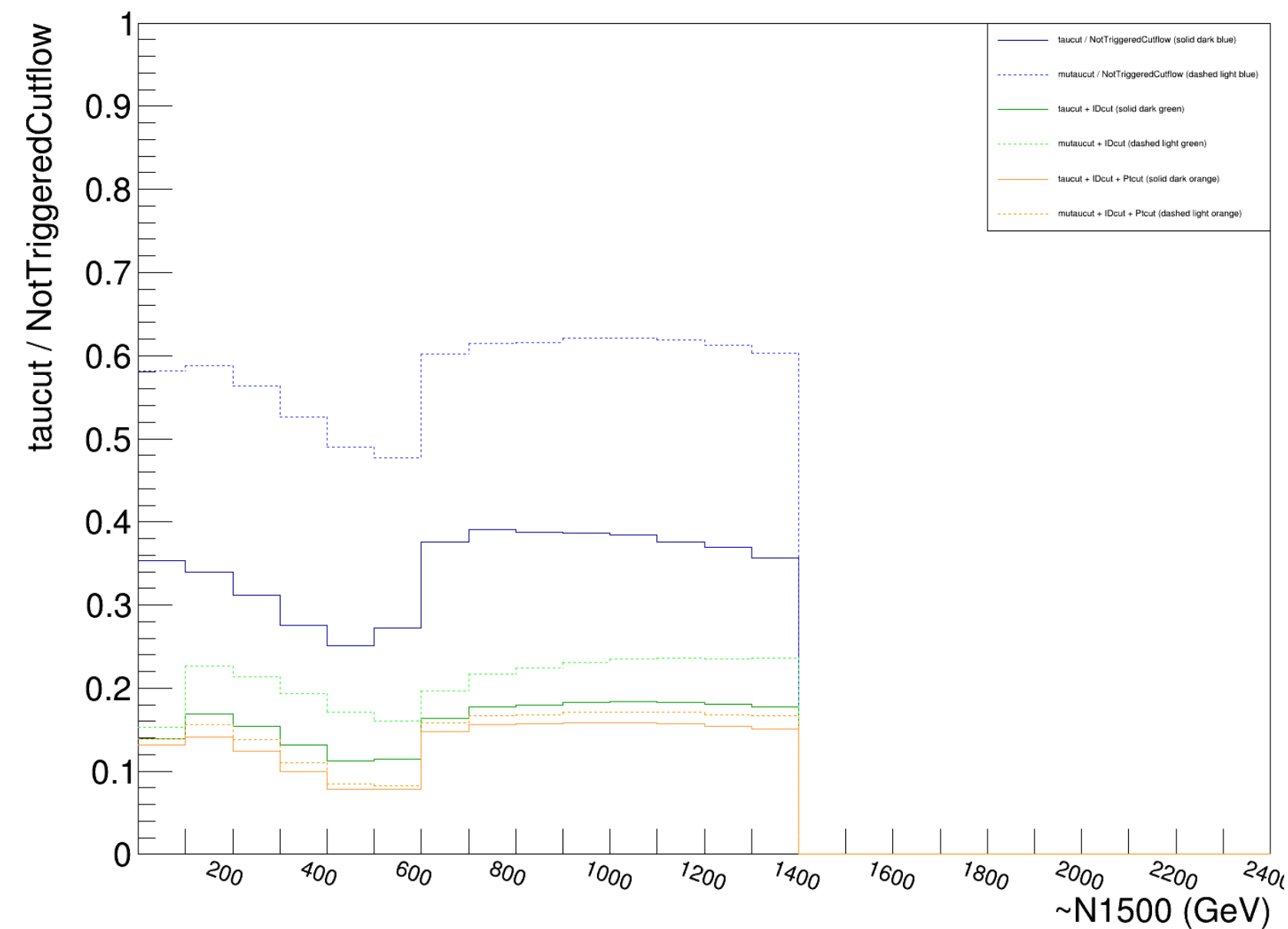
$(P_T + \tau\text{ID} + \tau\text{ trigger} + \text{MET filter}) / \text{MET filter}$

$(P_T + \tau\text{ID} + \tau\text{ trigger or } \mu\text{trigger} + \text{MET filter}) / \text{MET filter}$

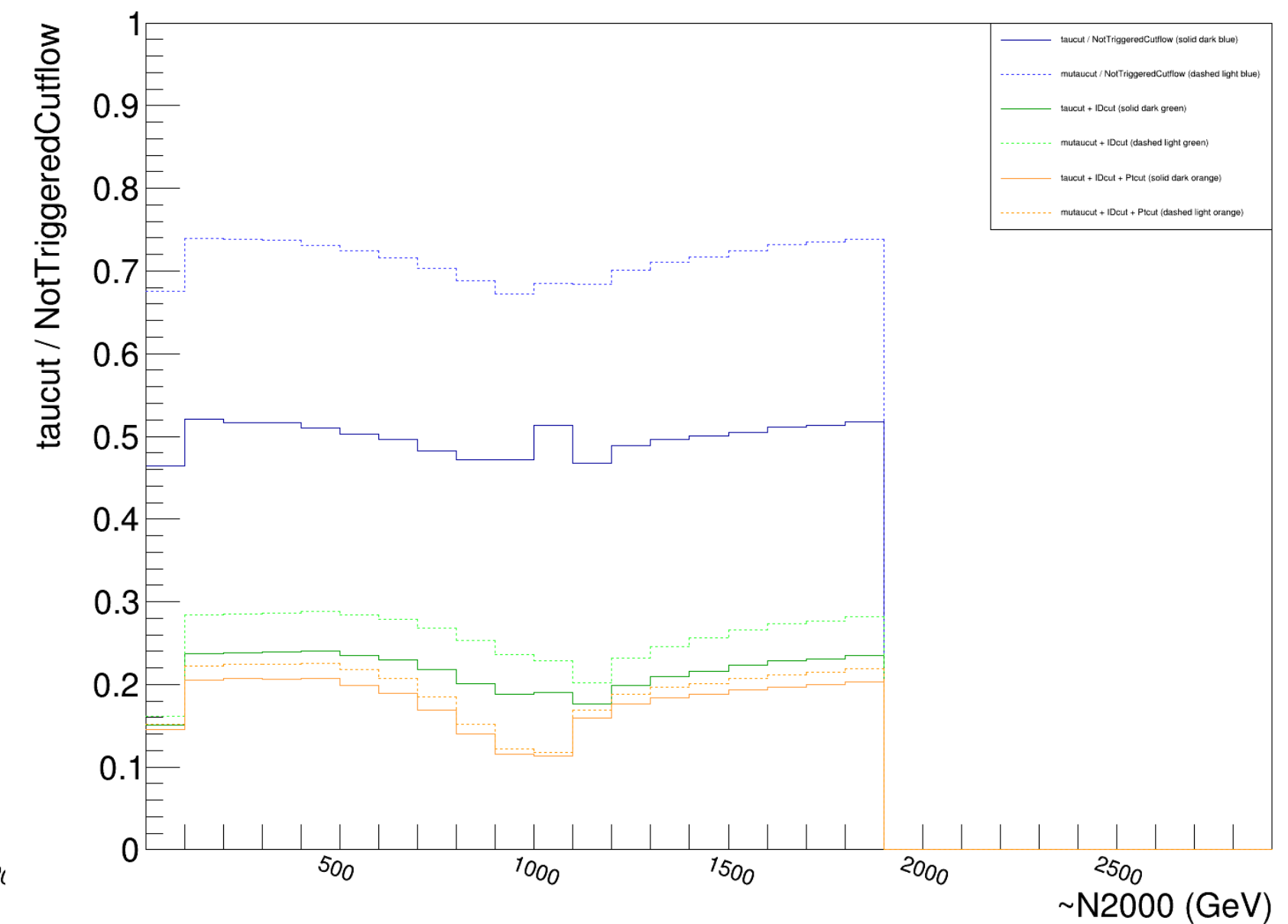
Ratio of taucut to NotTriggeredCutoff



Ratio of taucut to NotTriggeredCutoff



Ratio of taucut to NotTriggeredCutoff

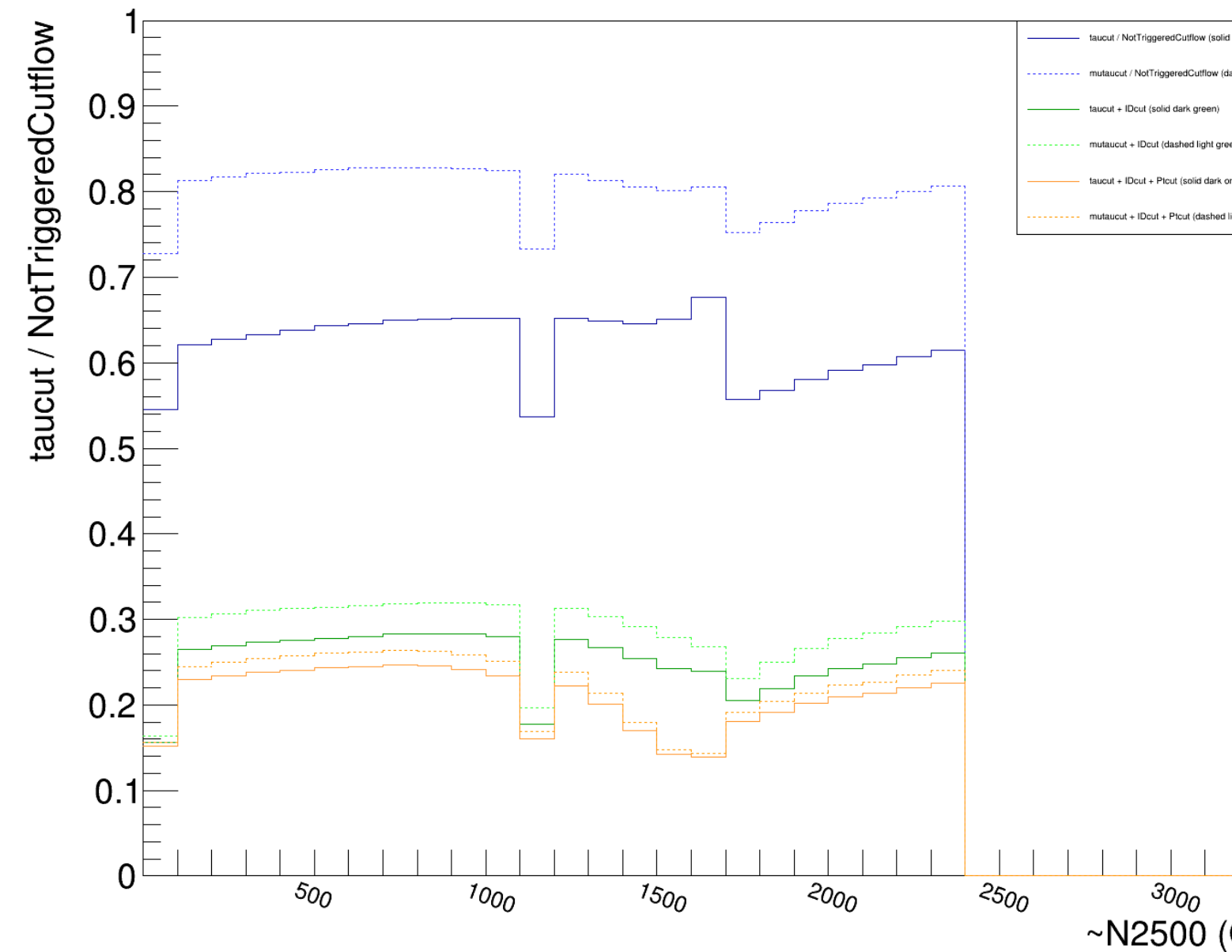


- $W_R$  1000 ~ 2000

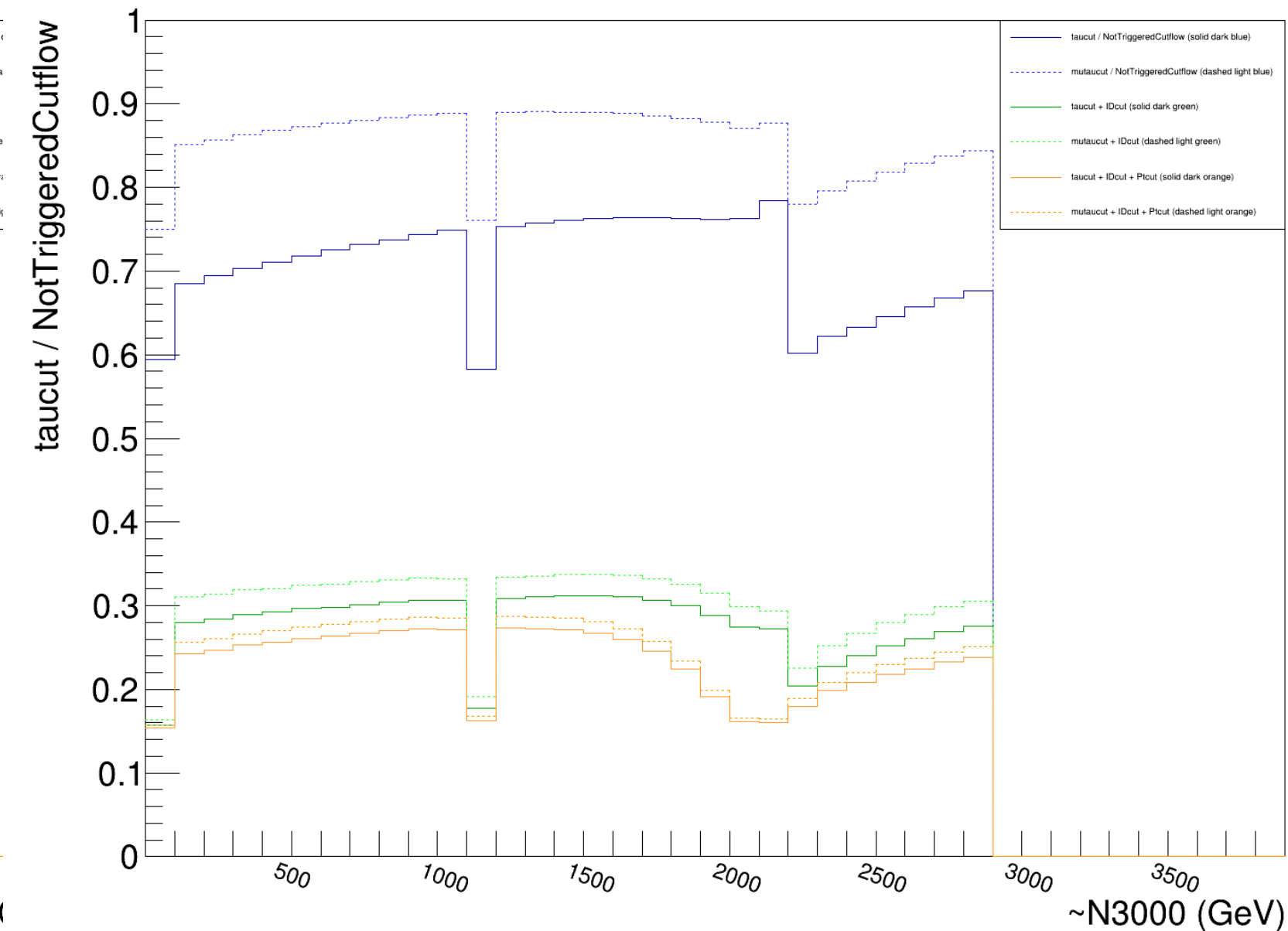
# $\mu$ or $\tau$ trigger & $\tau$ trigger

$$\begin{aligned} & (P_T + \tau\text{ID} + \tau\text{ trigger} + \text{MET filter}) / \text{MET filter} \\ & (P_T + \tau\text{ID} + \tau\text{ trigger or } \mu\text{trigger} + \text{MET filter}) / \text{MET filter} \end{aligned}$$

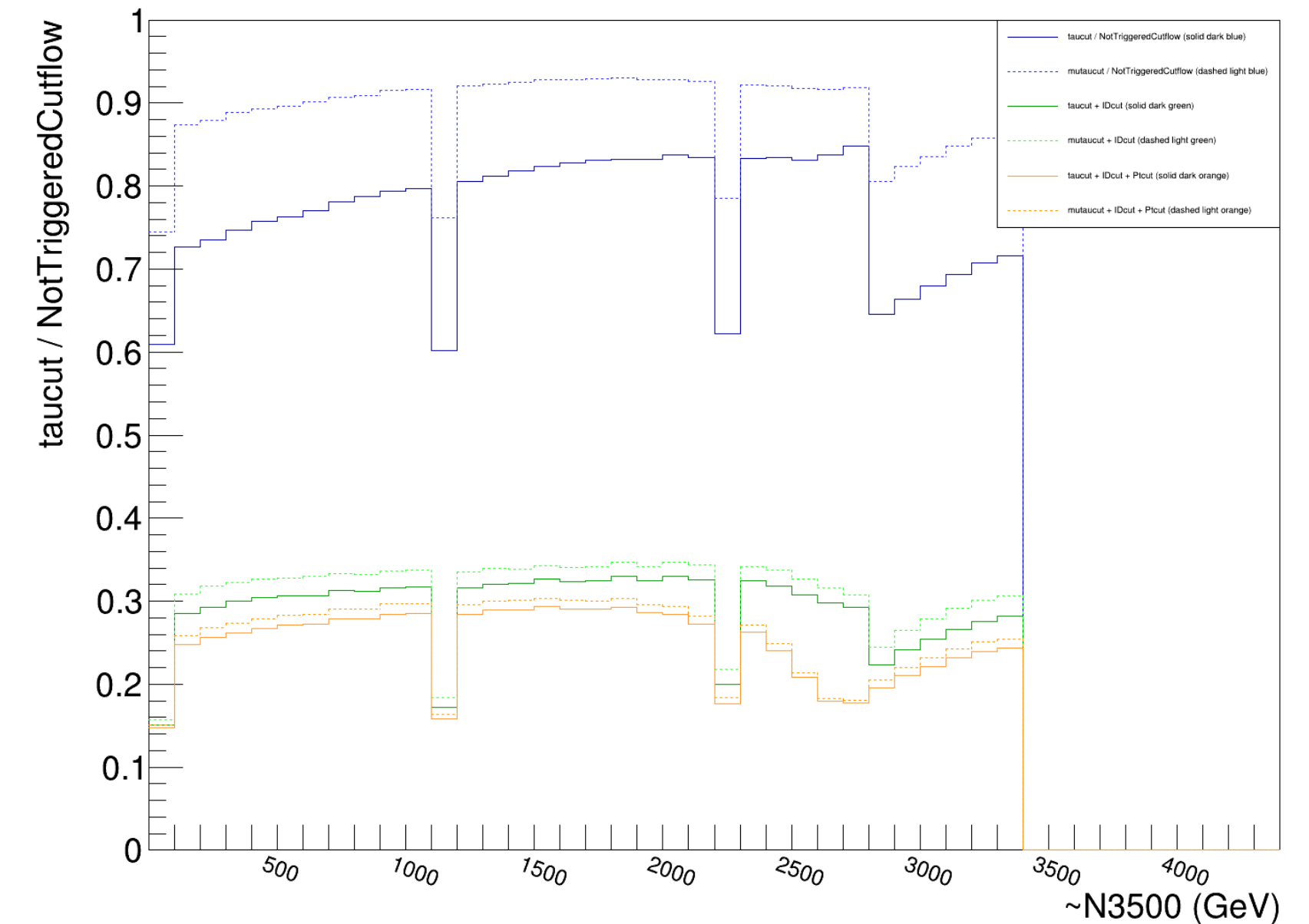
Ratio of taucut to NotTriggeredCutoff



Ratio of taucut to NotTriggeredCutoff



Ratio of taucut to NotTriggeredCutoff

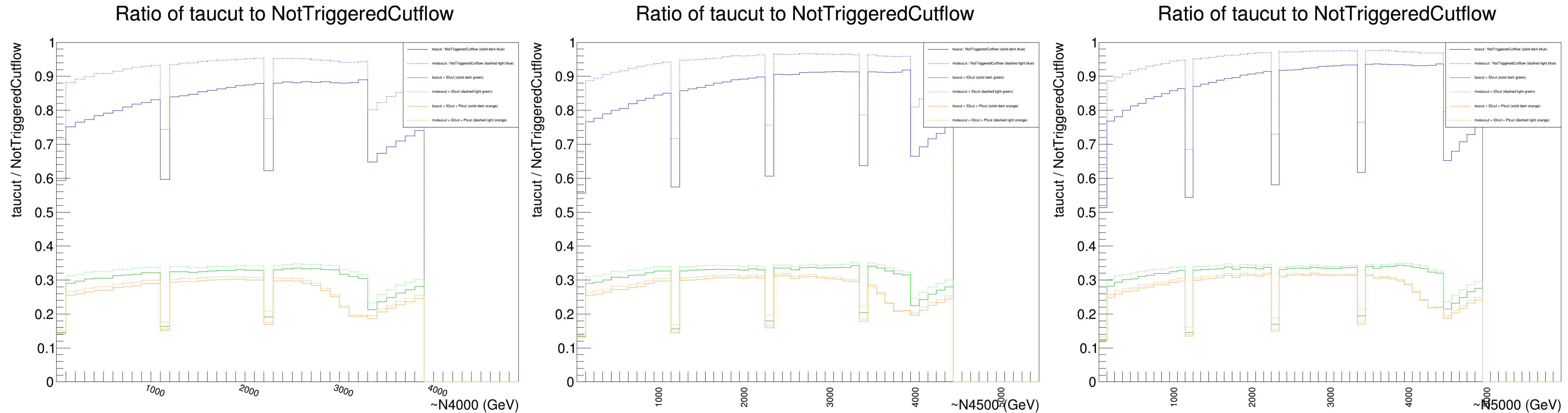


- $W_R$  2500 ~ 3500

# $\mu$ *or* $\tau$ trigger & $\tau$ trigger

$(P_T + \tau\text{ID} + \tau\text{ trigger} + \text{MET filter}) / \text{MET filter}$

$(P_T + \tau\text{ID} + \tau\text{ trigger or } \mu\text{trigger} + \text{MET filter}) / \text{MET filter}$

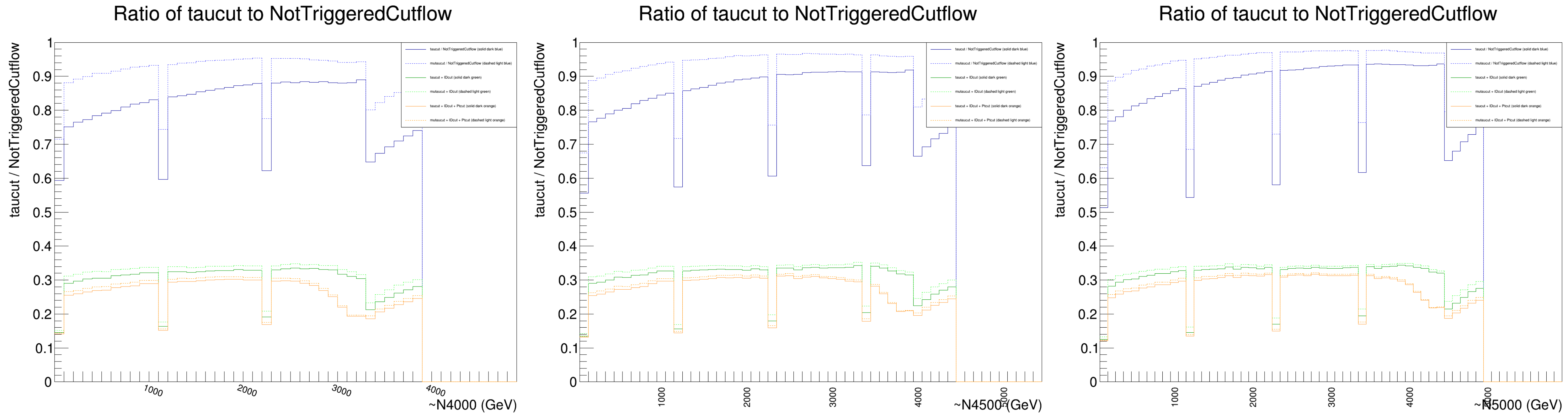


- $W_R$  4000~5000

# $\mu$ or $\tau$ trigger & $\tau$ trigger

$(P_T + \tau\text{ID} + \tau\text{ trigger} + \text{MET filter}) / \text{MET filter}$

$(P_T + \tau\text{ID} + \tau\text{ trigger or } \mu\text{trigger} + \text{MET filter}) / \text{MET filter}$

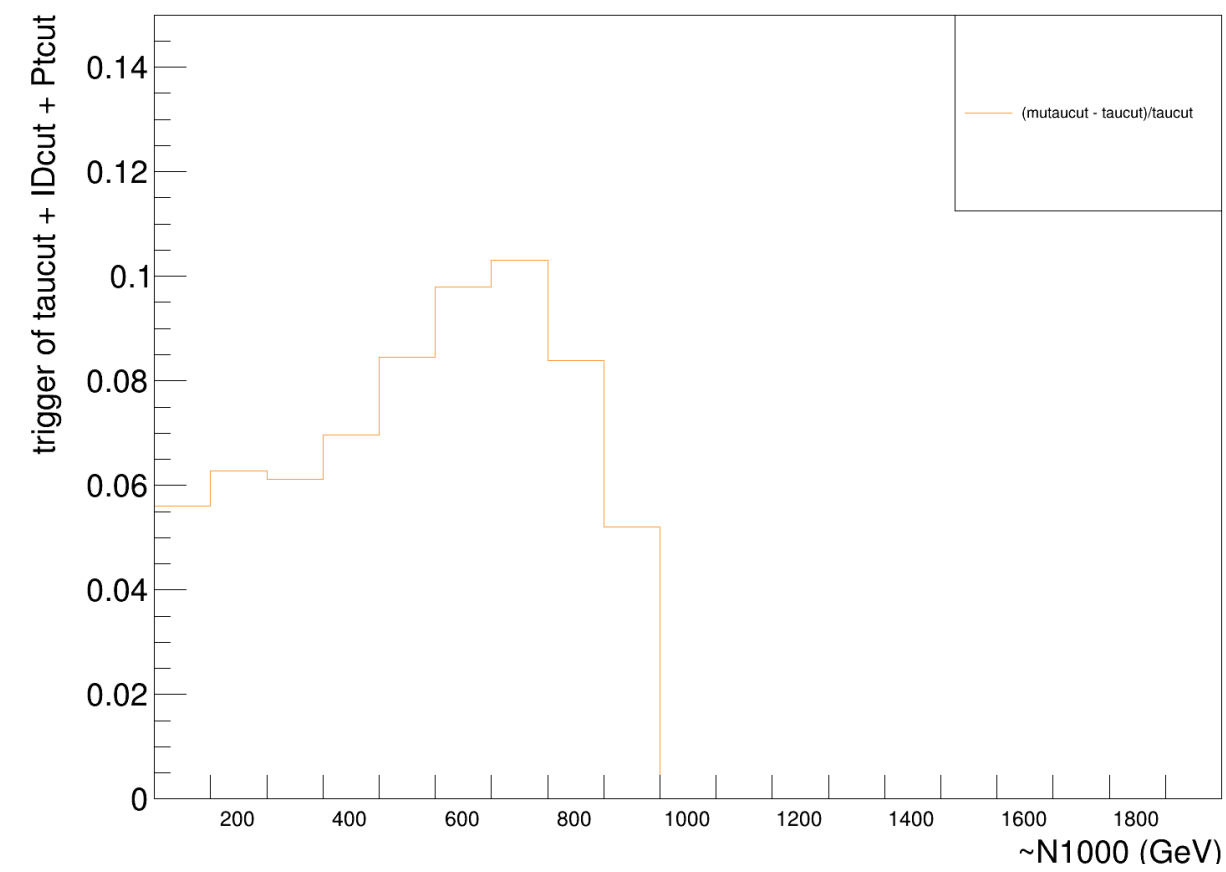


- $W_R$  5500~6500

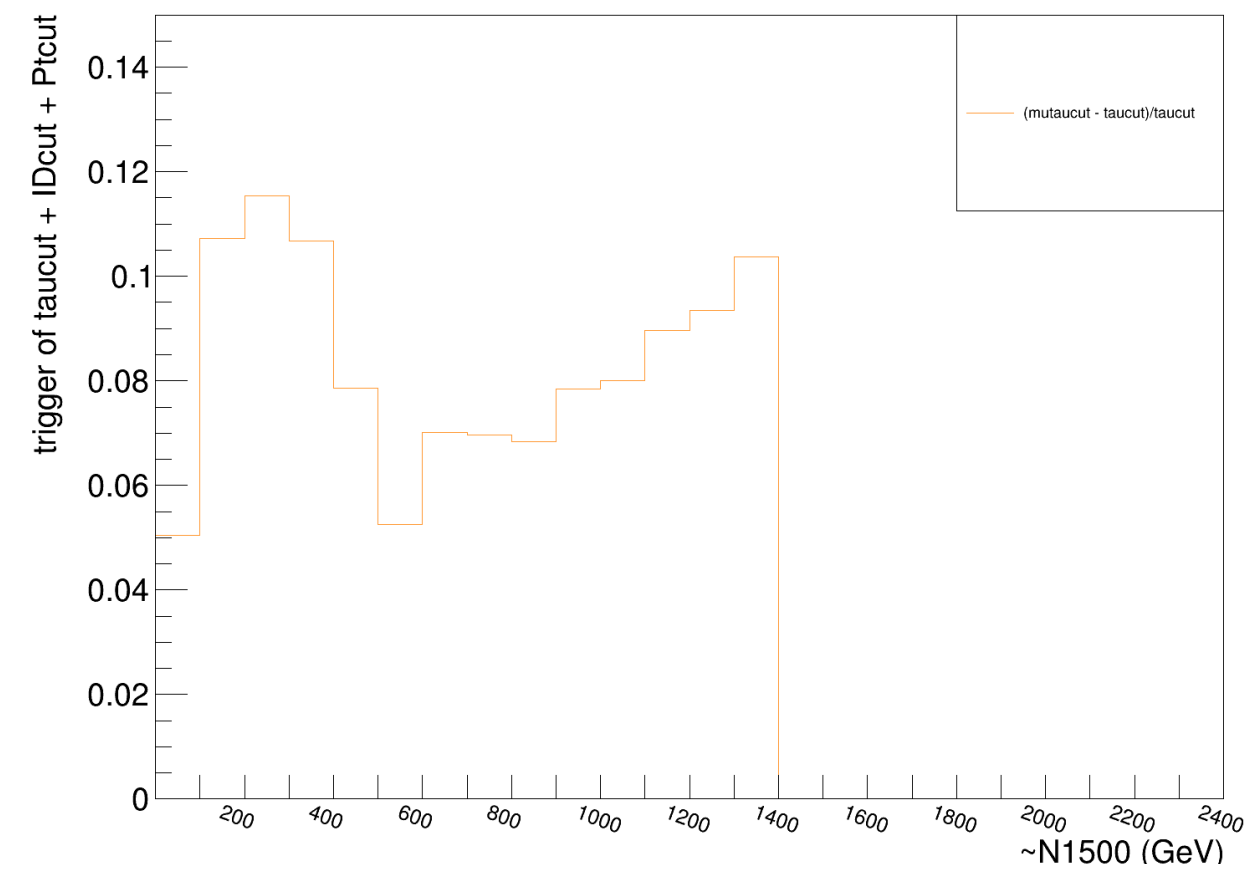
# $\mu$ or $\tau$ trigger & $\tau$ trigger

$$(\tau \text{ trigger} \& \mu \text{ trigger} - \tau \text{ trigger}) / \tau \text{ trigger}$$

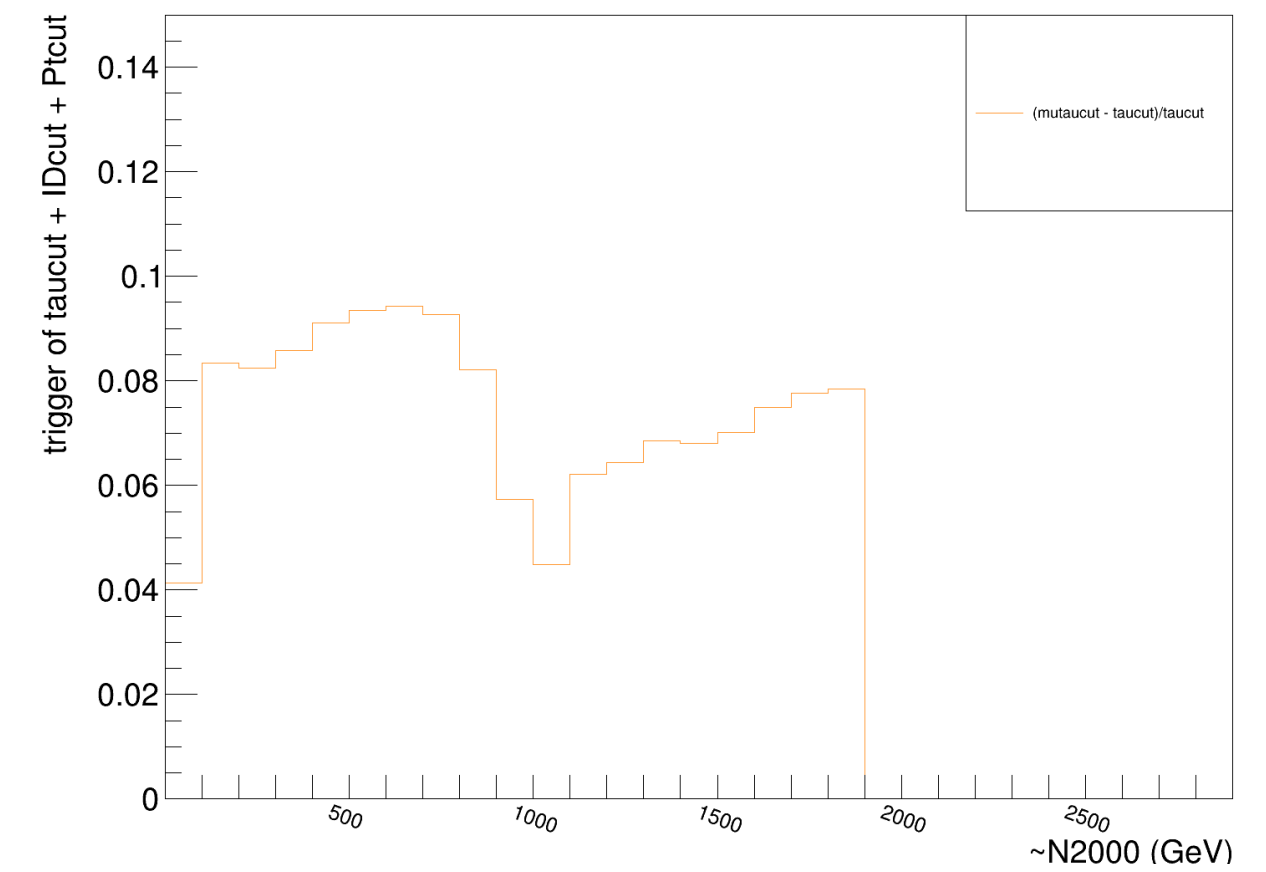
Ratio trigger of taucut + IDcut + Ptcut



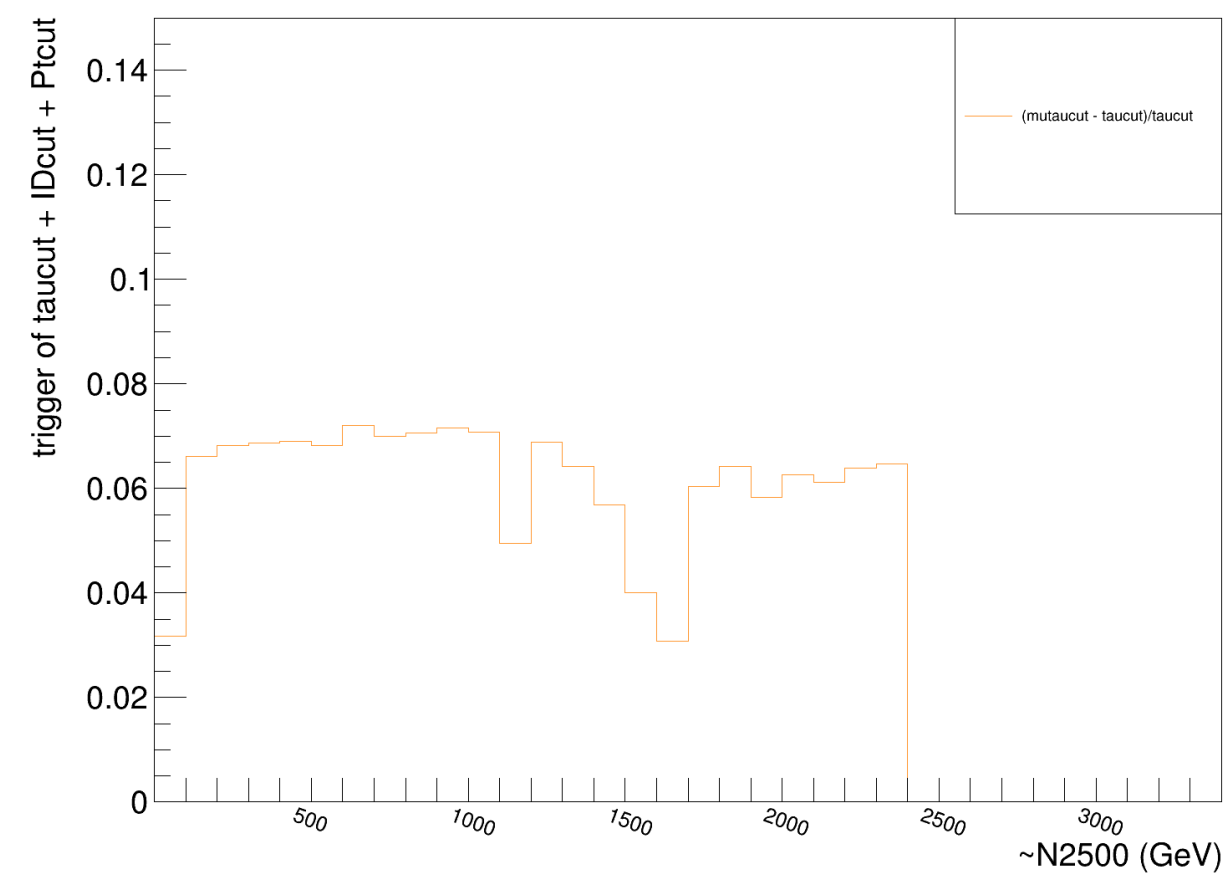
Ratio trigger of taucut + IDcut + Ptcut



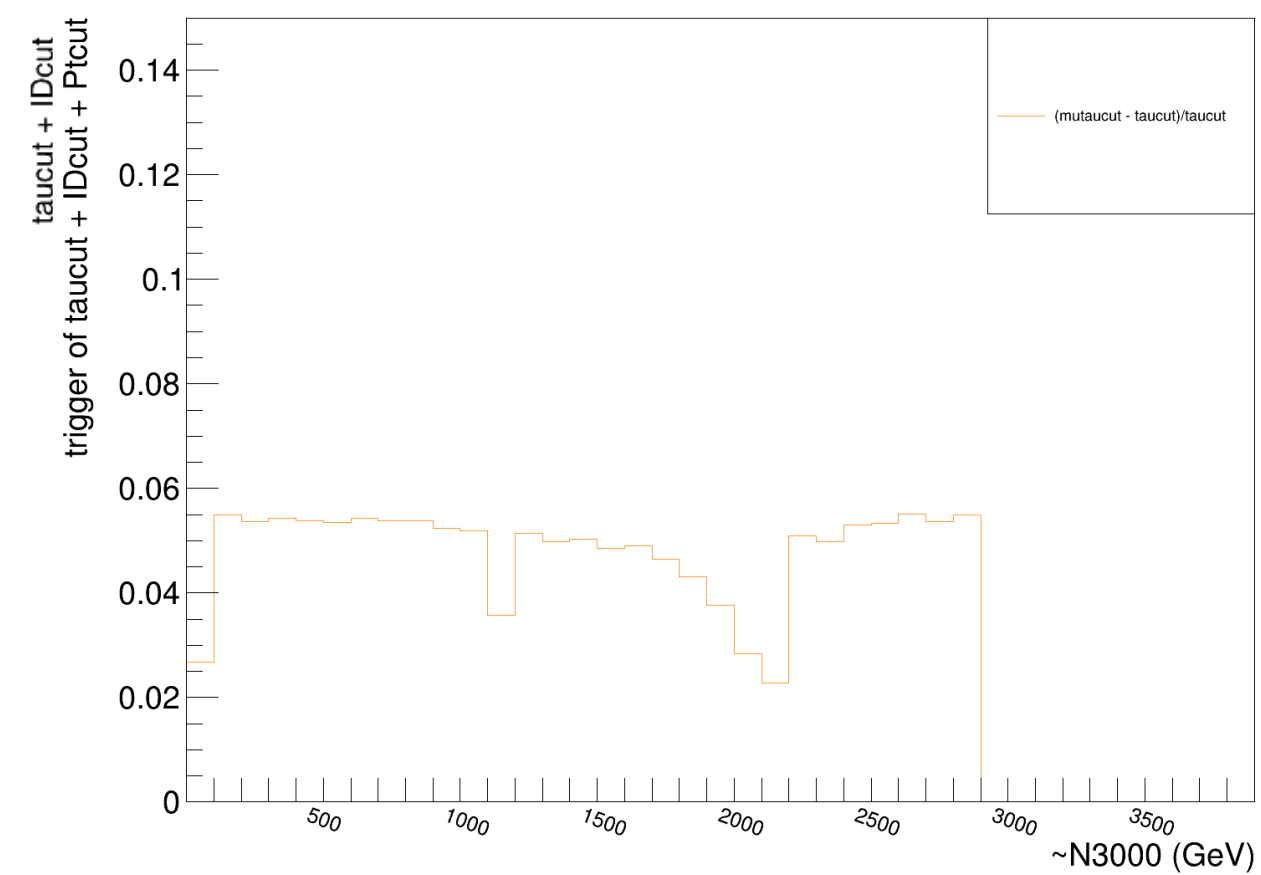
Ratio trigger of taucut + IDcut + Ptcut



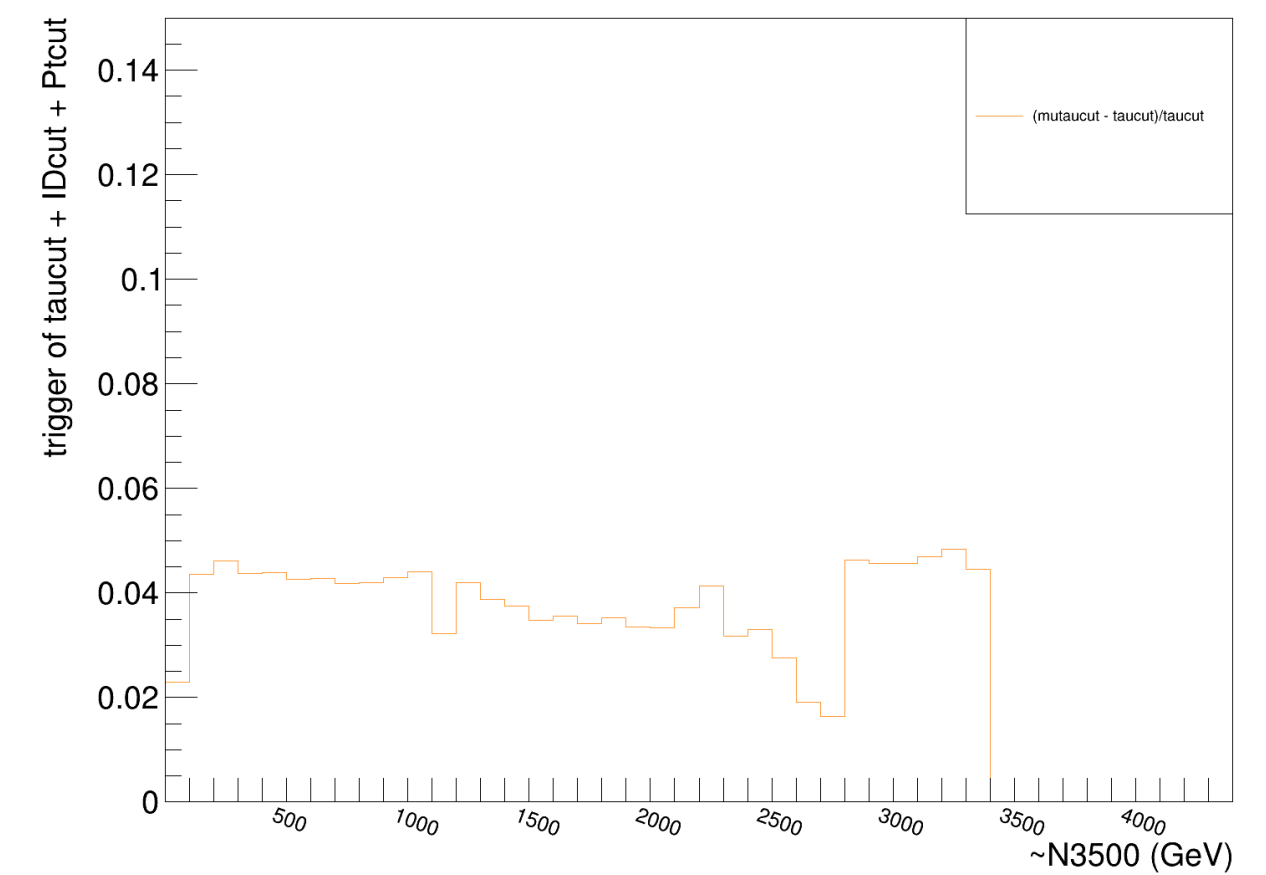
Ratio trigger of taucut + IDcut + Ptcut



Ratio trigger of taucut + IDcut + Ptcut



Ratio trigger of taucut + IDcut + Ptcut

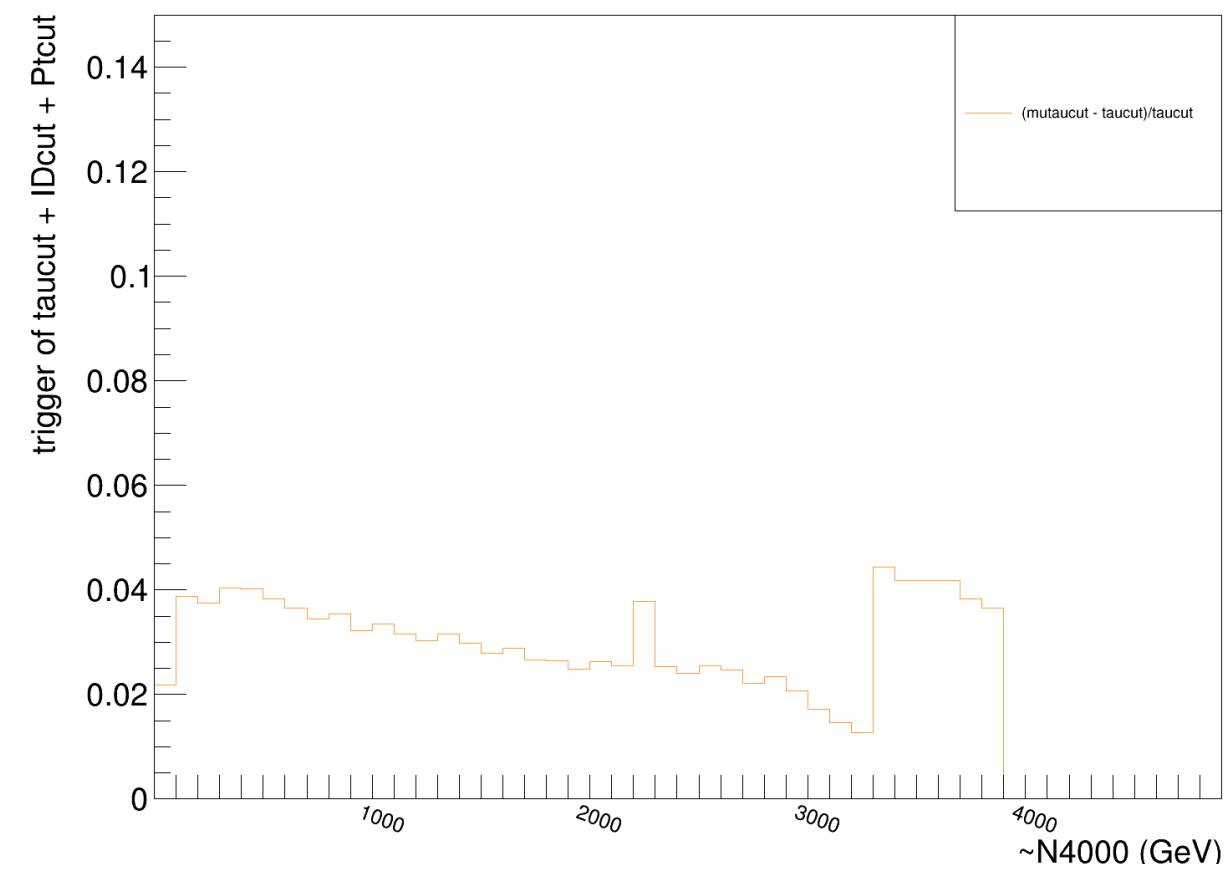


- $W_R$  1000~ 4000

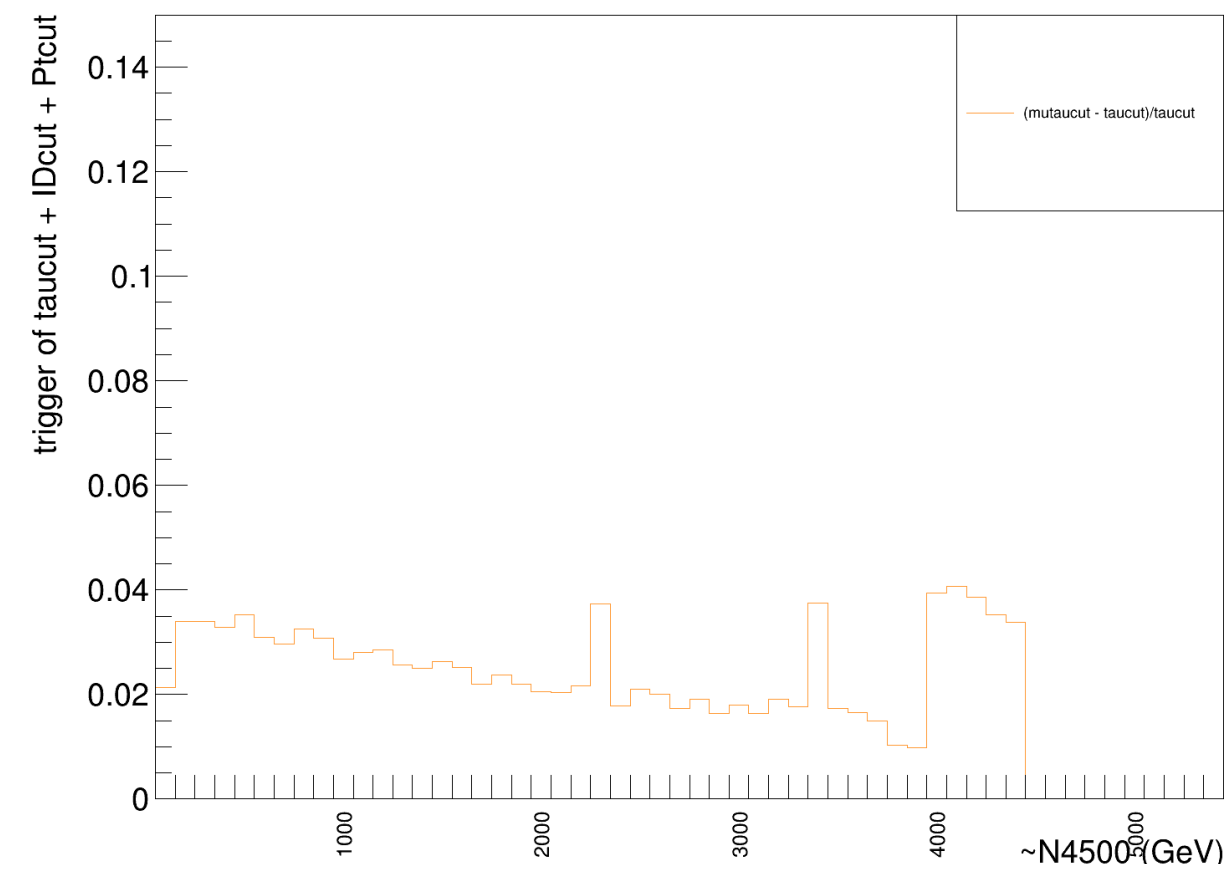
# $\mu$ or $\tau$ trigger & $\tau$ trigger

$$(\tau \text{ trigger} \& \mu \text{ trigger} - \tau \text{ trigger}) / \tau \text{ trigger}$$

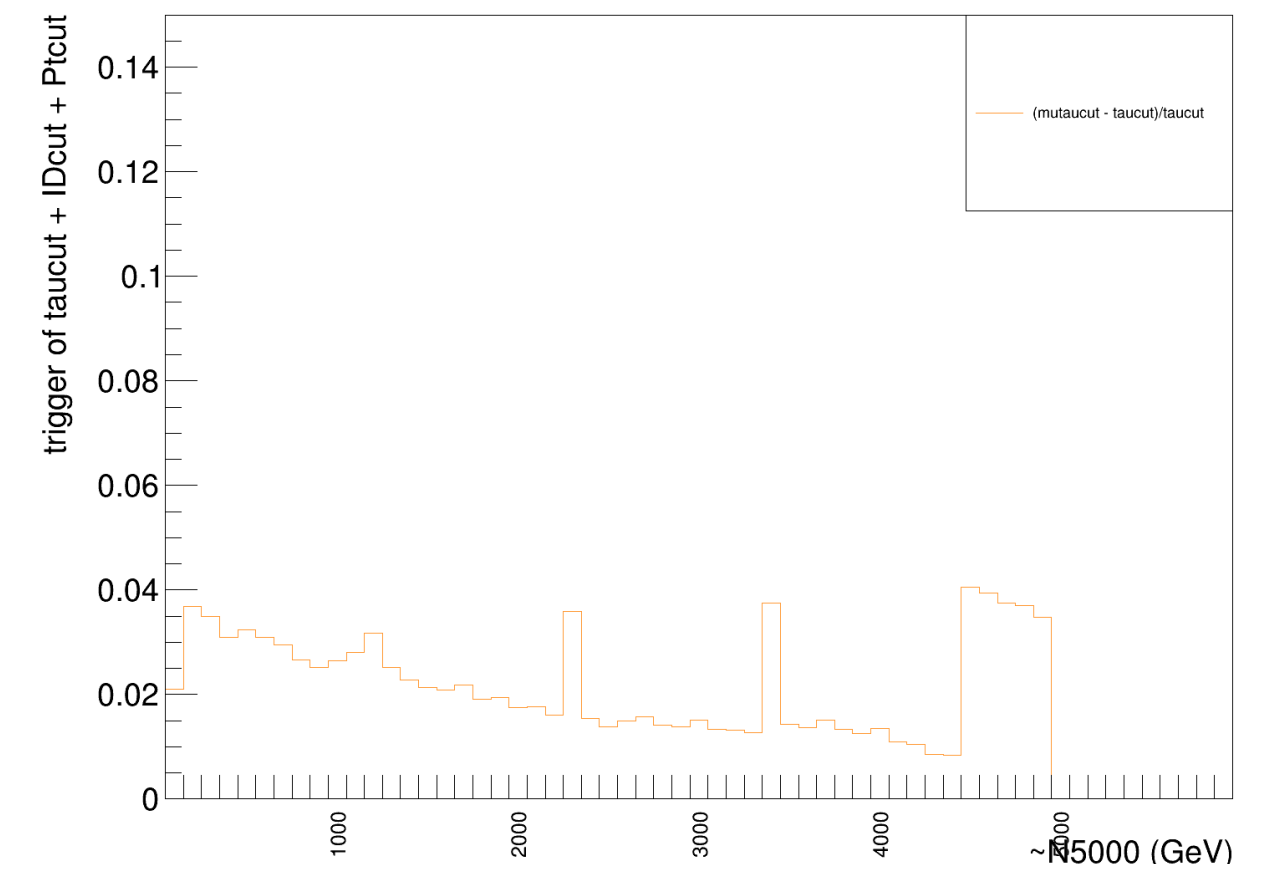
Ratio trigger of taucut + IDcut + Ptcut



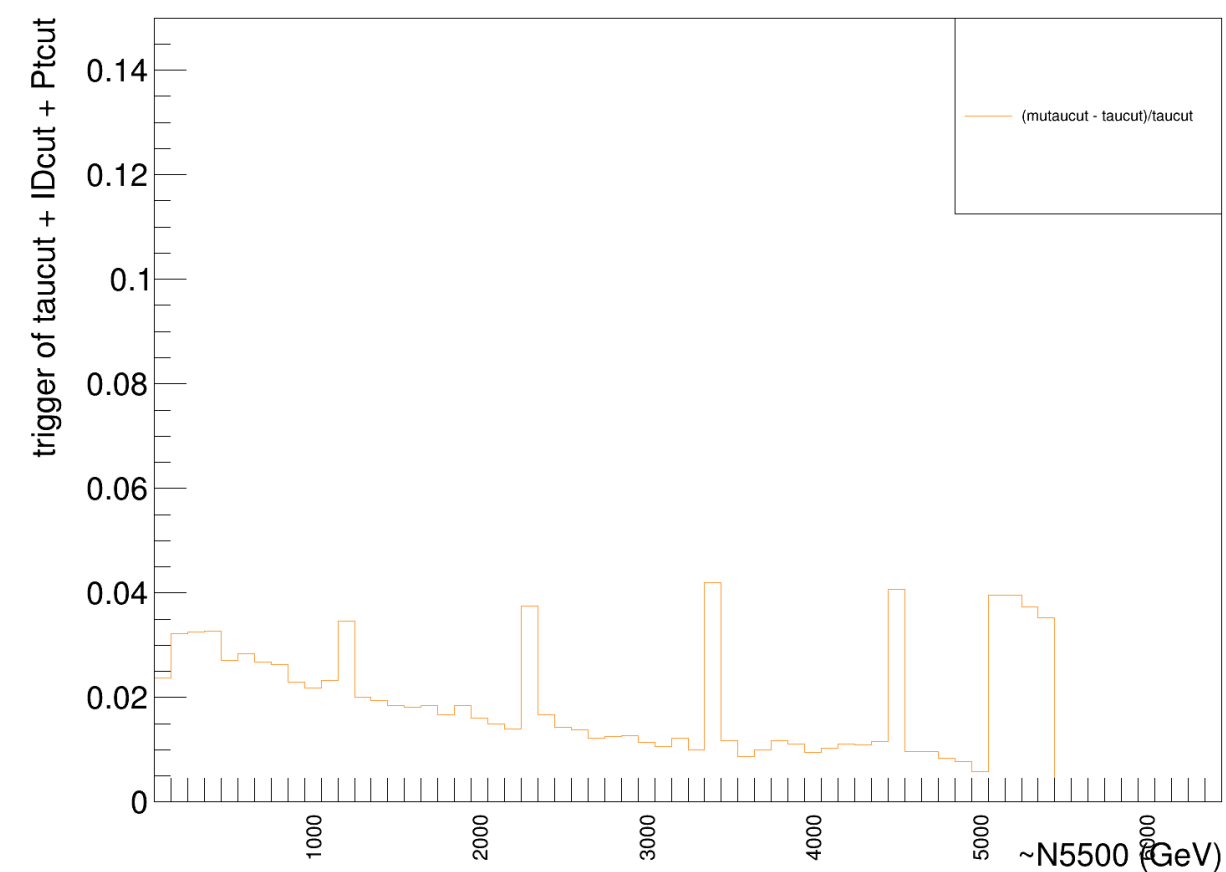
Ratio trigger of taucut + IDcut + Ptcut



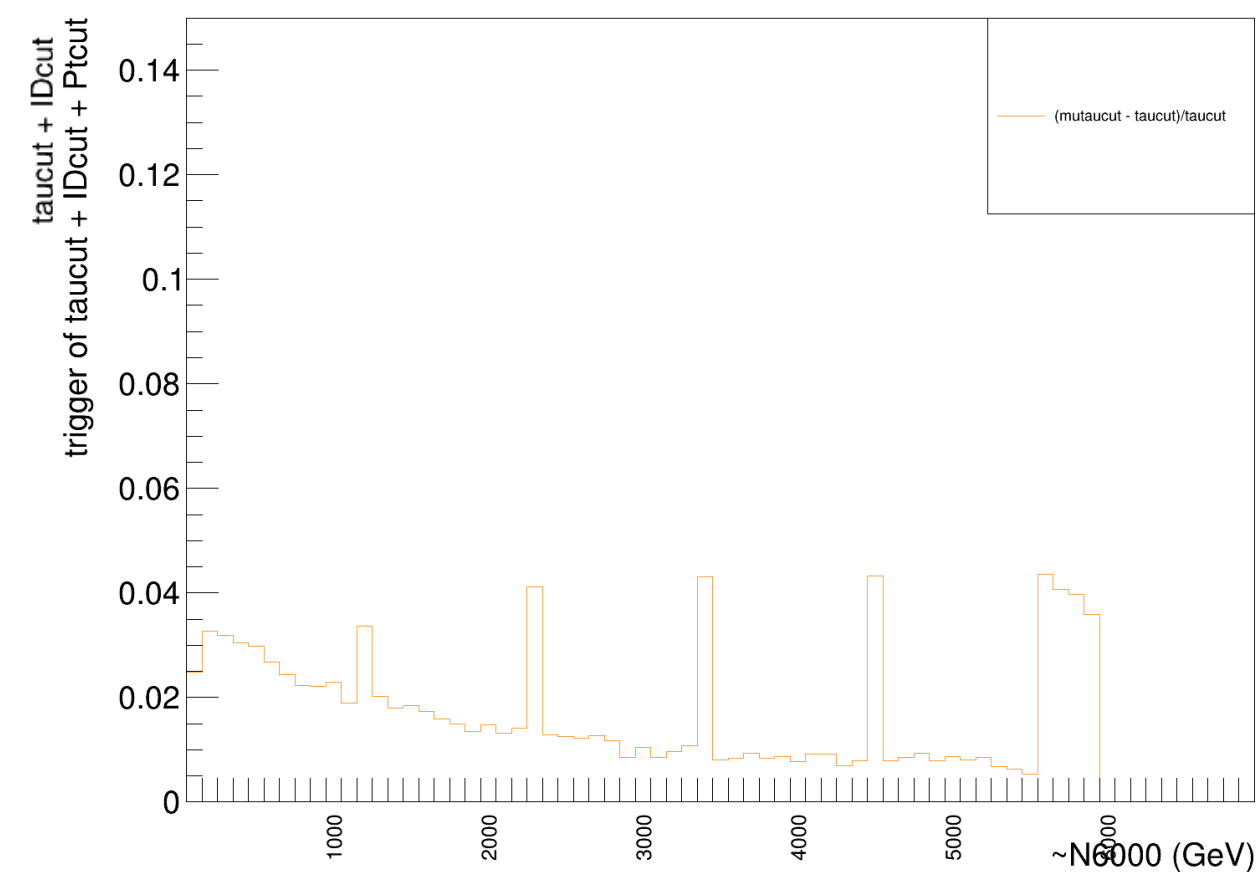
Ratio trigger of taucut + IDcut + Ptcut



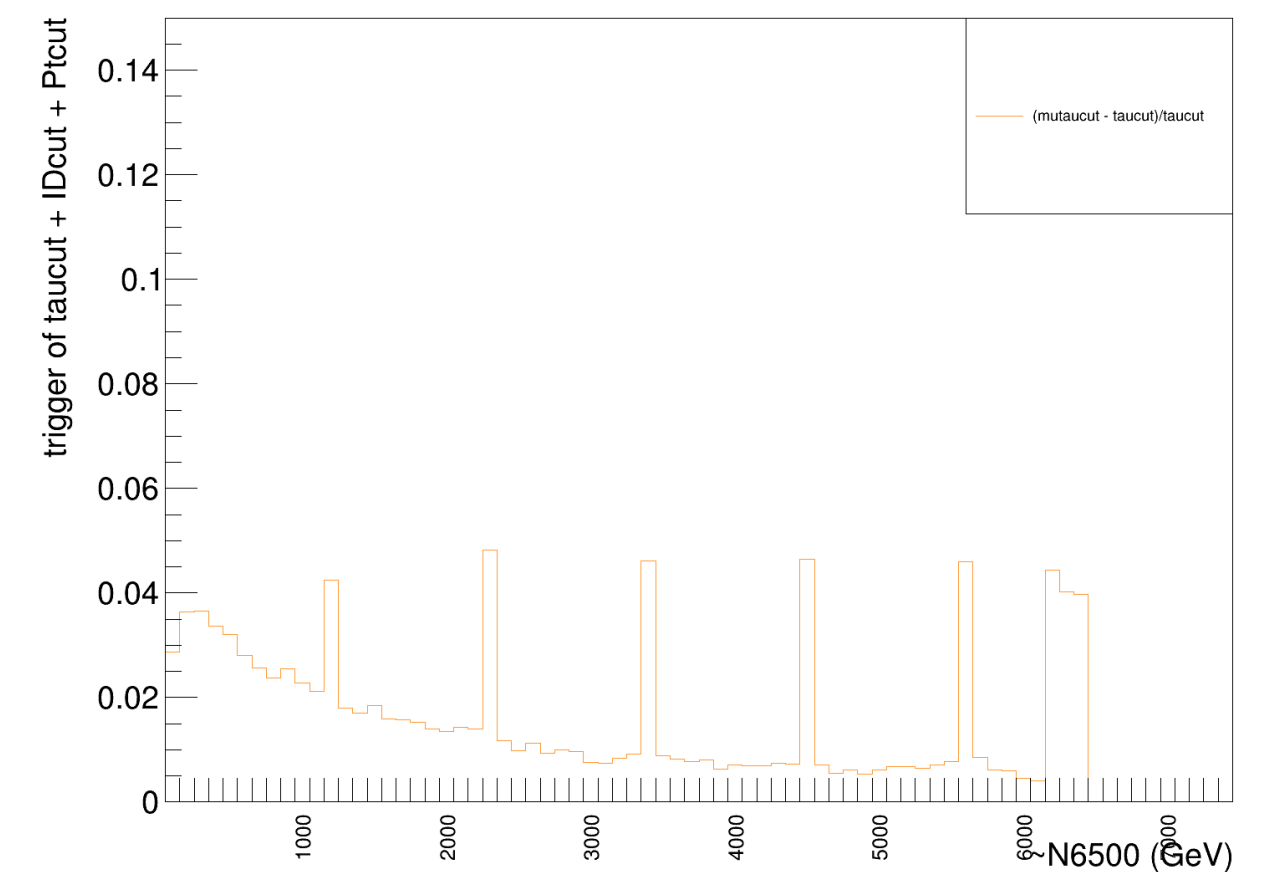
Ratio trigger of taucut + IDcut + Ptcut



Ratio trigger of taucut + IDcut + Ptcut



Ratio trigger of taucut + IDcut + Ptcut



- $W_R$  4500~6500

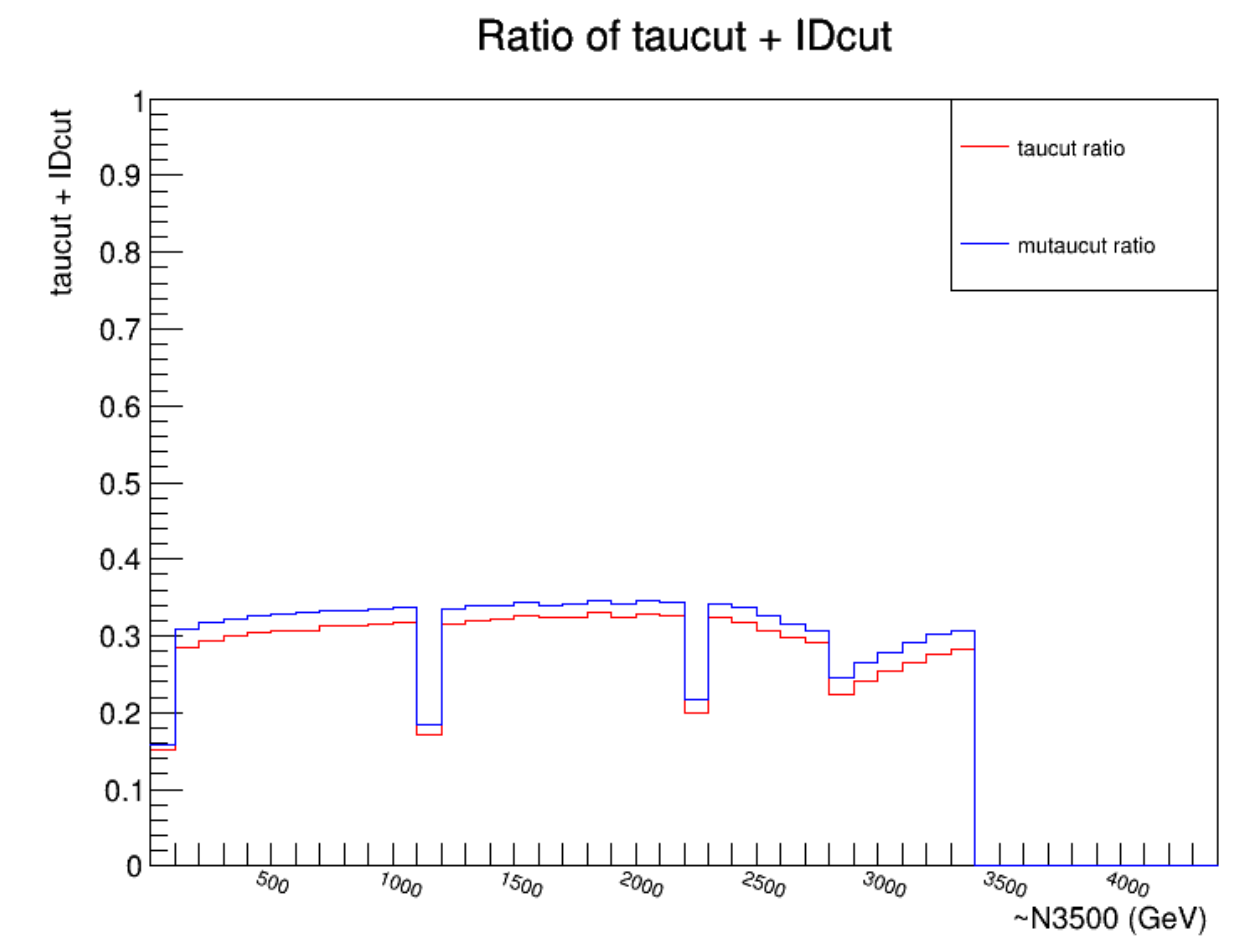
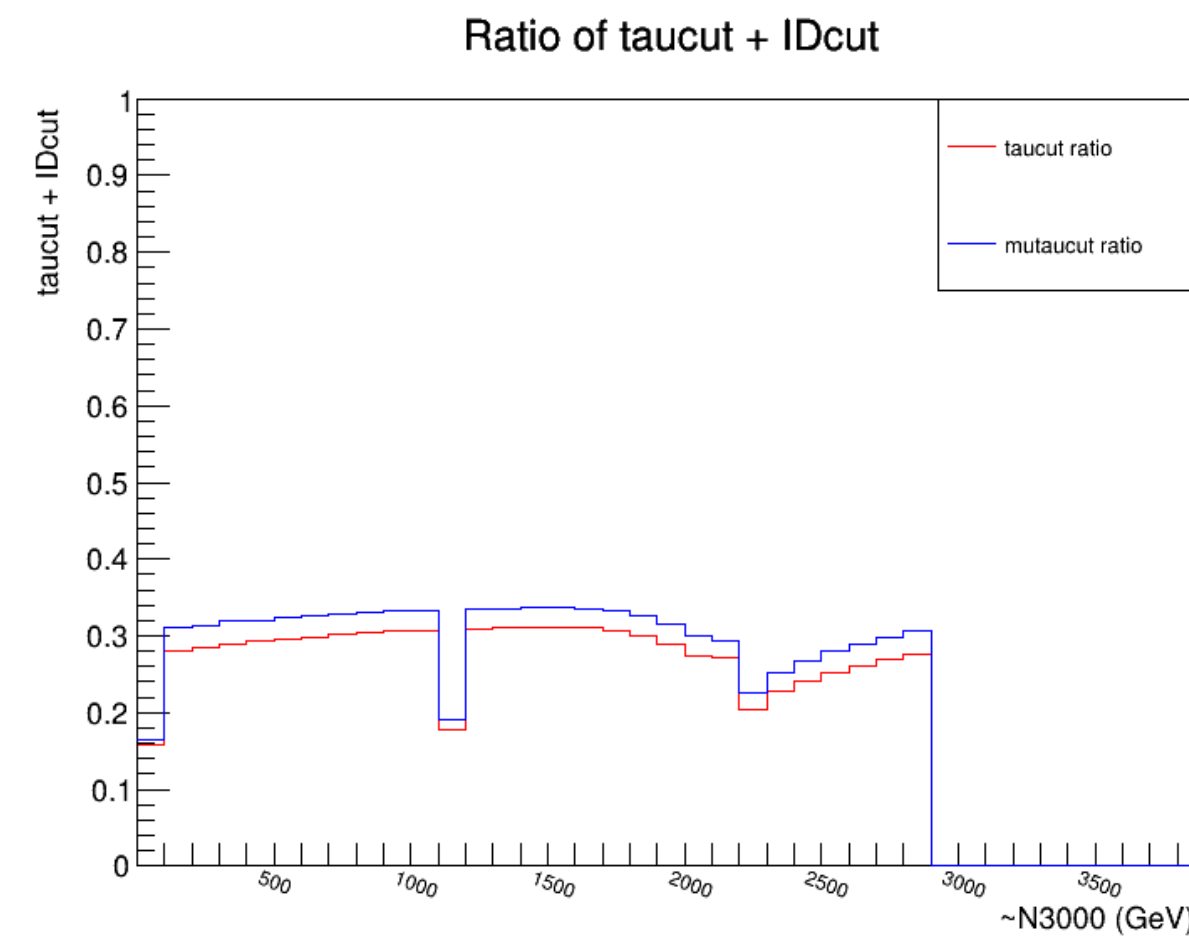
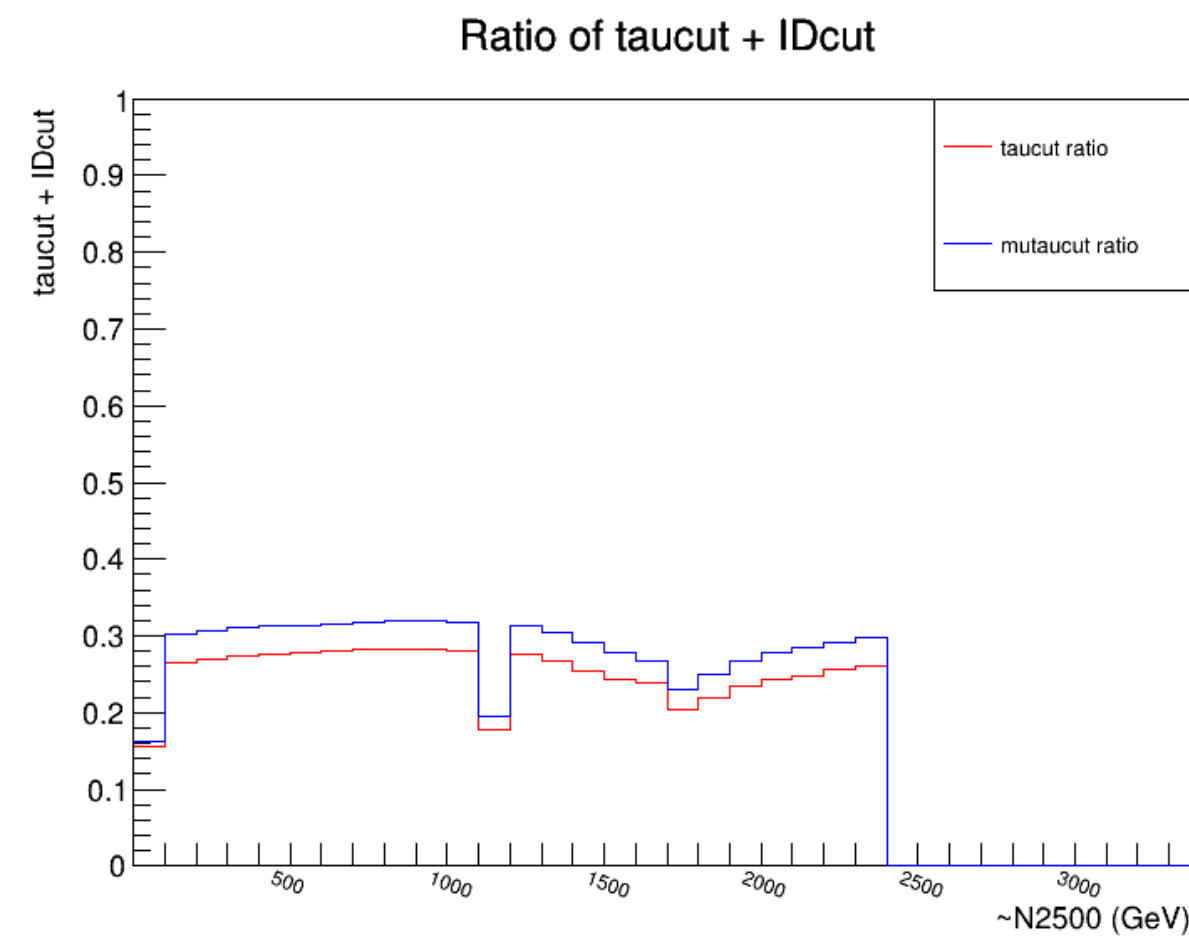
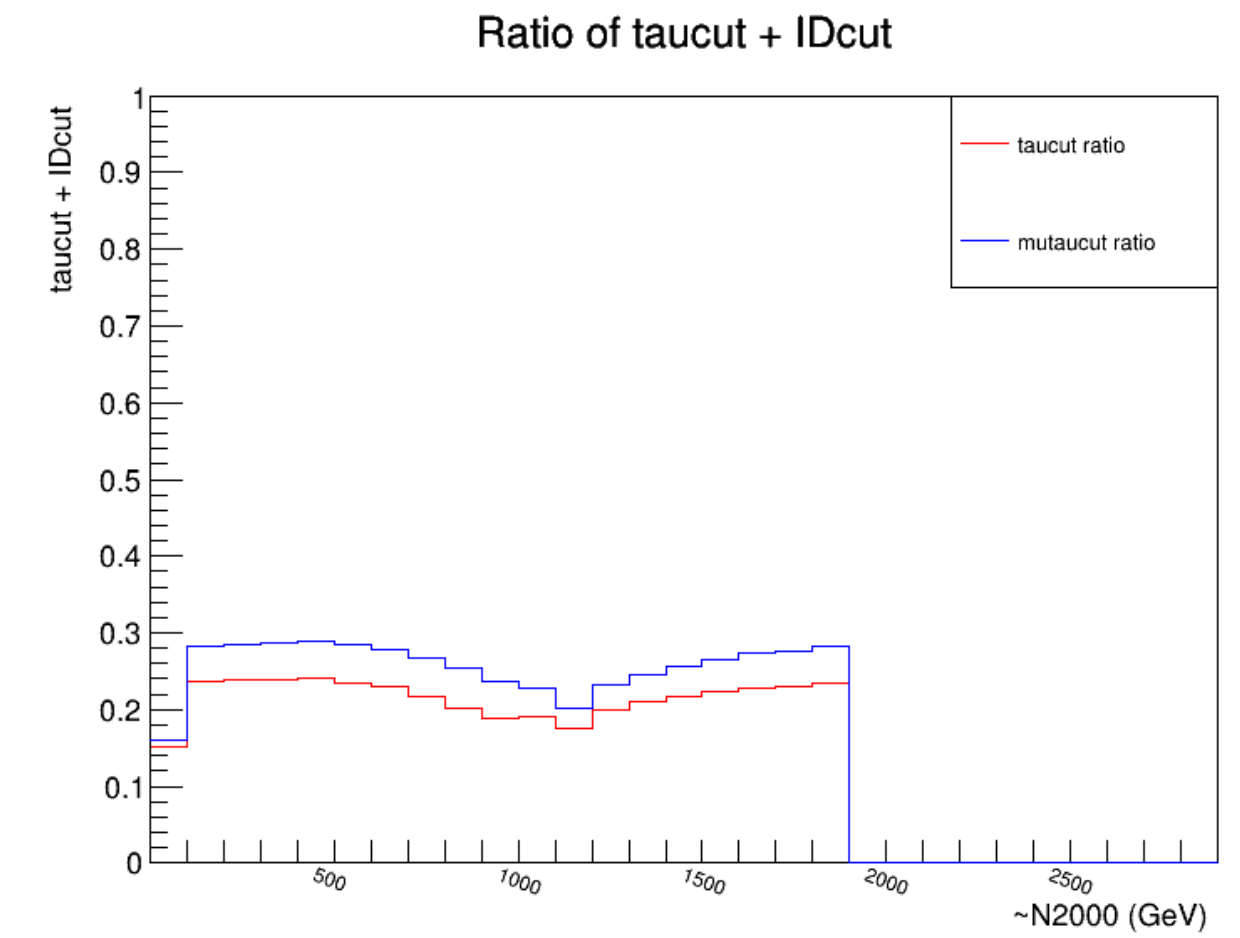
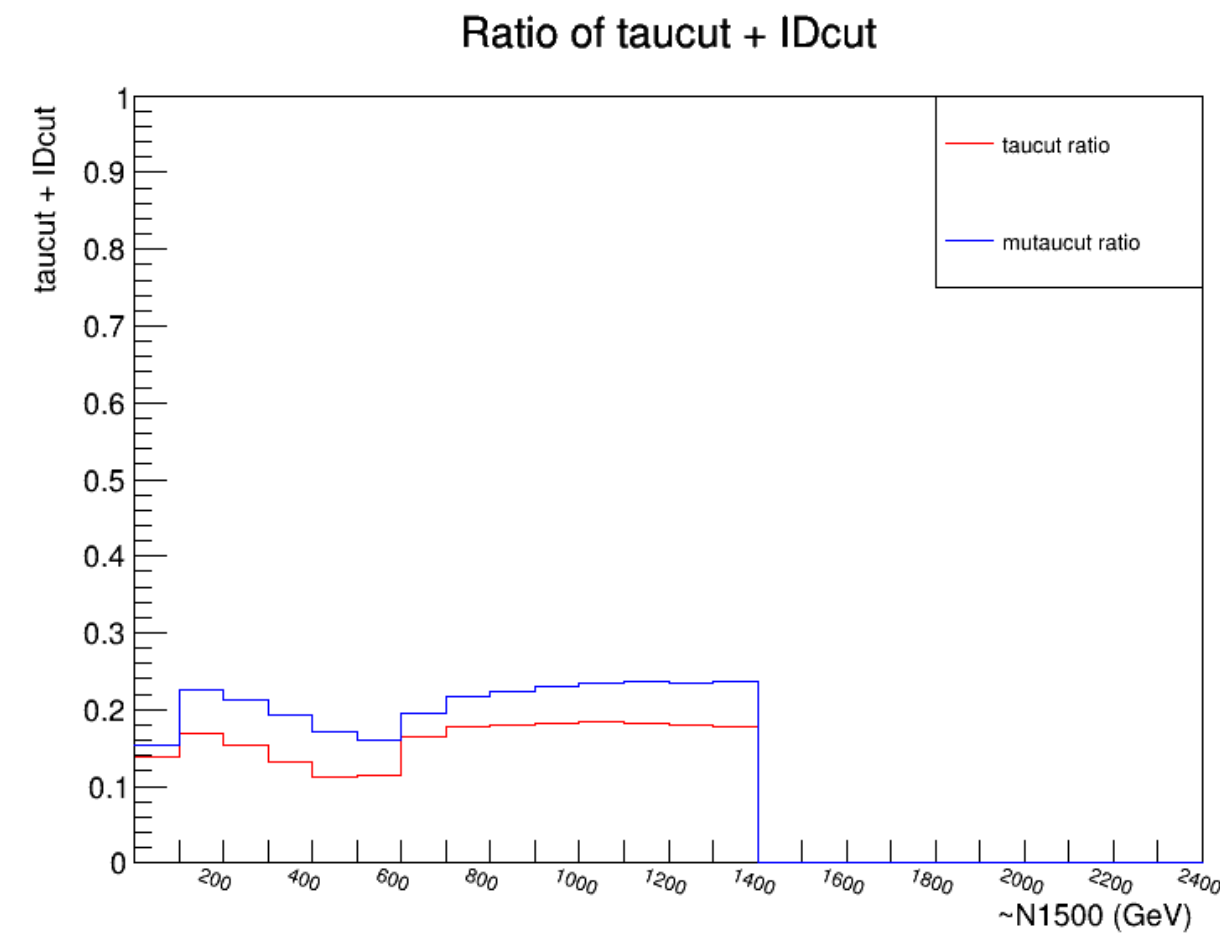
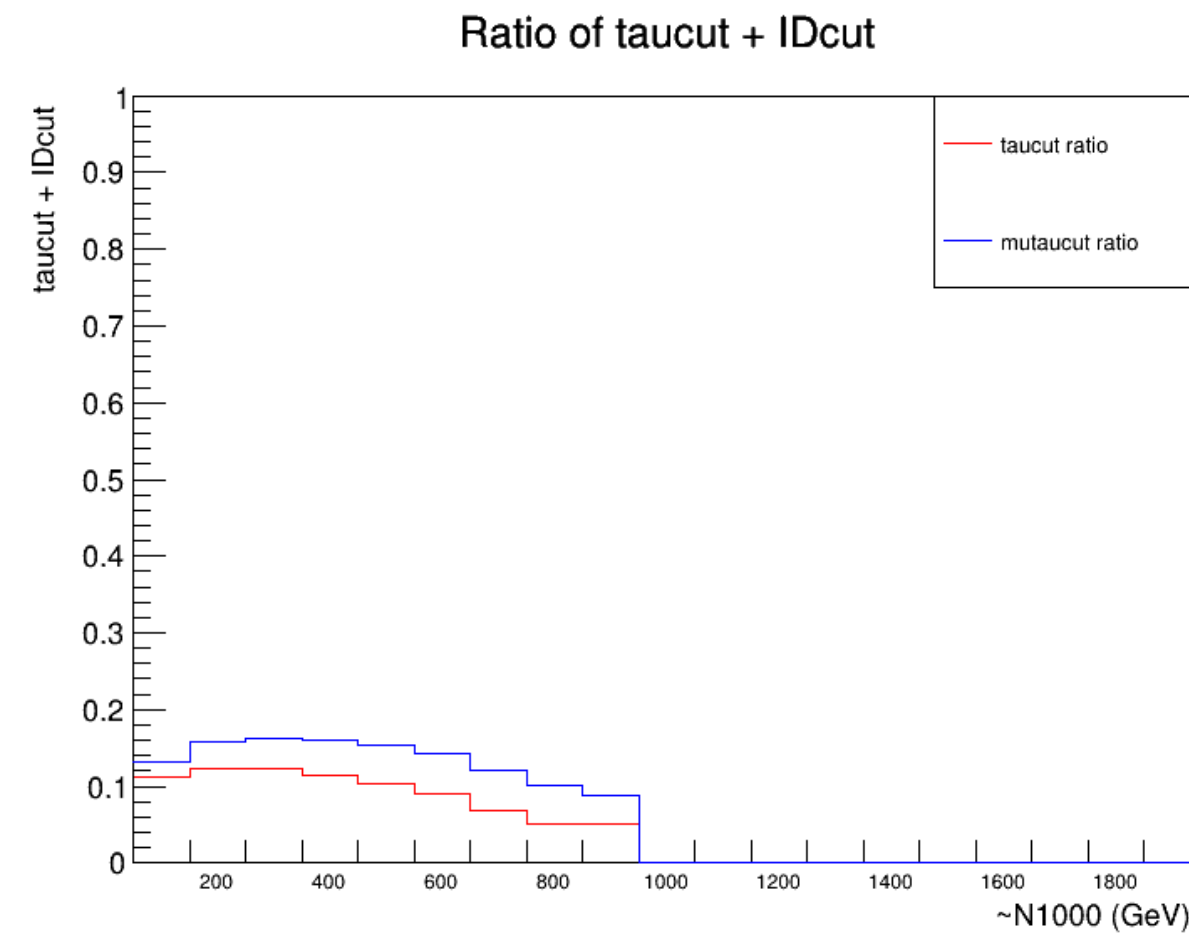


# Backup

$\tau$  ID cut &  $P_T$  cut

$\tau$  ID

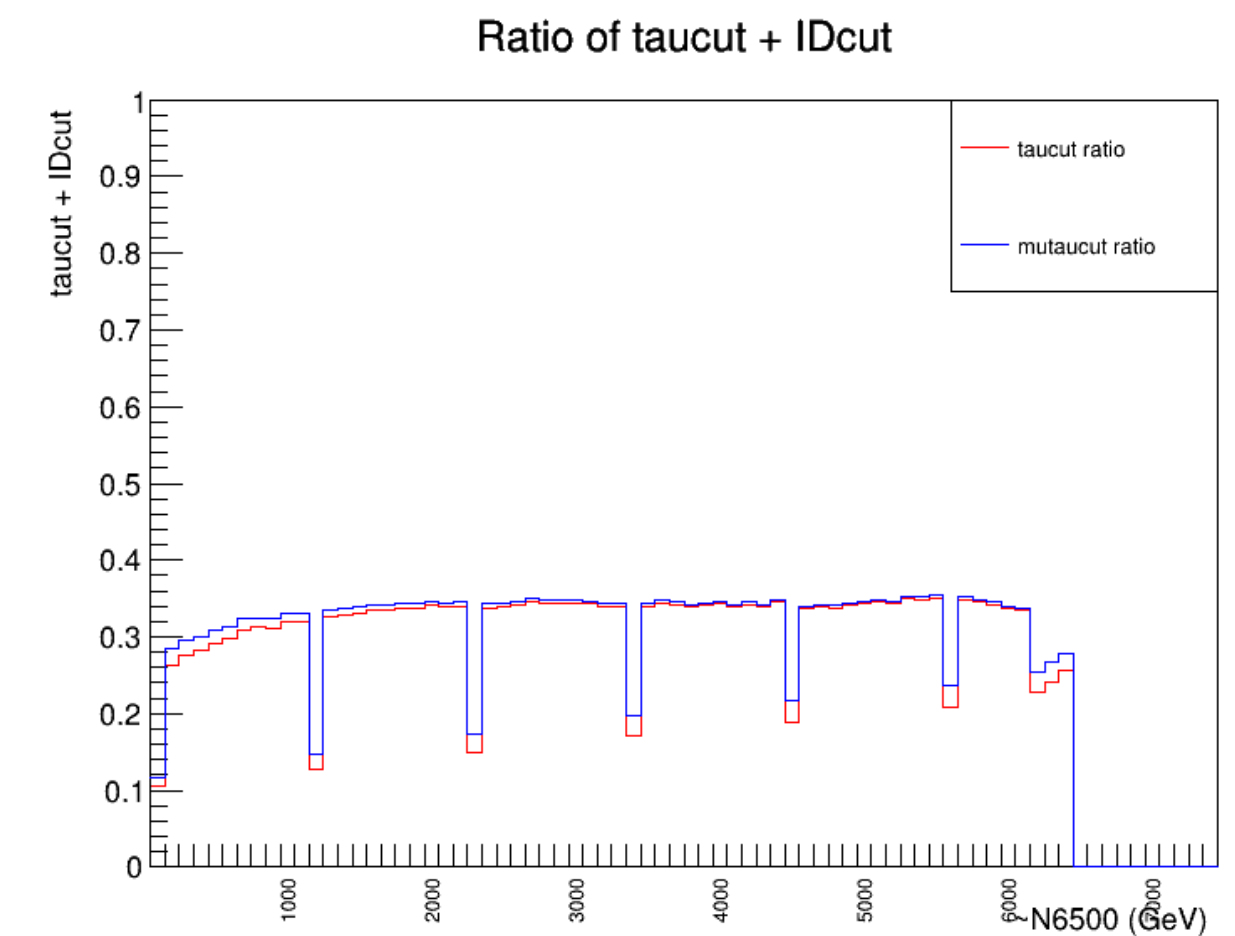
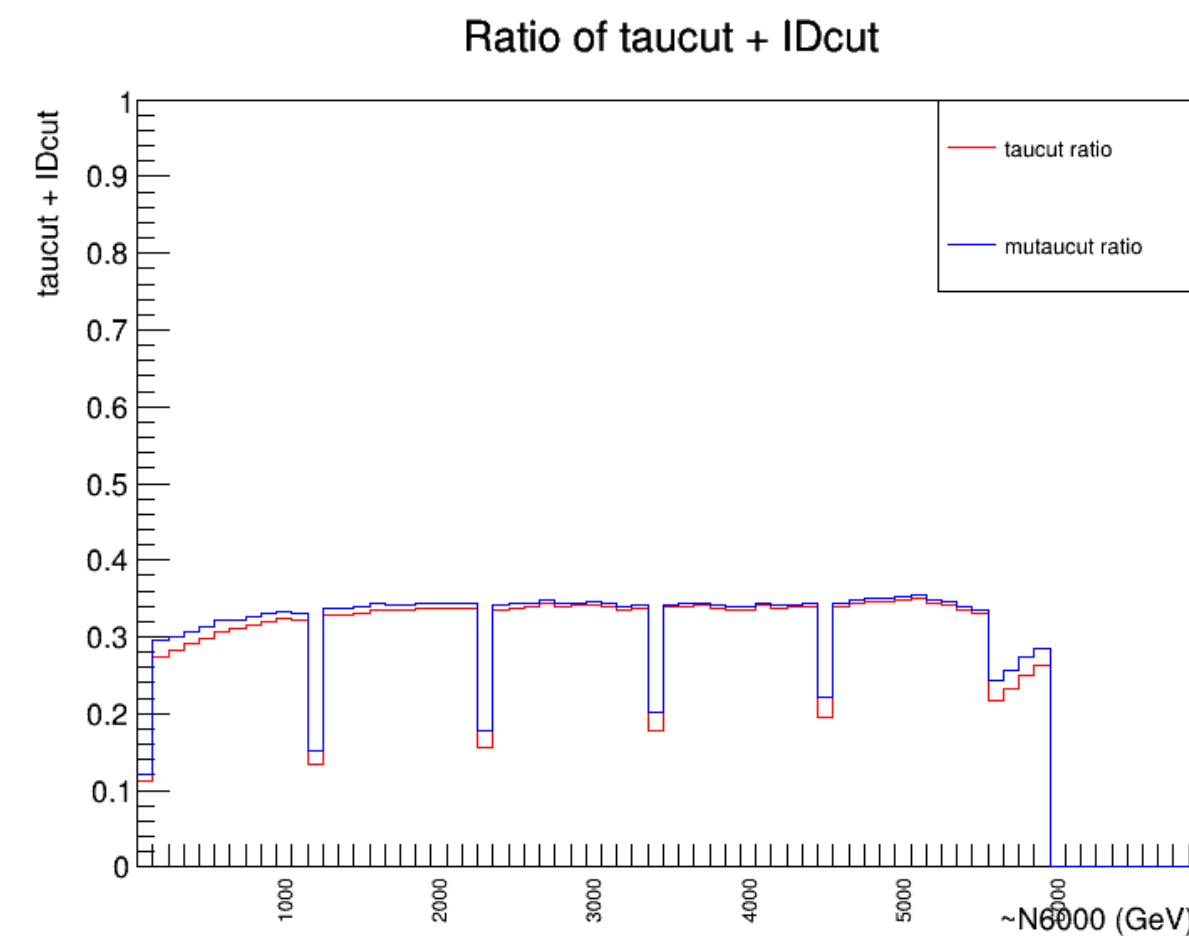
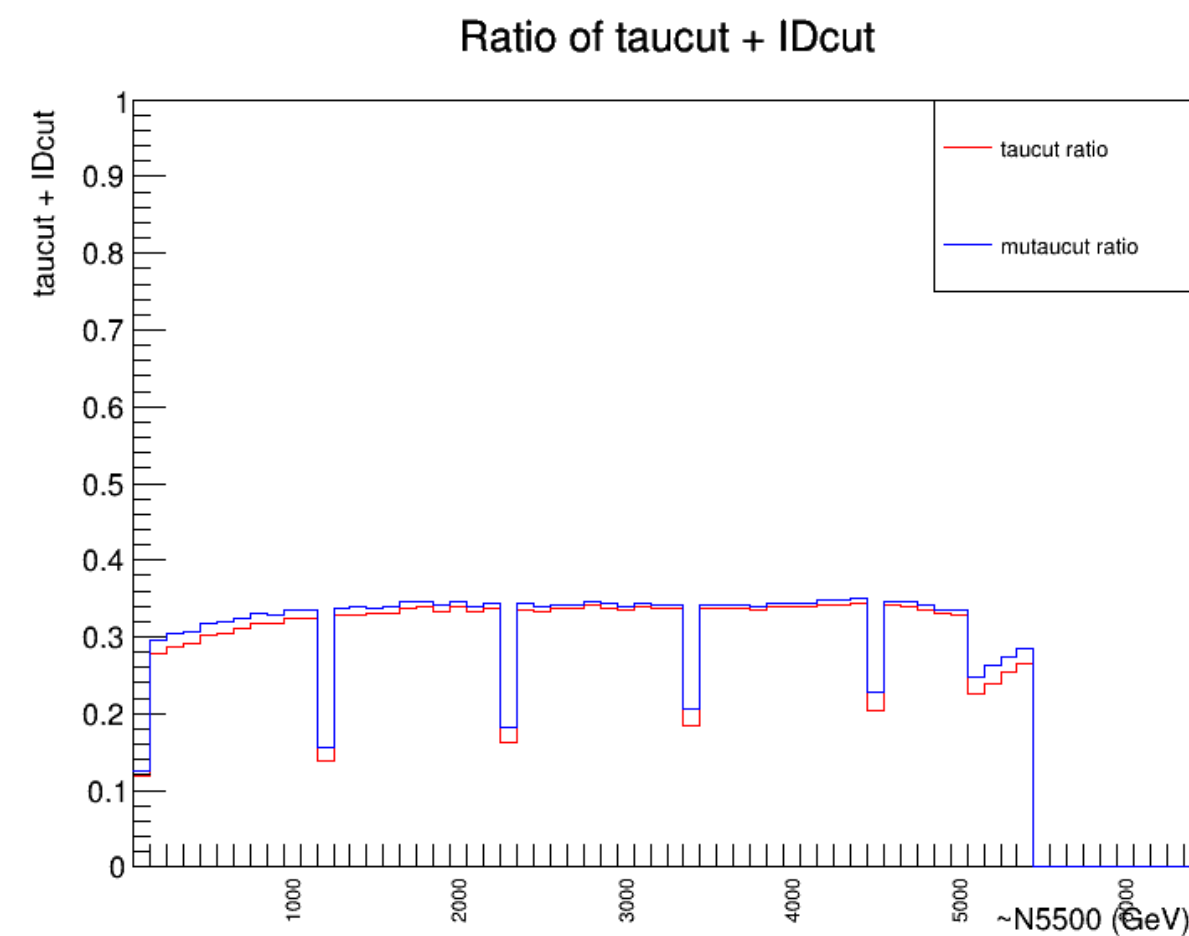
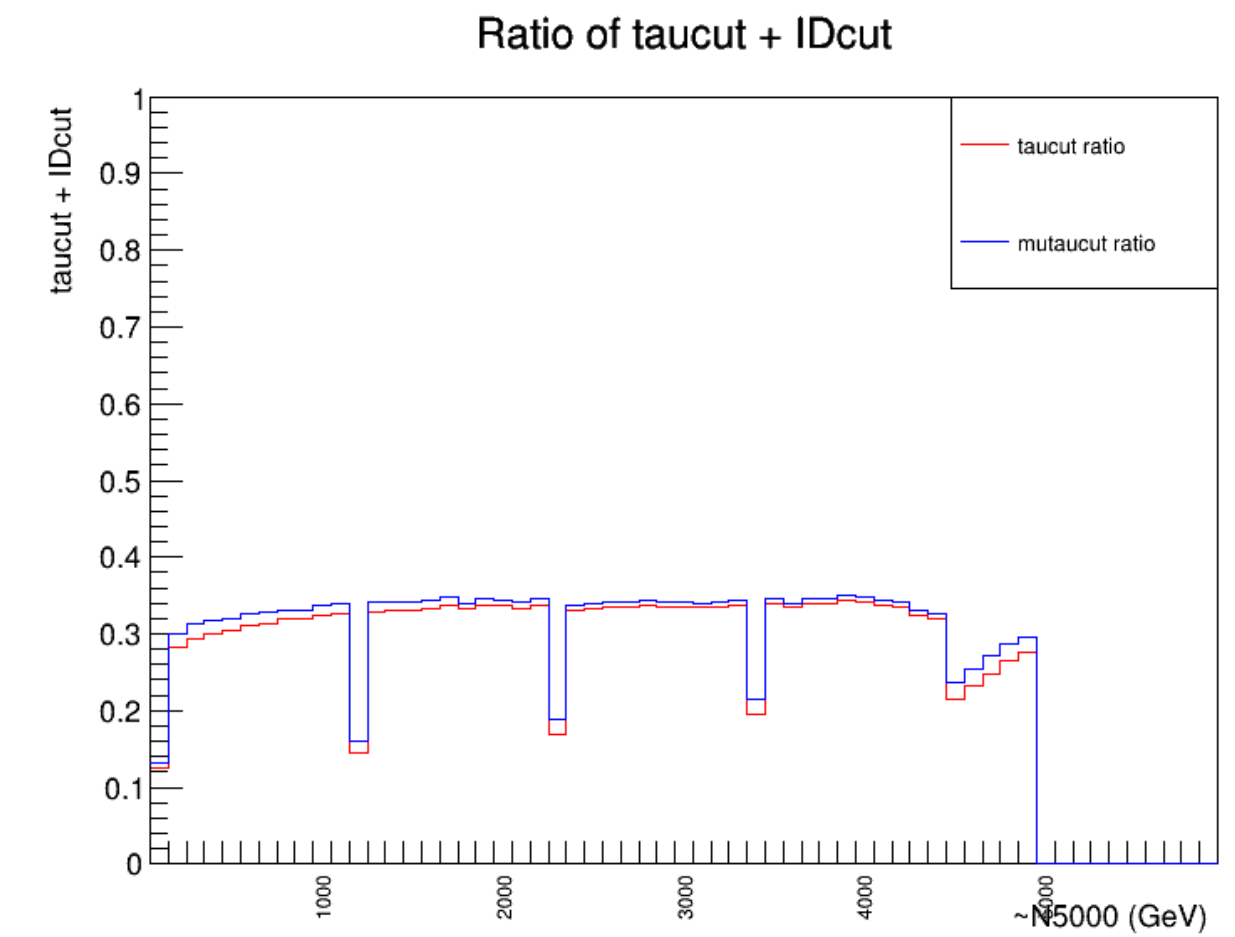
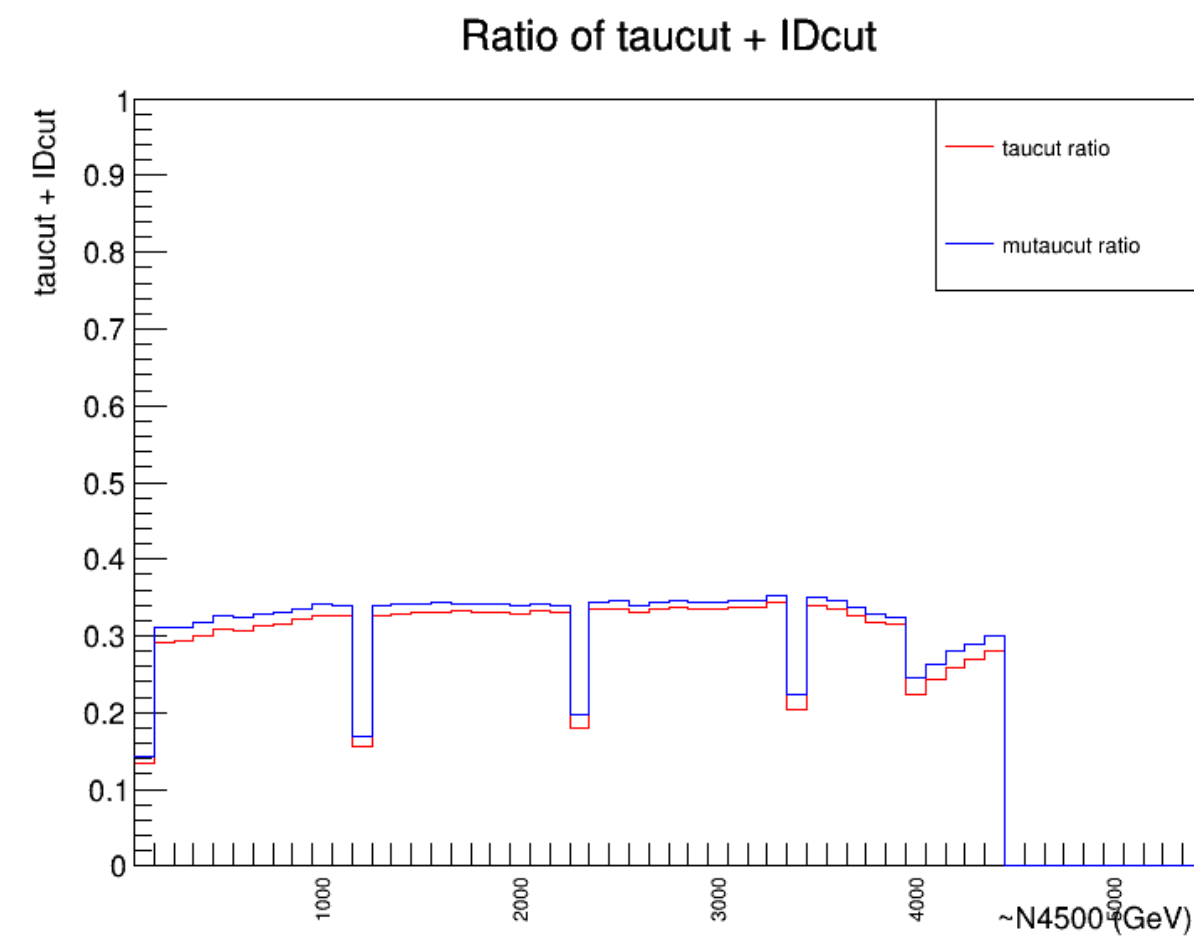
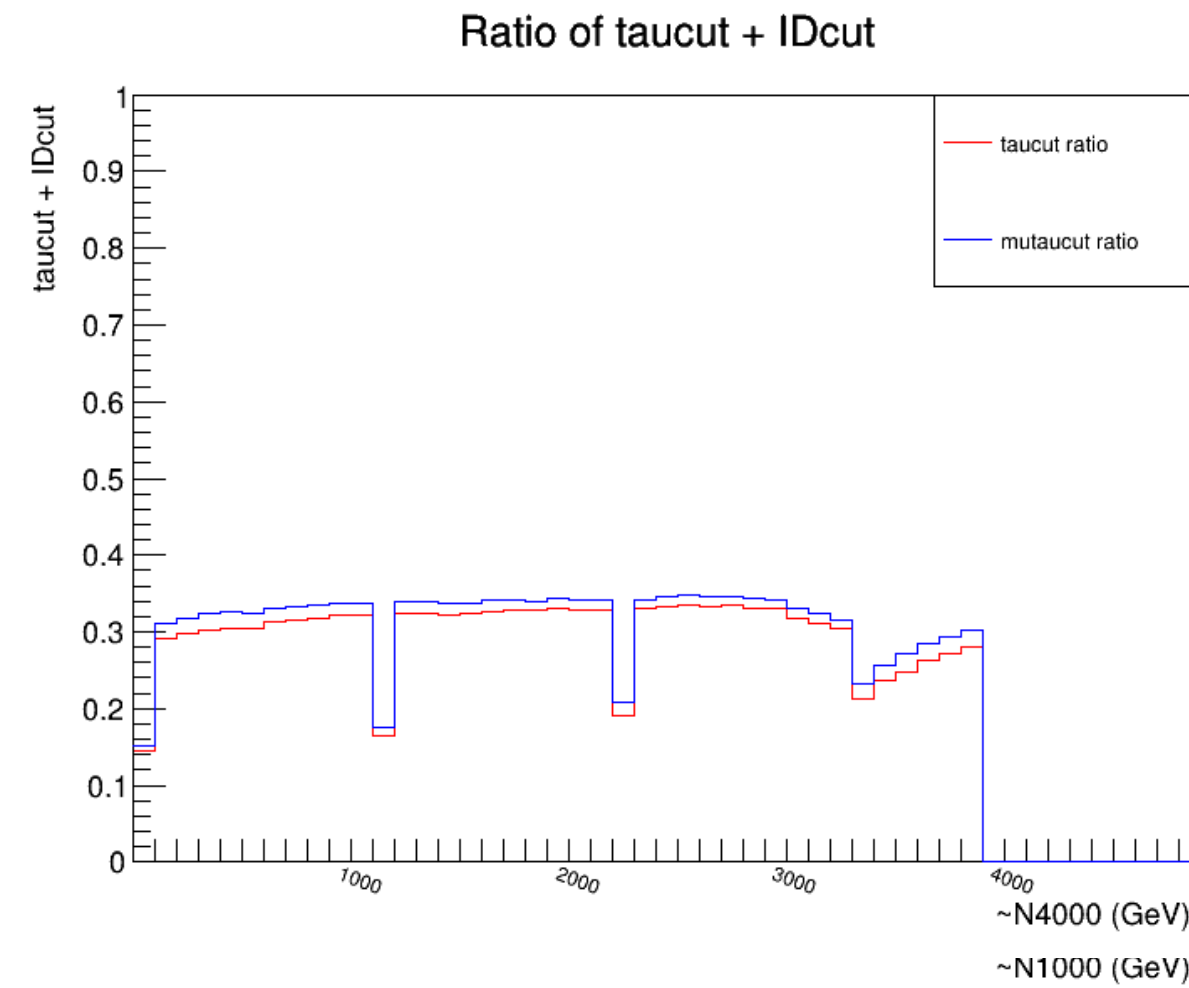
(  $\tau$ ID +  $\tau$  trigger + MET filter) / MET filter  
 ( $\tau$ ID +  $\tau$  trigger or  $\mu$ trigger + MET filter) / MET filter



- $W_R$  1000 ~ 3500

$\tau$  ID

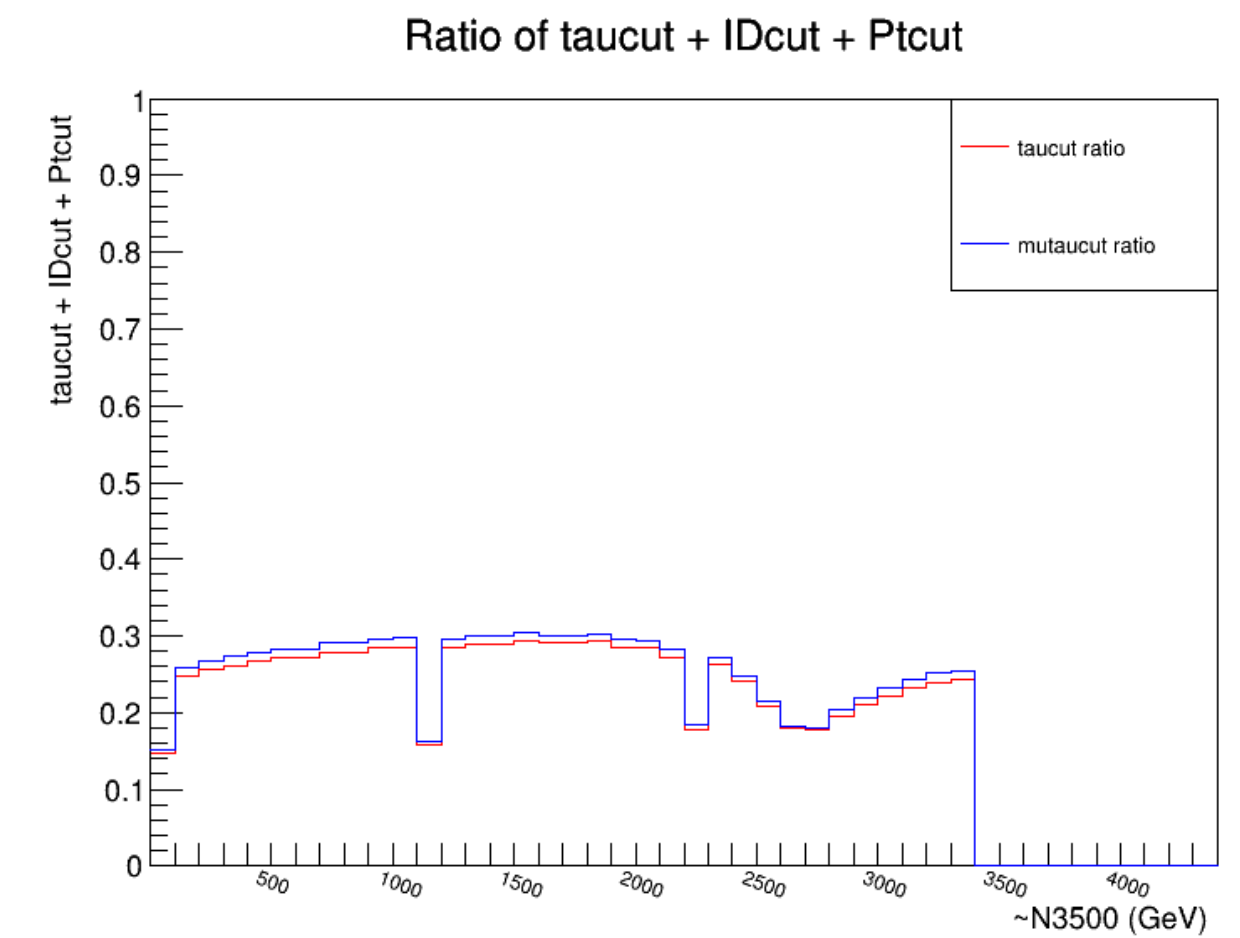
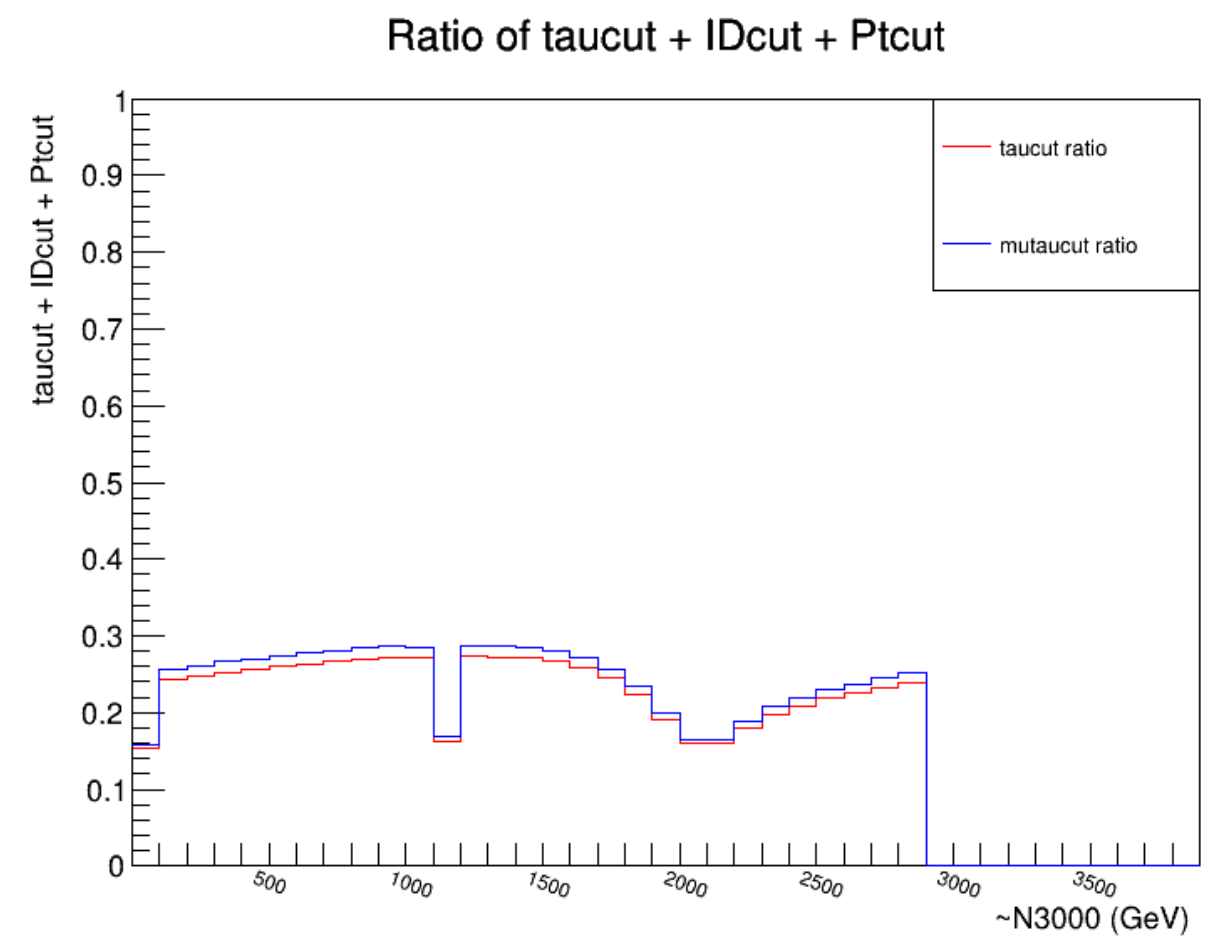
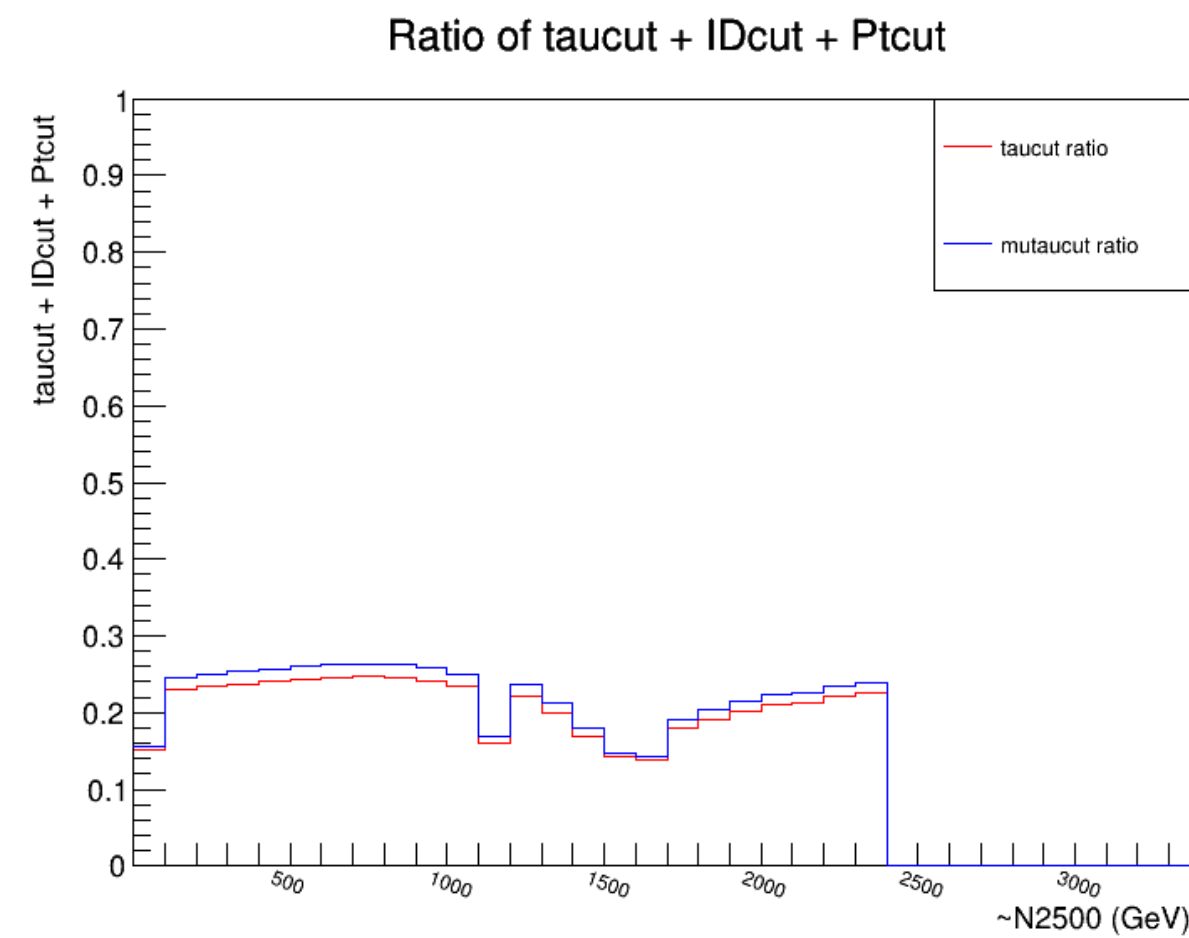
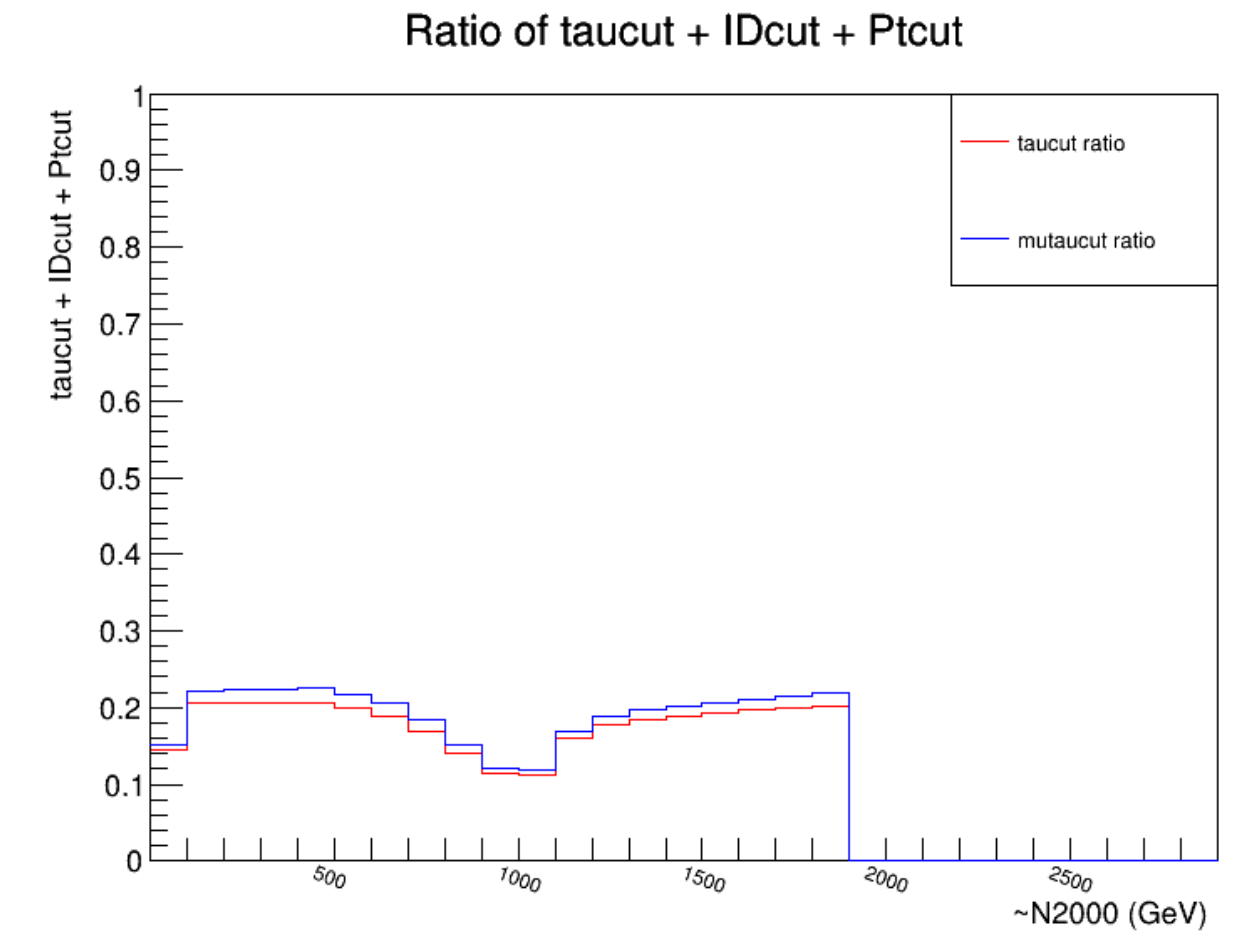
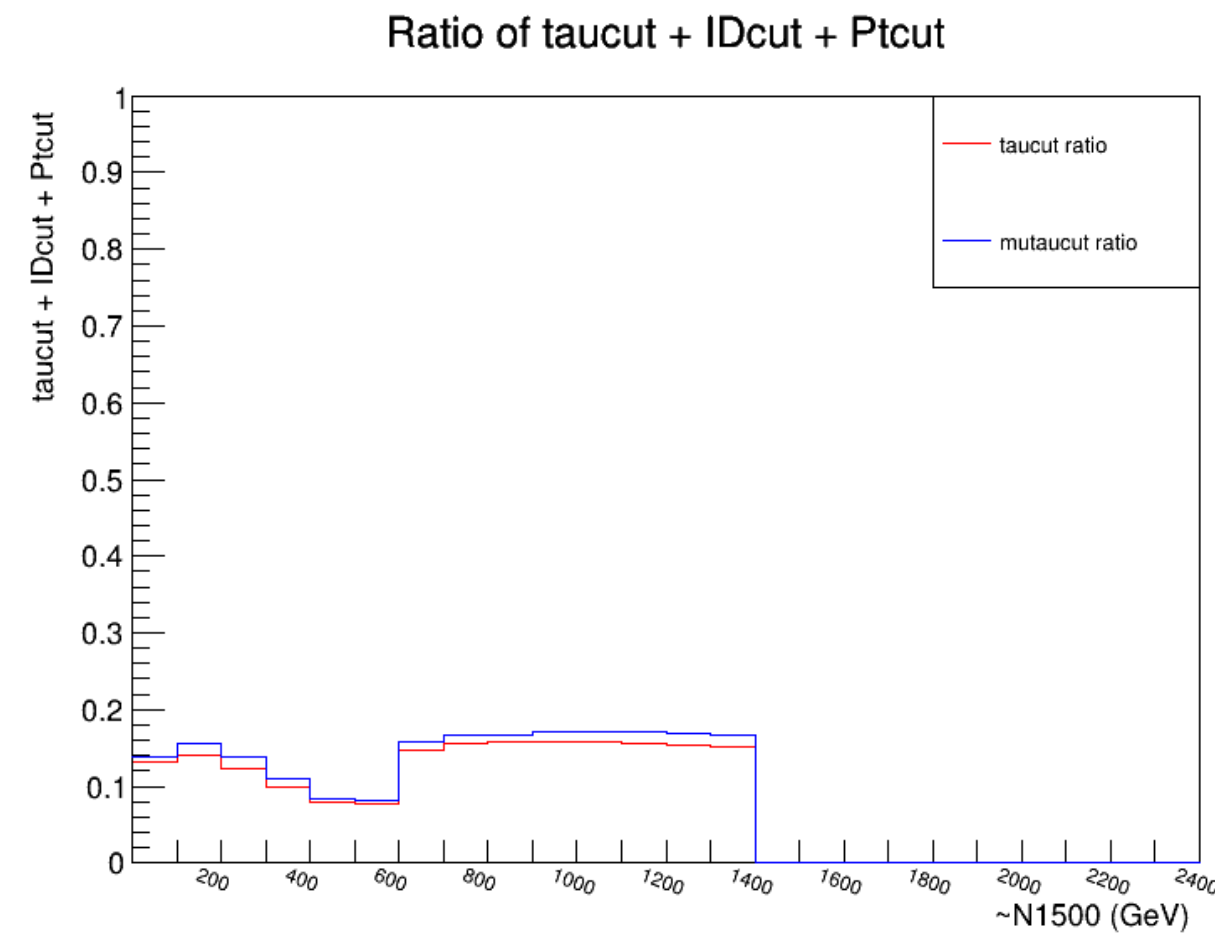
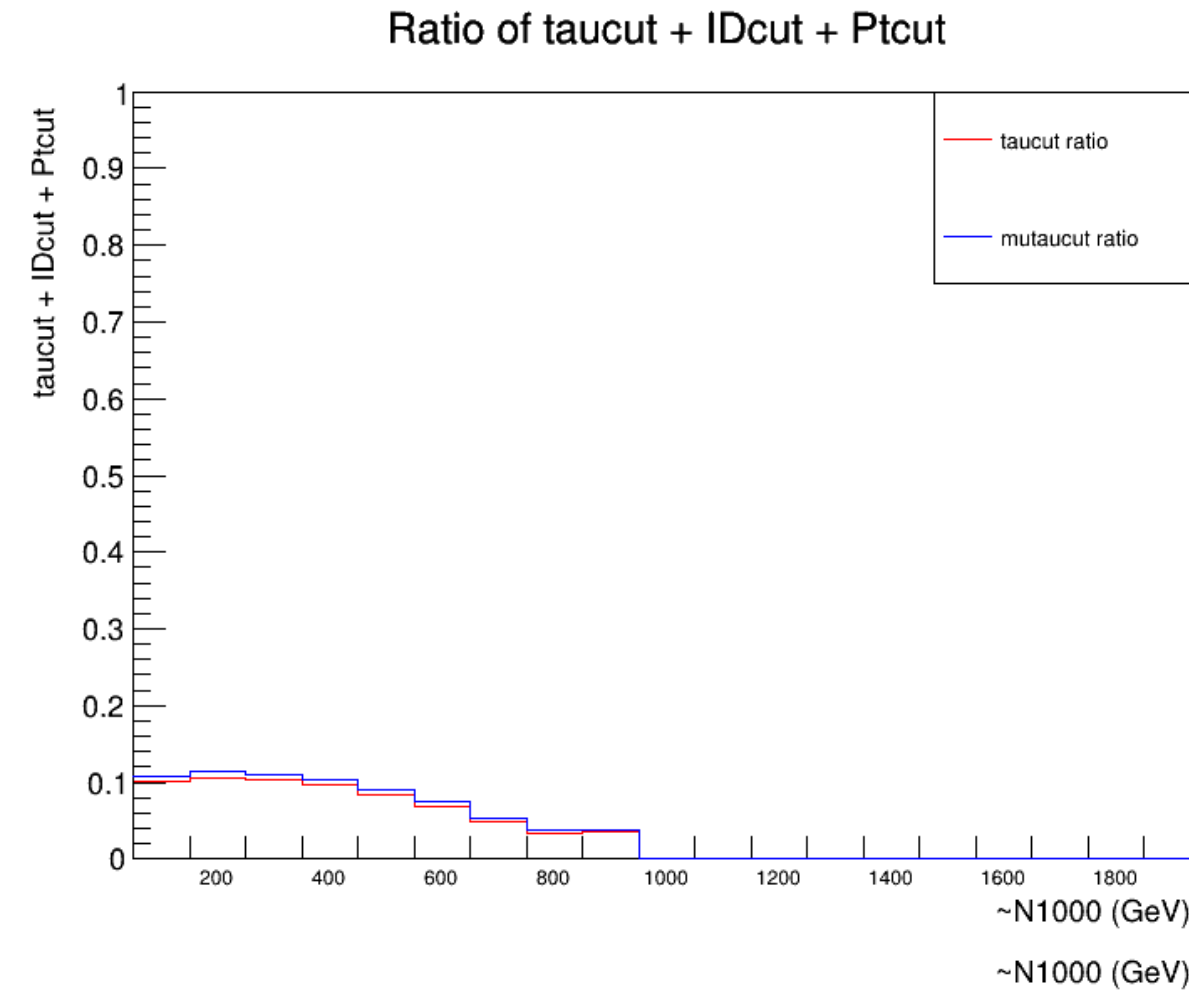
(  $\tau$ ID +  $\tau$  trigger + MET filter) / MET filter  
 ( $\tau$ ID +  $\tau$  trigger or  $\mu$ trigger + MET filter) / MET filter



- $W_R$  4000~6500

$P_T$ 

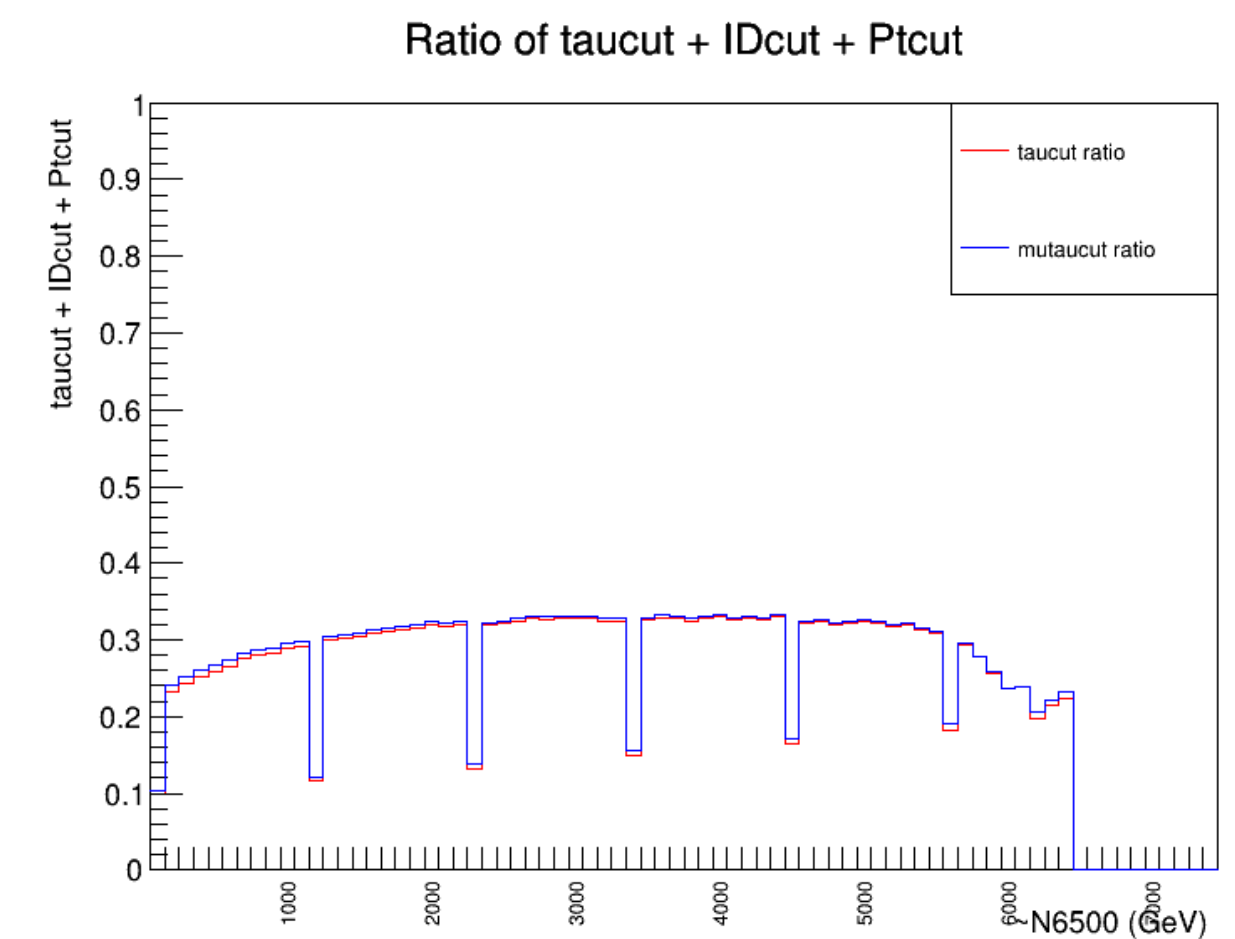
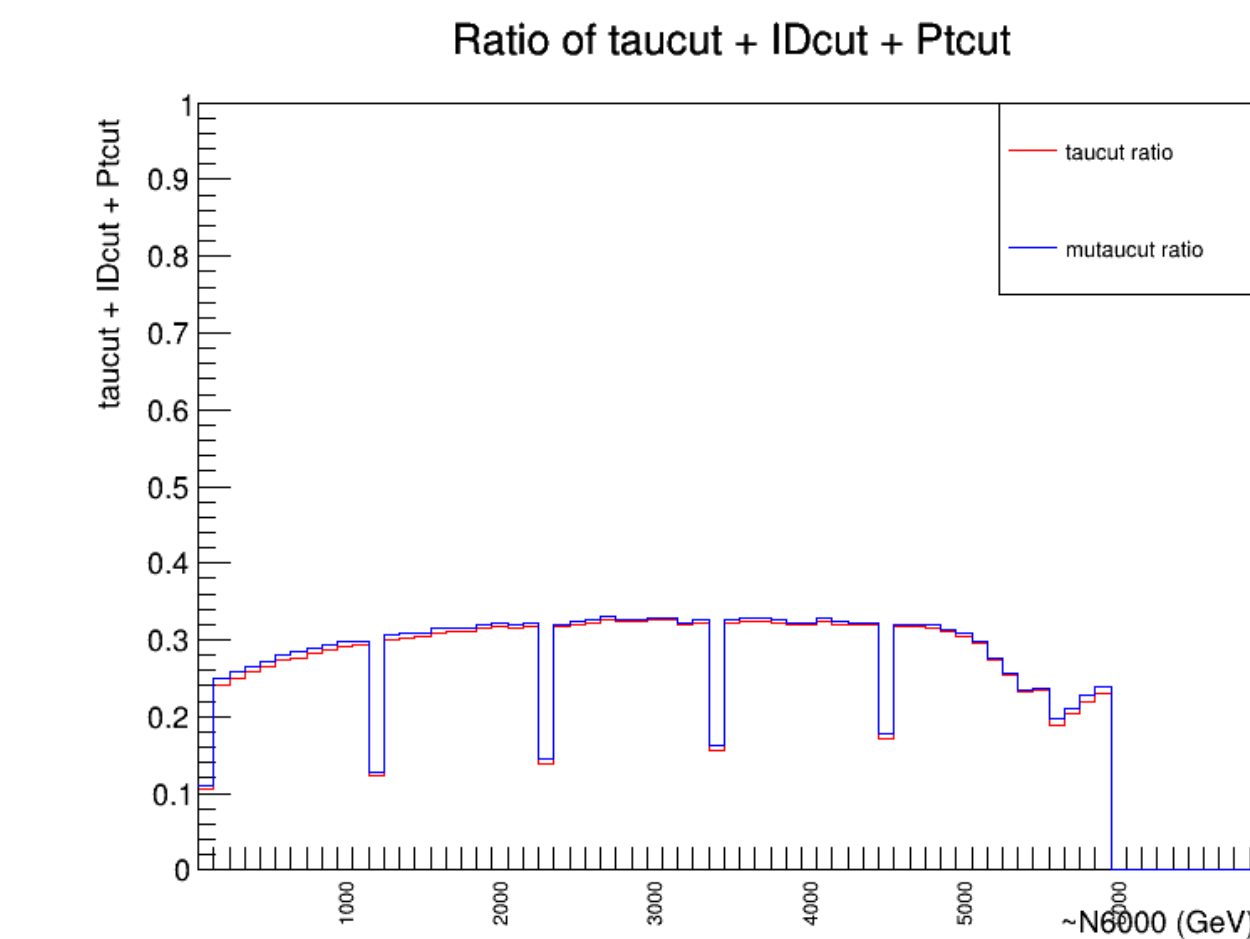
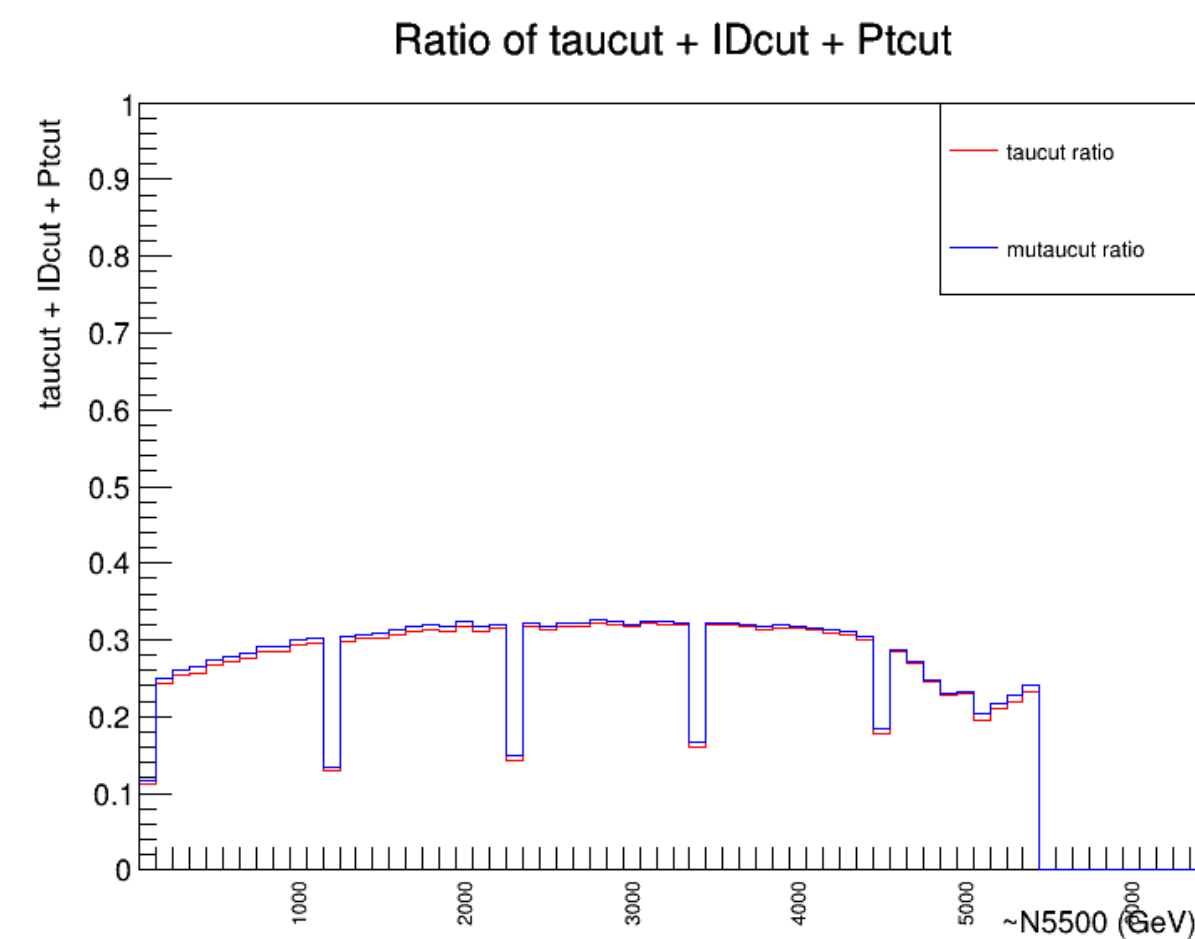
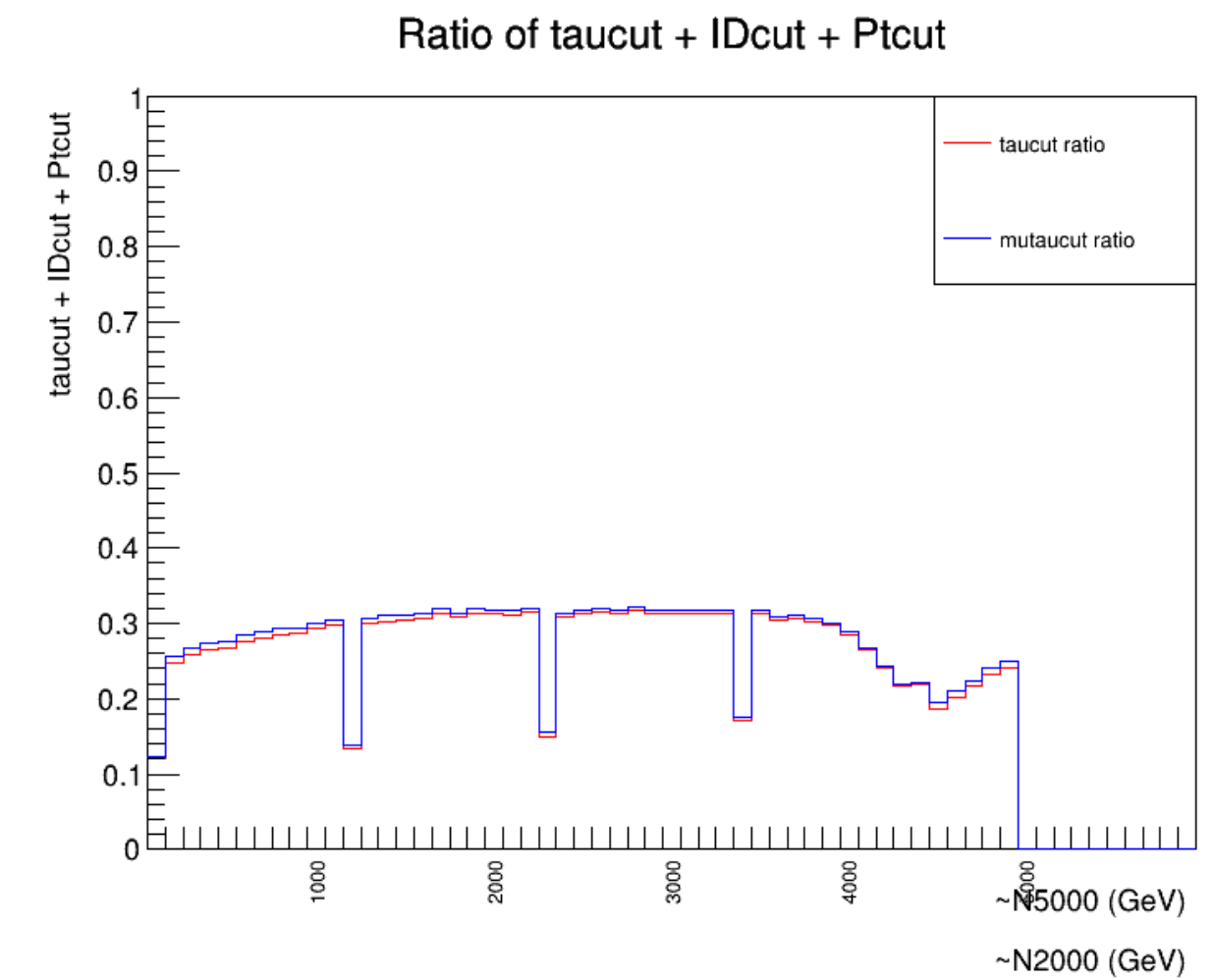
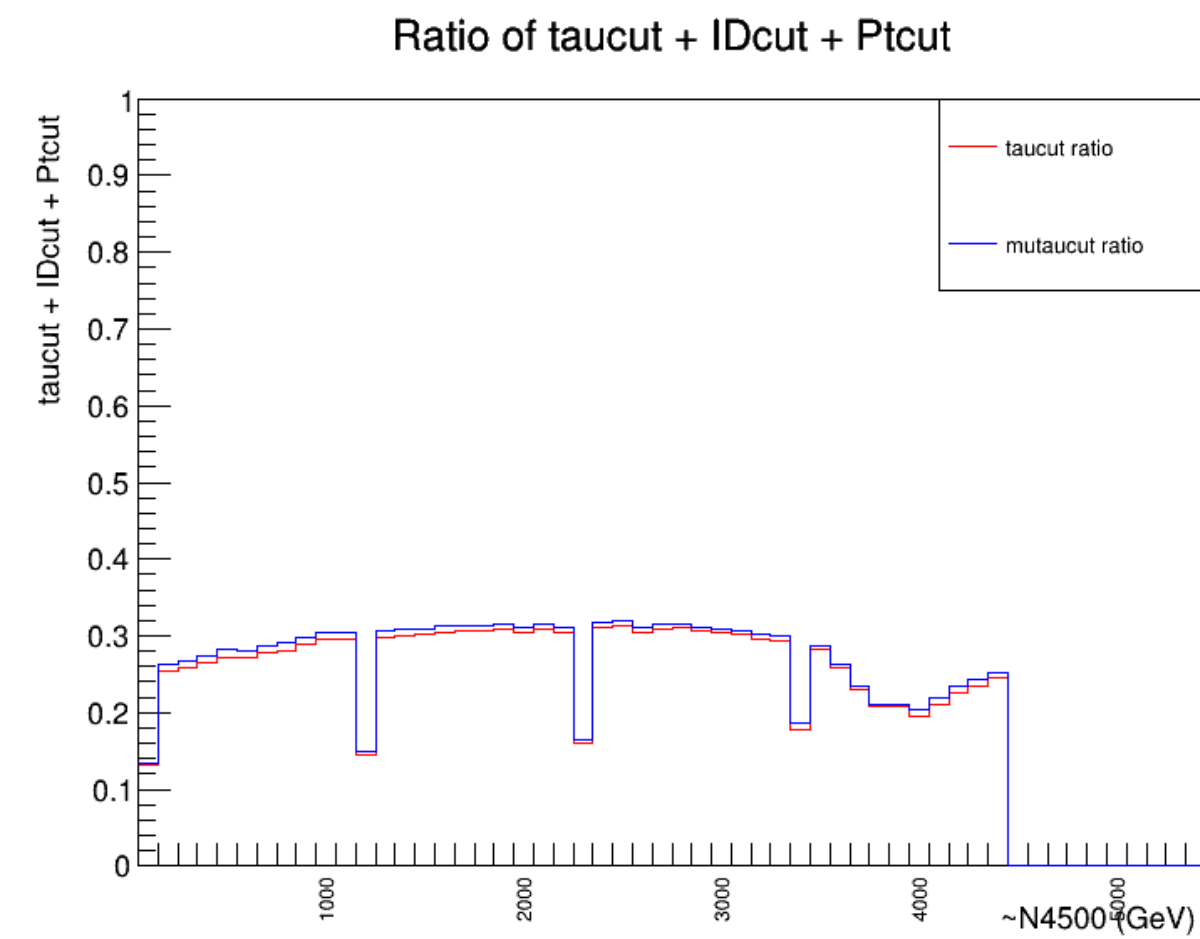
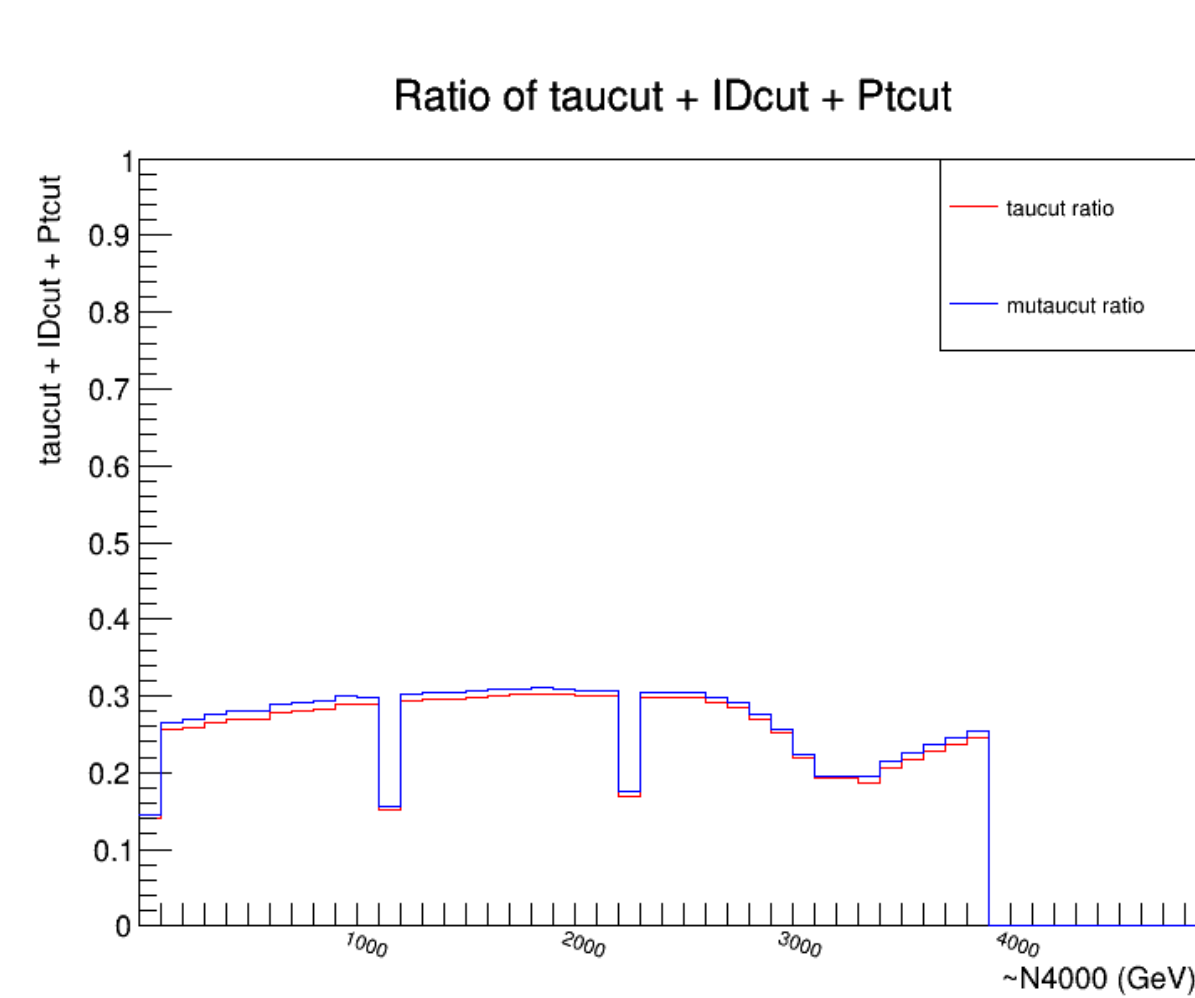
$$\begin{aligned} & (P_T + \tau \text{ID} + \tau \text{ trigger} + \text{MET filter}) / \text{MET filter} \\ & (P_T + \tau \text{ID} + \tau \text{ trigger or } \mu \text{ trigger} + \text{MET filter}) / \text{MET filter} \end{aligned}$$



- $W_R$  1000 ~ 3500

$P_T$

$(P_T + \tau\text{ID} + \tau\text{ trigger} + \text{MET filter}) / \text{MET filter}$   
 $(P_T + \tau\text{ID} + \tau\text{ trigger or } \mu\text{trigger} + \text{MET filter}) / \text{MET filter}$



- $W_R$  4000~6500