

### **On-line (pre-)selection Requisites for:**

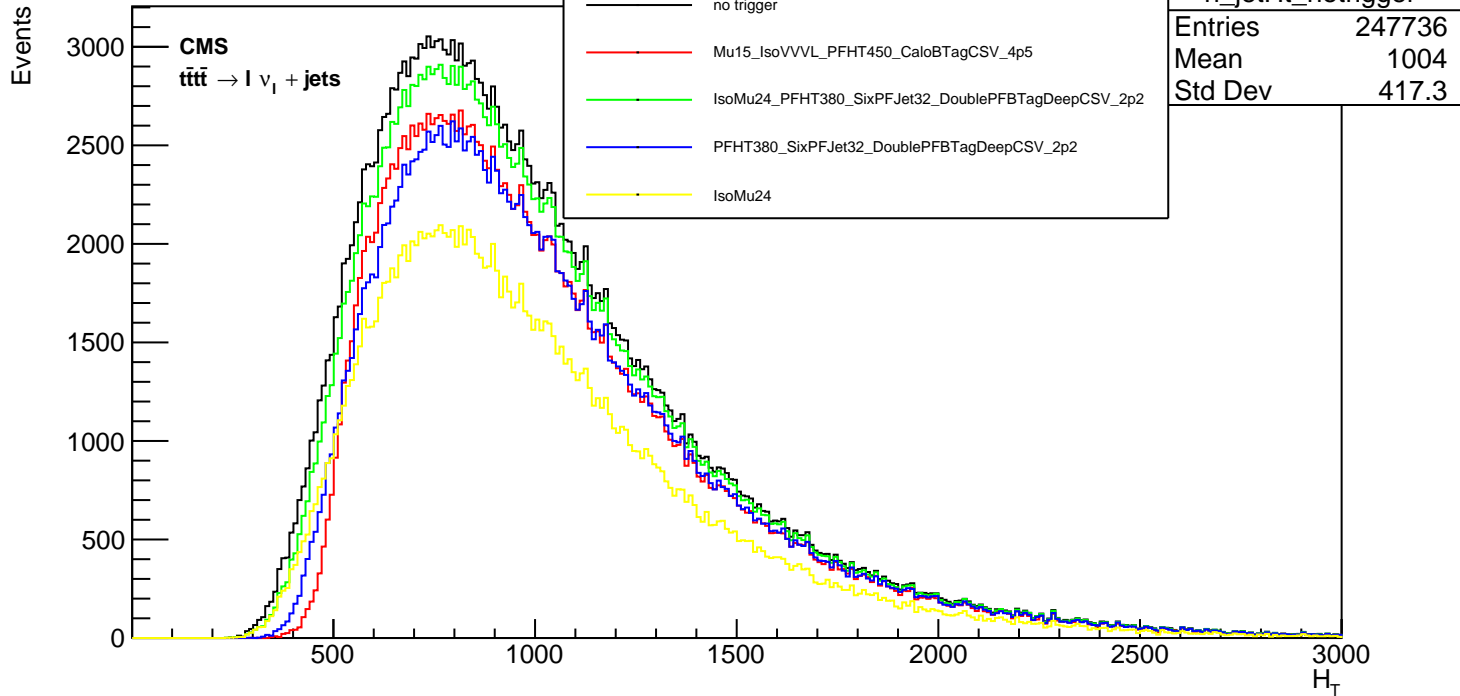
- **Jets:** number  $> 5$  ,  $\text{jetId} > 2$  and  $|\eta| < 2.4$
- **Muons:** number  $> 0$  and has  $\text{softId}$

**Event Limit:** None (see last page)

### **Off-line (post-)selection Requisites for:**

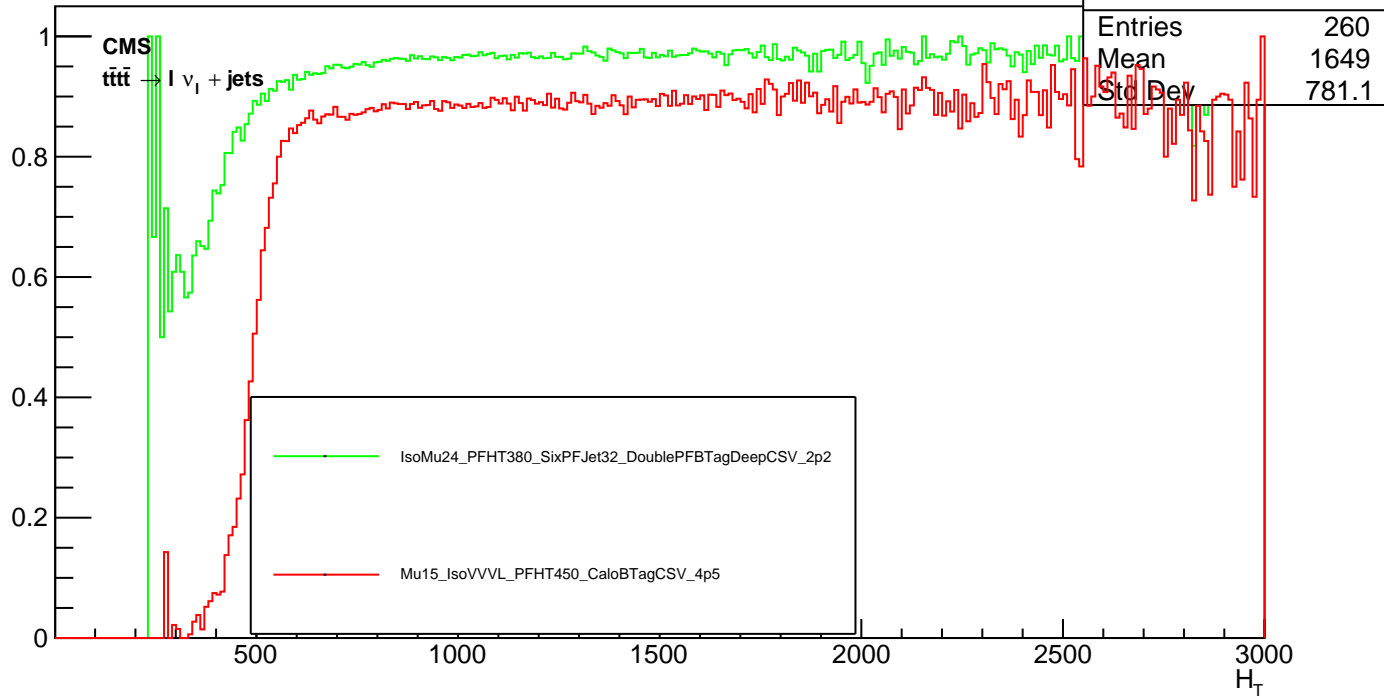
- **Jets:**  $\text{jetId} > 2$  ,  $p_T > 30$  and  $|\eta| < 2.4$  (for at least 6)  
 $\text{btagDeepFlavB} > 0.7489$  (for at least one jet)
- **Muons:** has  $\text{tightId}$ ,  $|\eta| < 2.4$  and  $\text{miniPFRellso\_all} < 0.15$  (for at least 1)

# no trigger



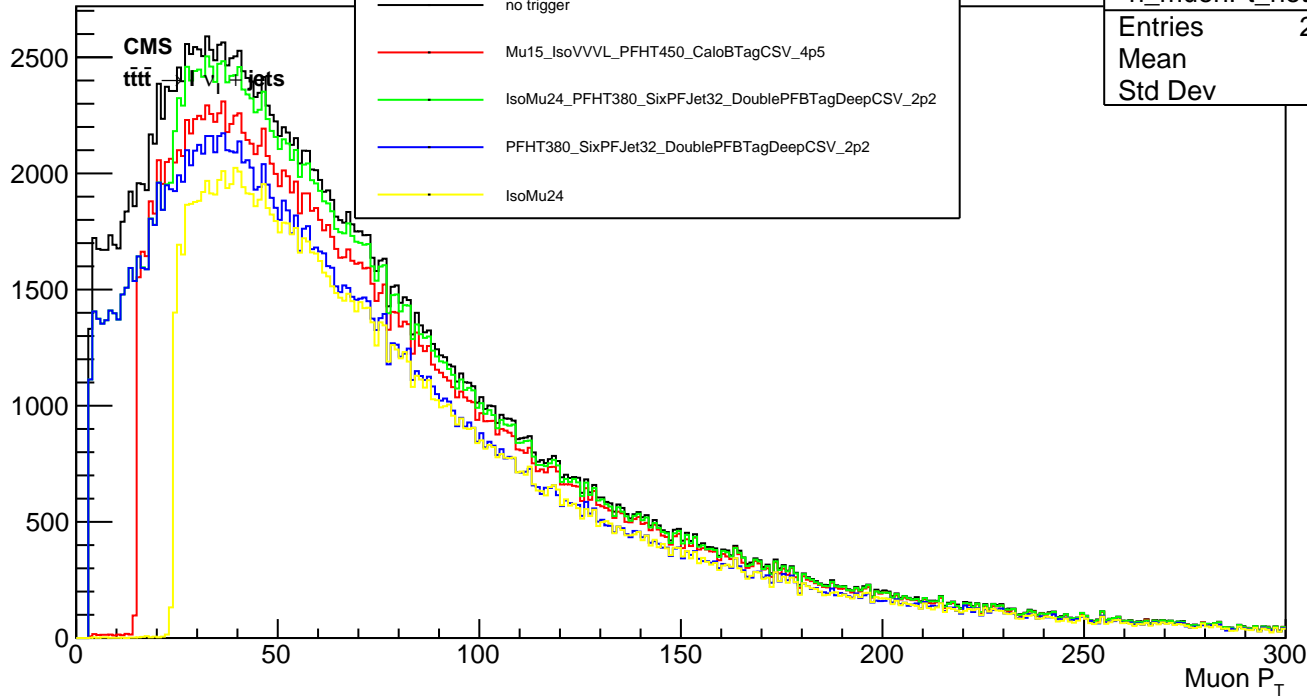
# IsoMu24\_PFH380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Events



# no trigger

Events

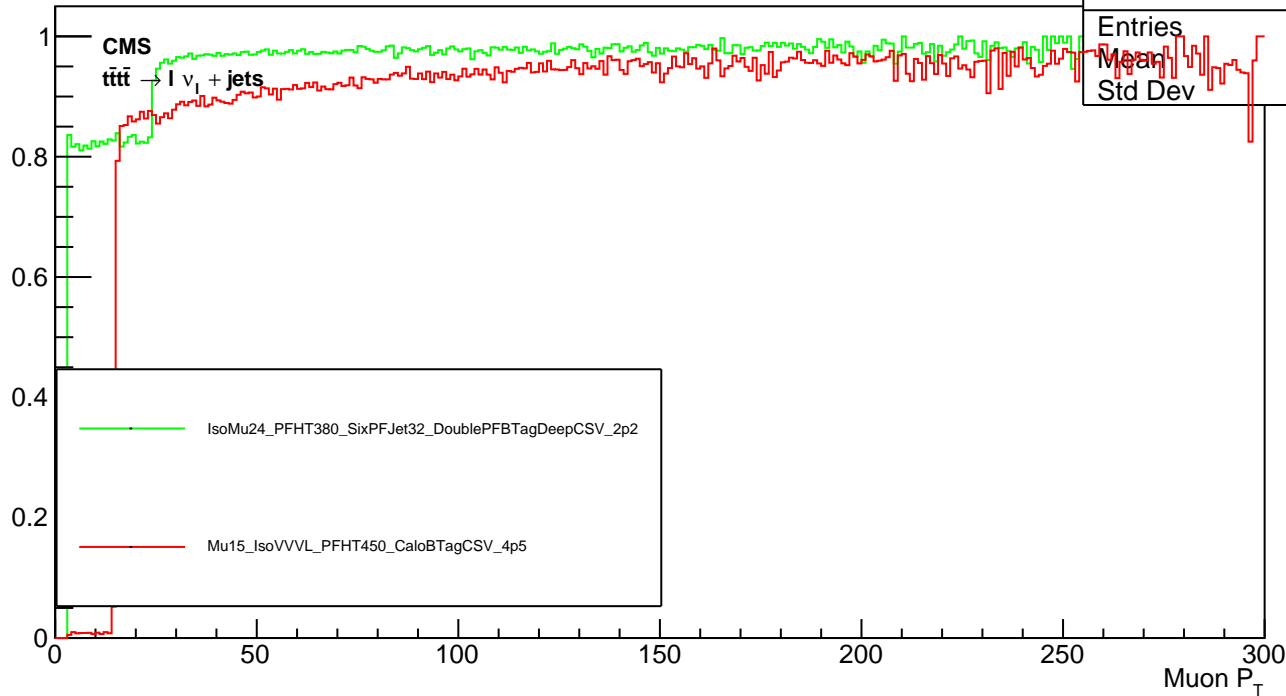


h\_muonPt\_notrigger

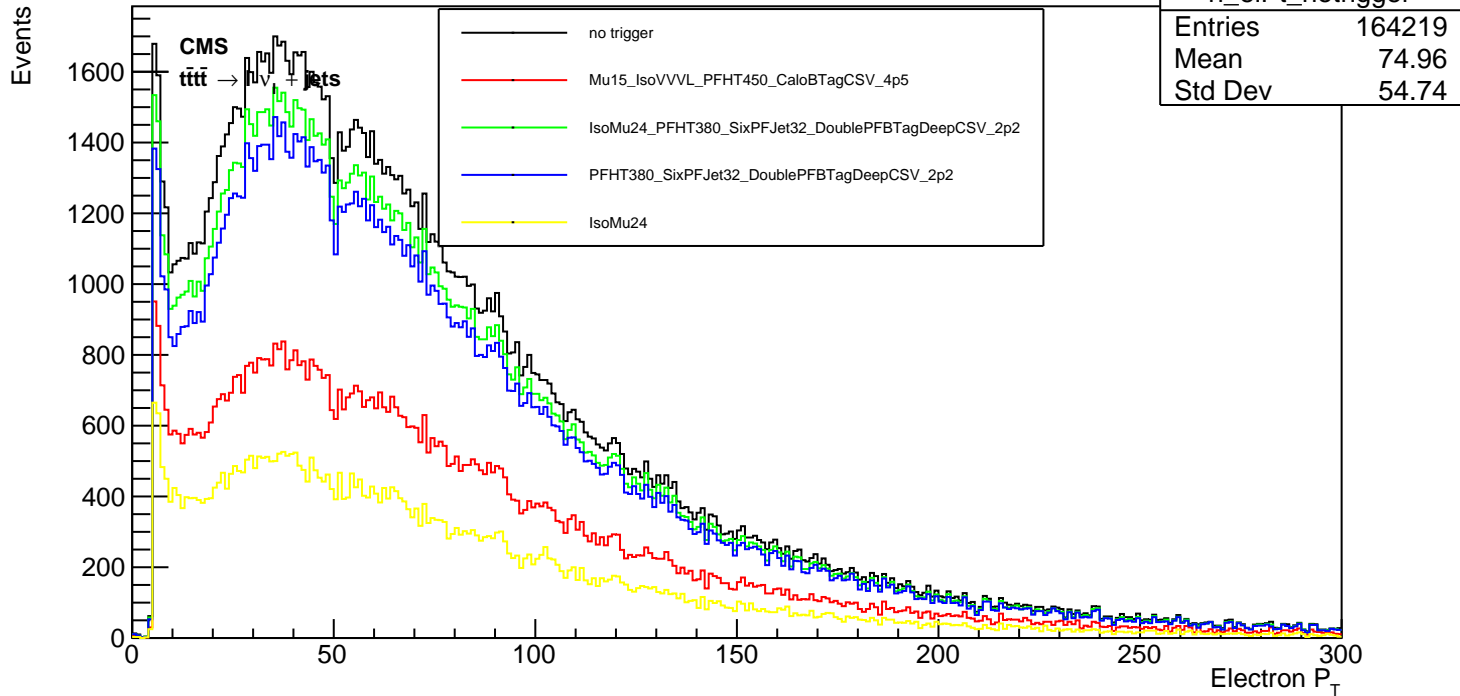
Entries	247736
Mean	73.34
Std Dev	55.88

# IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Events

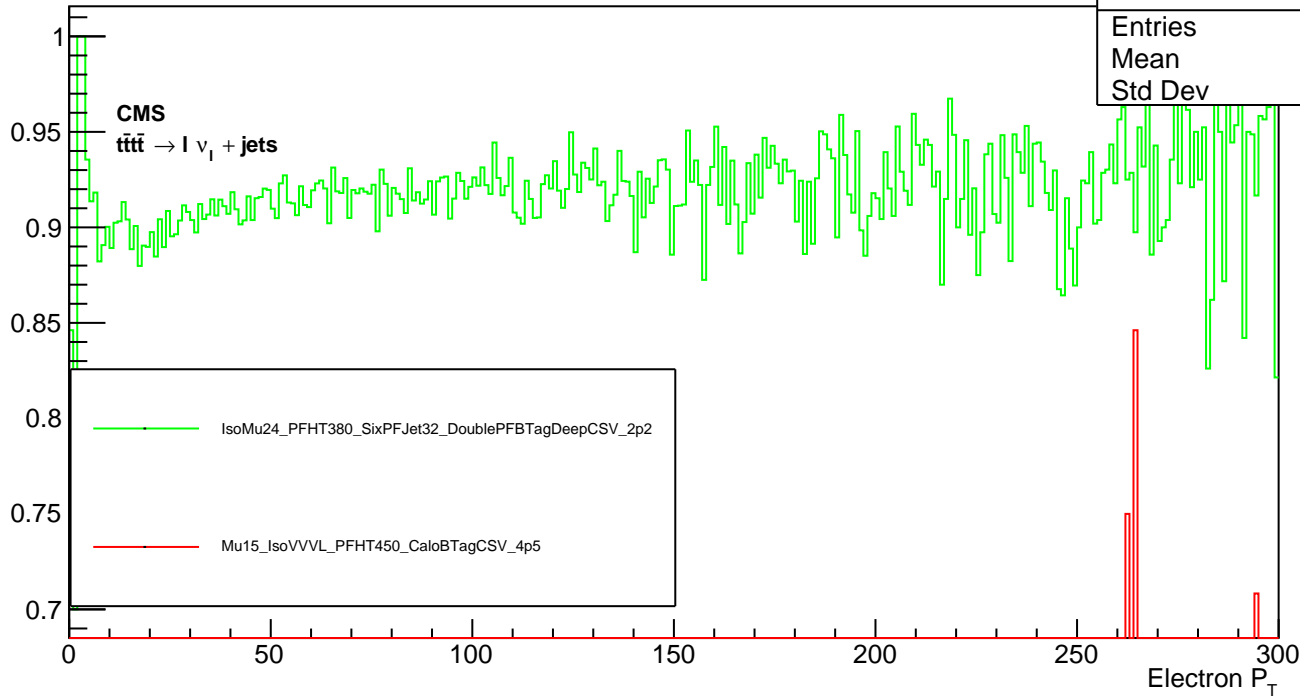


# no trigger



# IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

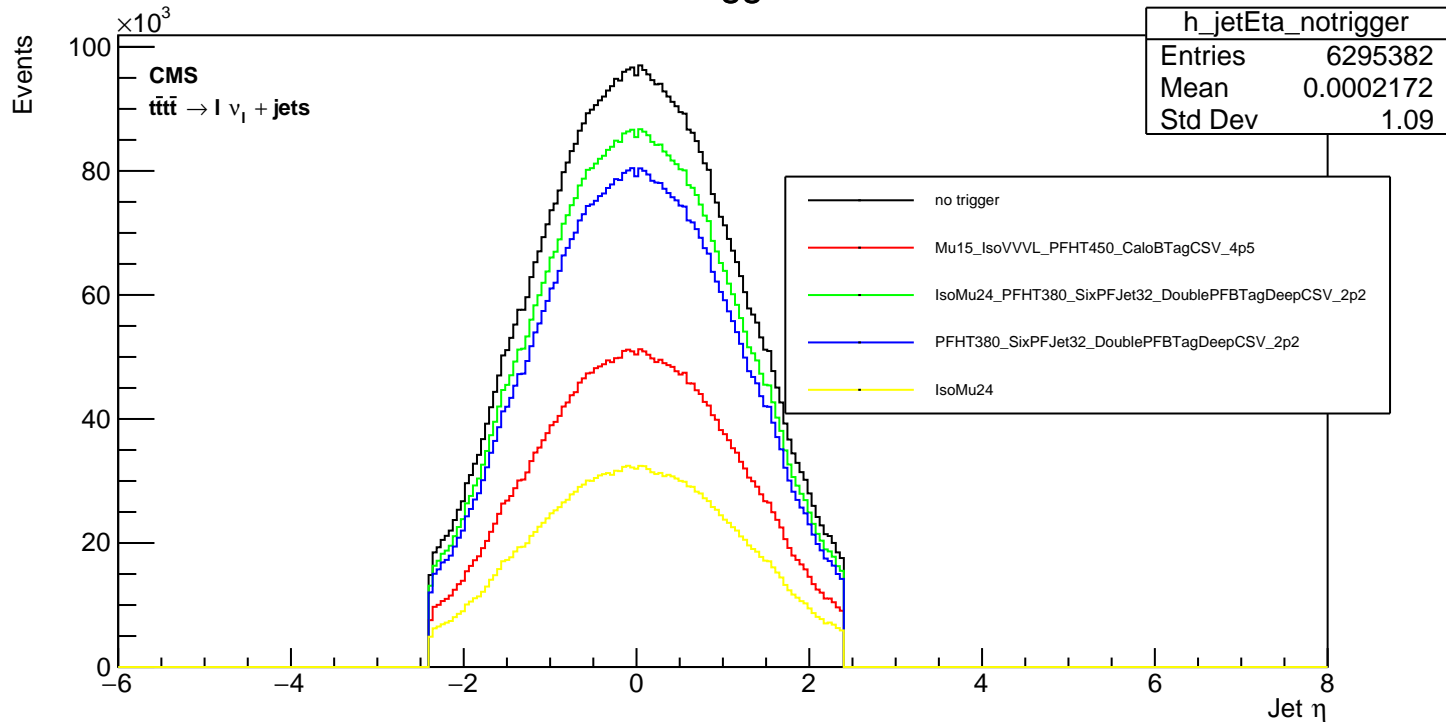
Events



h\_elPTratioIsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Entries	276
Mean	150.7
Std Dev	86.48

## no trigger





# no trigger

Events

CMS

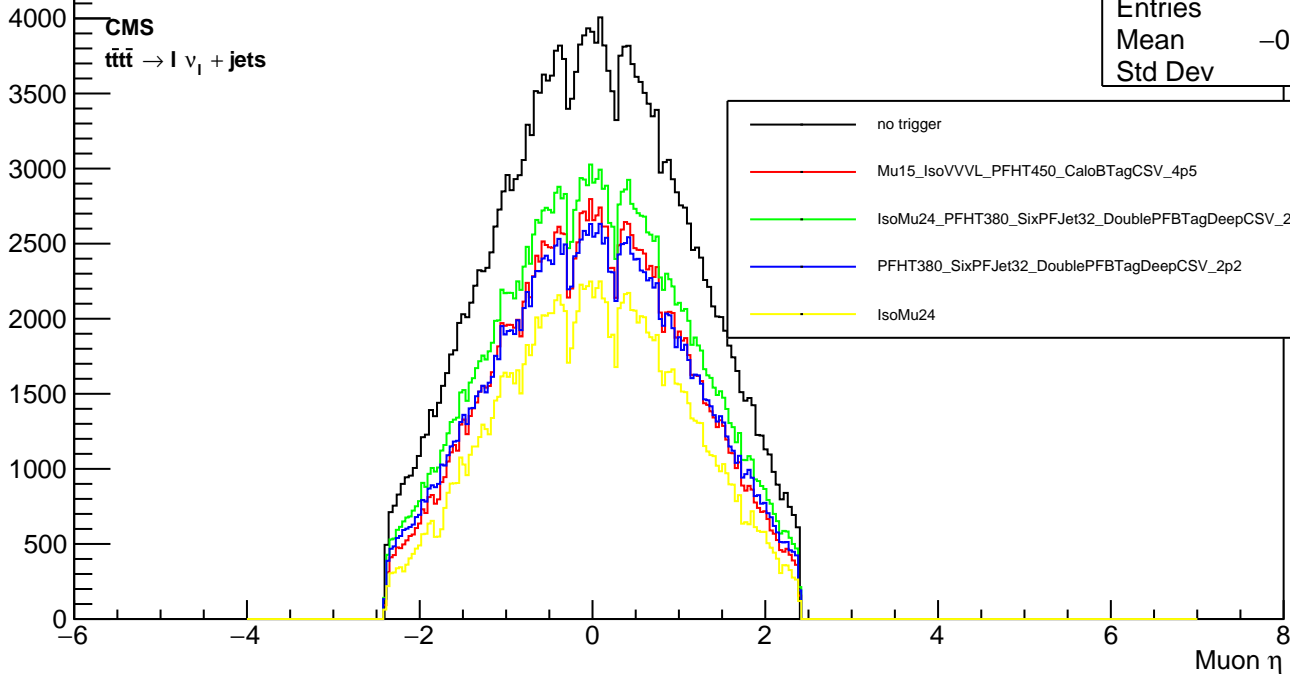
$t\bar{t}\bar{t} \rightarrow l \nu_l + \text{jets}$

h\_muonEta\_notrigger

Entries 247736

Mean -0.000262

Std Dev 1.089



## no trigger

Events

CMS

 $t\bar{t}t\bar{t} \rightarrow l \nu_l + \text{jets}$ 

2500

2000

1500

1000

500

0

-6

-4

-2

0

2

4

6

8

Electron  $\eta$ 

h\_elEta\_notrigger

Entries 164219

Mean 0.006327

Std Dev 1.145

no trigger

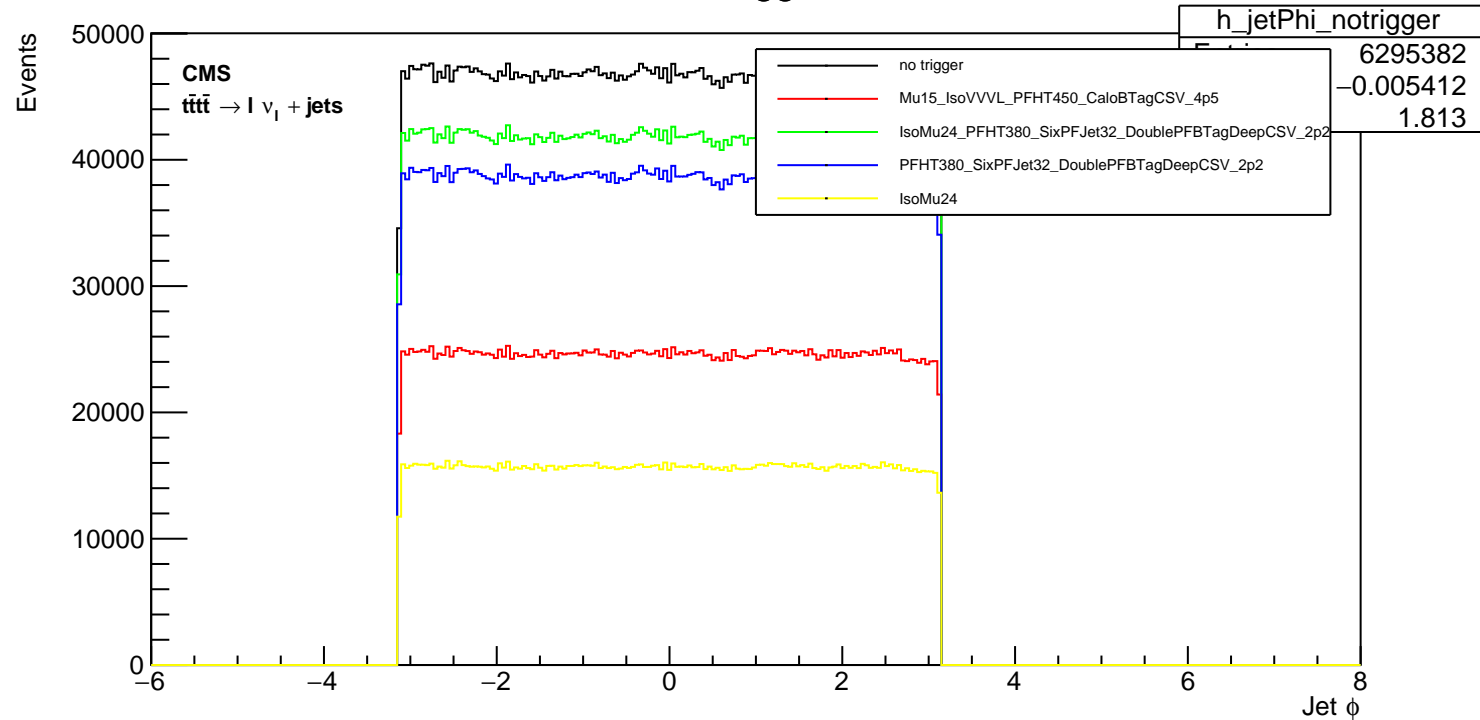
Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5

IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

IsoMu24

no trigger

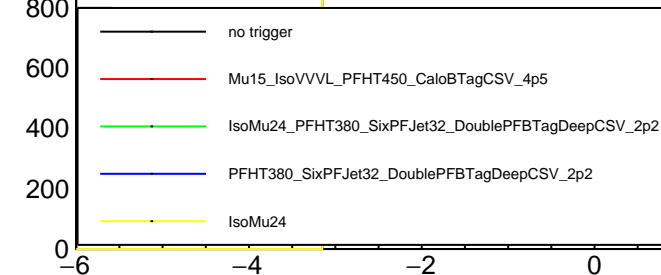


# no trigger

Events

**CMS**  
 $t\bar{t}t\bar{t} \rightarrow l \nu_l + \text{jets}$

h_muonPhi_notrigger	
Entries	247736
Mean	-0.007082
Std Dev	1.813



Muon  $\phi$

no trigger

Events

CMS

$t\bar{t}t\bar{t} \rightarrow l \nu_l + \text{jets}$

1200

1000

800

600

400

200

0

-6

-4

-2

0

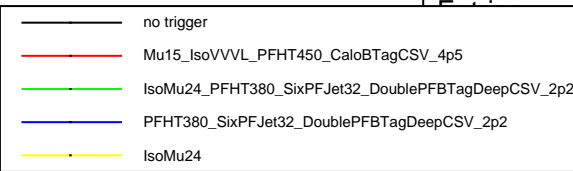
2

4

6

8

Electron  $\phi$



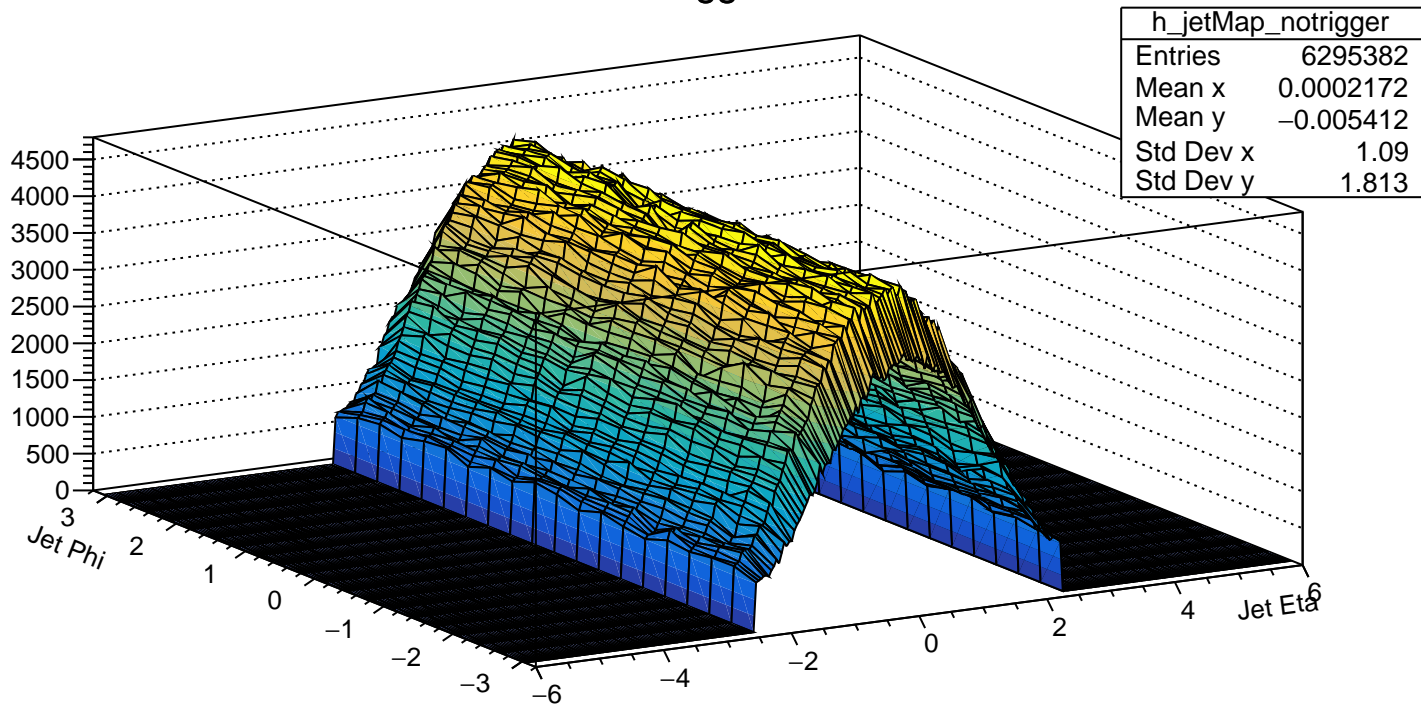
h\_elPhi\_notrigger

164219

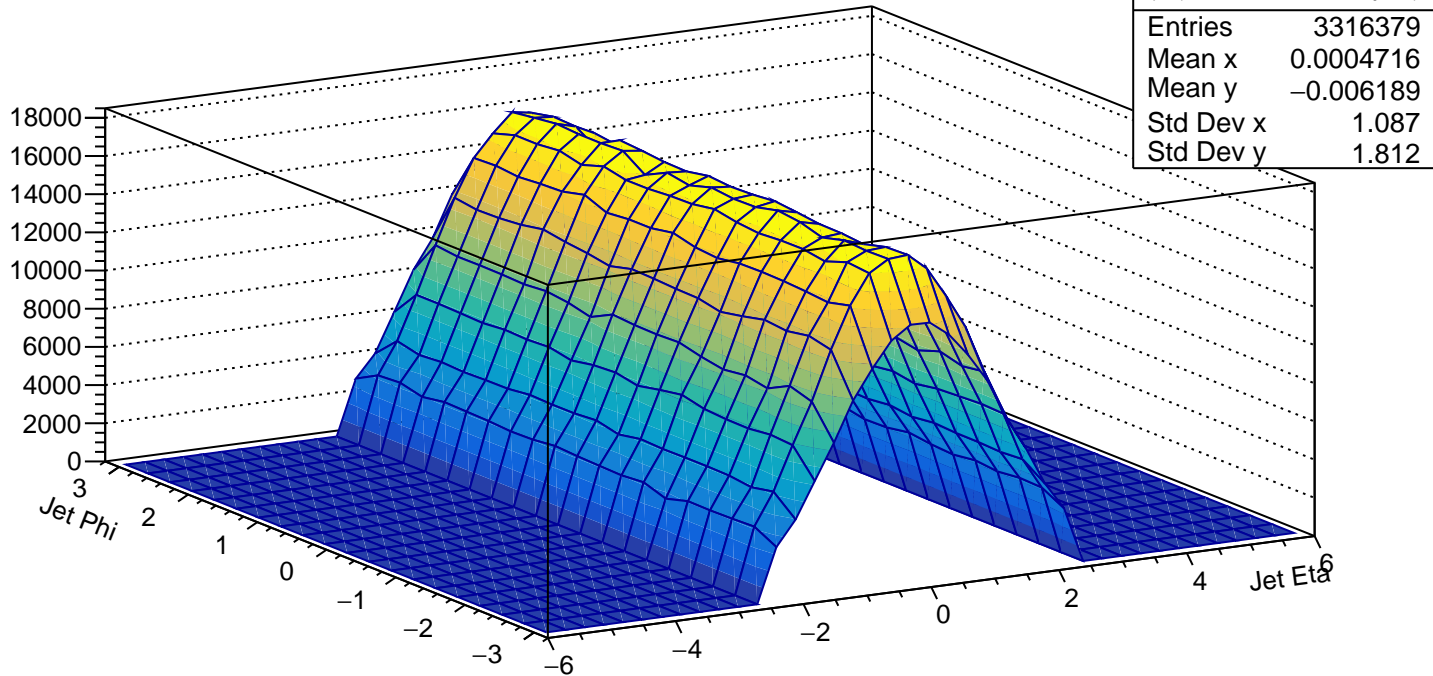
-0.00913

1.81

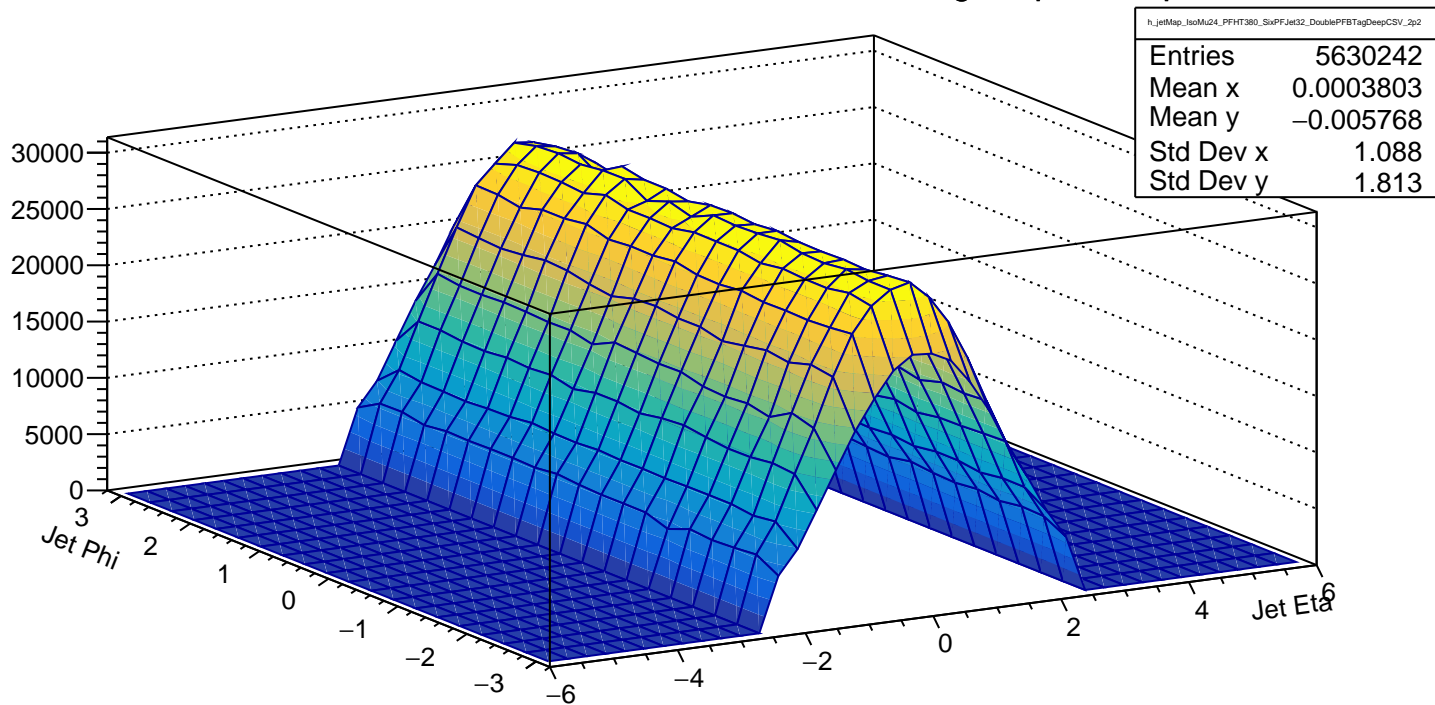
no trigger



# Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5

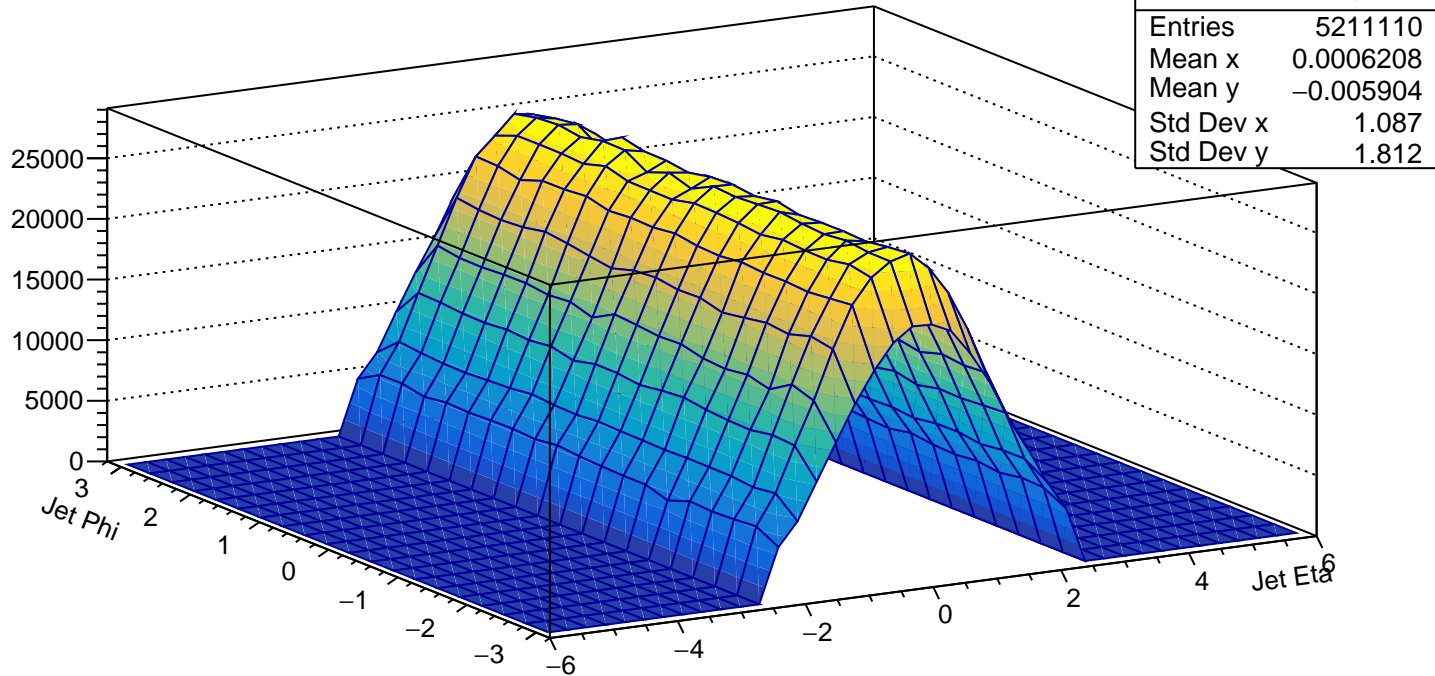


# IsoMu24\_PFH380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

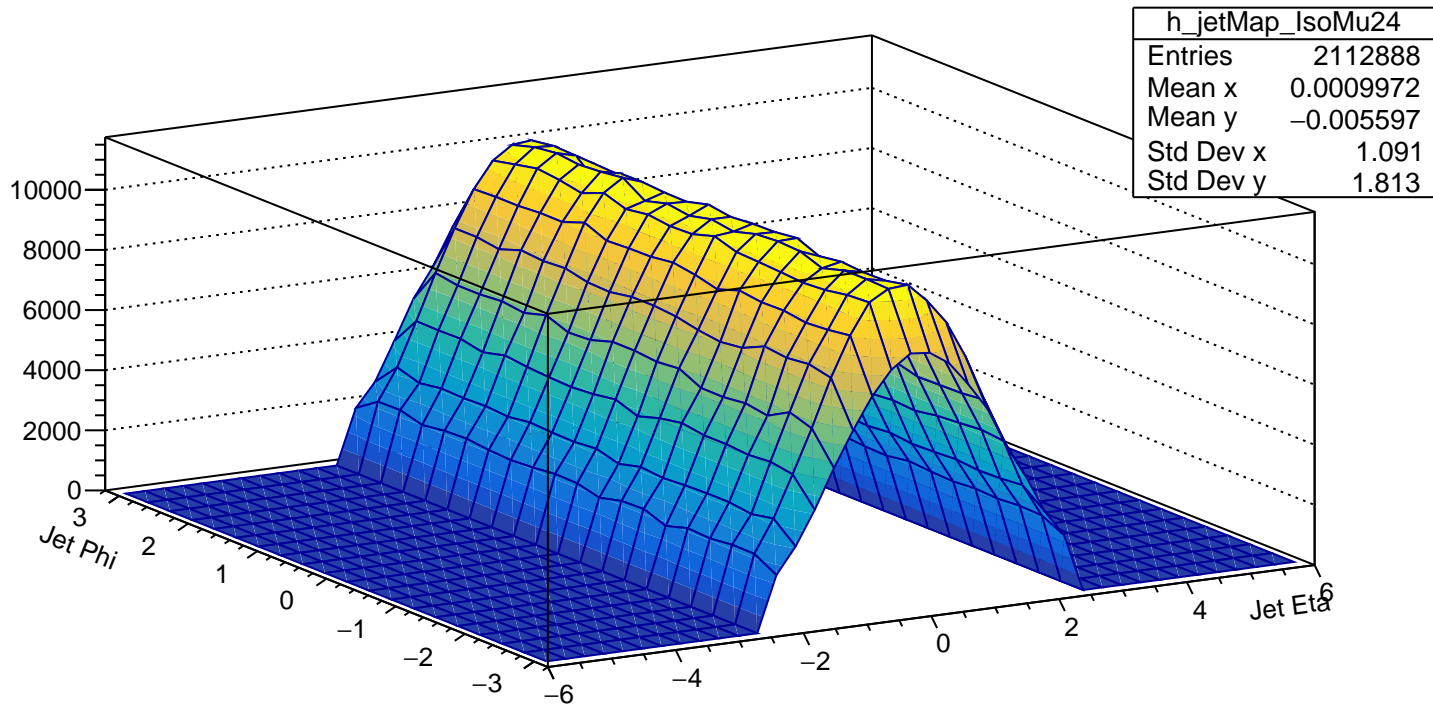




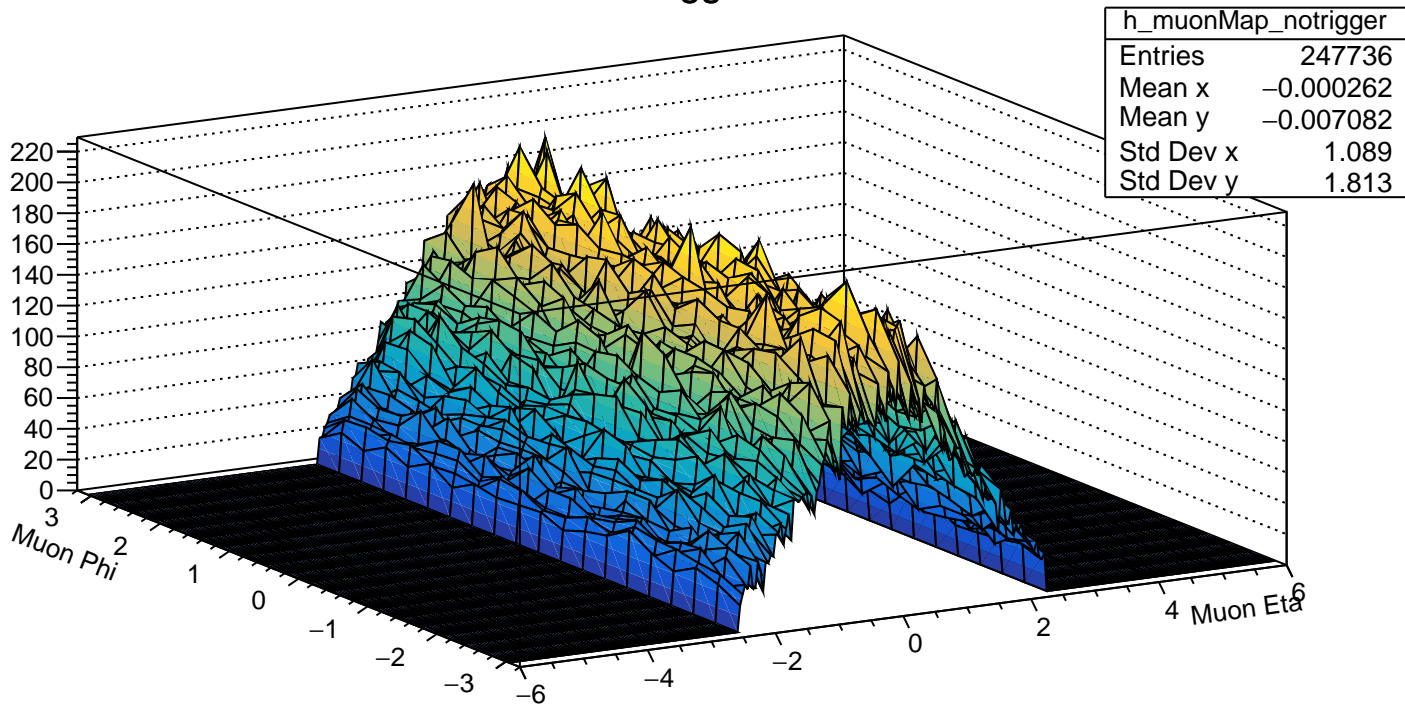
# PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



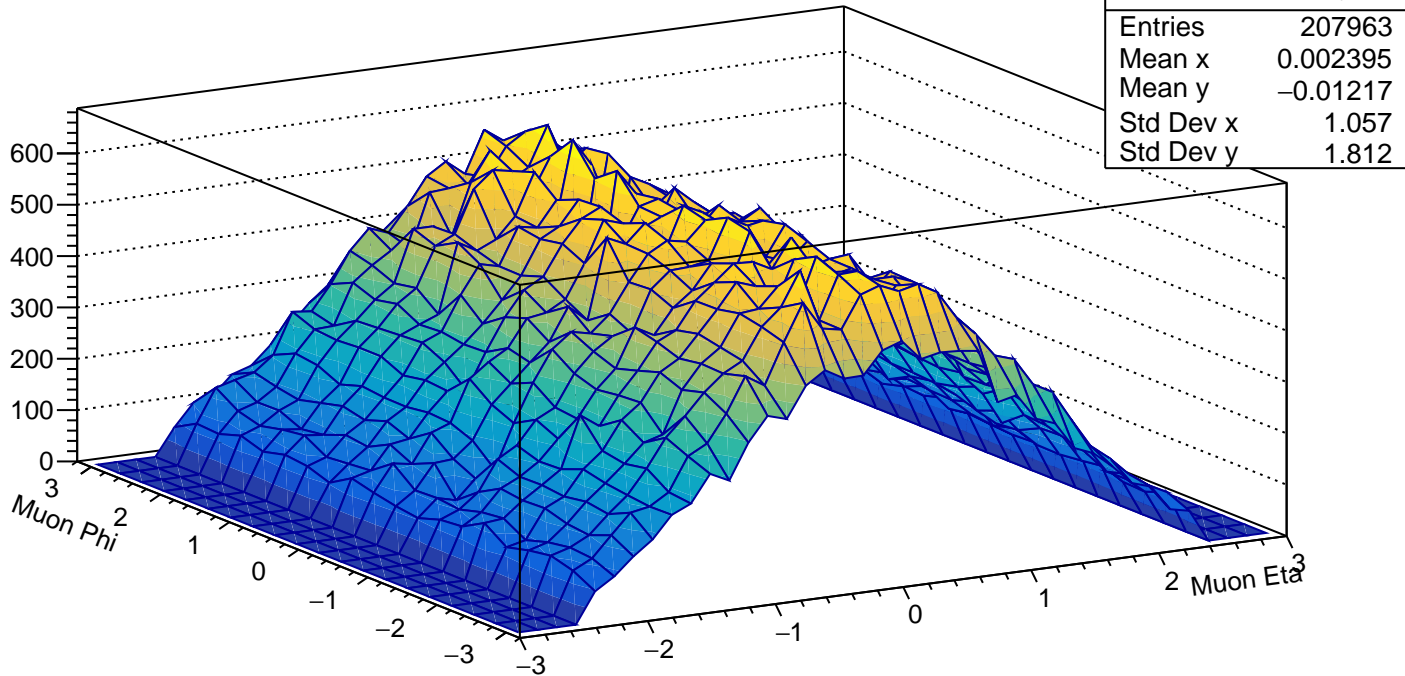
# IsoMu24



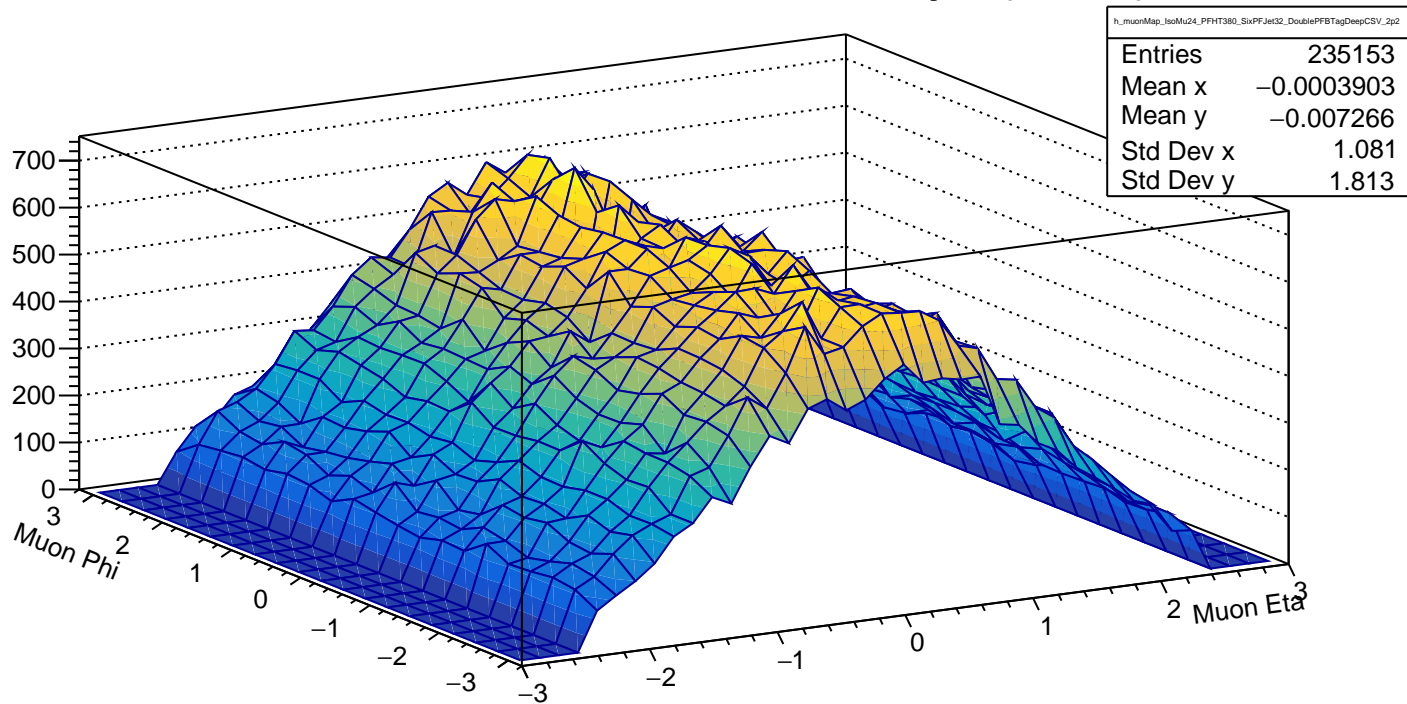
no trigger



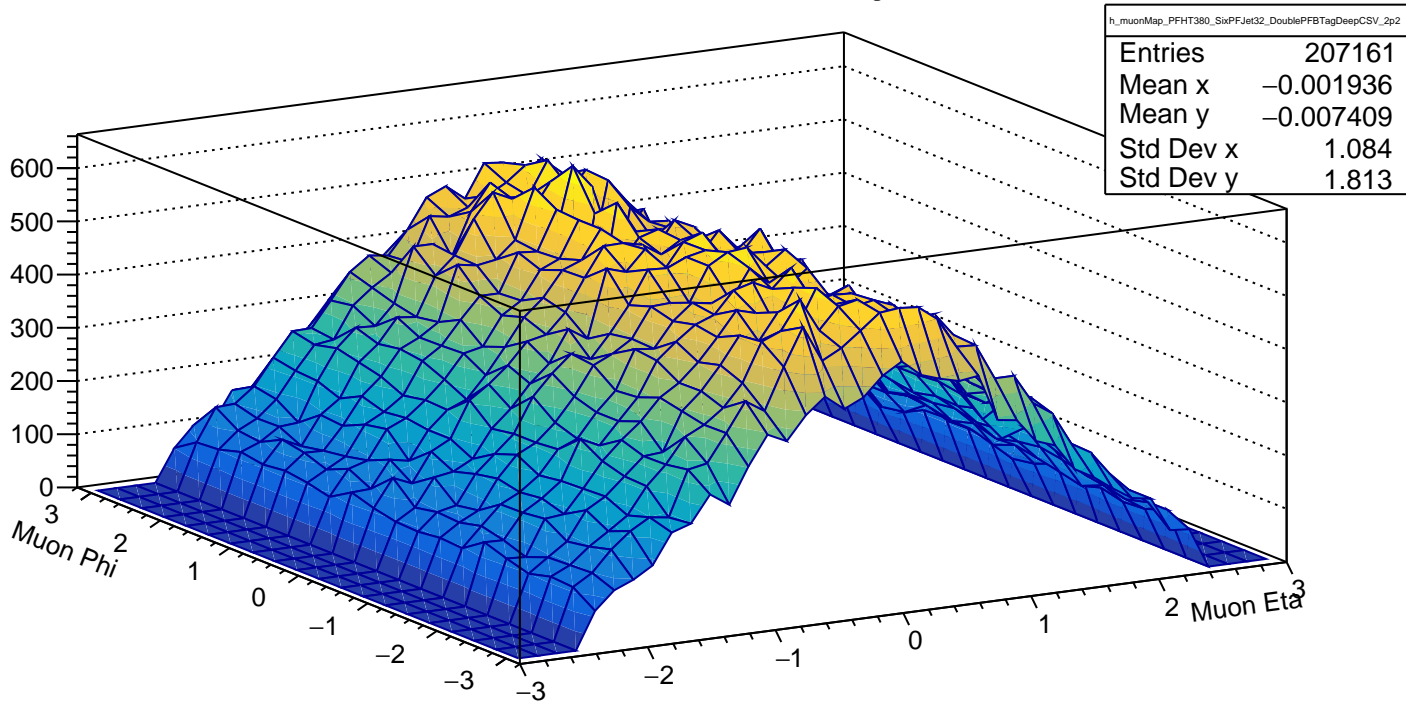
# Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



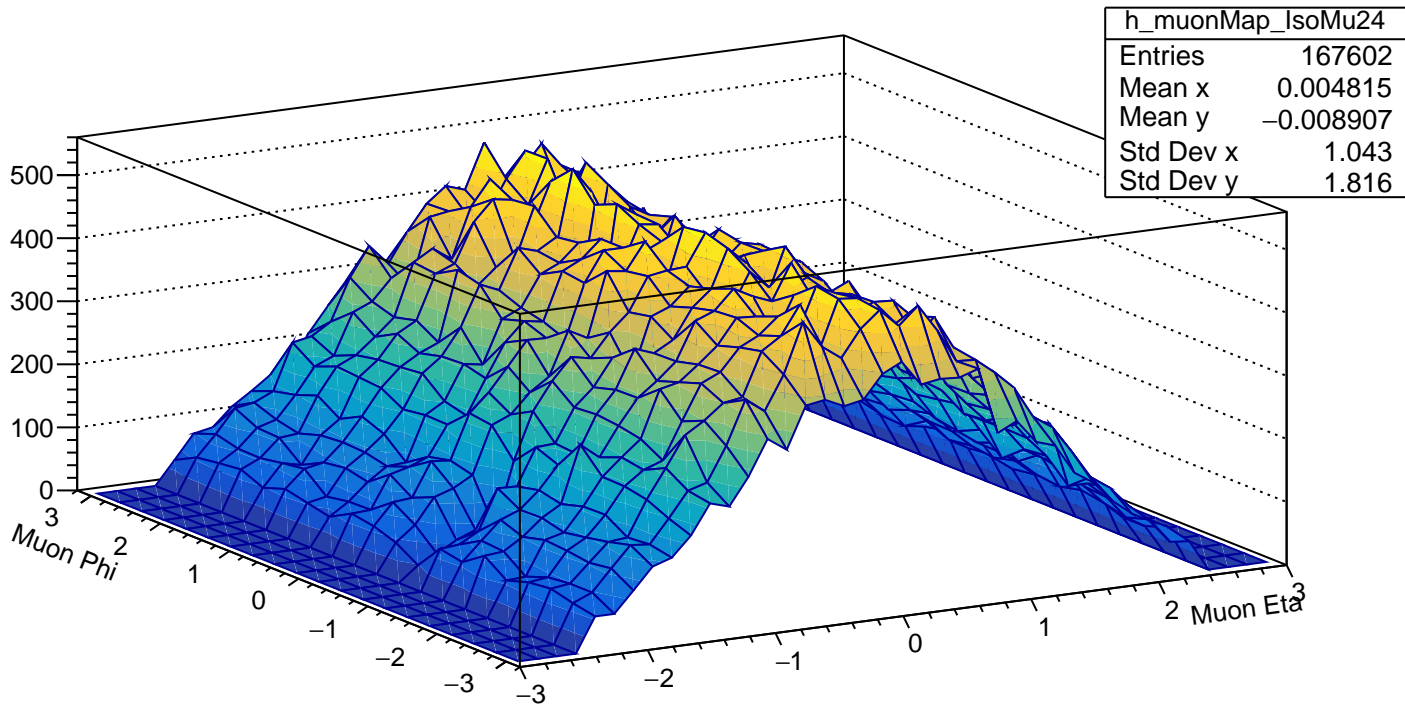
# IsoMu24\_PFH380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



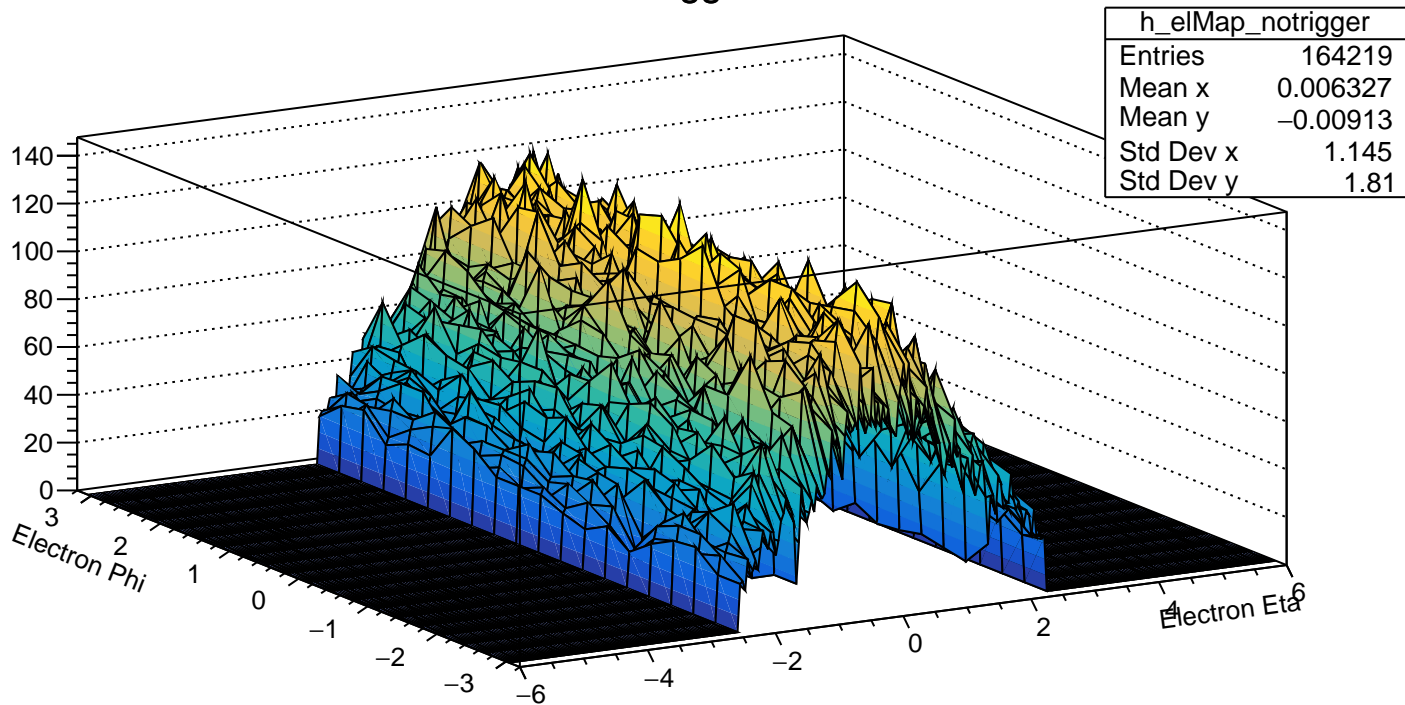
# PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



# IsoMu24

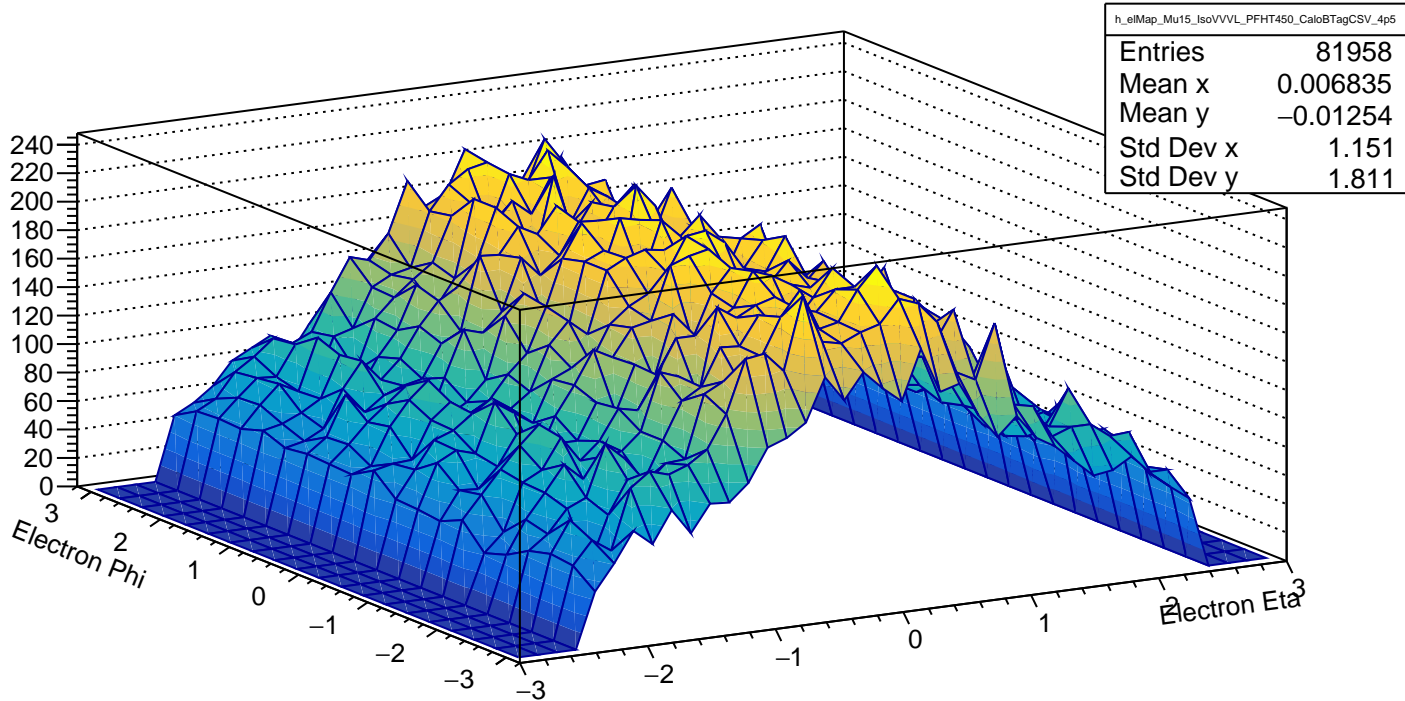


no trigger

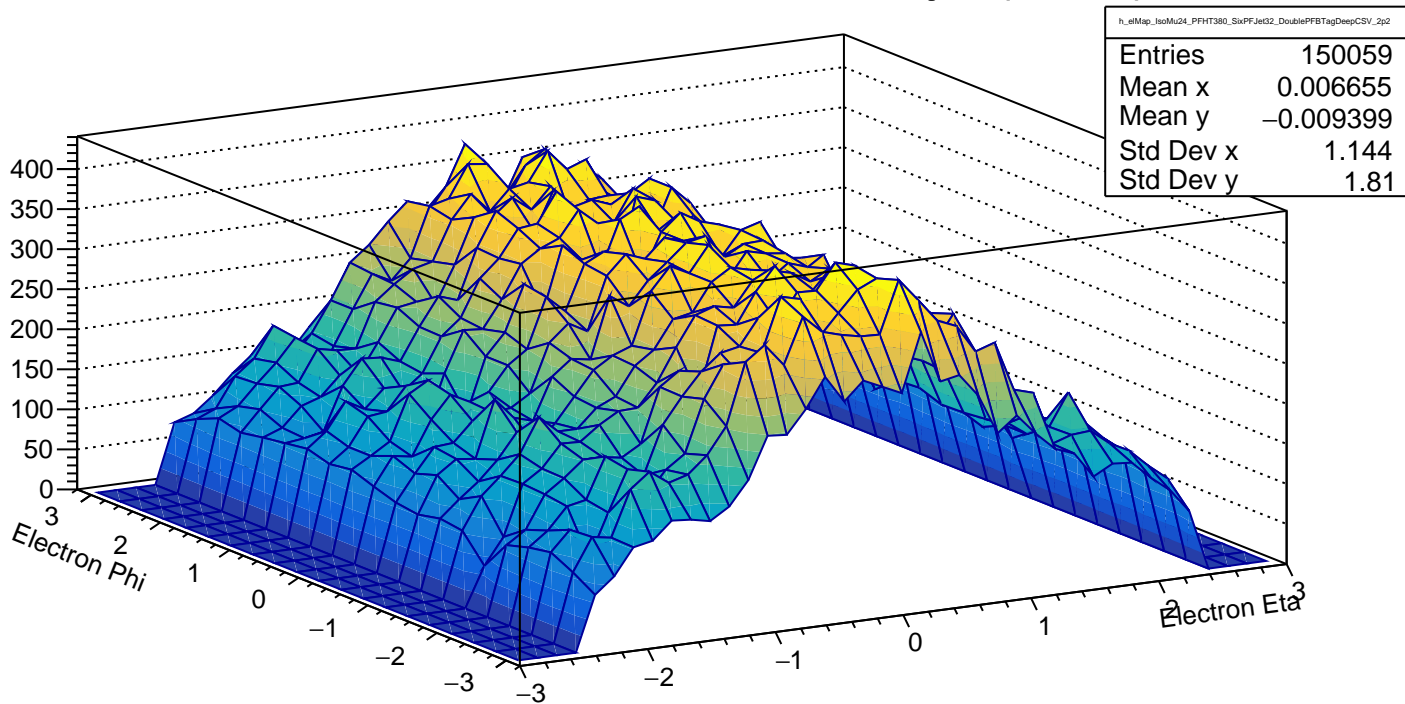




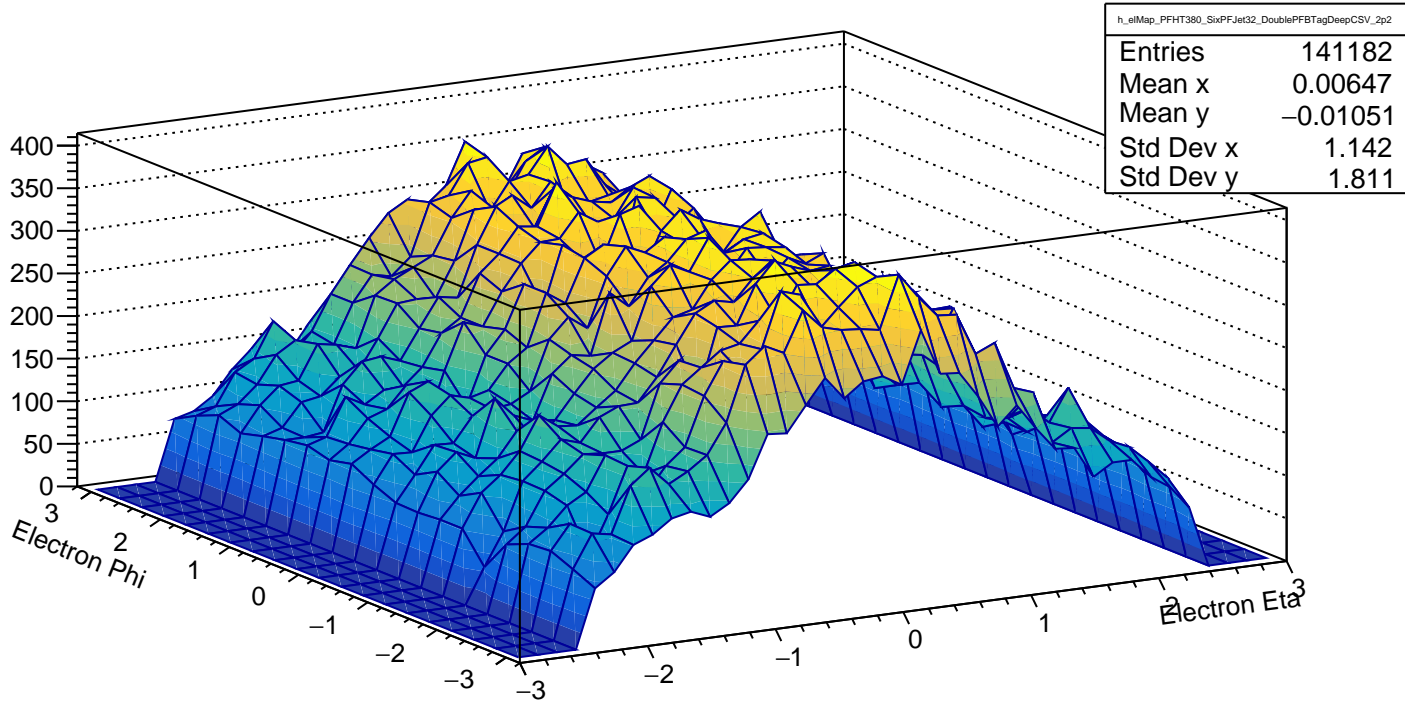
# Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



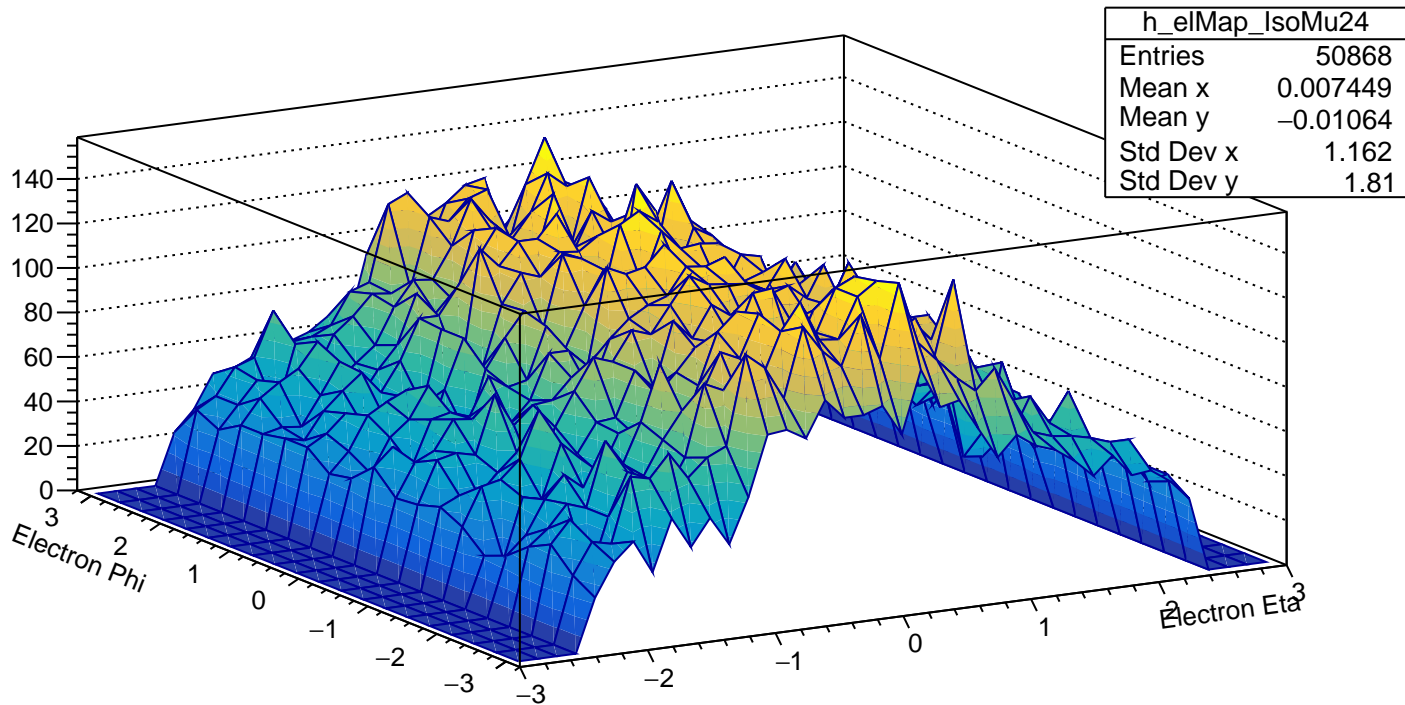
# IsoMu24\_PFH380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



# PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



# IsoMu24



## no trigger

Events

CMS

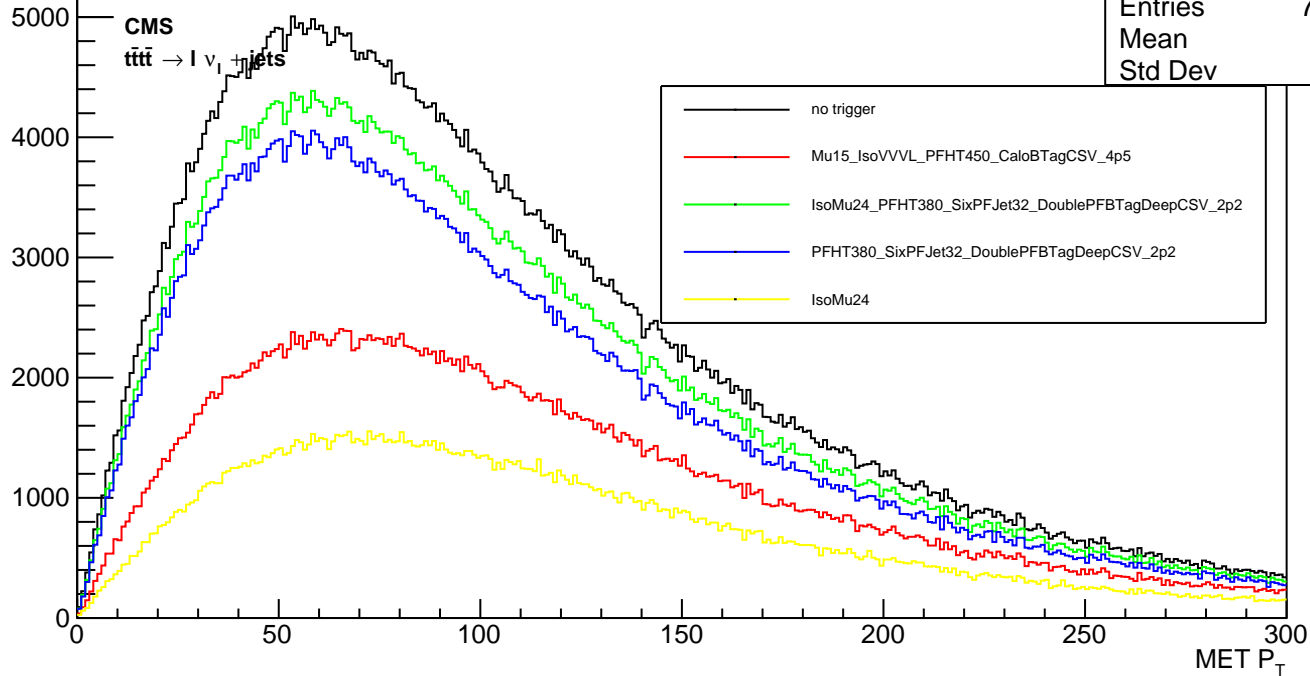
 $t\bar{t}t\bar{t} \rightarrow l \nu_l + \text{jets}$ 

h\_metPt\_notrigger

Entries 711824

Mean 103.9

Std Dev 65.09



# IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Events

0.92

IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

0.9

Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5

0.88

**CMS**

$t\bar{t}t\bar{t} \rightarrow l\gamma + \text{jets}$

0.86

0.84

0

50

100

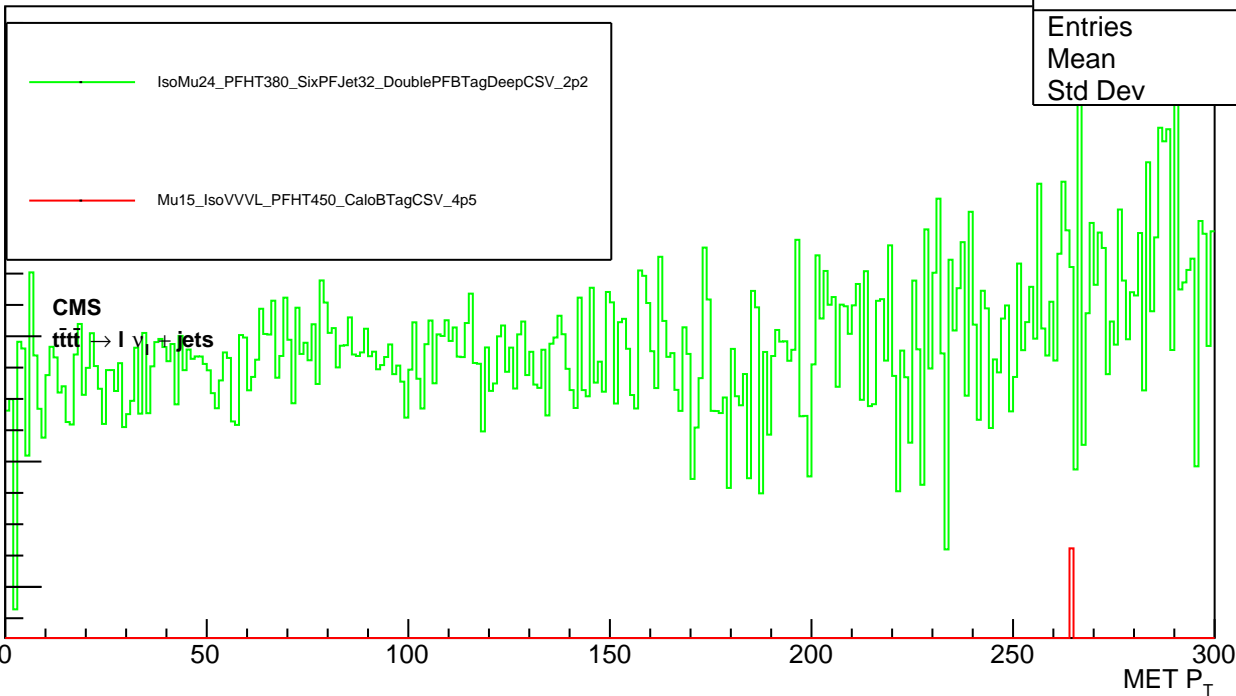
150

200

250

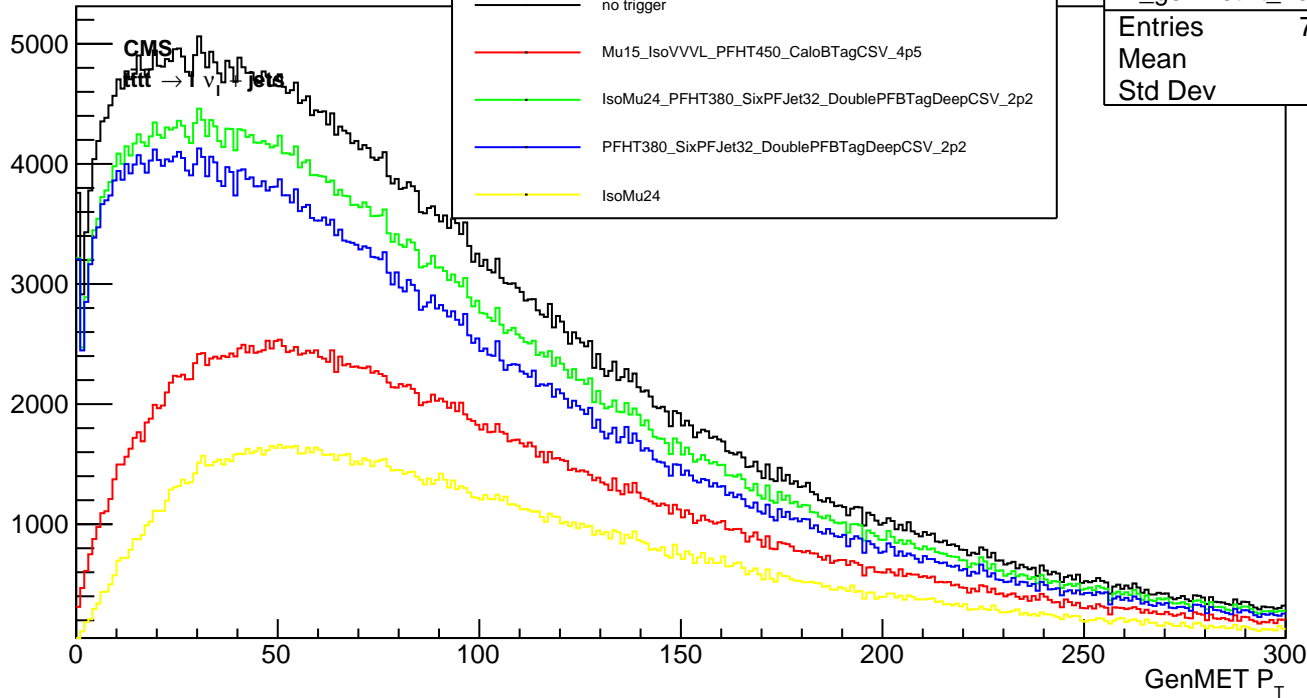
MET  $P_T$

Entries	264
Mean	150.4
Std Dev	86.68



# no trigger

Events



h_genMetPt_notrigger	
Entries	711824
Mean	90.54
Std Dev	67.13

# IsoMu24\_PFH380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Events

0.92  
0.91  
0.9  
0.89  
0.88  
0.87  
0.86  
0.85  
0.84

IsoMu24\_PFH380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Mu15\_IsoVVVL\_PFH380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

**CMS**  
**tttt  $\rightarrow$  l  $\nu_l$  + jets**

h.genMetPiratioIsoMu24\_PFH380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Entries	263
Mean	150.3
Std Dev	86.67

GenMET  $P_T$



