

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

- **Jets:** number > 5
- **Muons:** number >0 and has softId

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

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

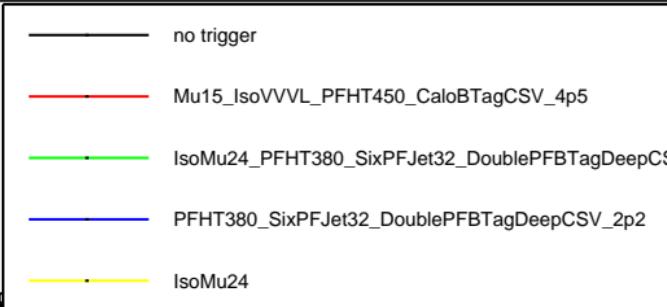
- **Jets:** jetId > 2 ,  $p_T > 30$  and  $|\eta| < 2.4$  (for at least 6)  
 $btagDeepFlavB > 0.7489$  (for at least one jet)
- **Muons:** has tightId,  $|\eta| < 2.4$  and  $\text{miniPFRellso\_all} < 0.15$  (for at least 1)

# no trigger

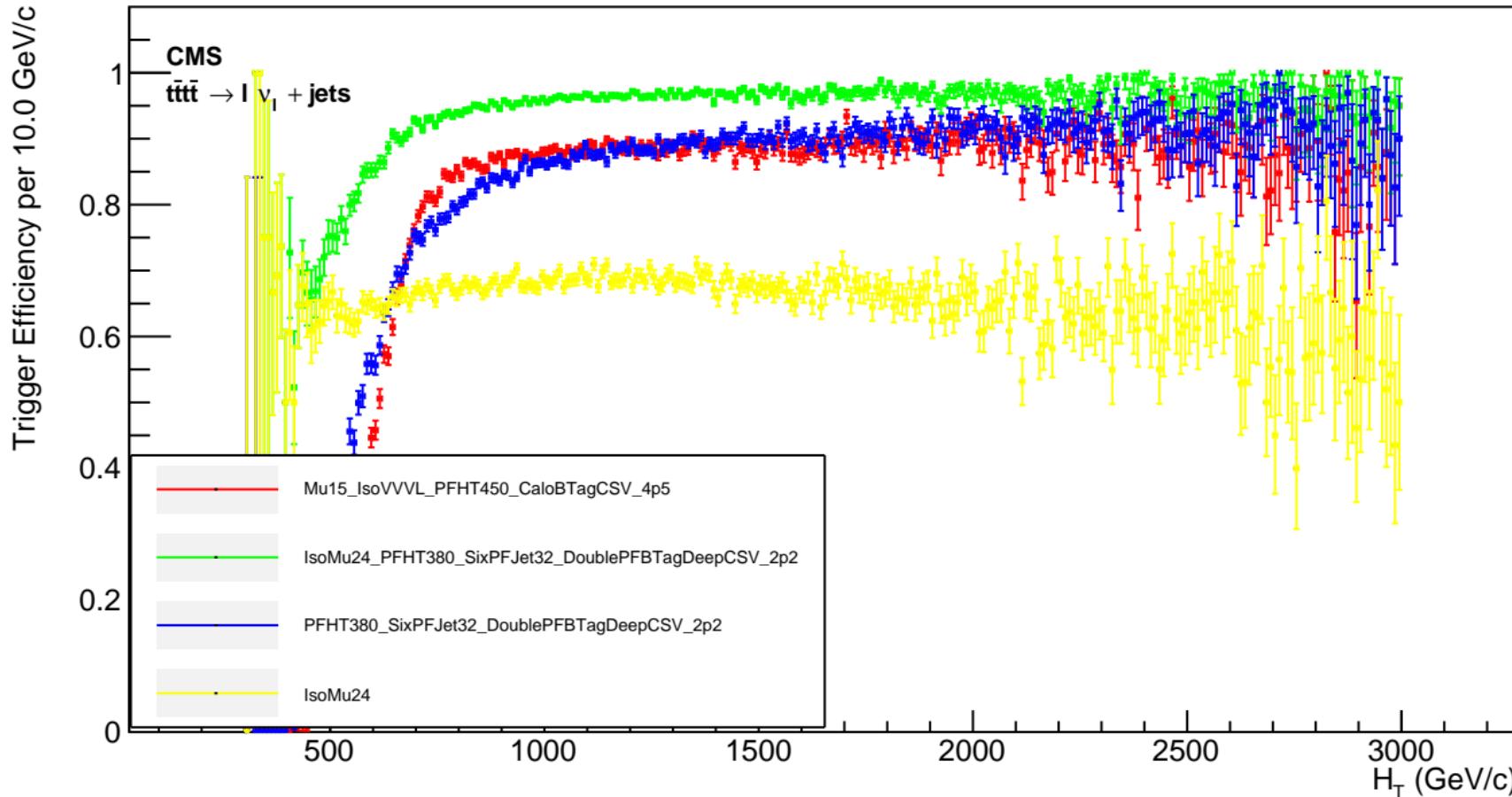
Number of Events per 10 GeV/c

CMS

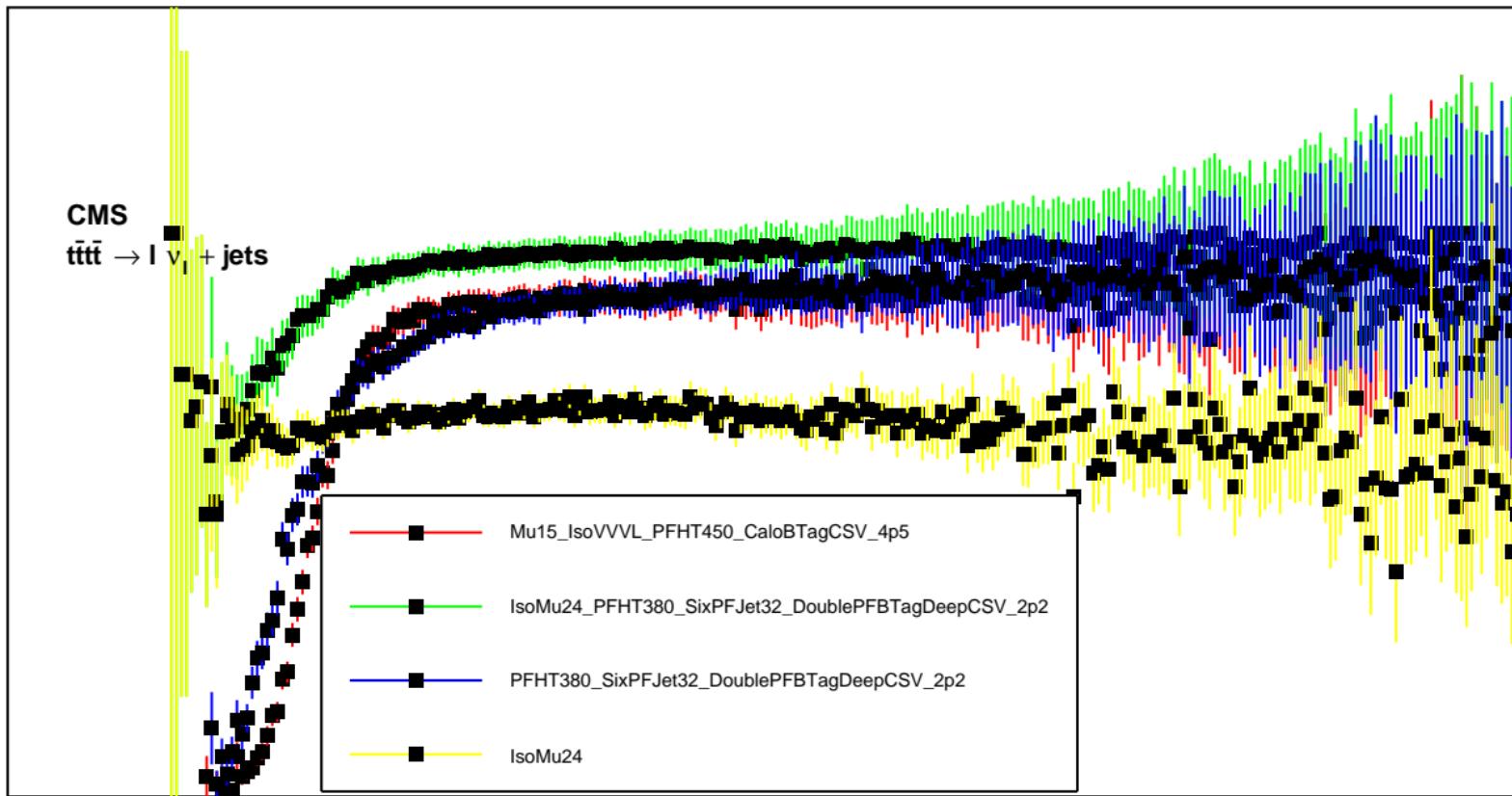
$t\bar{t}t\bar{t} \rightarrow l\nu_l + \text{jets}$



h_jetHt_notrigger	
Entries	252720
Mean	1136
Std Dev	411.2

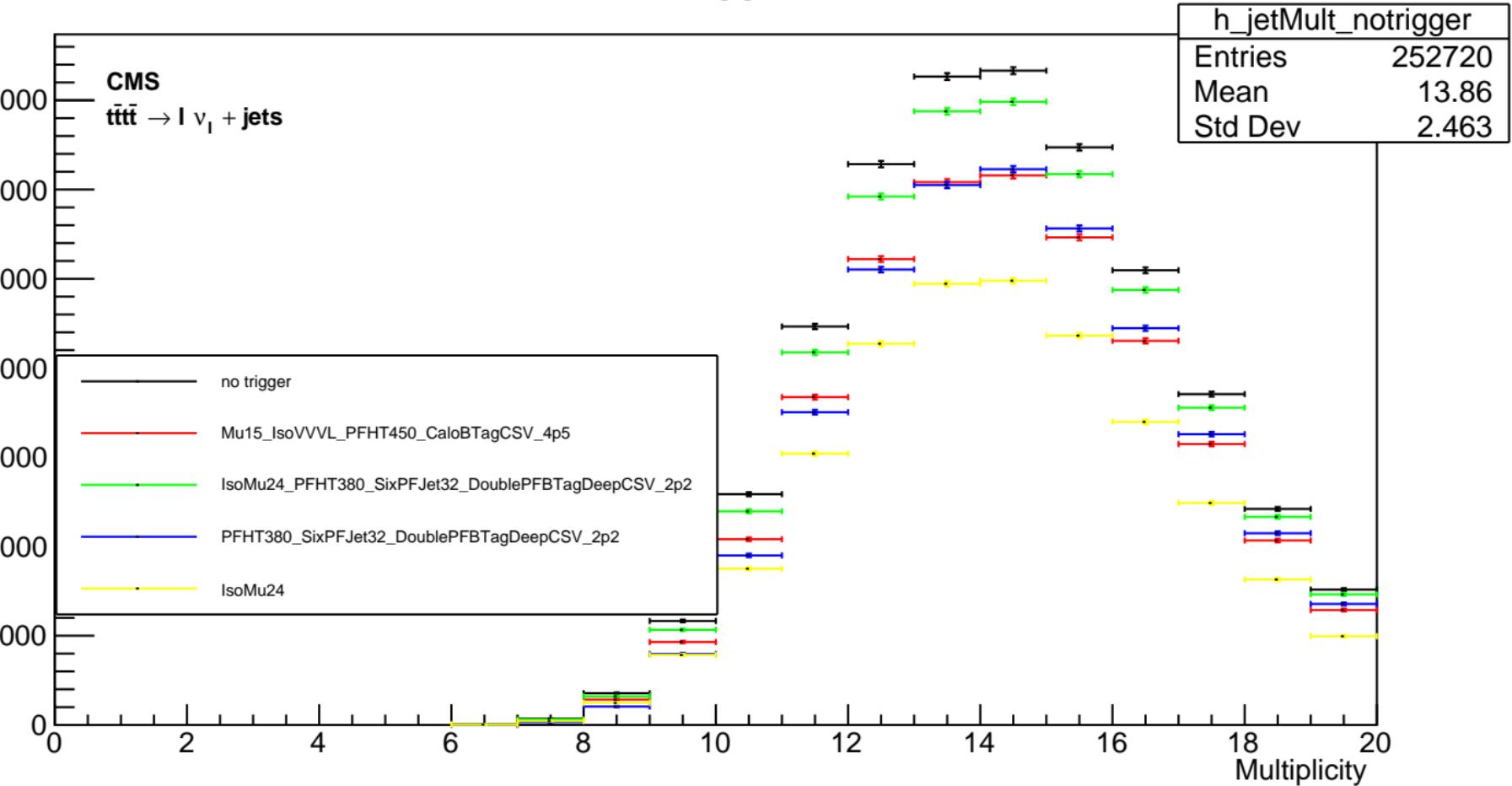


# Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5

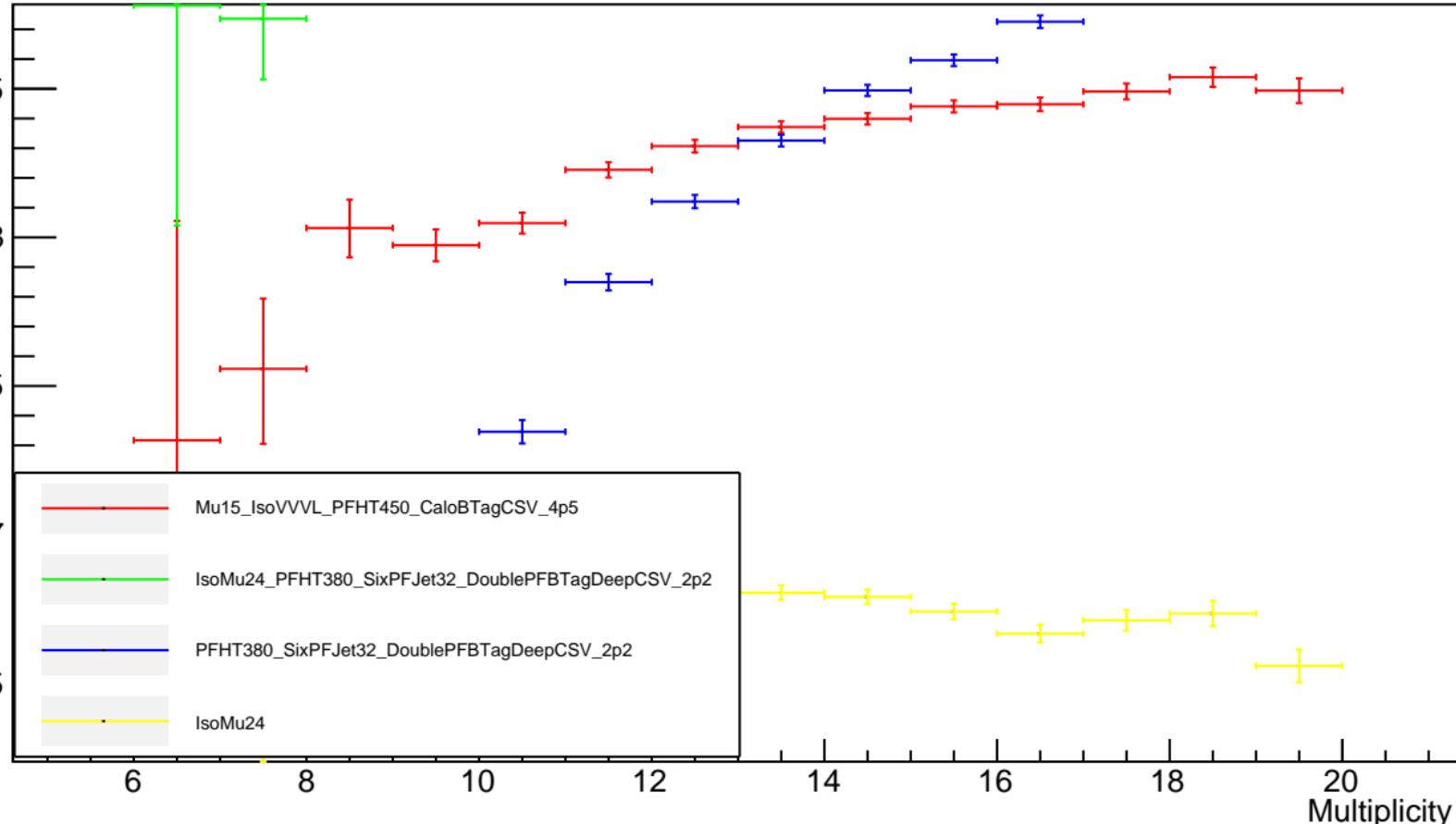


# no trigger

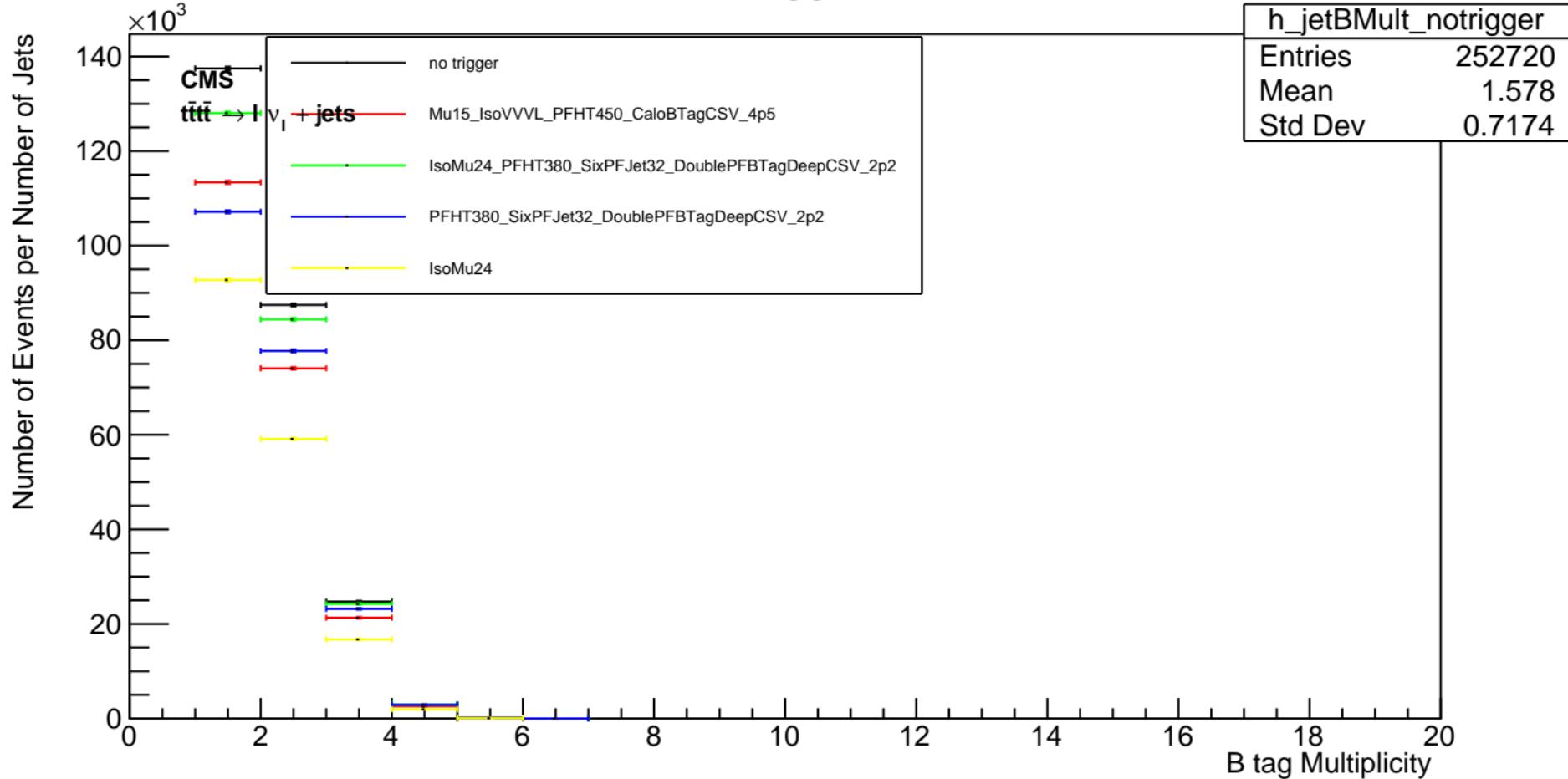
Number of Events per Number of Jets



Trigger Efficiency per 1.0 Jet



# no trigger



Trigger Efficiency per 1.0 Jet

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

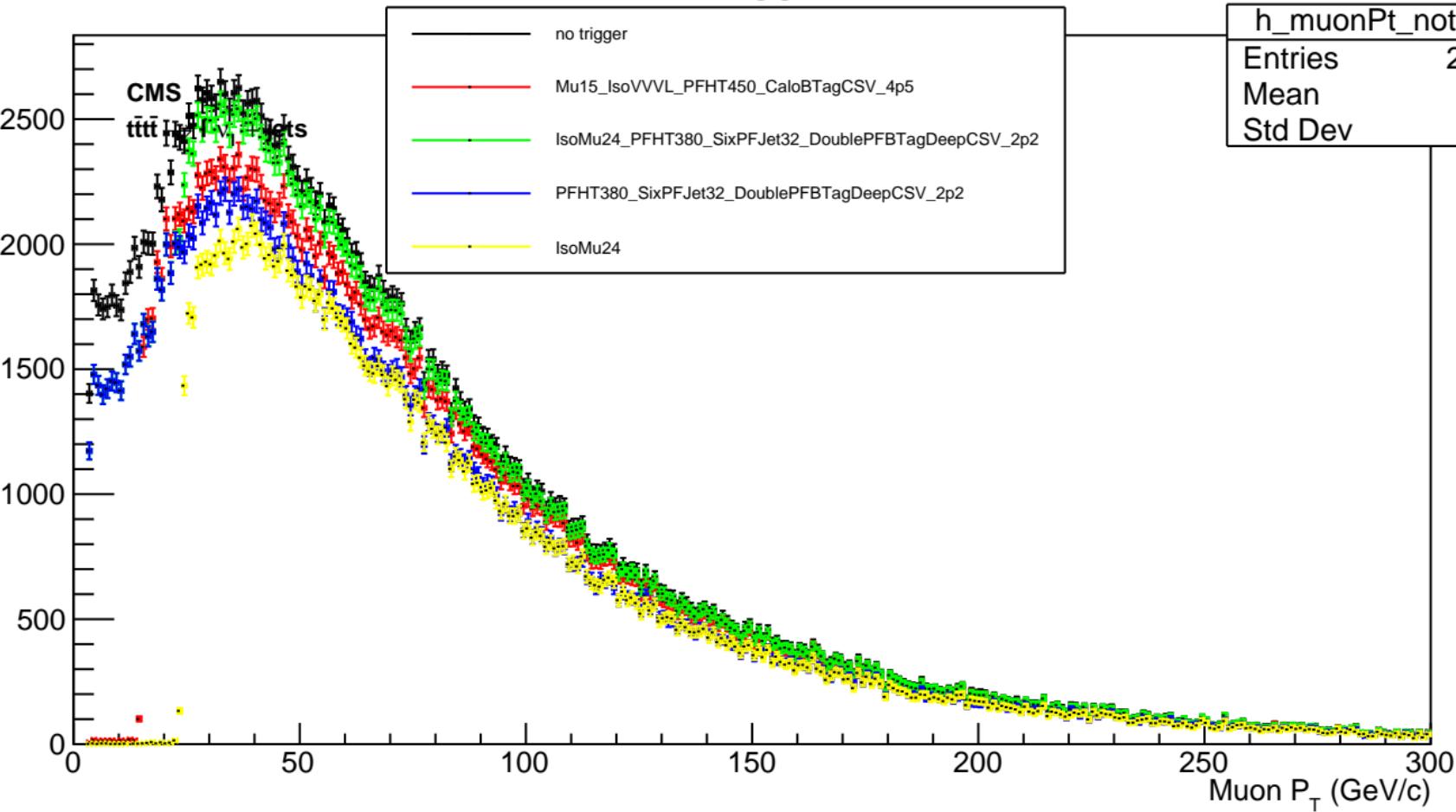
1 2 3 4 5 6 7

B tag Multiplicity

- Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5
- IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2
- PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2
- IsoMu24

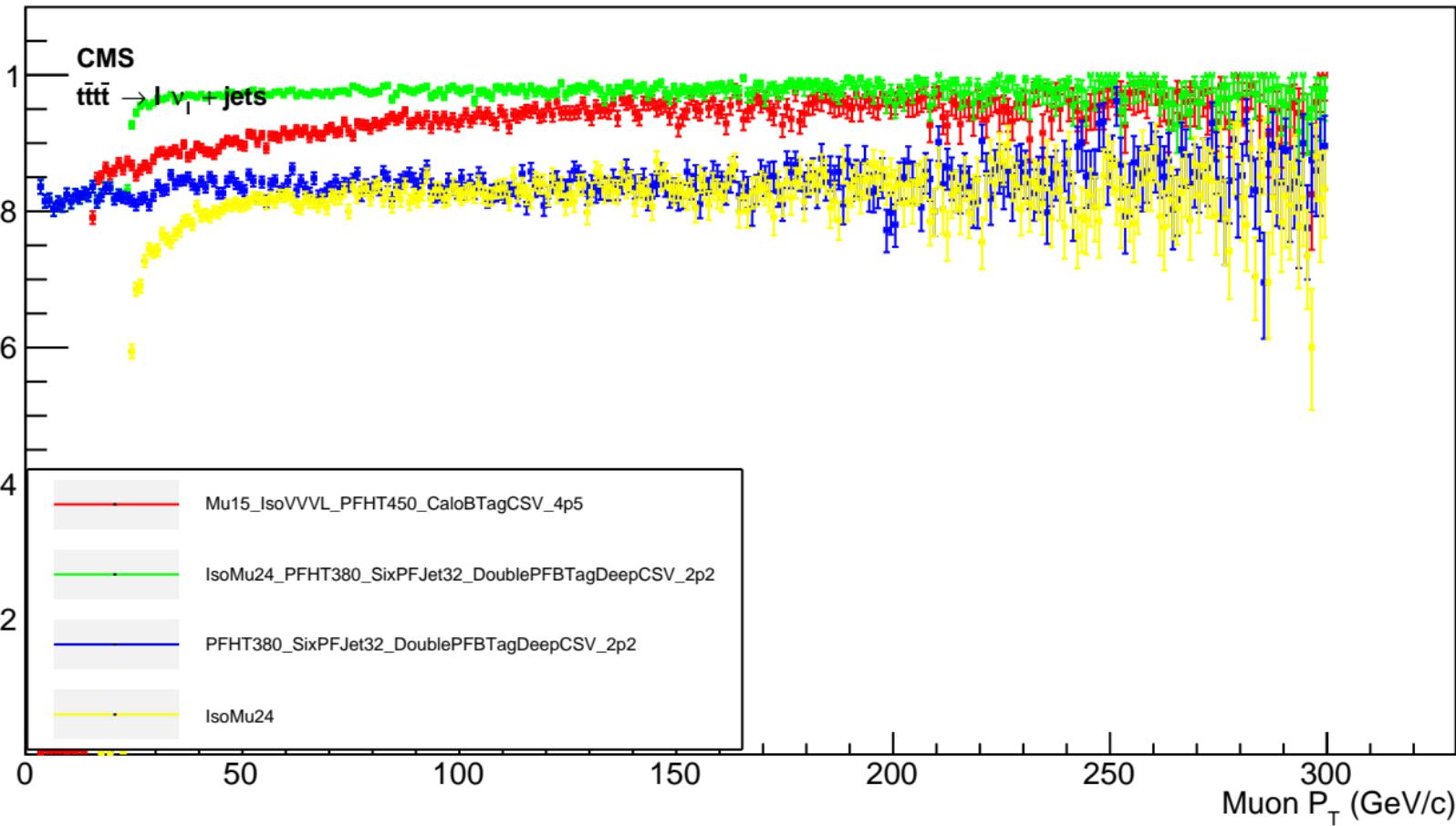
# no trigger

Number of Events per 1 GeV/c



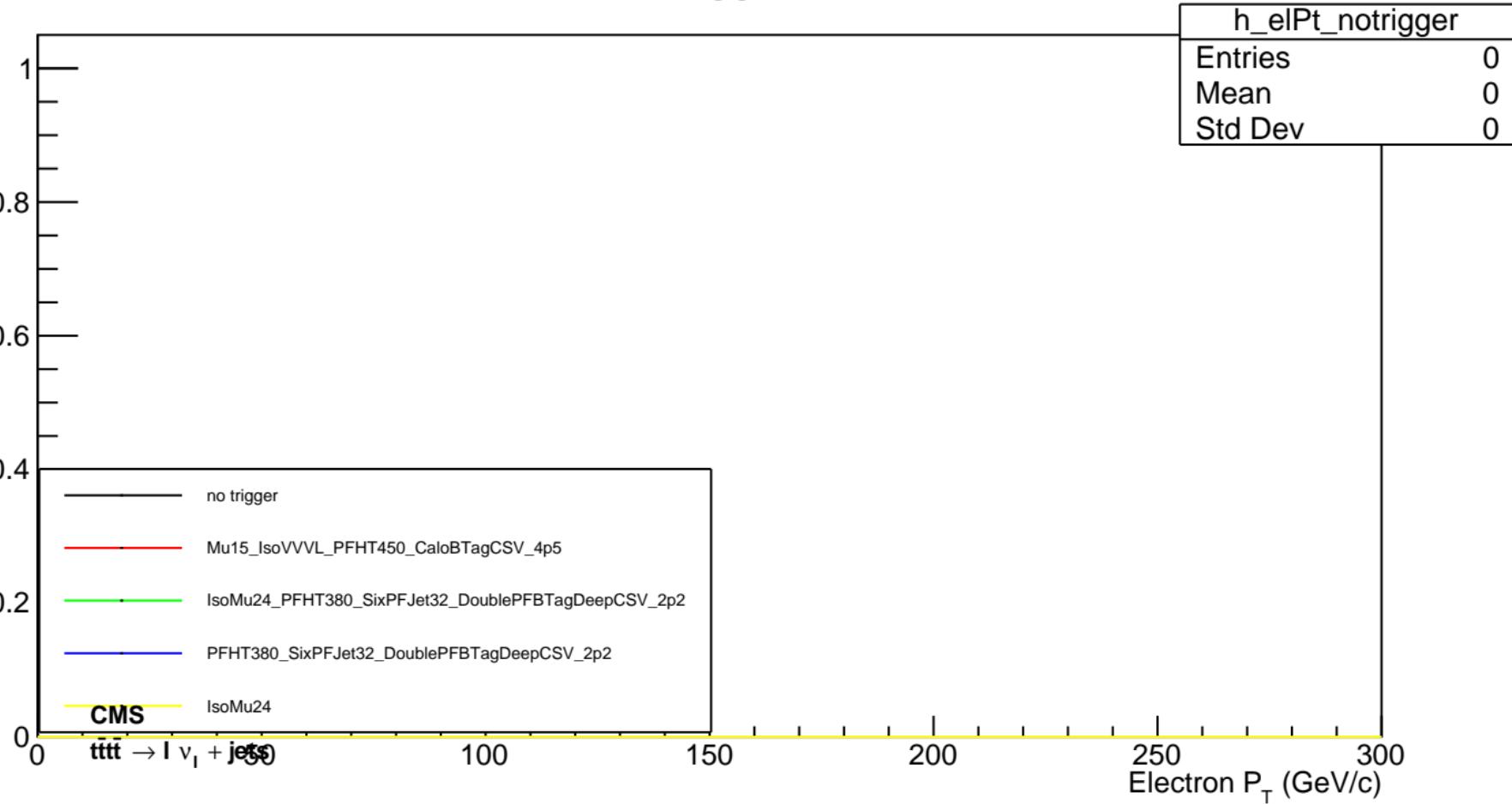
h_muonPt_notrigger	
Entries	252720
Mean	72.96
Std Dev	55.72

Trigger Efficiency per 1.0 GeV/c



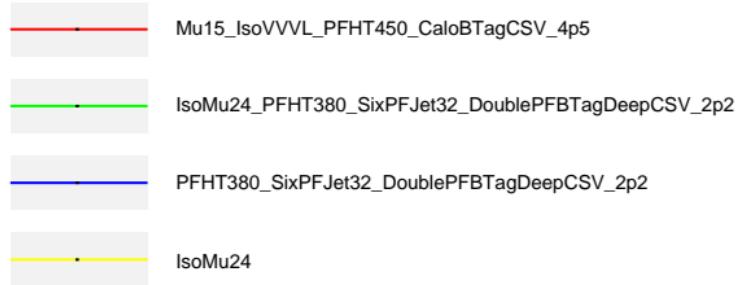
# no trigger

Number of Events per 1 GeV/c



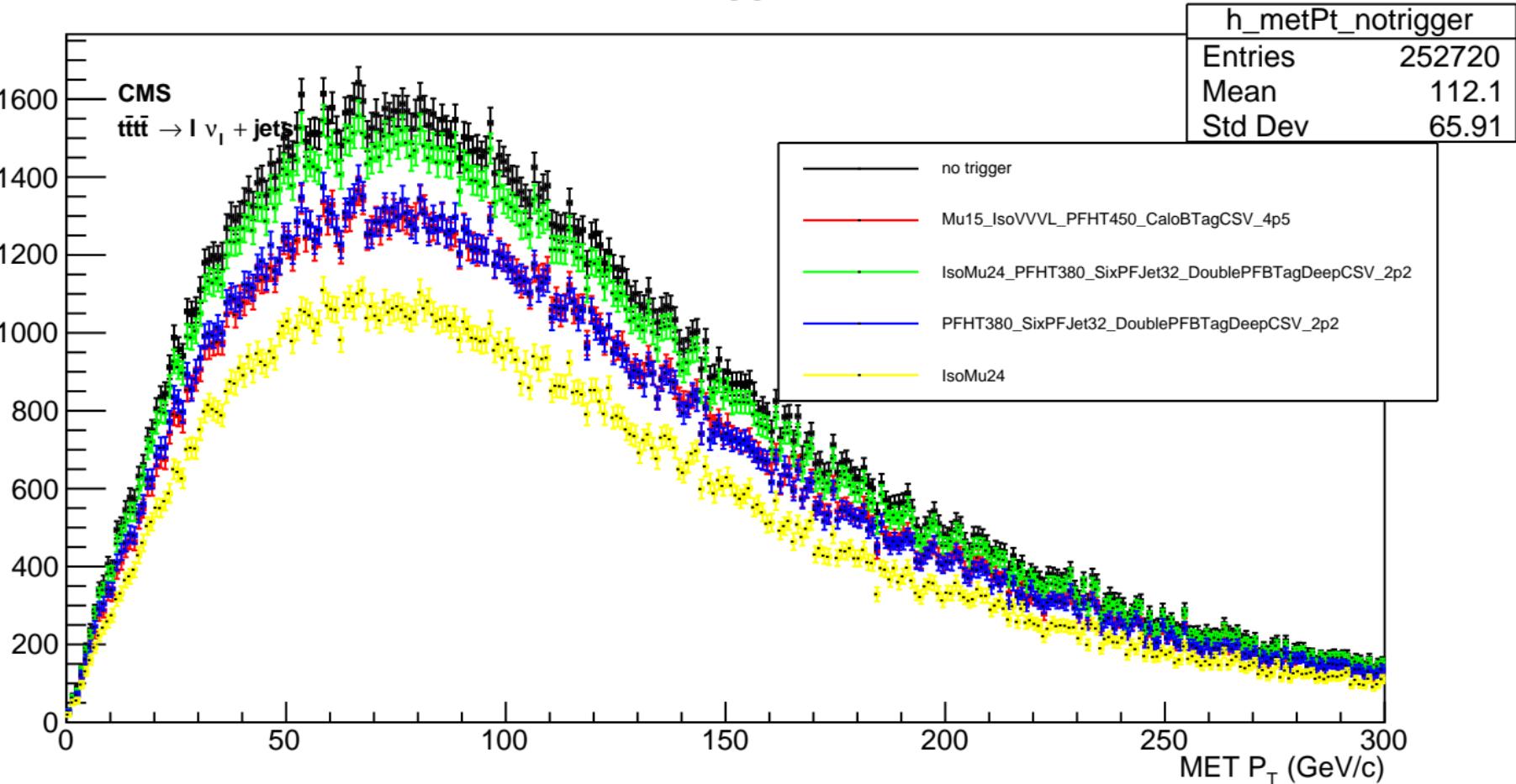
**CMS**

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



# no trigger

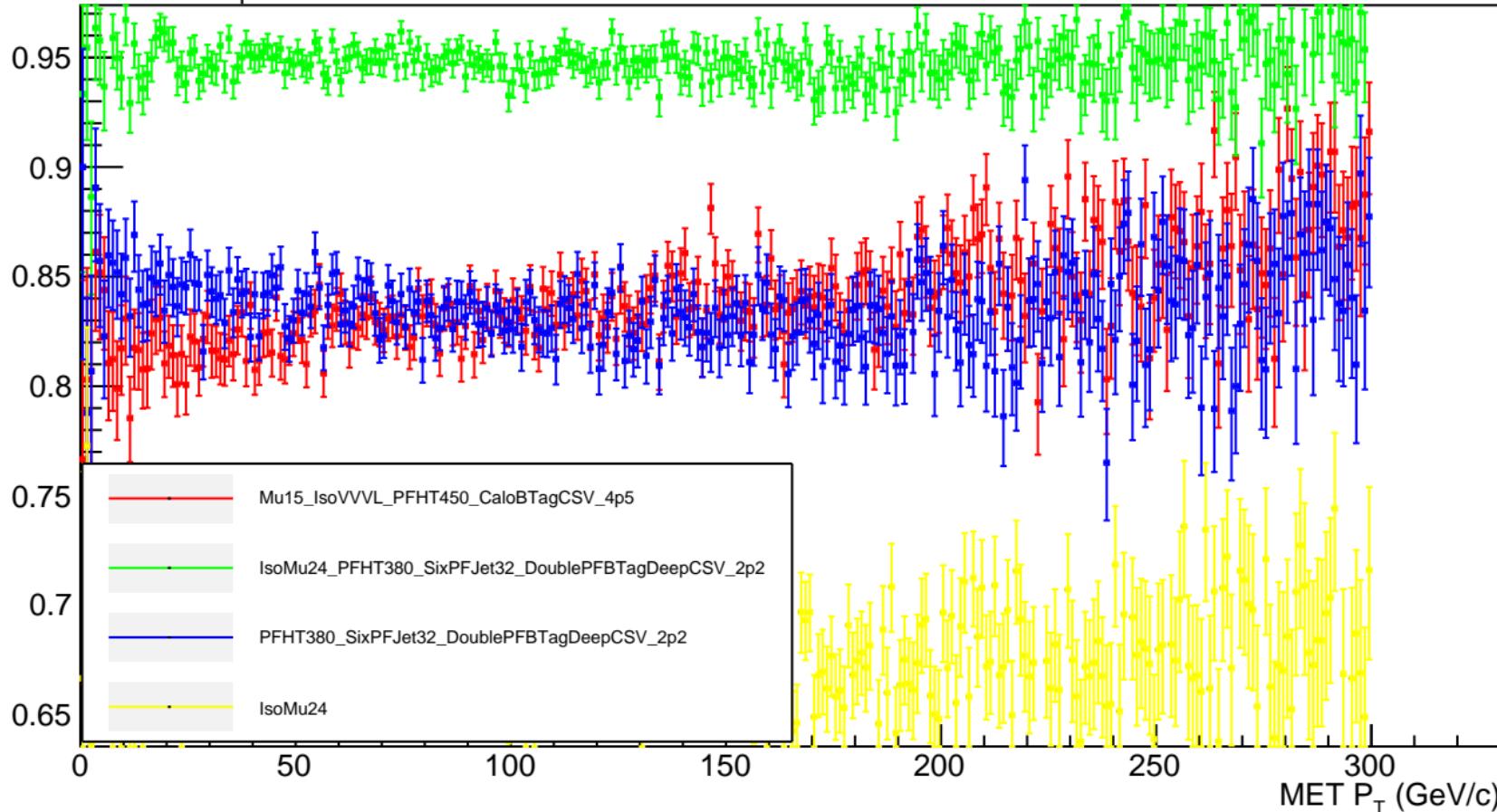
Number of Events per 1 GeV/c



CMS

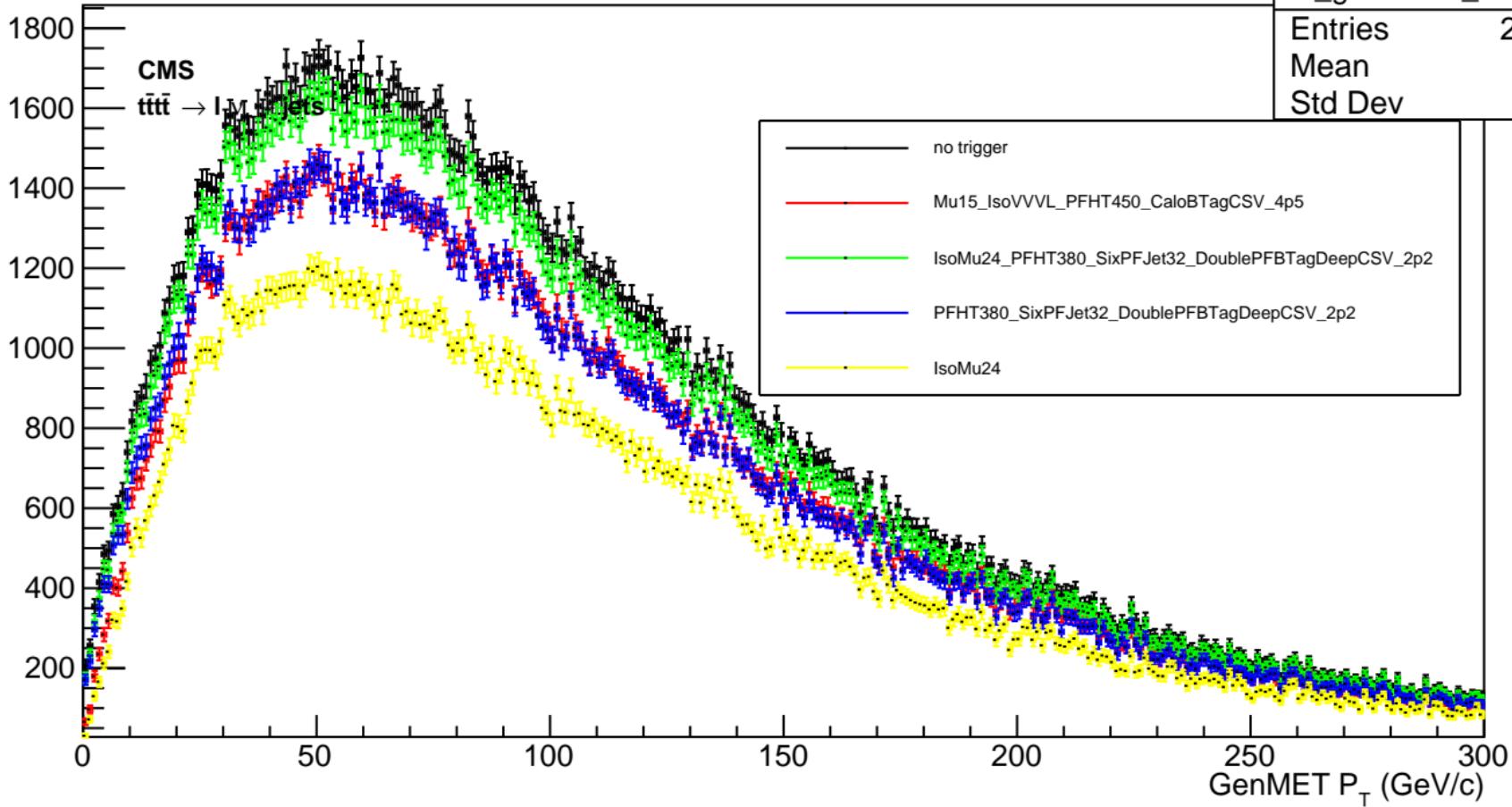
 $t\bar{t}t\bar{t} \rightarrow l\nu_l + \text{jets}$ 

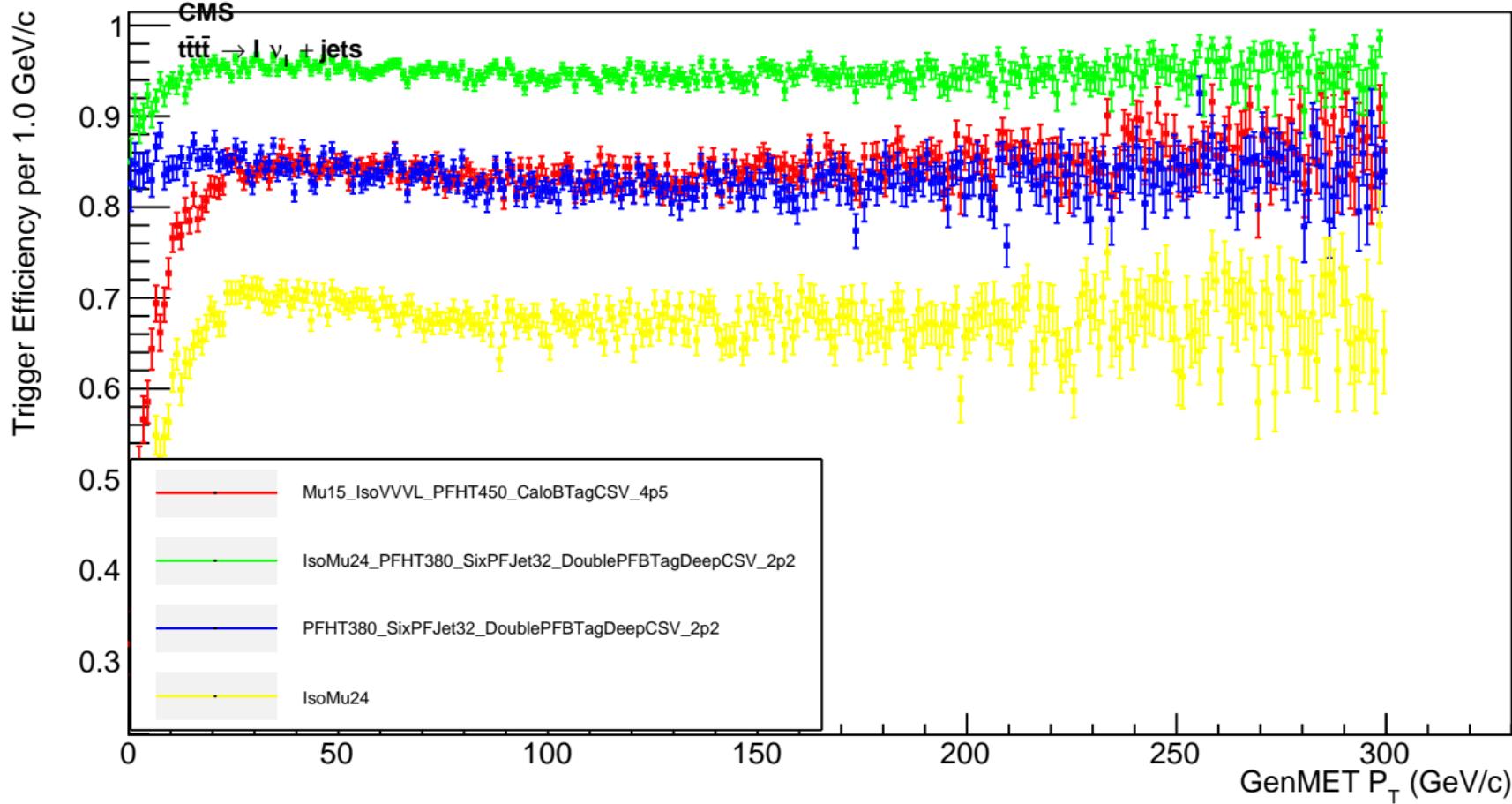
Trigger Efficiency per 1.0 GeV/c



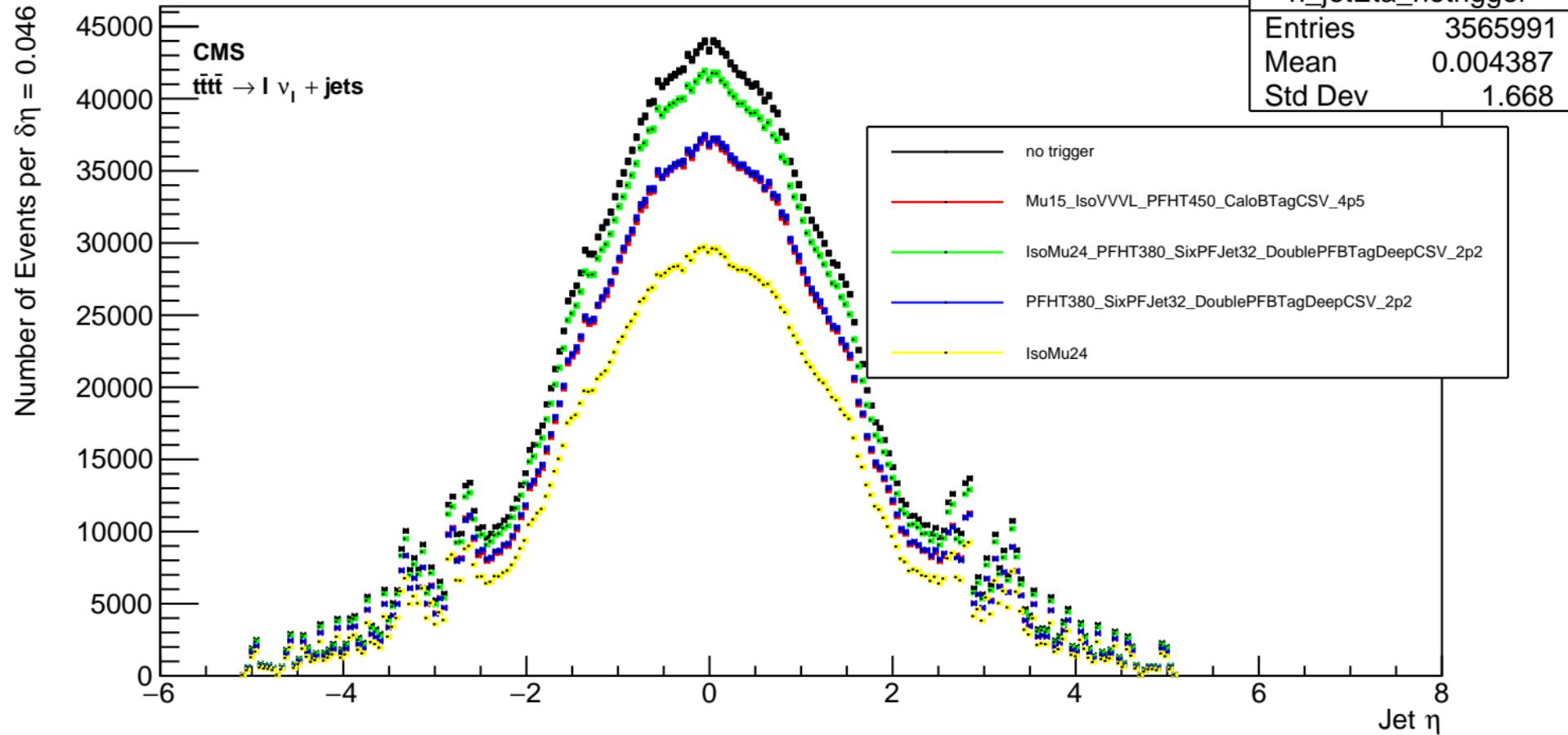
# no trigger

Number of Events per 1GeV/c



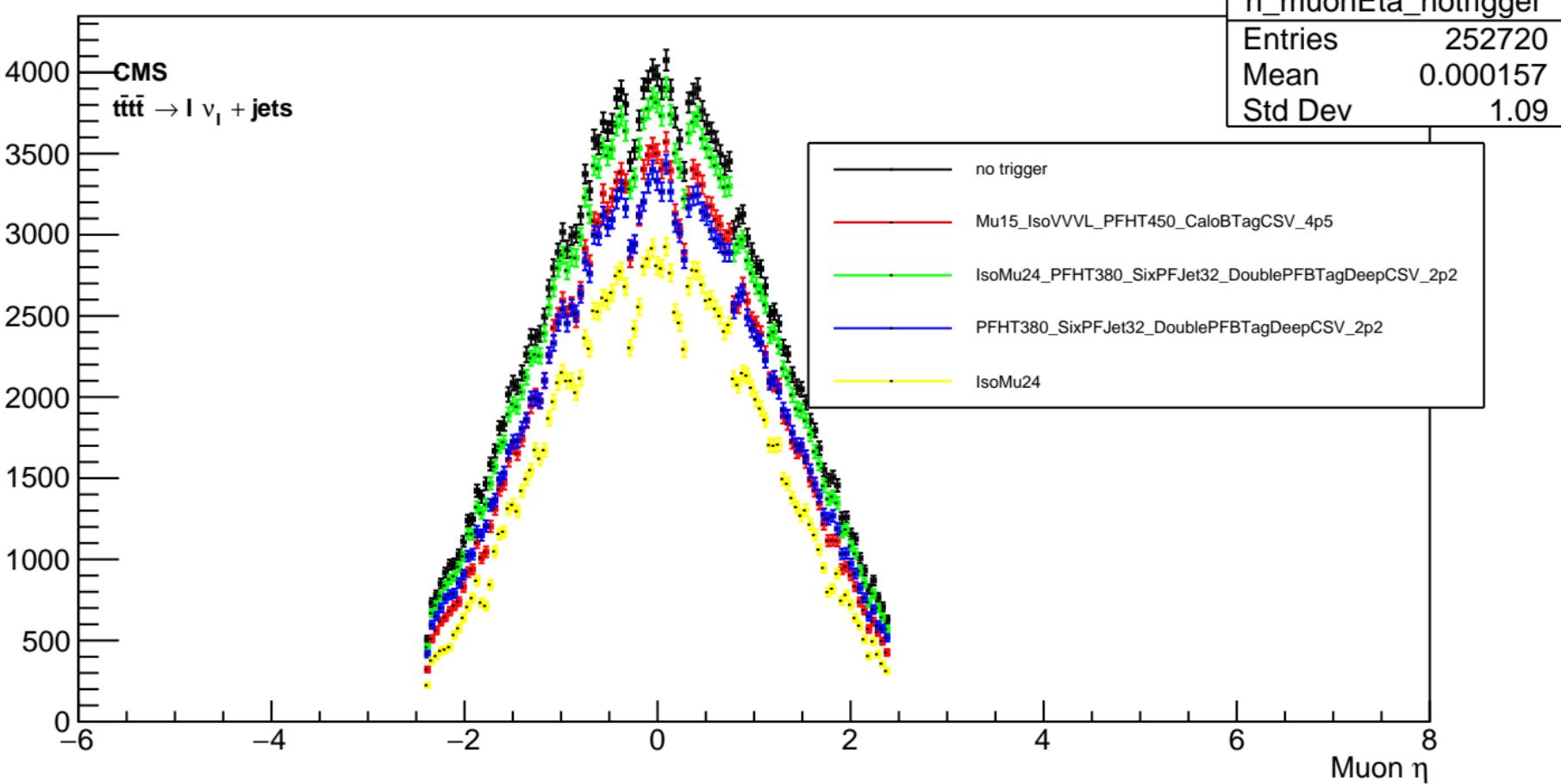


# no trigger



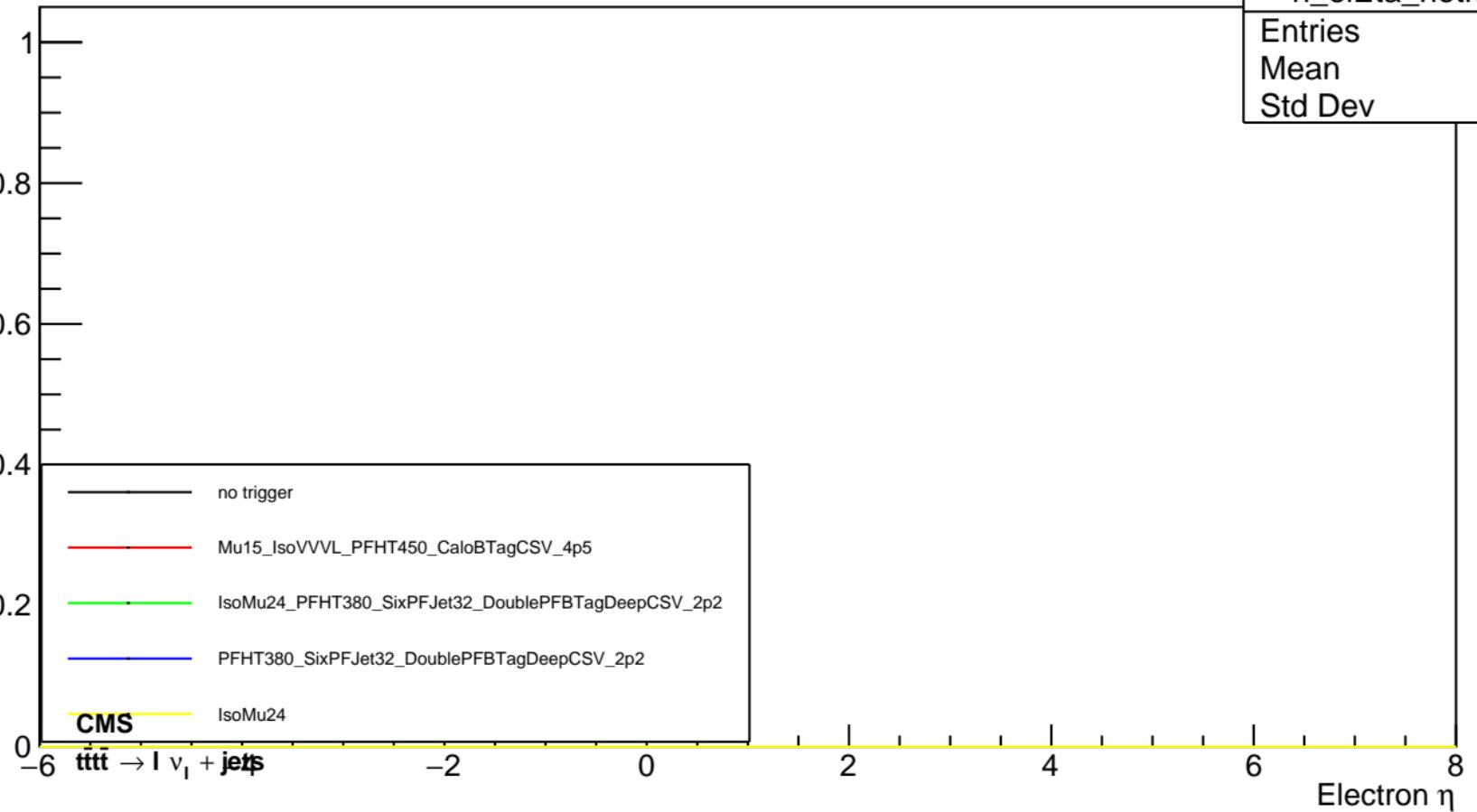
# no trigger

Number of Events per  $\delta\eta = 0.046$

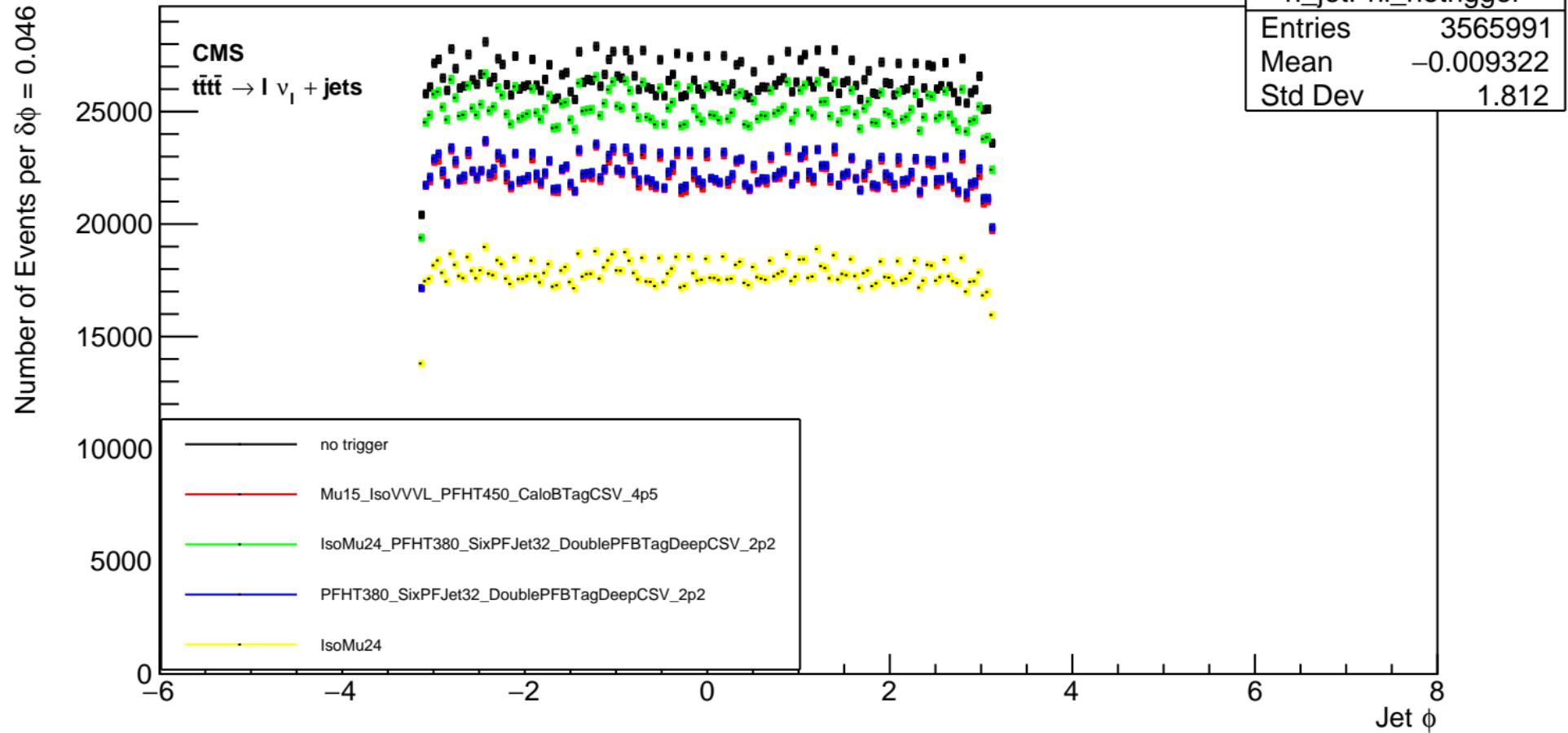


# no trigger

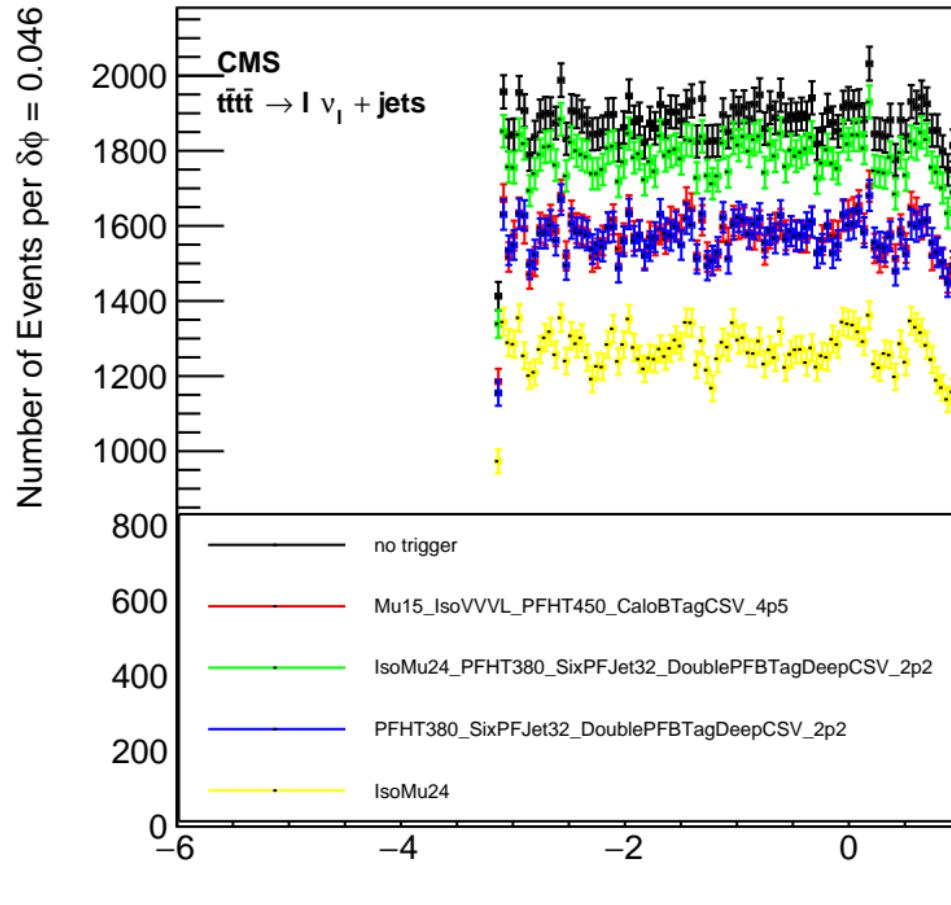
Number of Events per  $\delta\eta = 0.046$



# no trigger



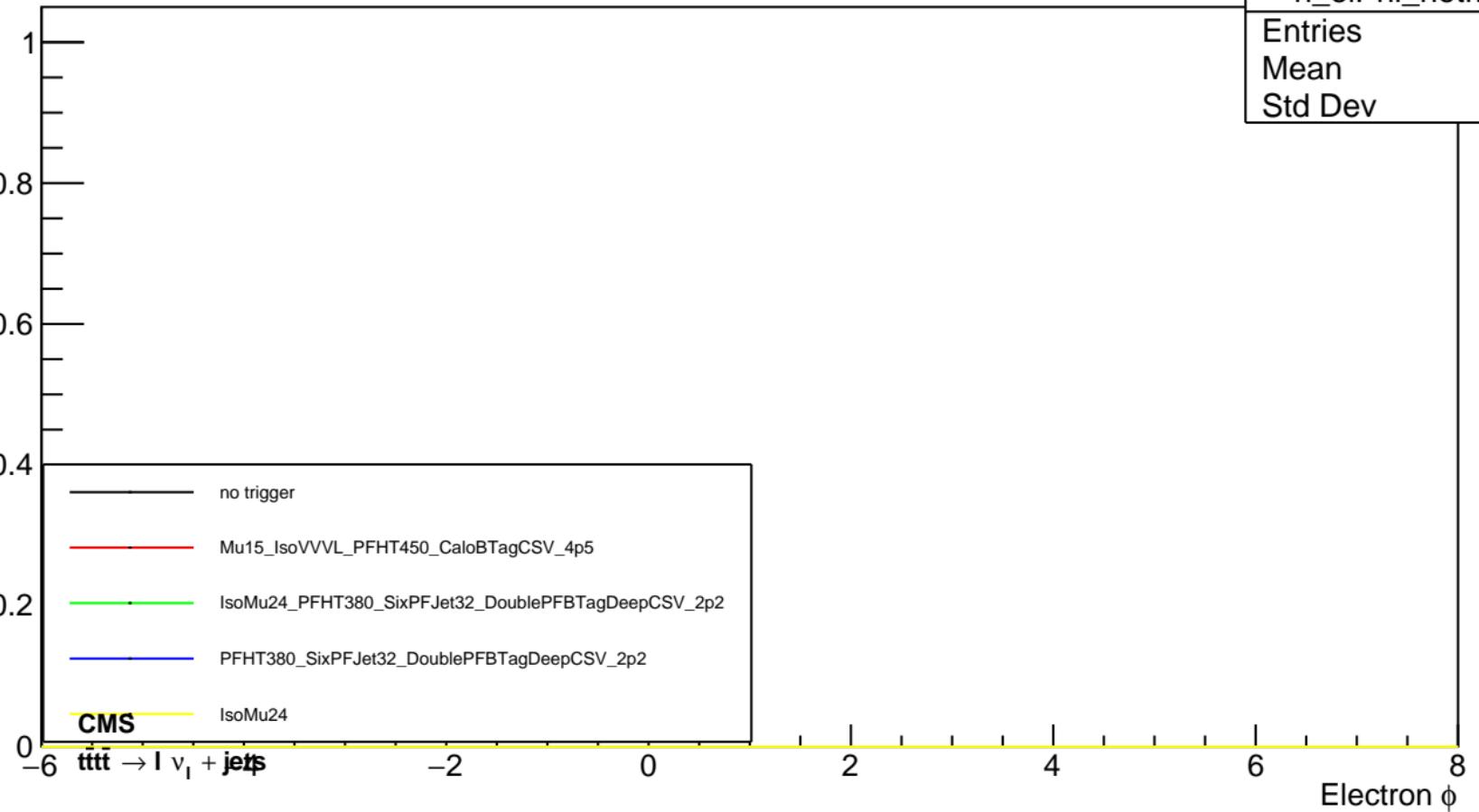
# no trigger



h_muonPhi_notrigger	
Entries	252720
Mean	-0.006832
Std Dev	1.813

# no trigger

Number of Events per  $\delta\phi = 0.046$

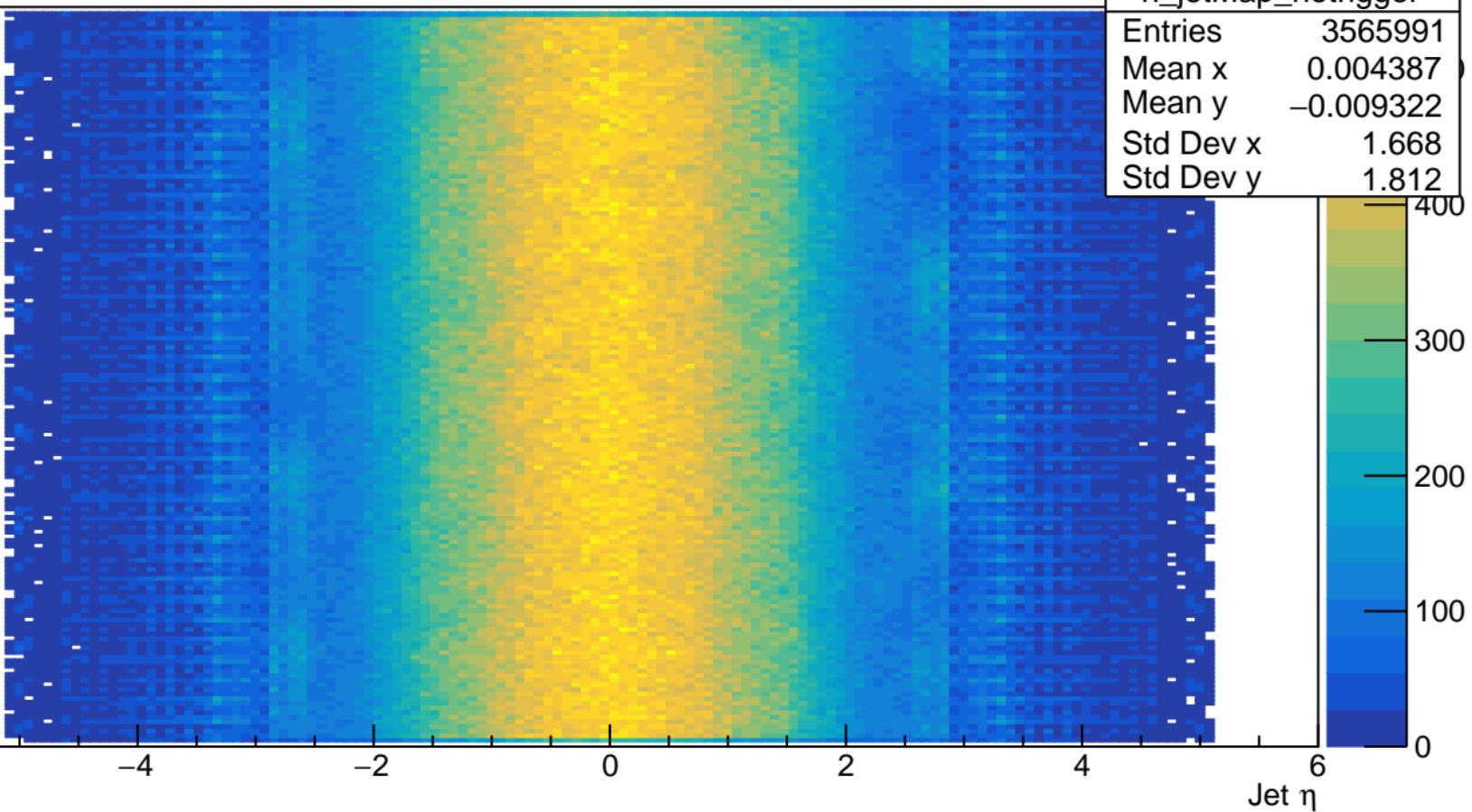


h_elPhi_notrigger	
Entries	0
Mean	0
Std Dev	0

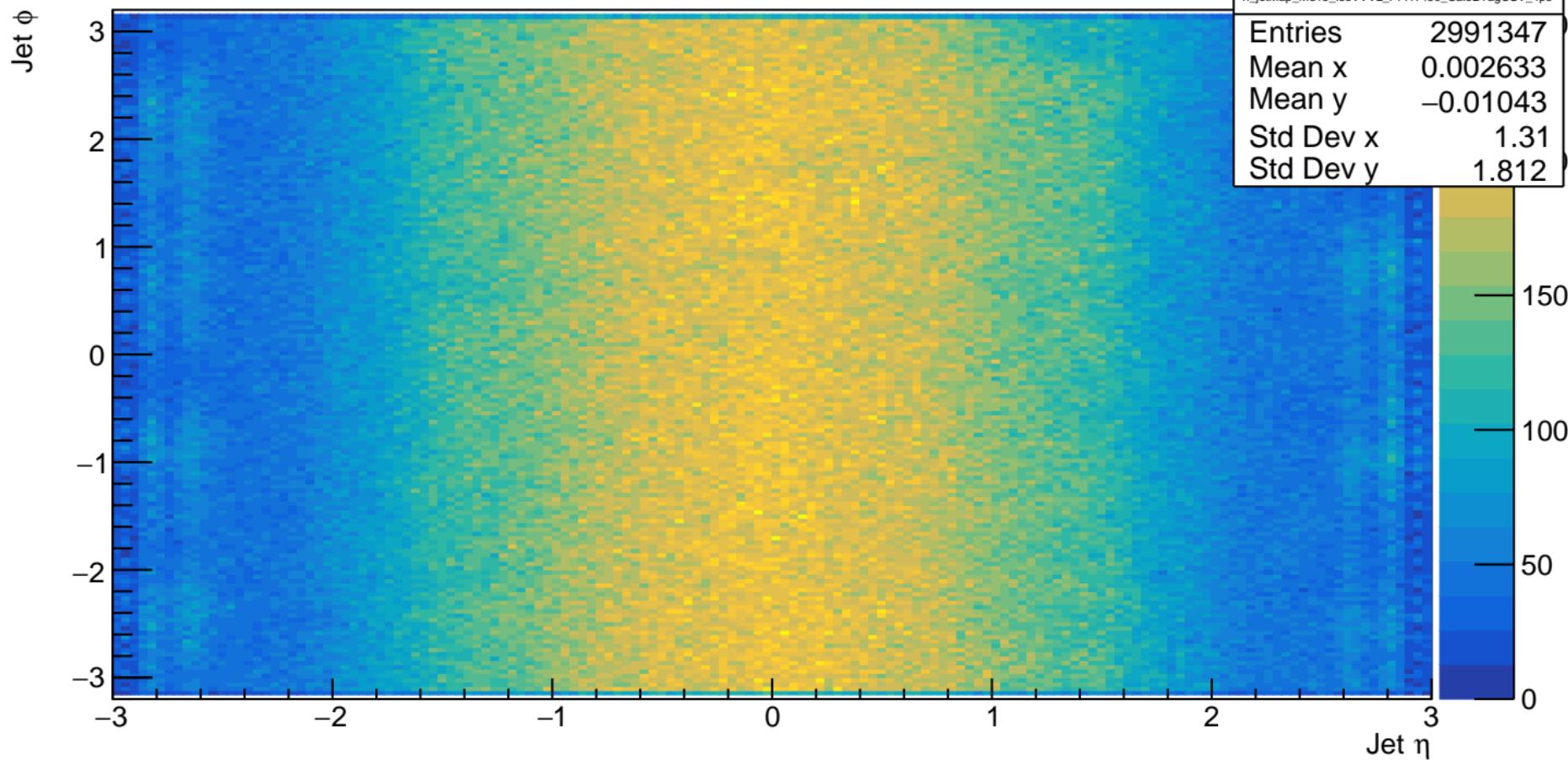
# no trigger

Jet  $\phi$

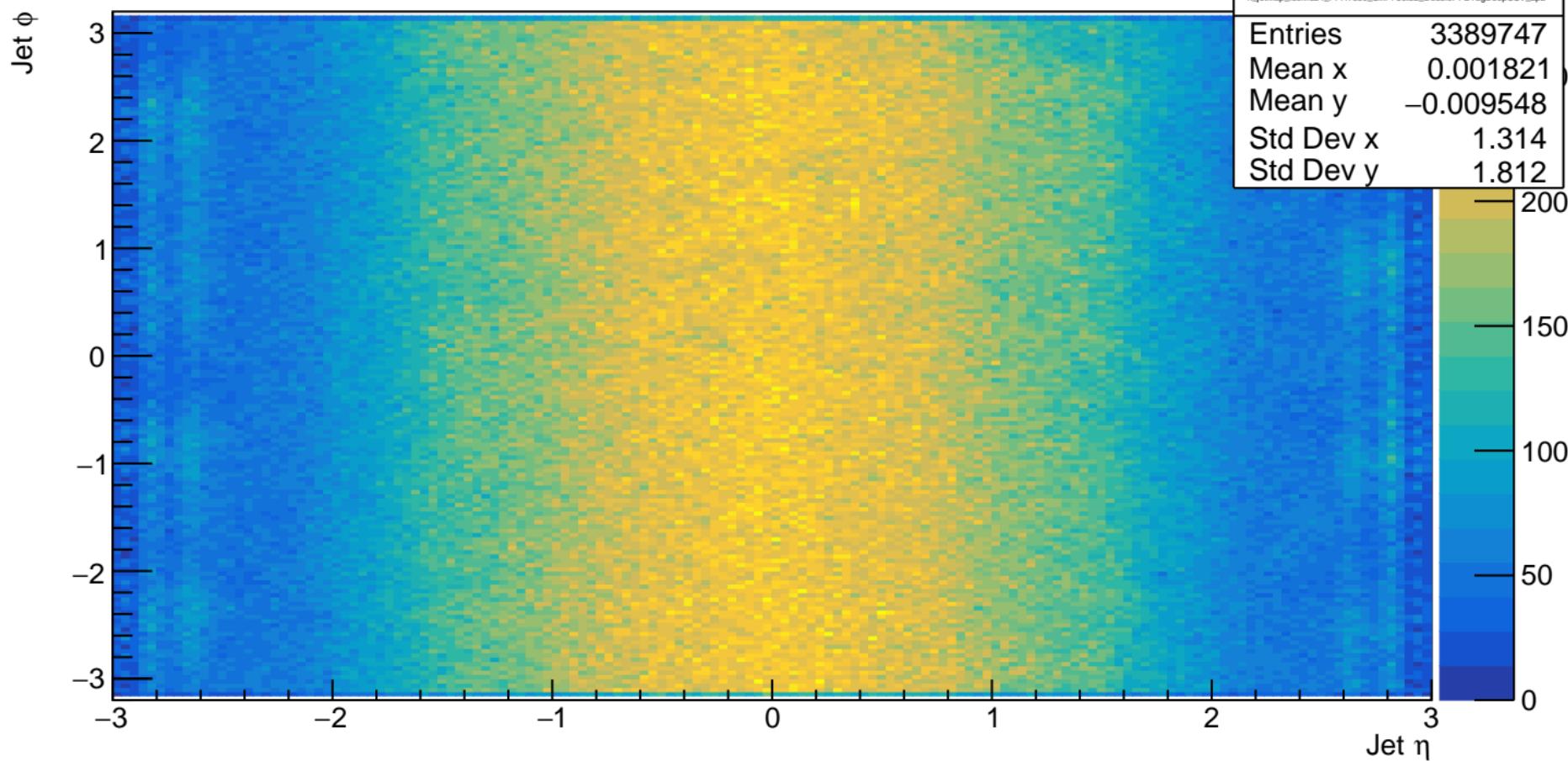
3  
2  
1  
0  
-1  
-2  
-3



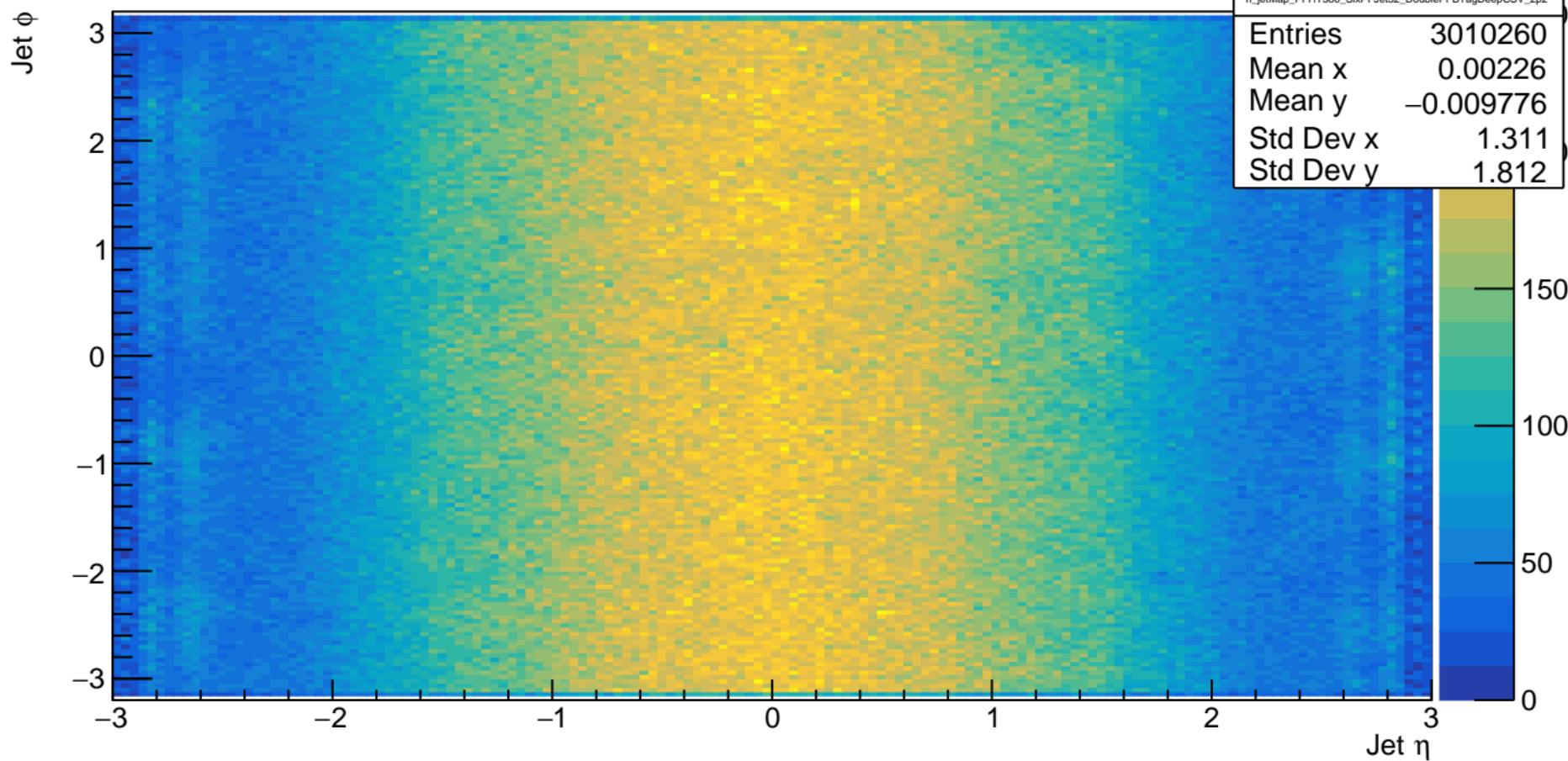
# Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



# IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



# PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



# IsoMu24

Jet  $\phi$

3  
2  
1  
0  
-1  
-2  
-3

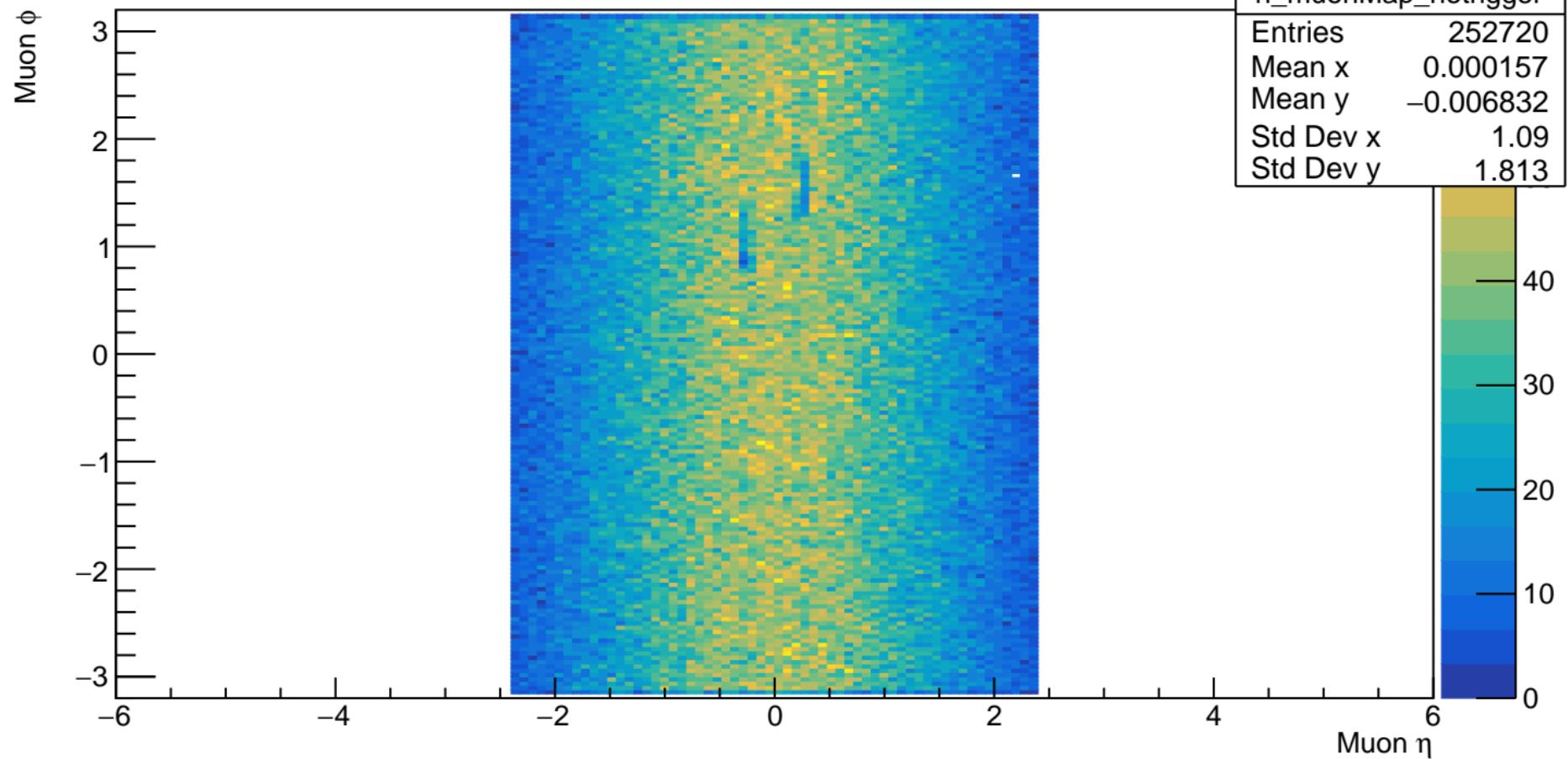
-3 -2 -1 0 1 2 3

Jet  $\eta$

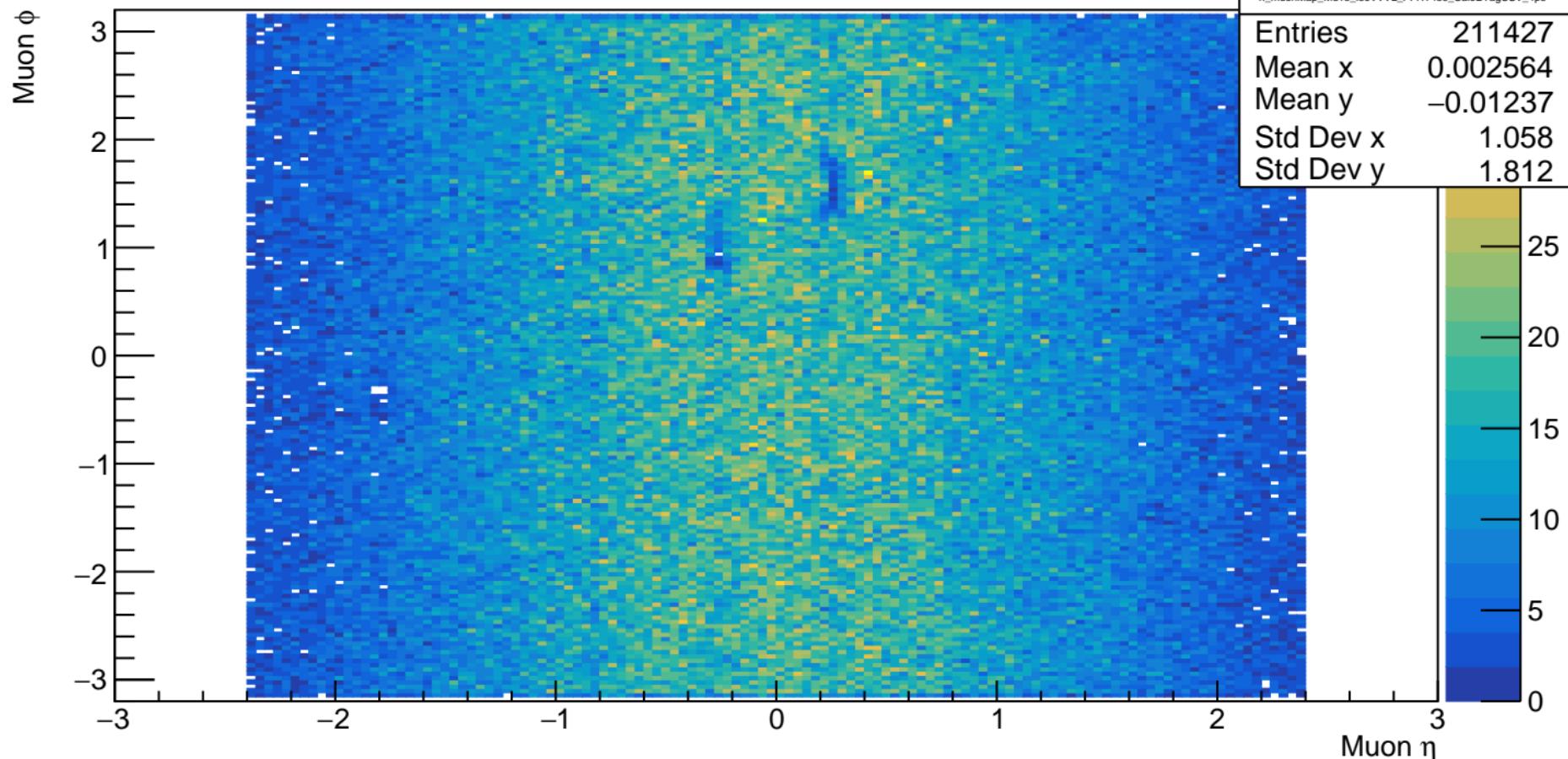
h_jetMap_IsoMu24	
Entries	2403378
Mean x	0.00237
Mean y	-0.00869
Std Dev x	1.314
Std Dev y	1.812

140  
120  
100  
80  
60  
40  
20  
0

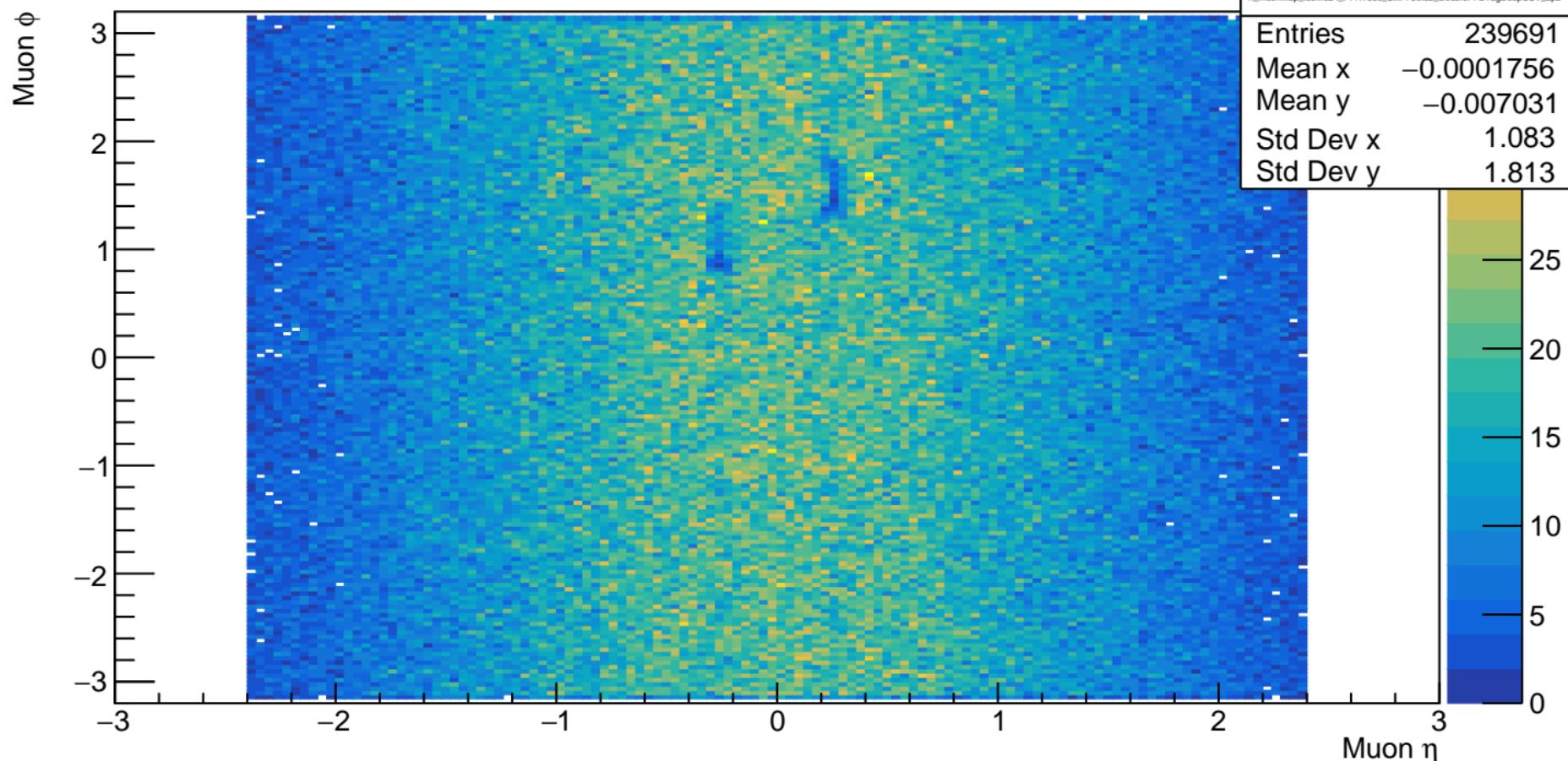
no trigger



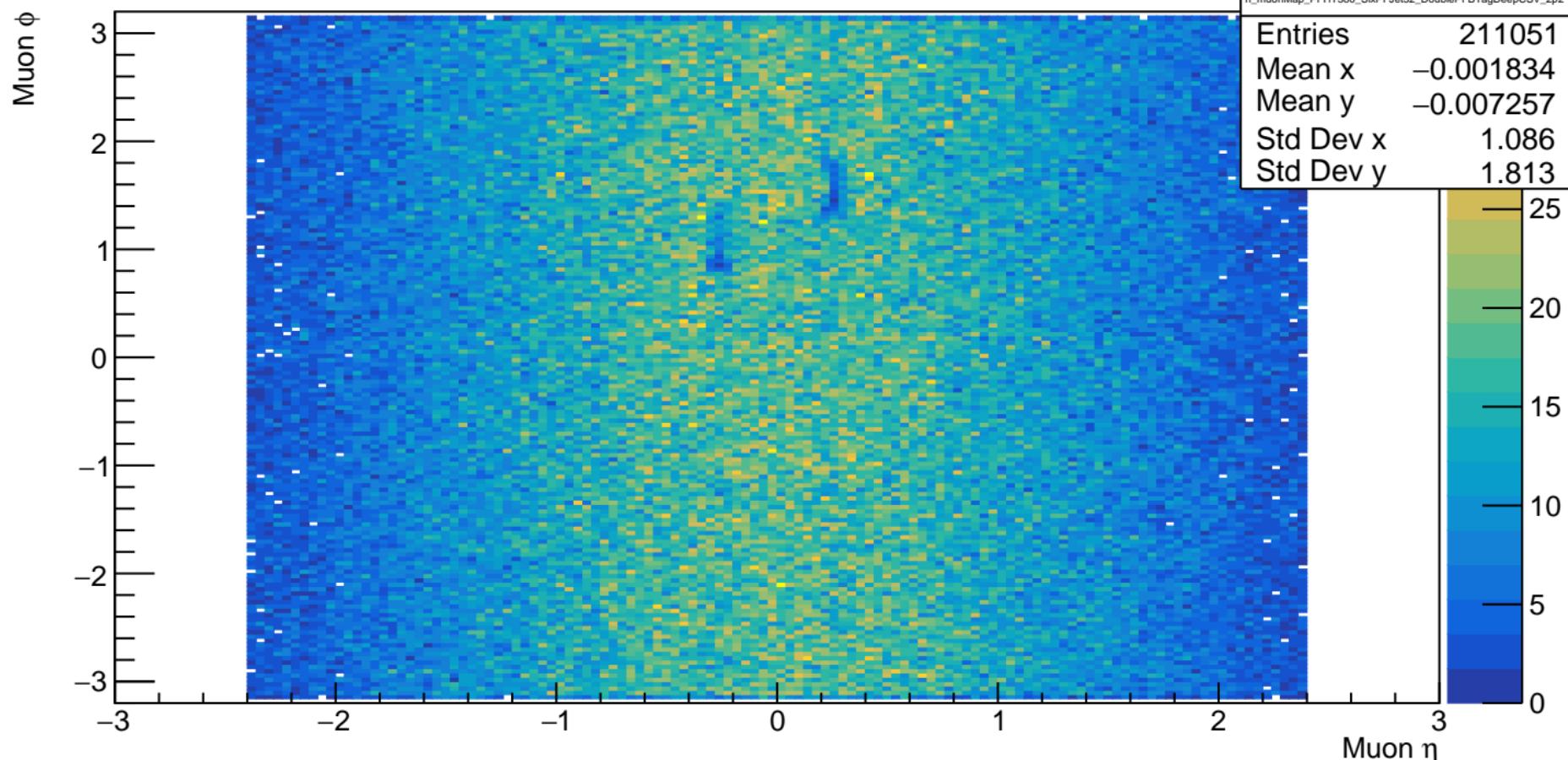
# Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



# IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



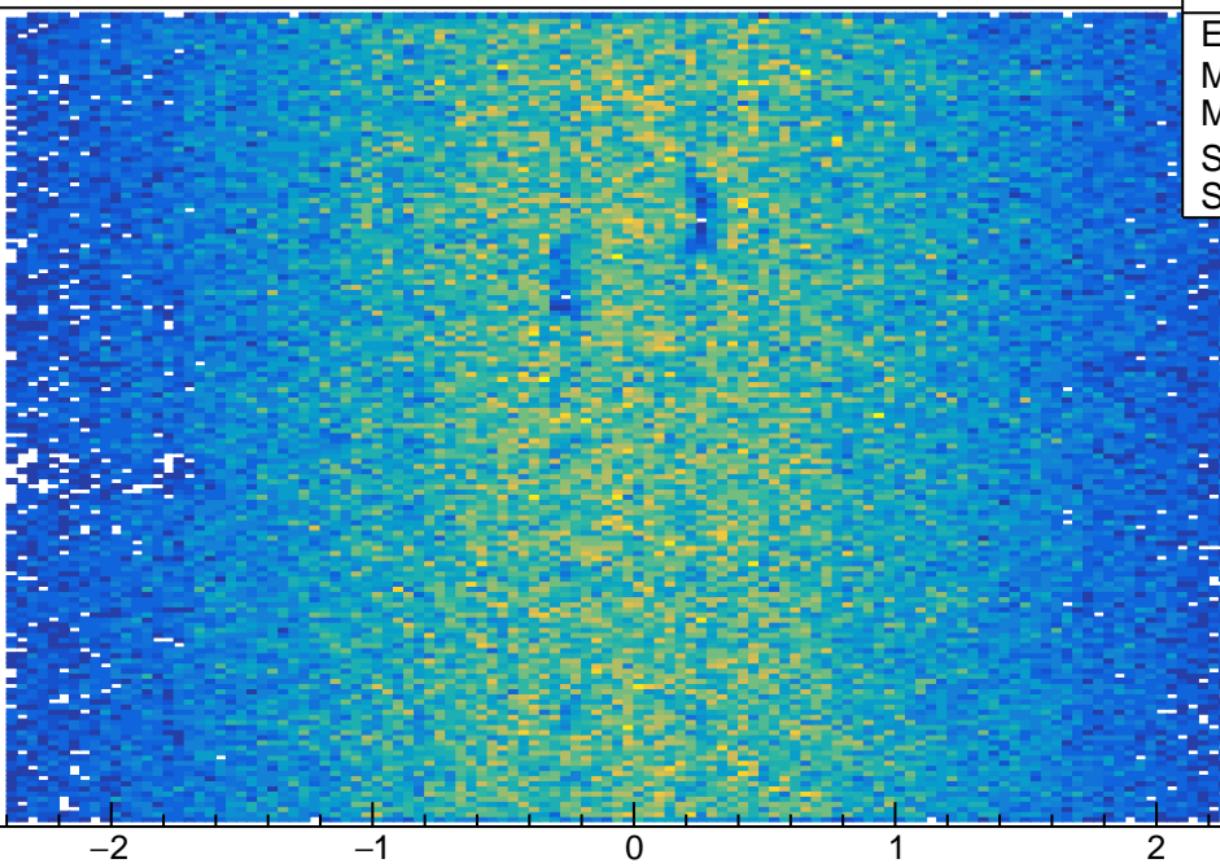
# PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



# IsoMu24

Muon  $\phi$

3  
2  
1  
0  
-1  
-2  
-3



h_muonMap_IsoMu24	
Entries	170595
Mean x	0.005168
Mean y	-0.008568
Std Dev x	1.044
Std Dev y	1.816

20  
15  
10  
5  
0

Muon  $\eta$

# no trigger

Electron  $\phi$

3  
2  
1  
0  
-1  
-2  
-3

-6 -4 -2 0 2 4 6

Electron  $\eta$

h_elMap_notrigger	
Entries	0
Mean x	0
Mean y	0
Std Dev x	0
Std Dev y	0

# Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5

Electron  $\phi$



Electron  $\eta$

h_elMap_Mu15_IsoVVVL_PFHT450_CaloBTagCSV_4p5	
Entries	0
Mean x	0
Mean y	0
Std Dev x	0
Std Dev y	0

# IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

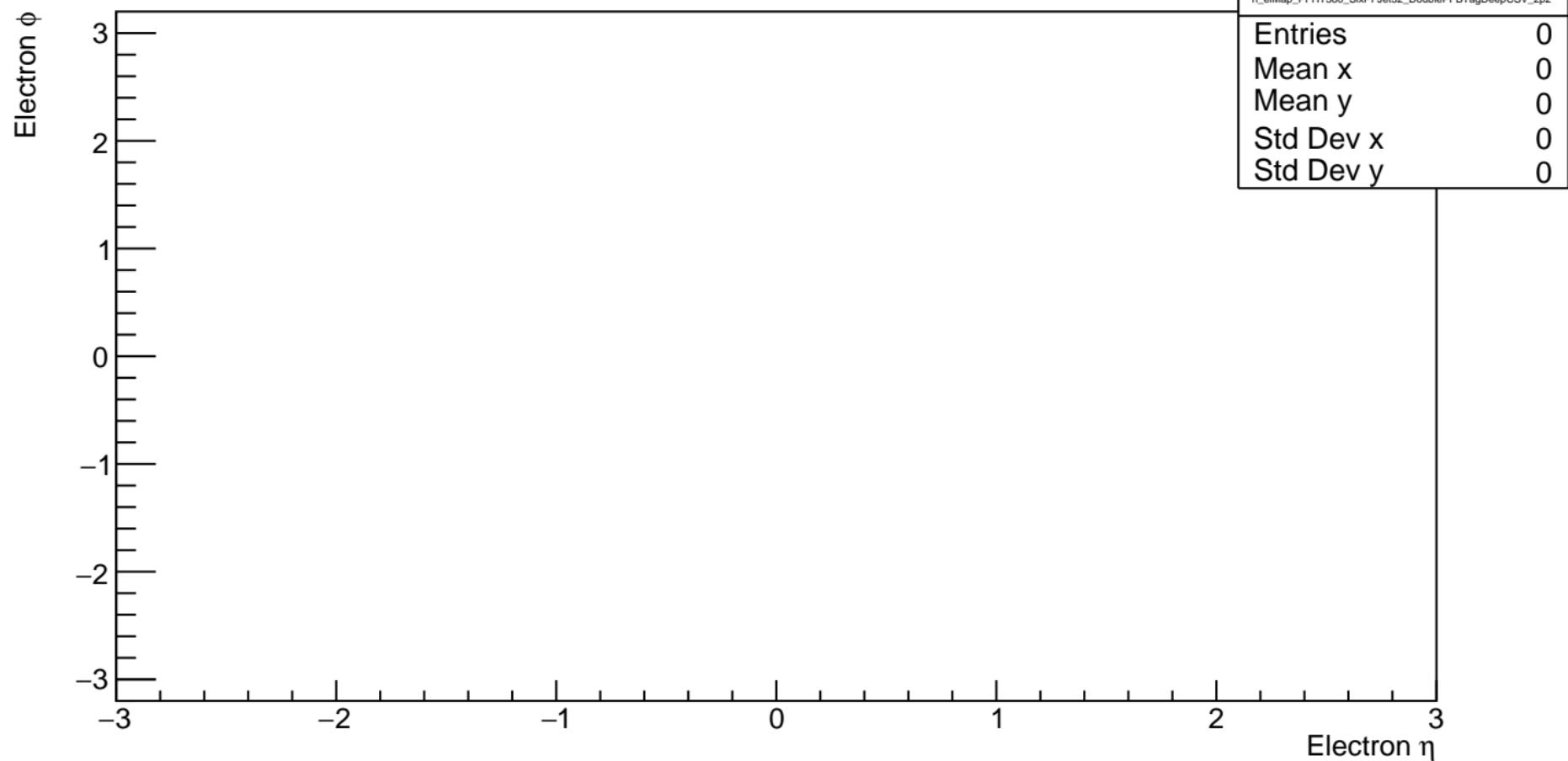
Electron  $\phi$



h_elMap_IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2	
Entries	0
Mean x	0
Mean y	0
Std Dev x	0
Std Dev y	0

Electron  $\eta$

# PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2



# IsoMu24

Electron  $\phi$

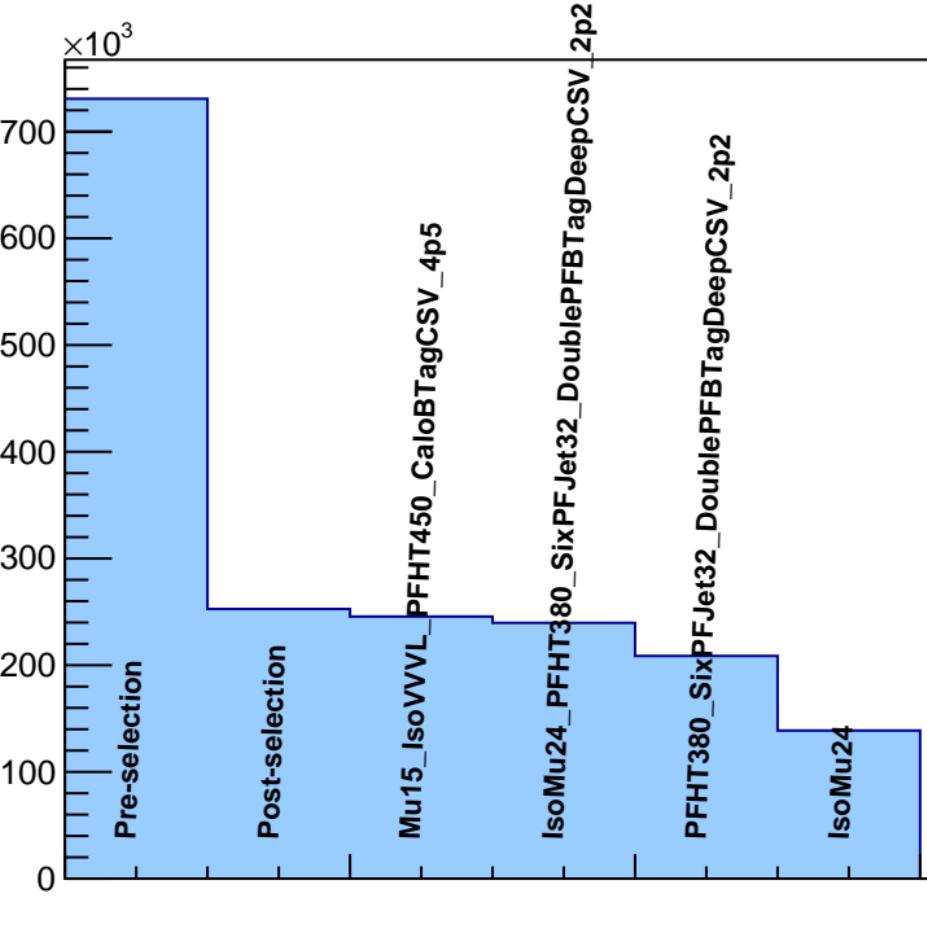
3  
2  
1  
0  
-1  
-2  
-3

-3 -2 -1 0 1 2 3

Electron  $\eta$

h_elMap_IsoMu24	
Entries	0
Mean x	0
Mean y	0
Std Dev x	0
Std Dev y	0

Total Number of Accepted Events



h_eventsPrg	
Entries	1816299
Mean	1.647
Std Dev	1.704