

On-line (pre-)selection Requisites for:

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

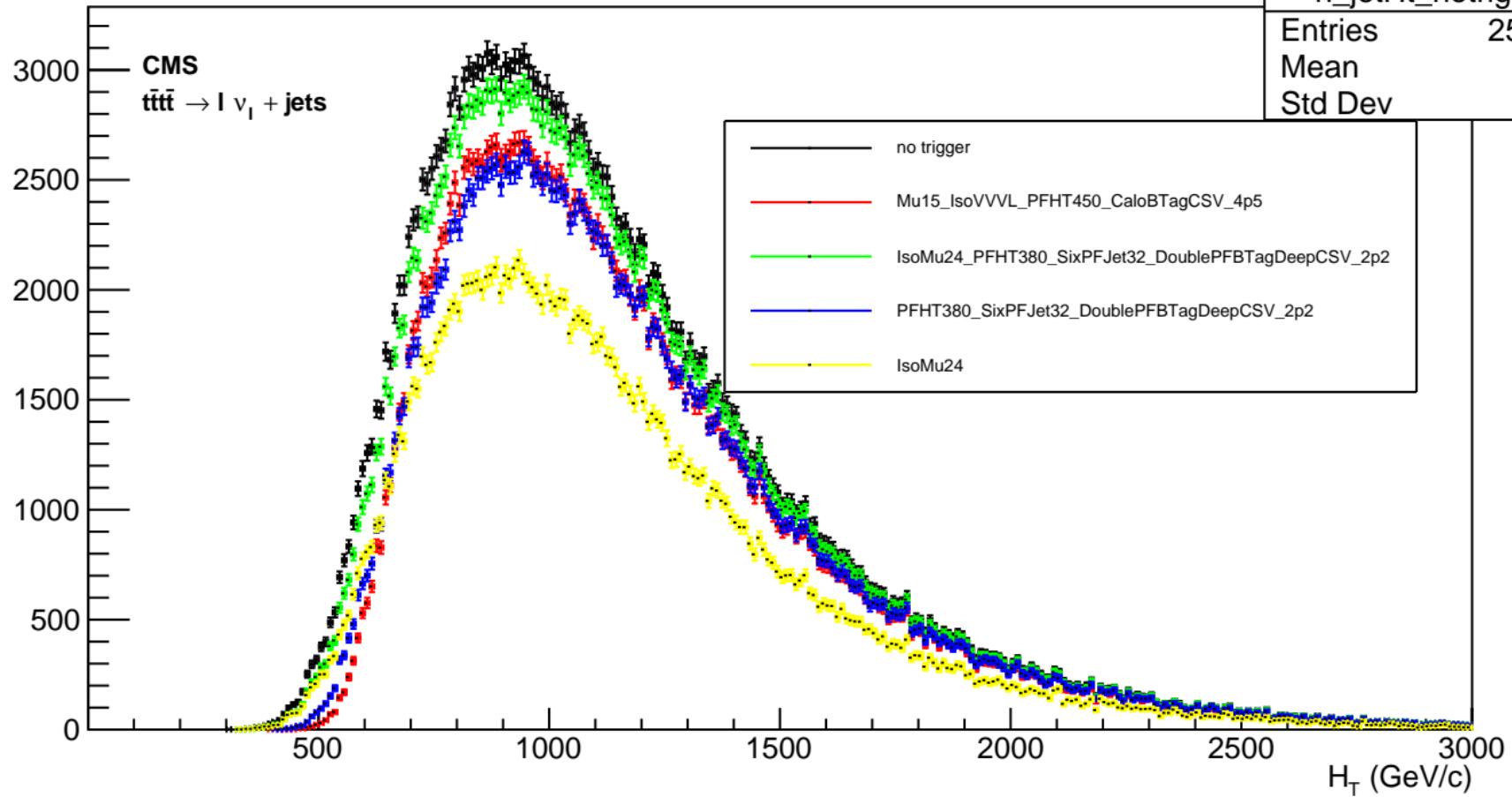
Event Limit: None (see last page)

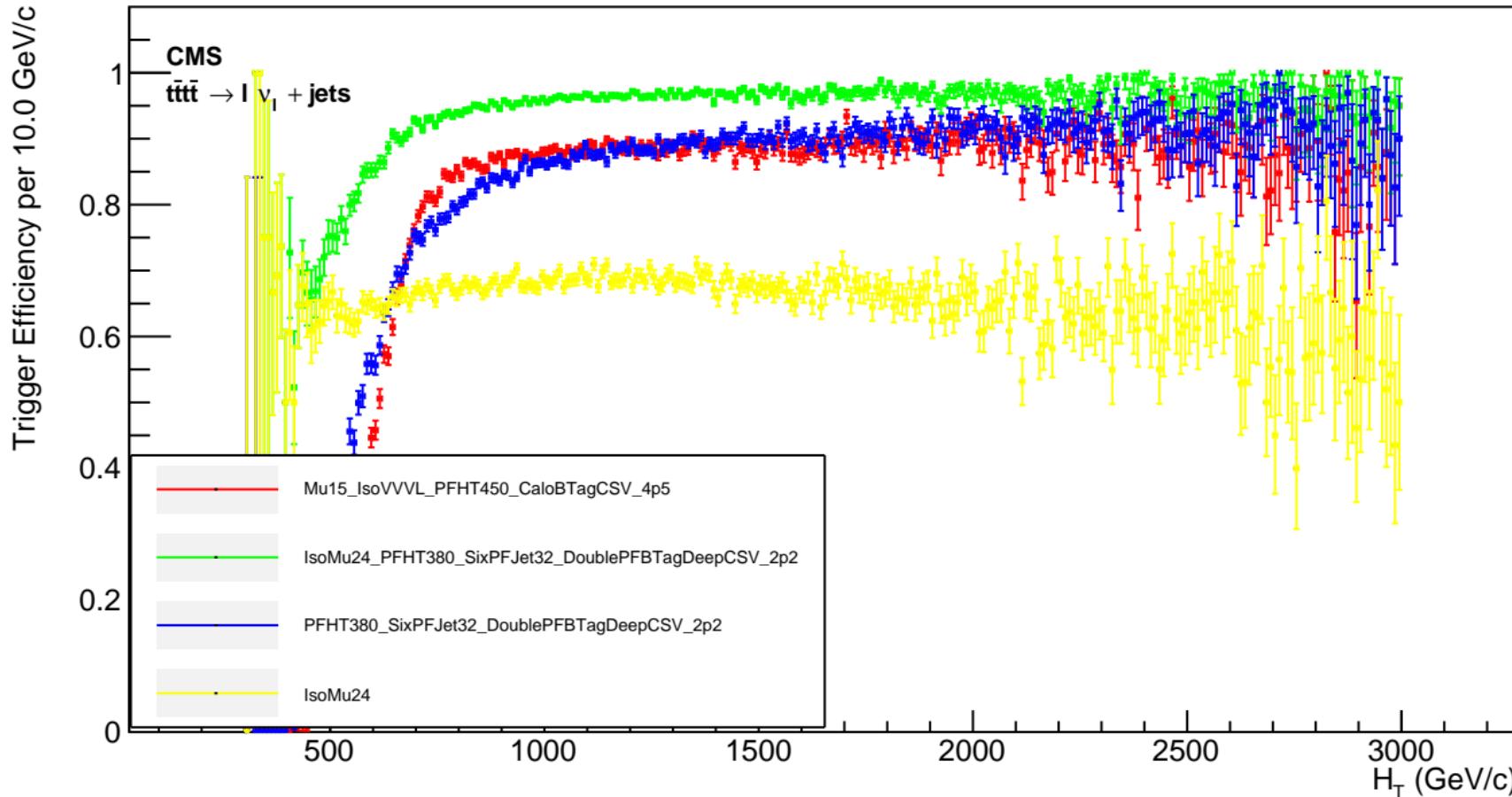
Off-line (post-)selection Requisites for:

- **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

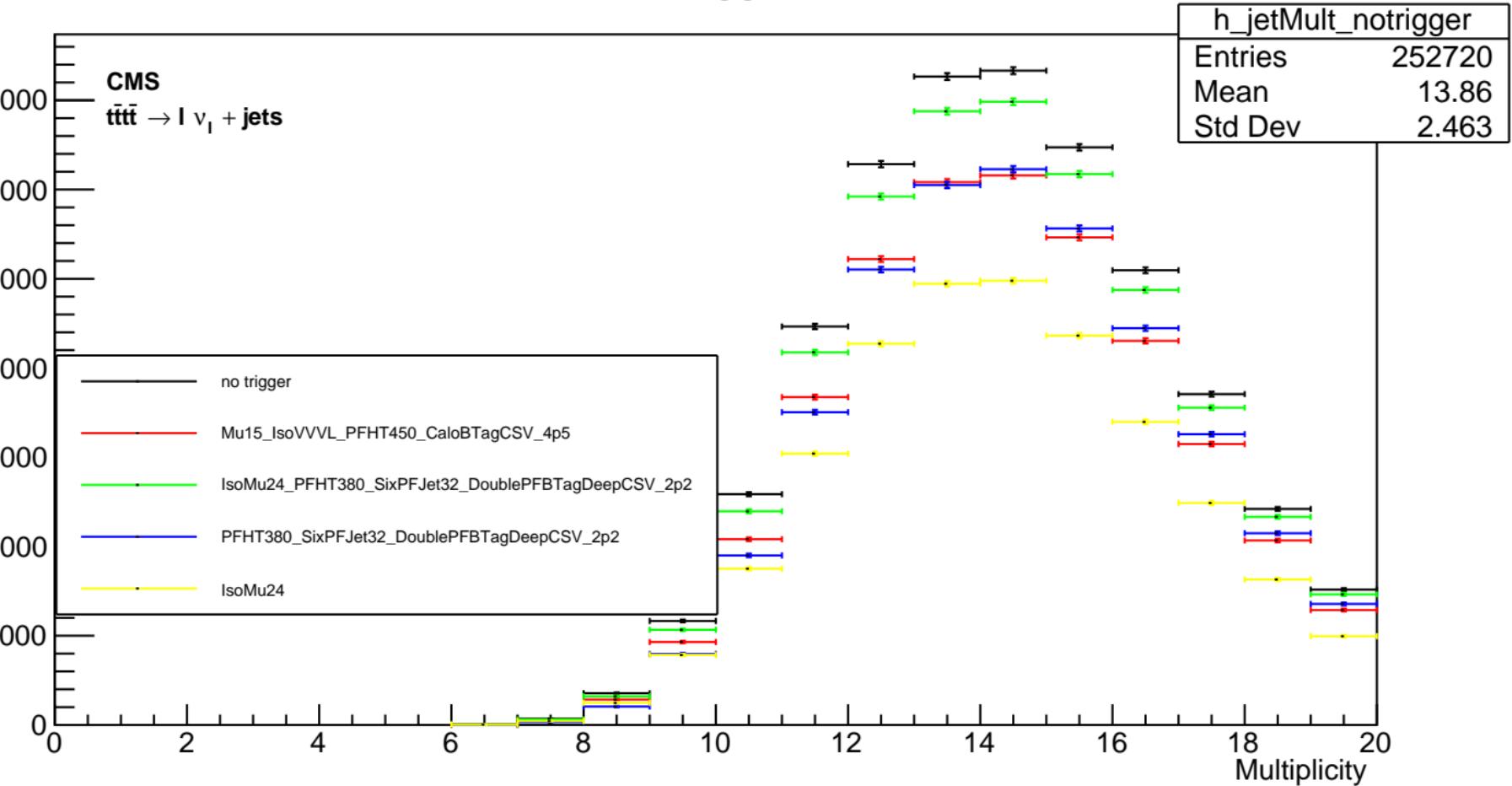
Number of Events per 10 GeV/c

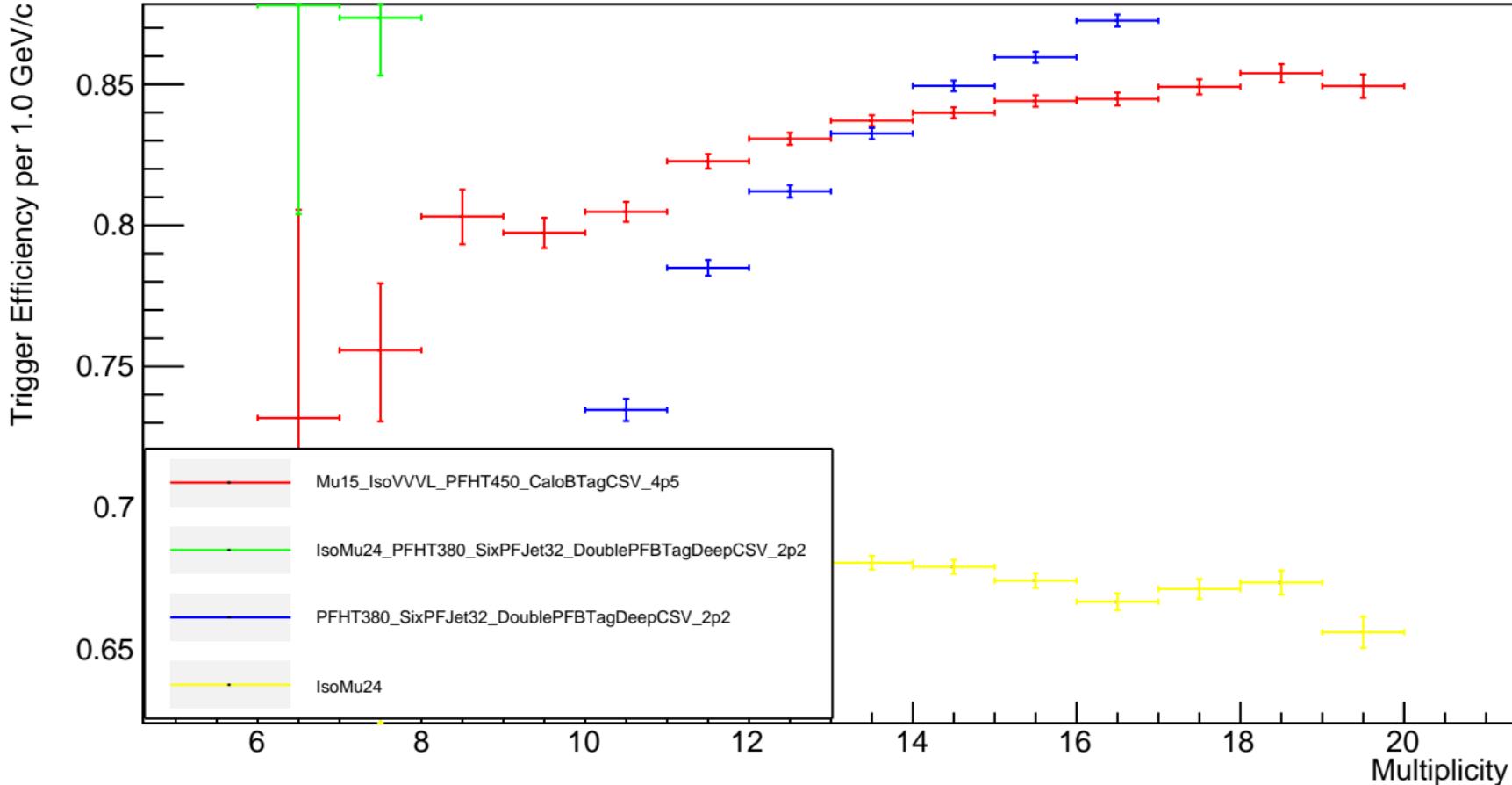




no trigger

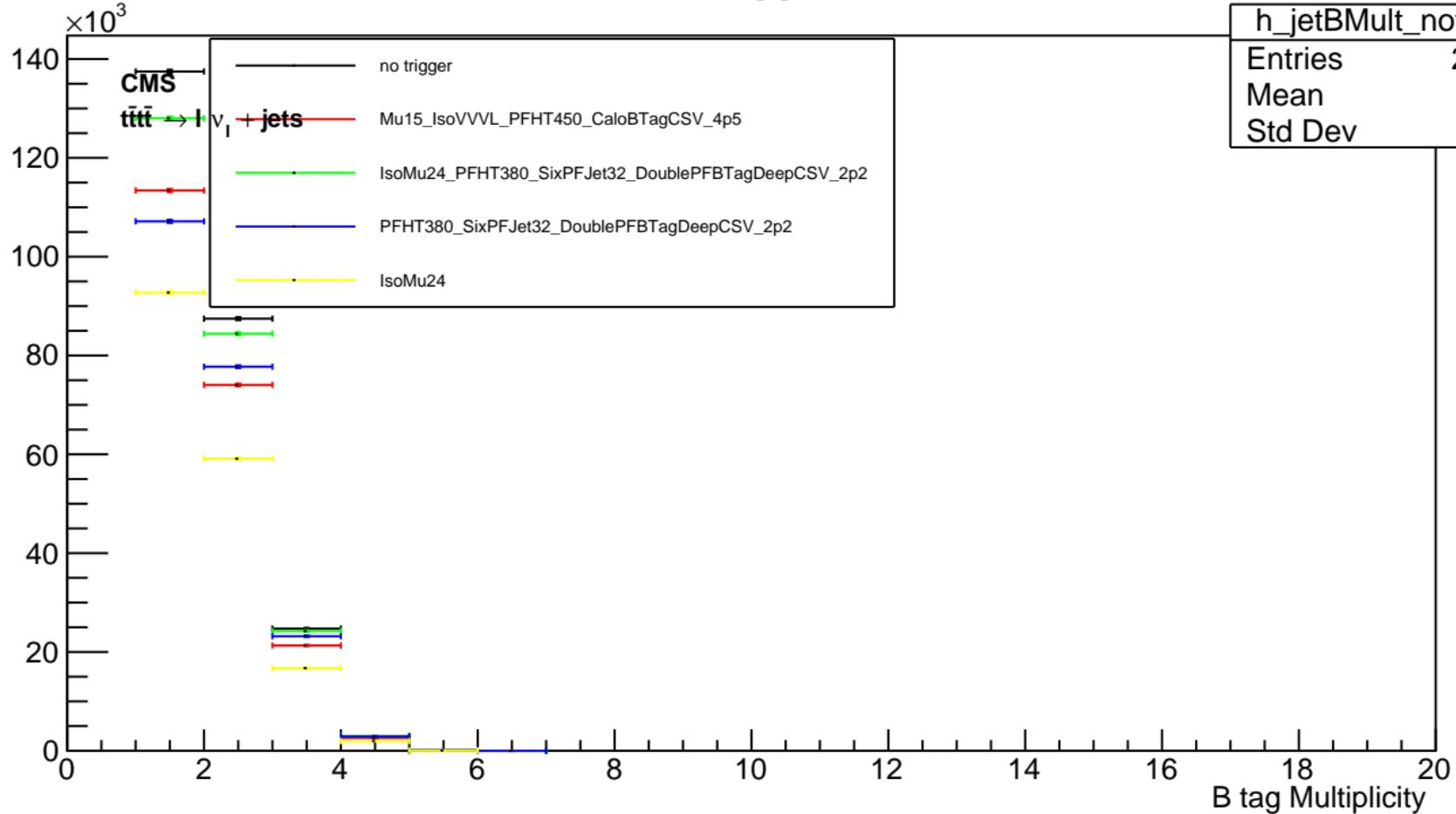
Number of Events per Number of Jets





no trigger

Number of Events per Number of Jets



h_jetBMult_notrigger	
Entries	252720
Mean	1.578
Std Dev	0.7174

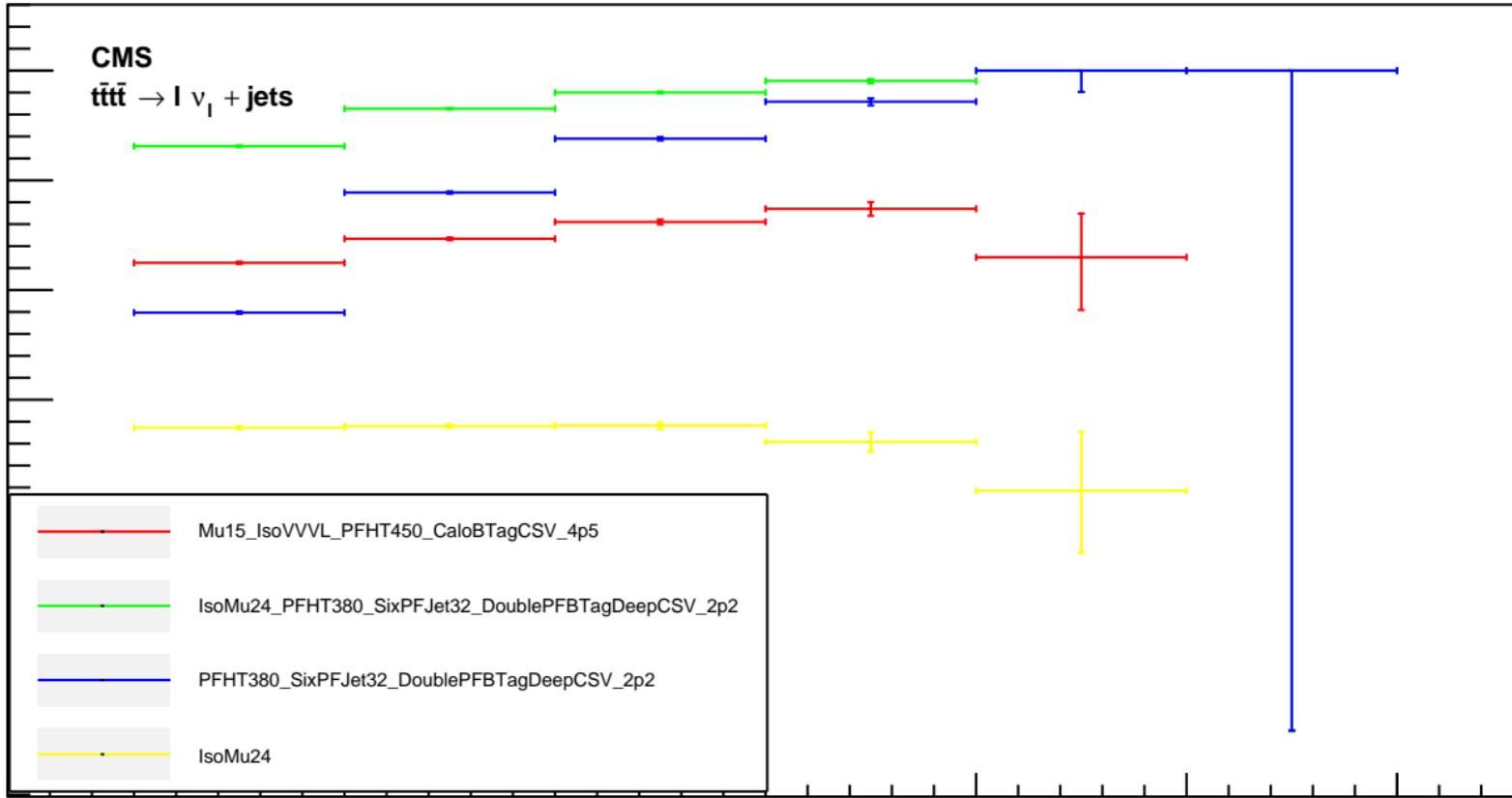
Trigger Efficiency per 1.0 GeV/c

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

1 2 3 4 5 6 7

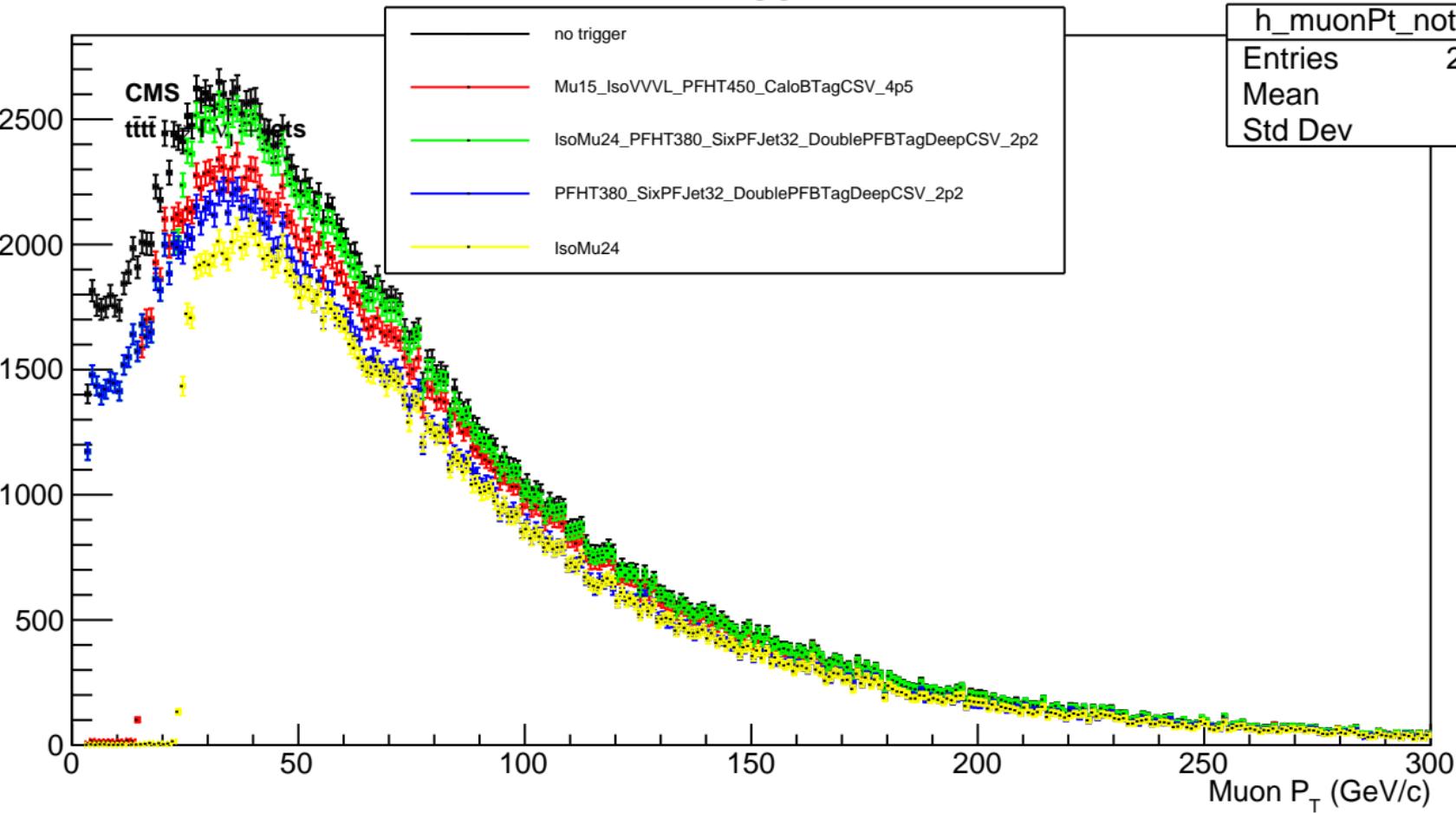
B tag Multiplicity

- Mu15_IsoVVVL_PFHT450_CaloBTagCSV_4p5
- IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
- PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
- IsoMu24



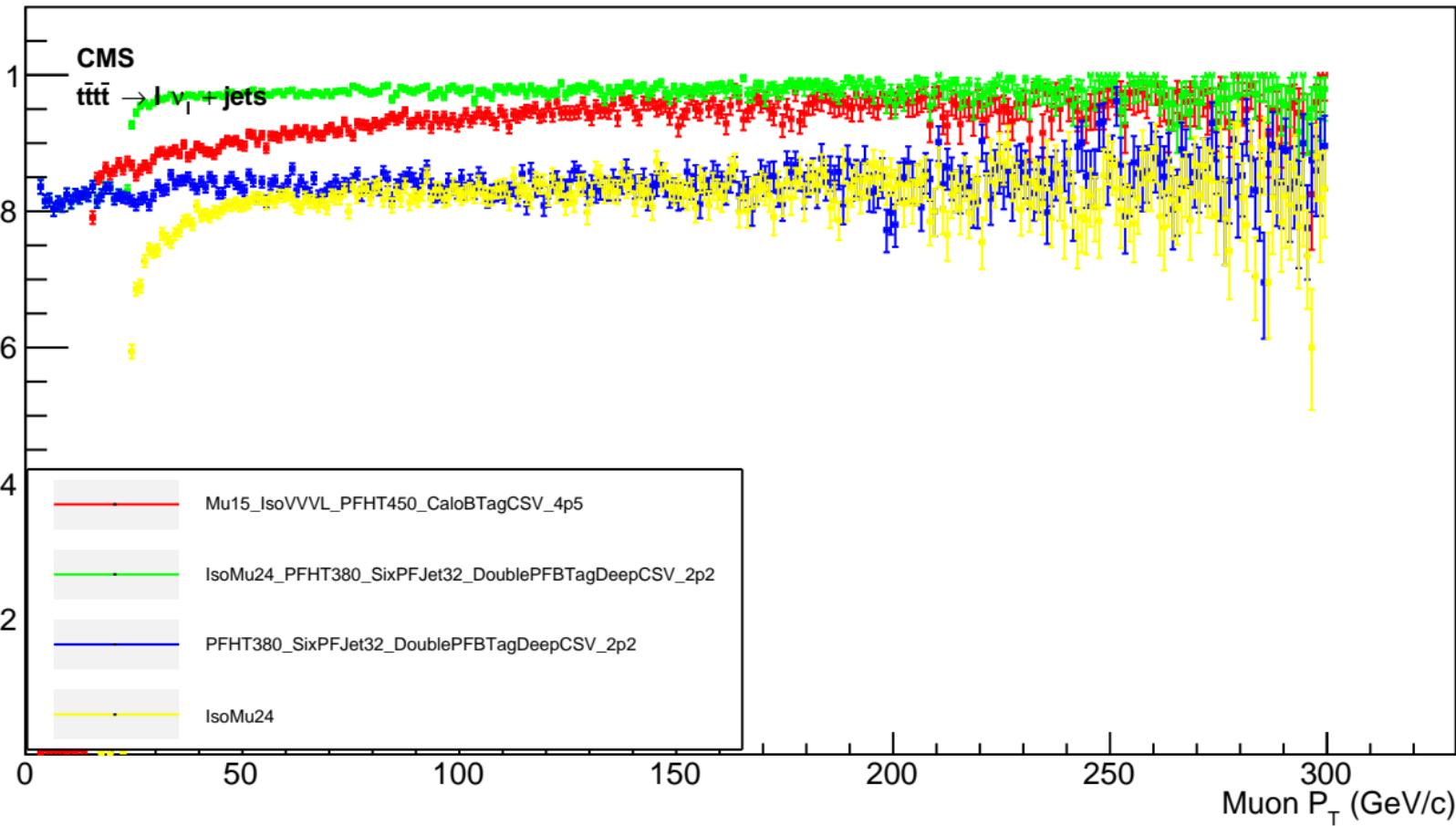
no trigger

Number of Events per 1 GeV/c



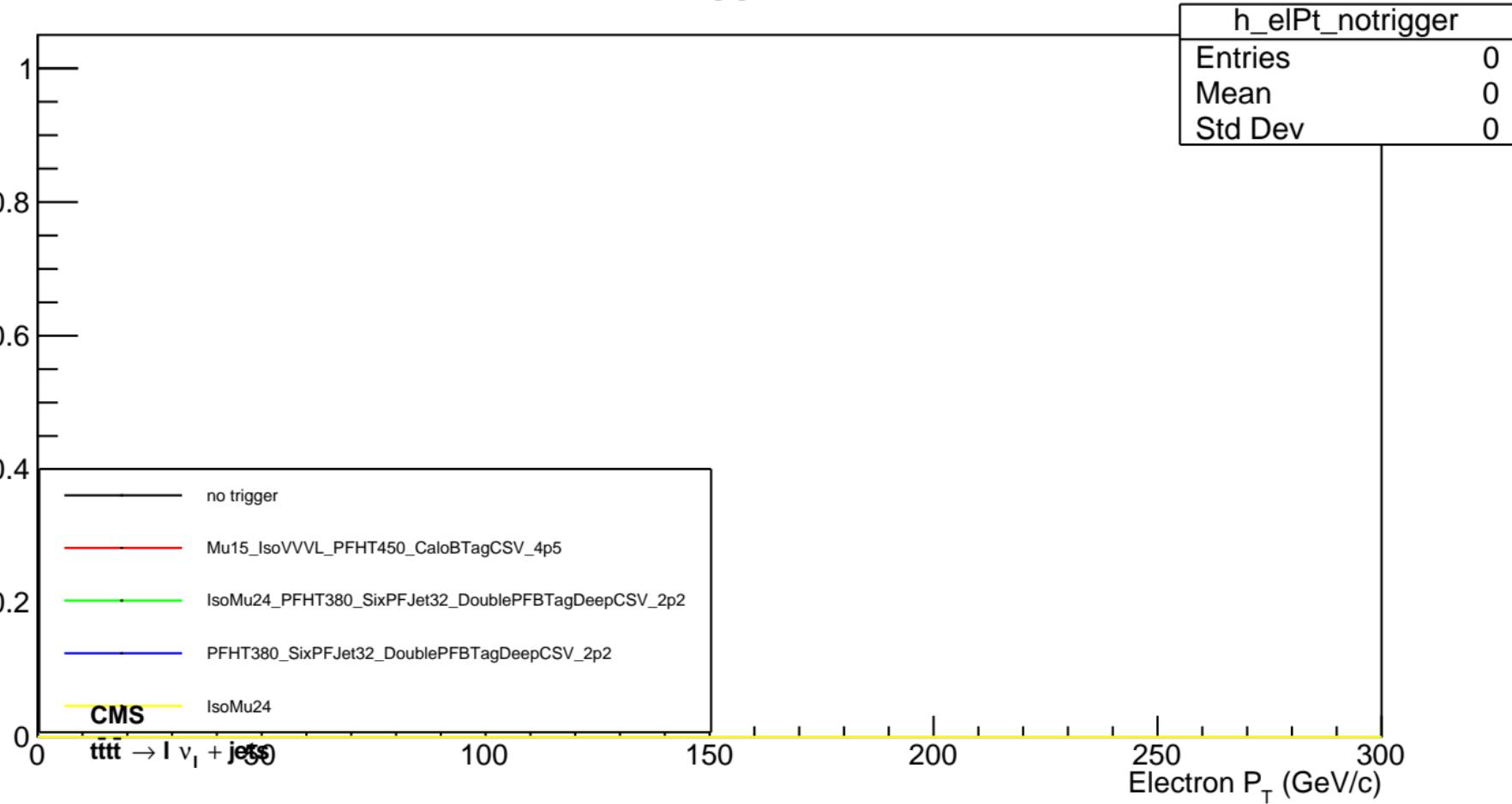
h_muonPt_notrigger	
Entries	252720
Mean	72.96
Std Dev	55.72

Trigger Efficiency per 1.0 GeV/c



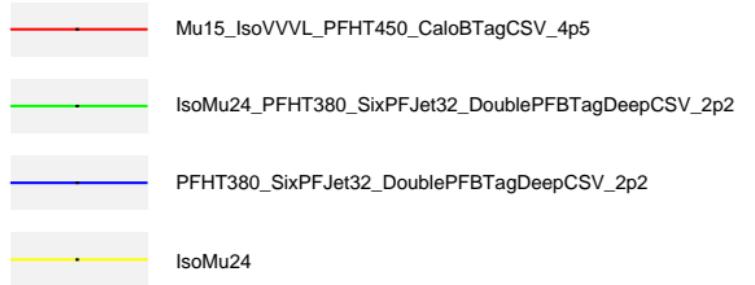
no trigger

Number of Events per 1 GeV/c

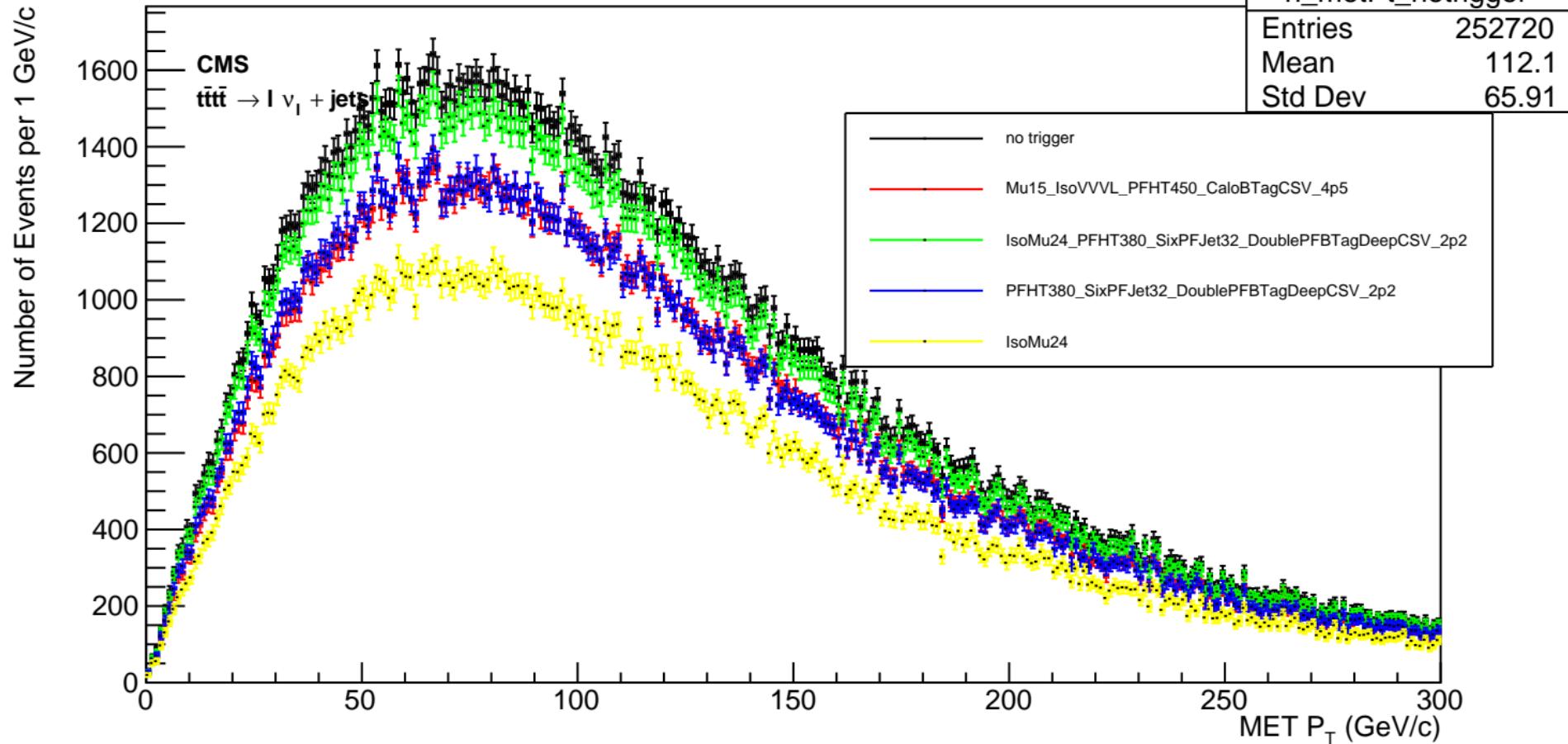


CMS

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



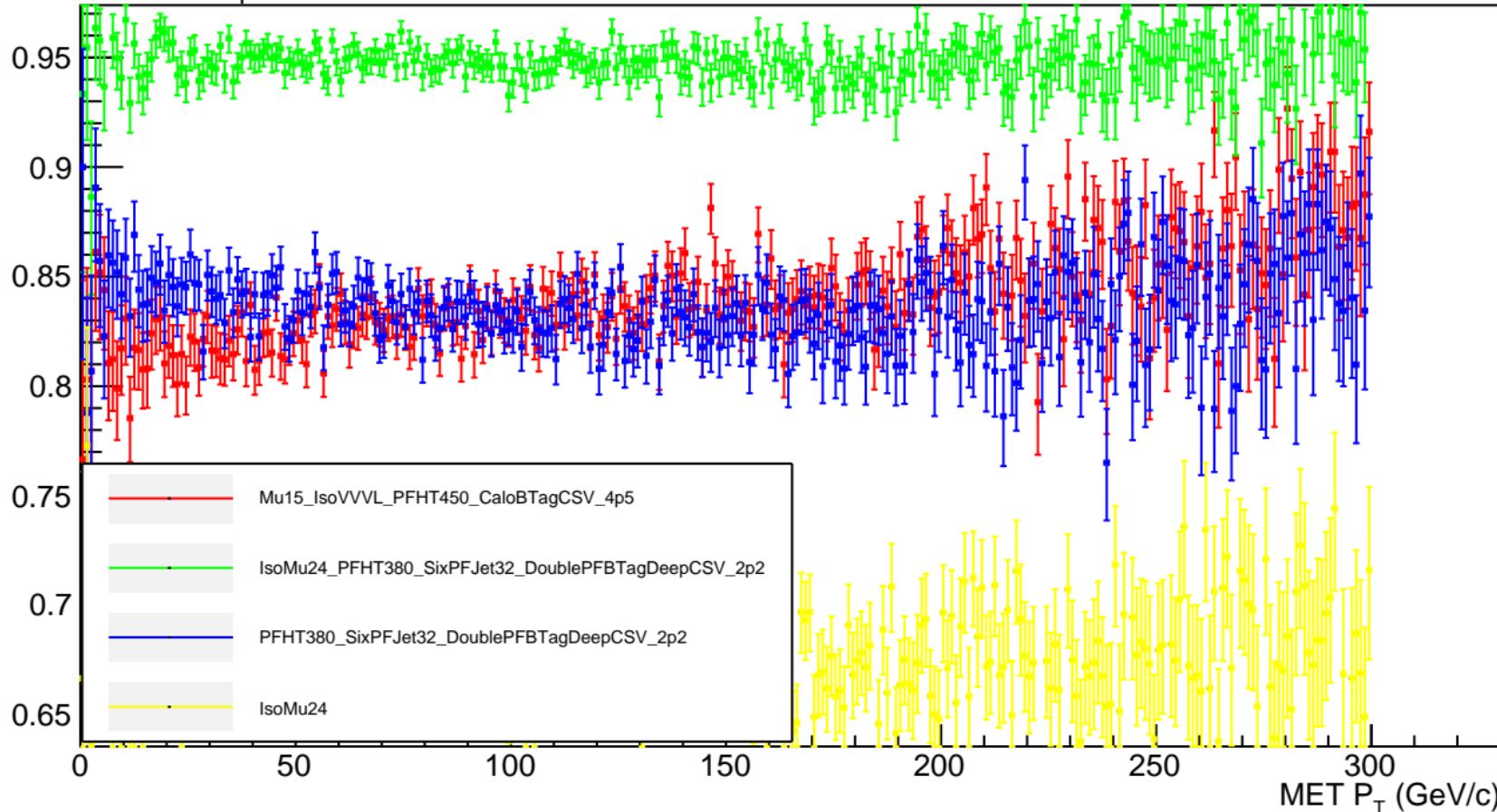
no trigger



CMS

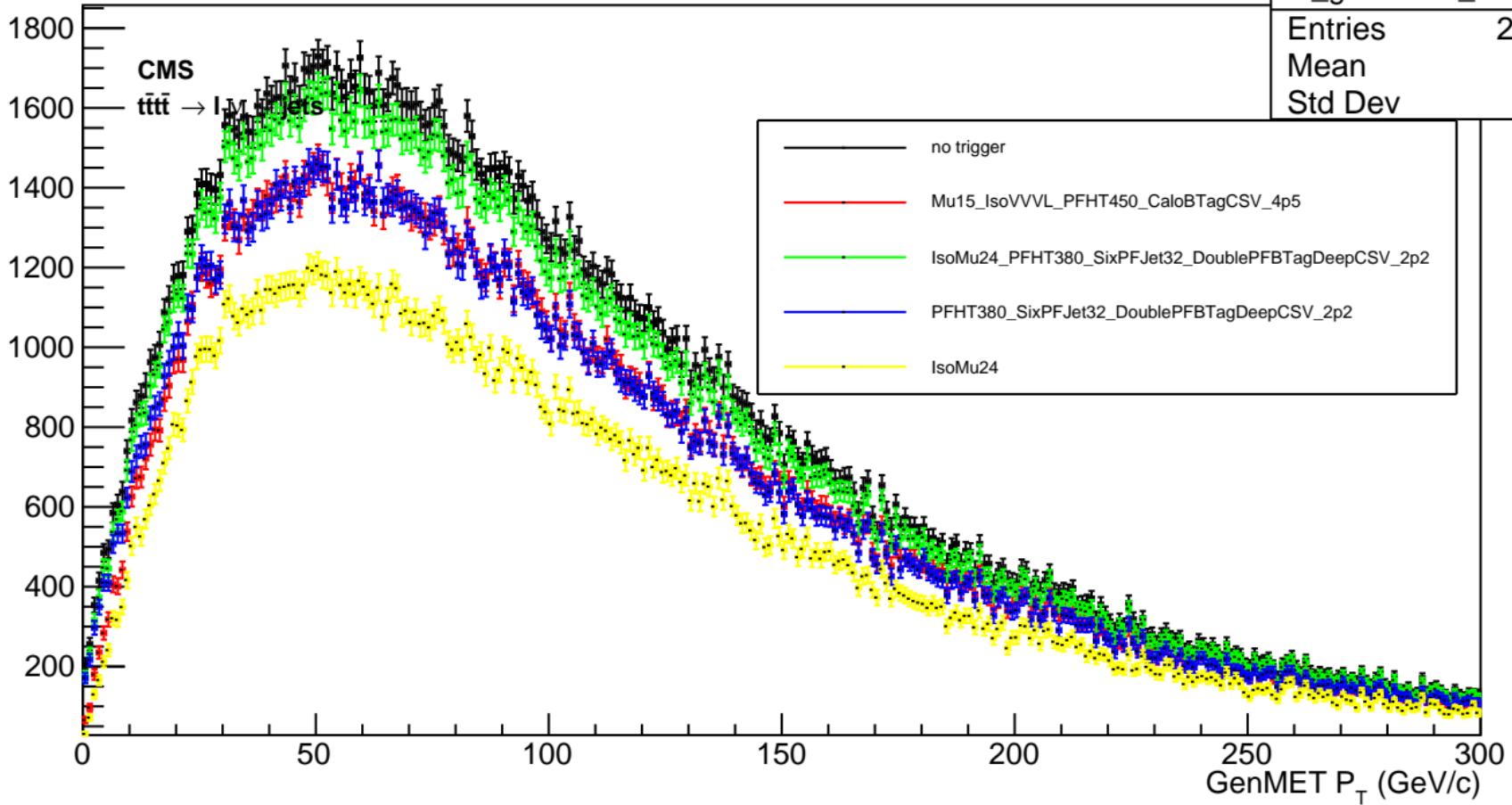
 $t\bar{t}t\bar{t} \rightarrow l\nu_l + \text{jets}$

Trigger Efficiency per 1.0 GeV/c

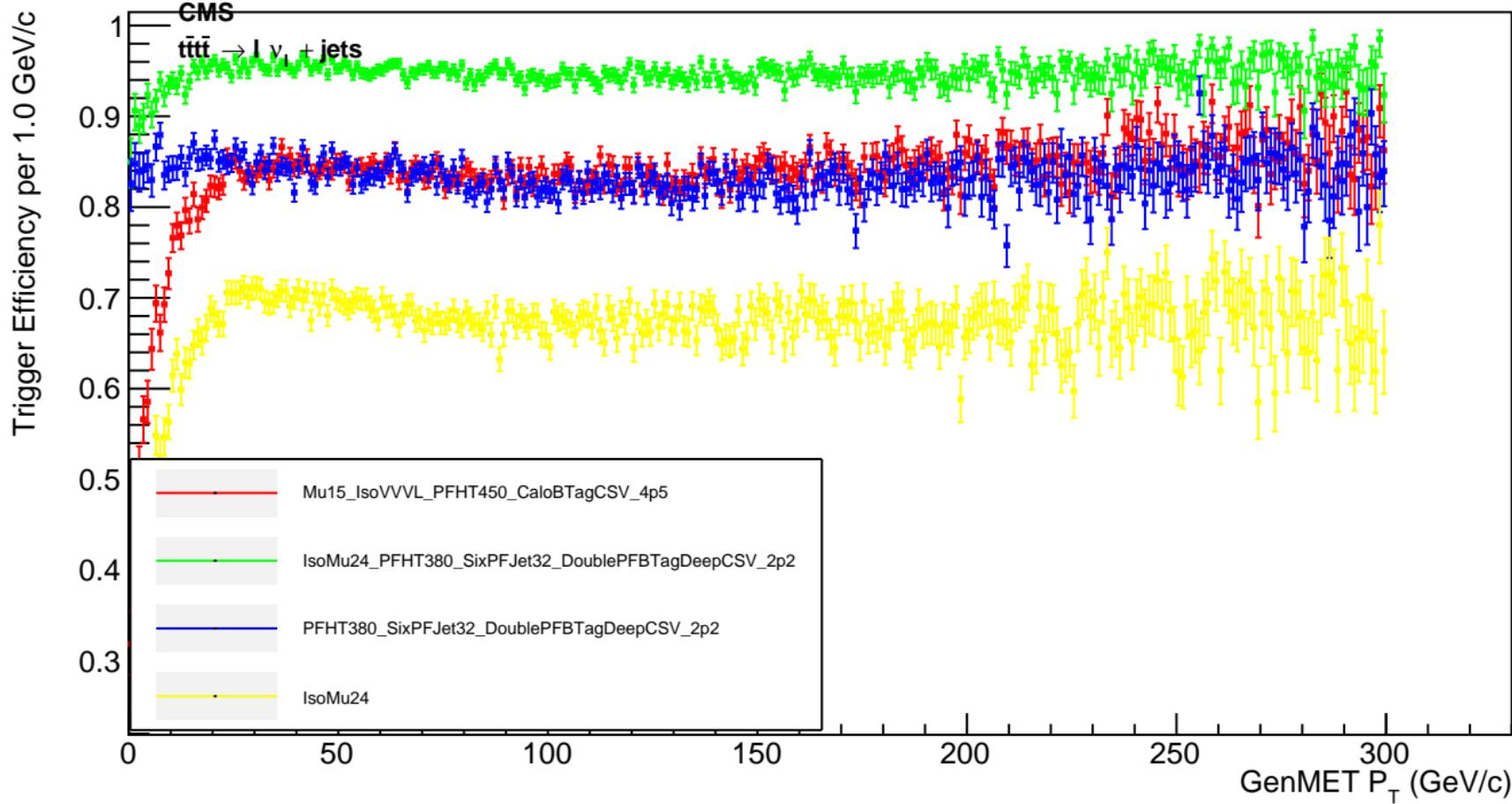


no trigger

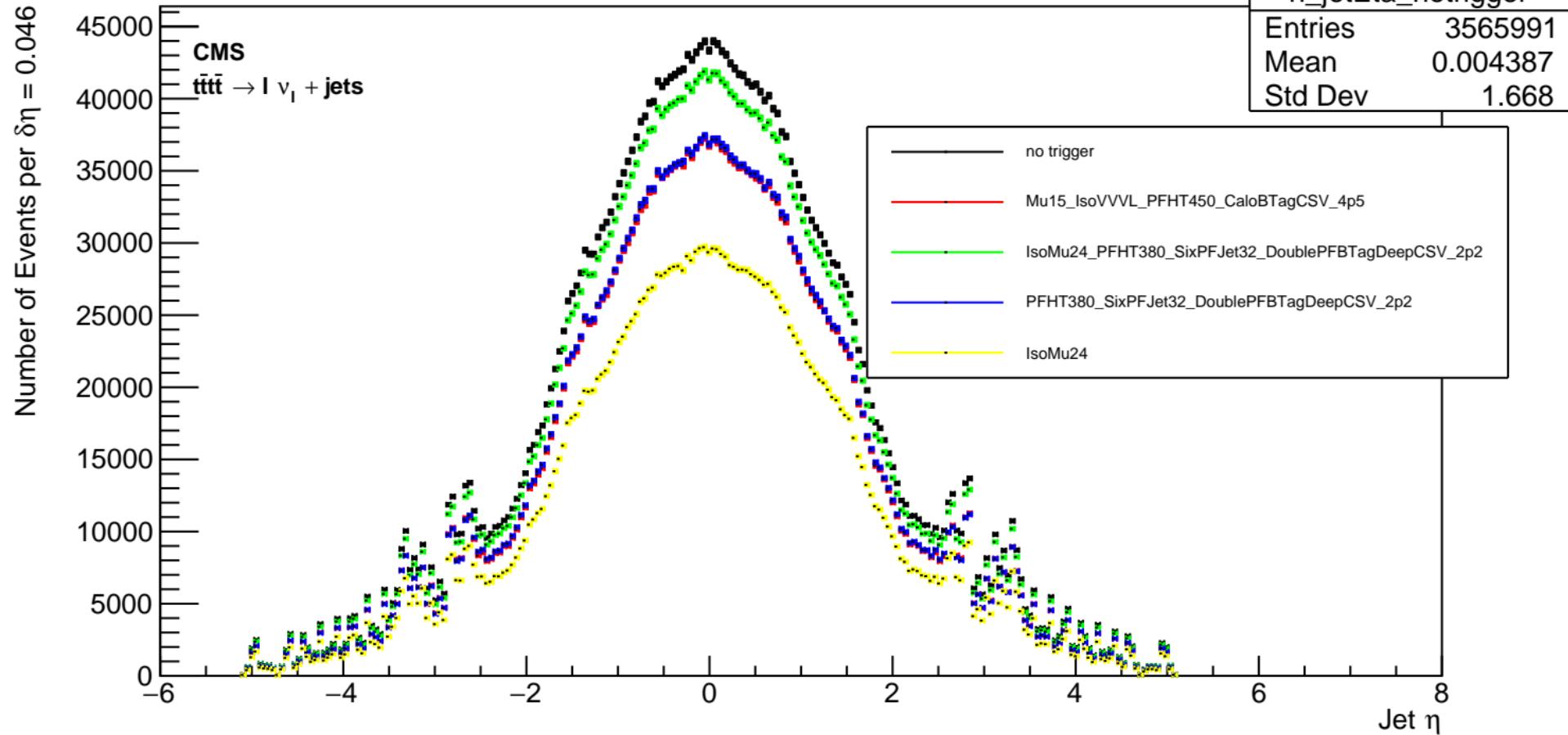
Number of Events per 1GeV/c



h_genMetPt_notrigger	
Entries	252720
Mean	101.8
Std Dev	66.1

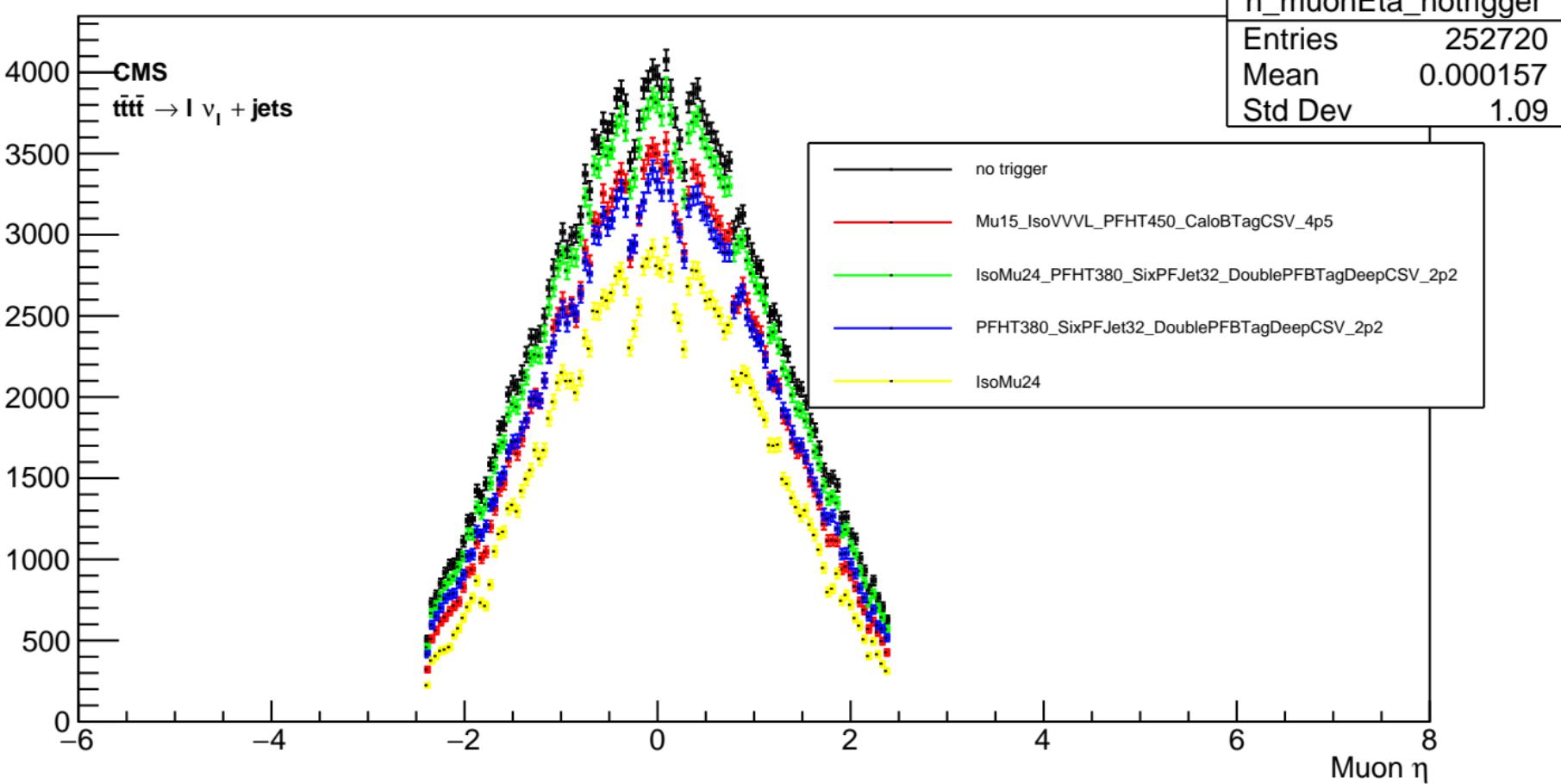


no trigger



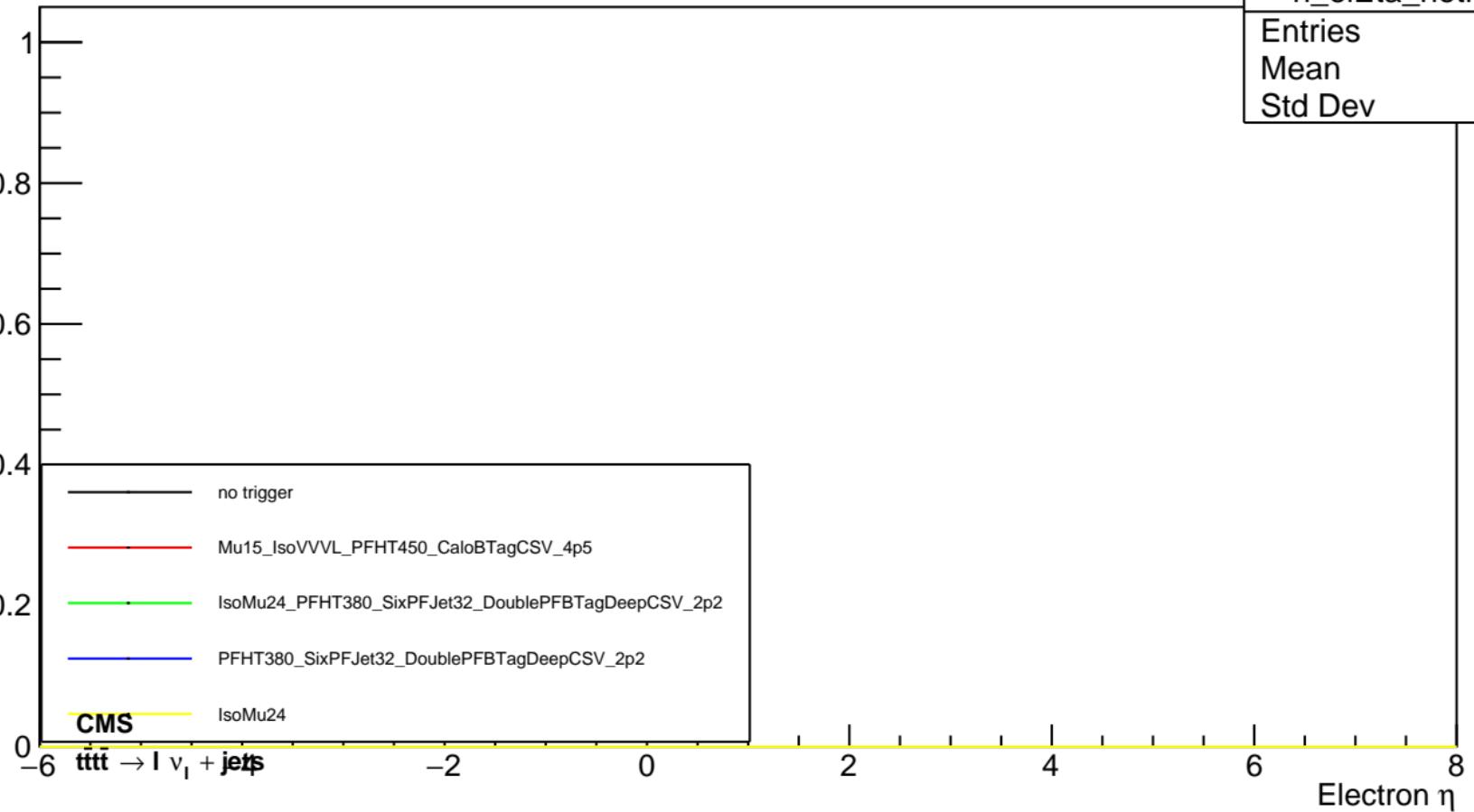
no trigger

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



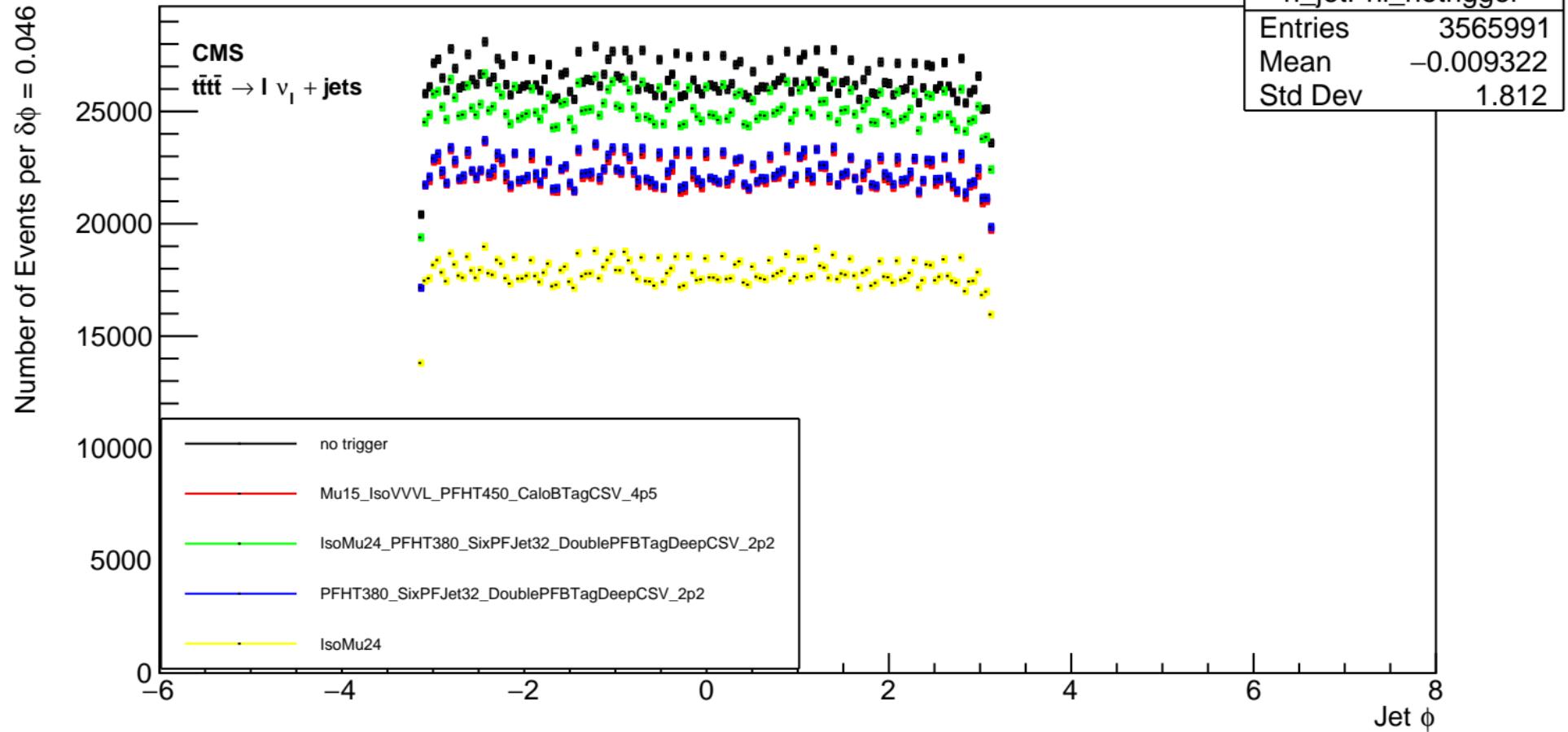
no trigger

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

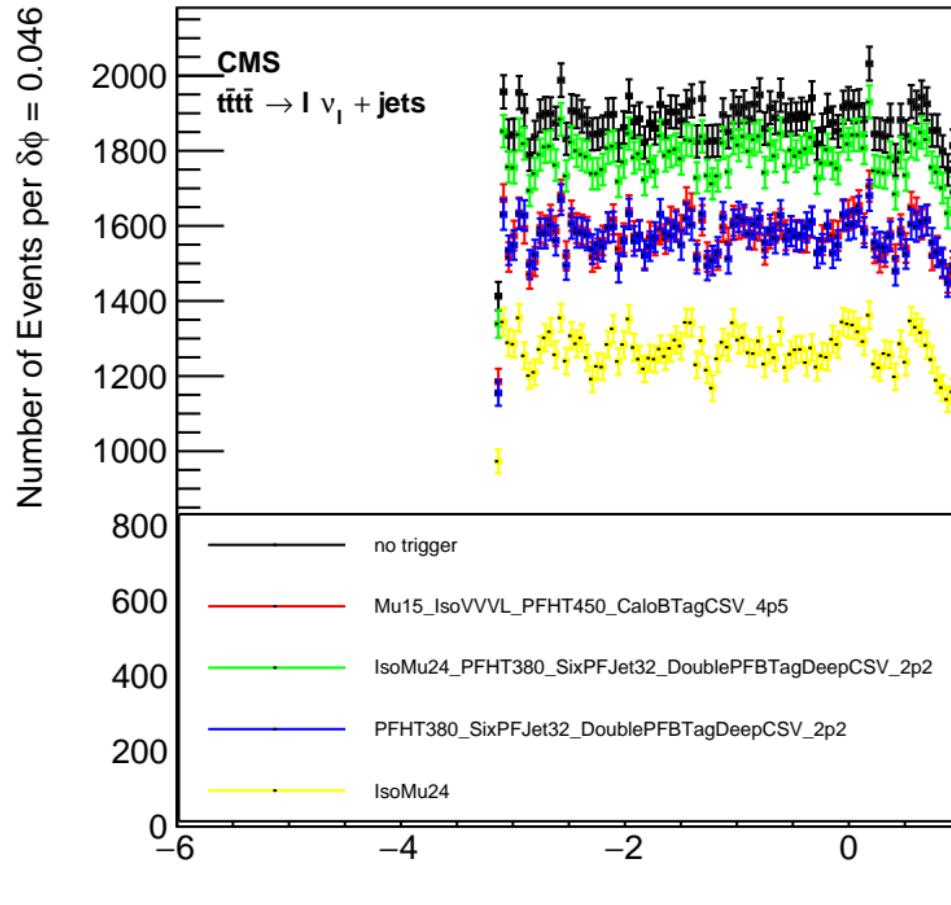


h_elEta_notrigger	
Entries	0
Mean	0
Std Dev	0

no trigger



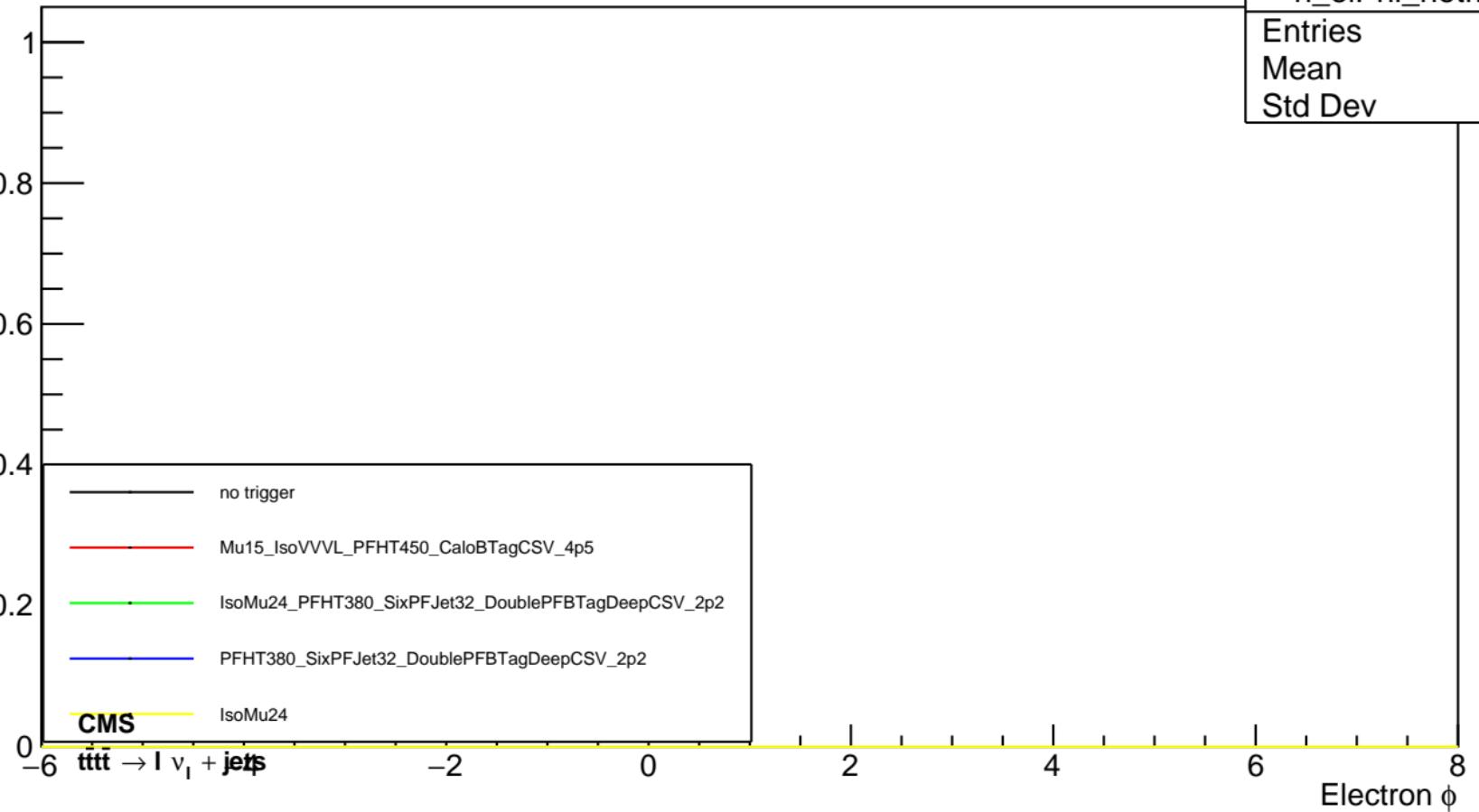
no trigger



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 ϕ

3
2
1
0
-1
-2
-3

-6 -4 -2 0 2 4 6

Jet η

h_jetMap_notrigger	
Entries	3565991
Mean x	0.004387
Mean y	-0.009322
Std Dev x	1.668
Std Dev y	1.812

400

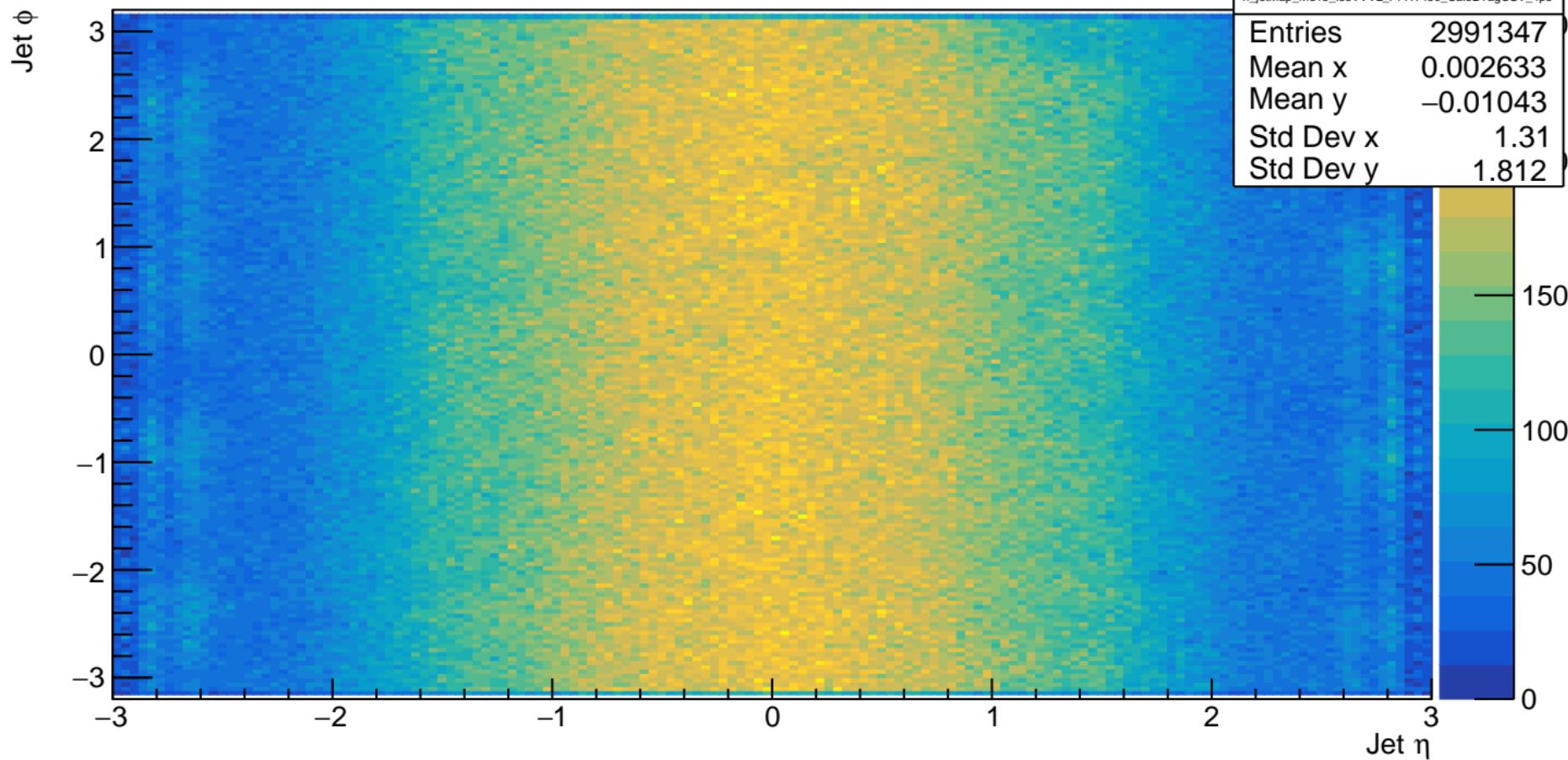
300

200

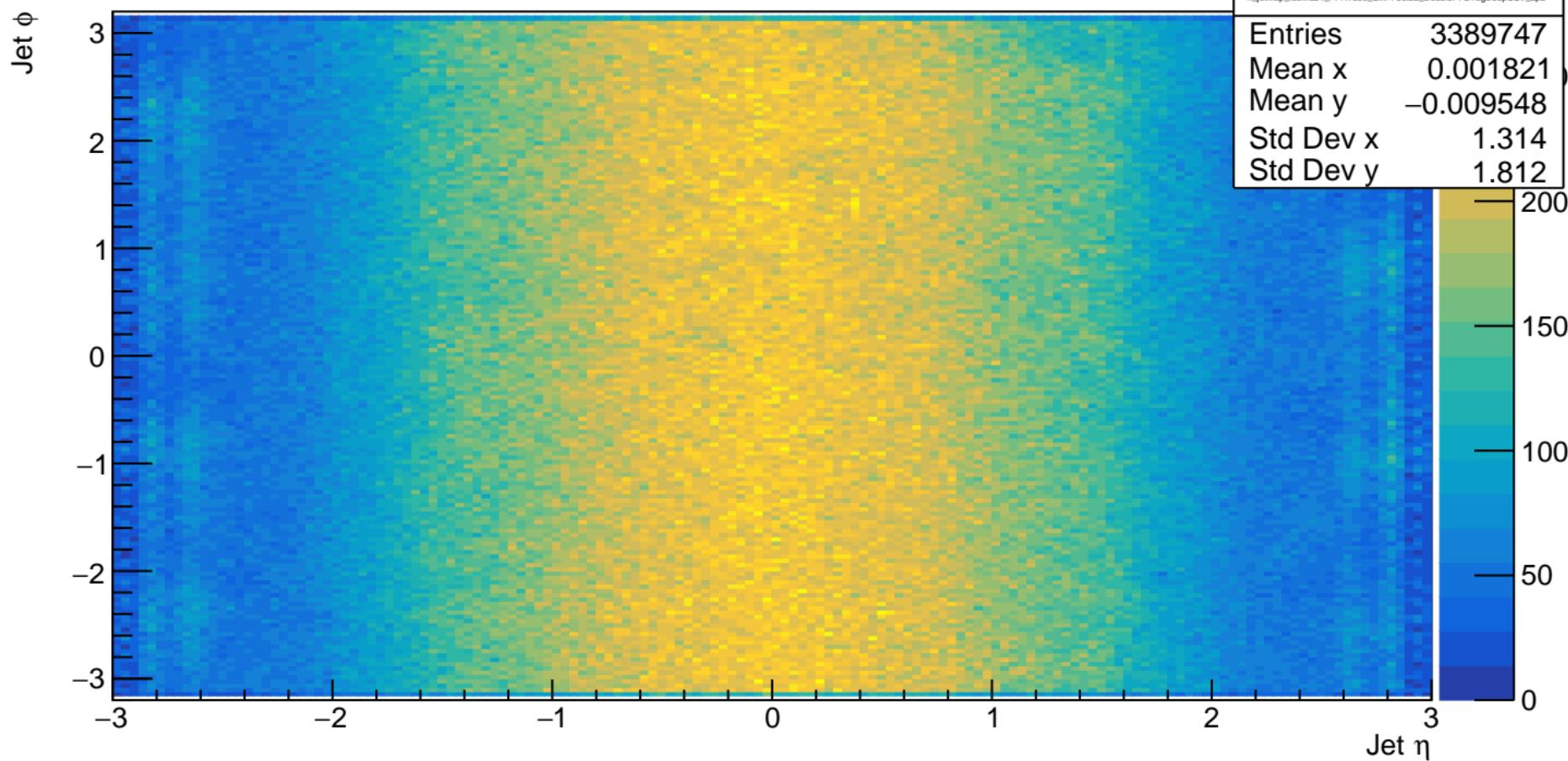
100

0

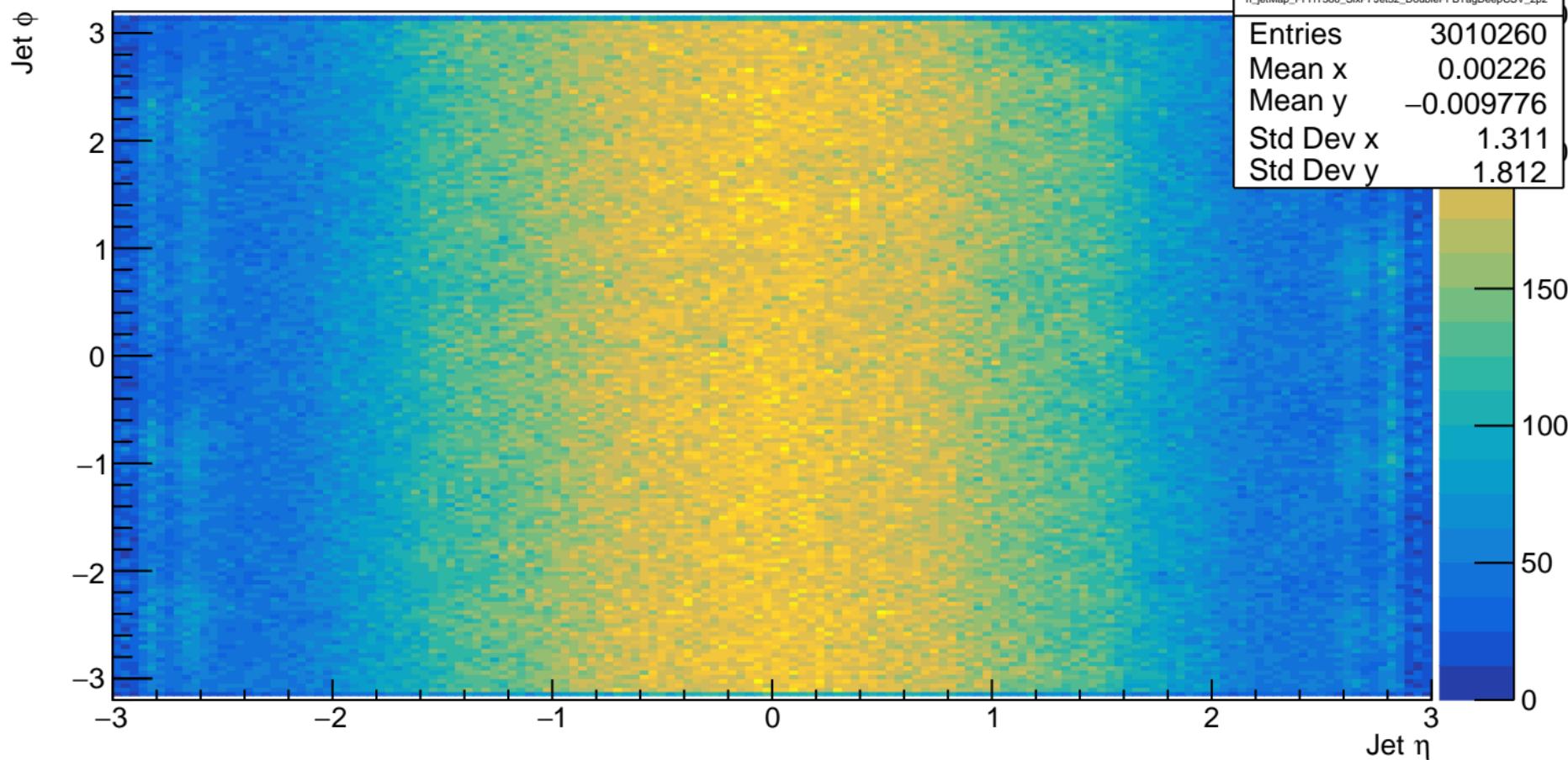
Mu15_IsoVVVL_PFHT450_CaloBTagCSV_4p5



IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



IsoMu24

Jet ϕ

3
2
1
0
-1
-2
-3

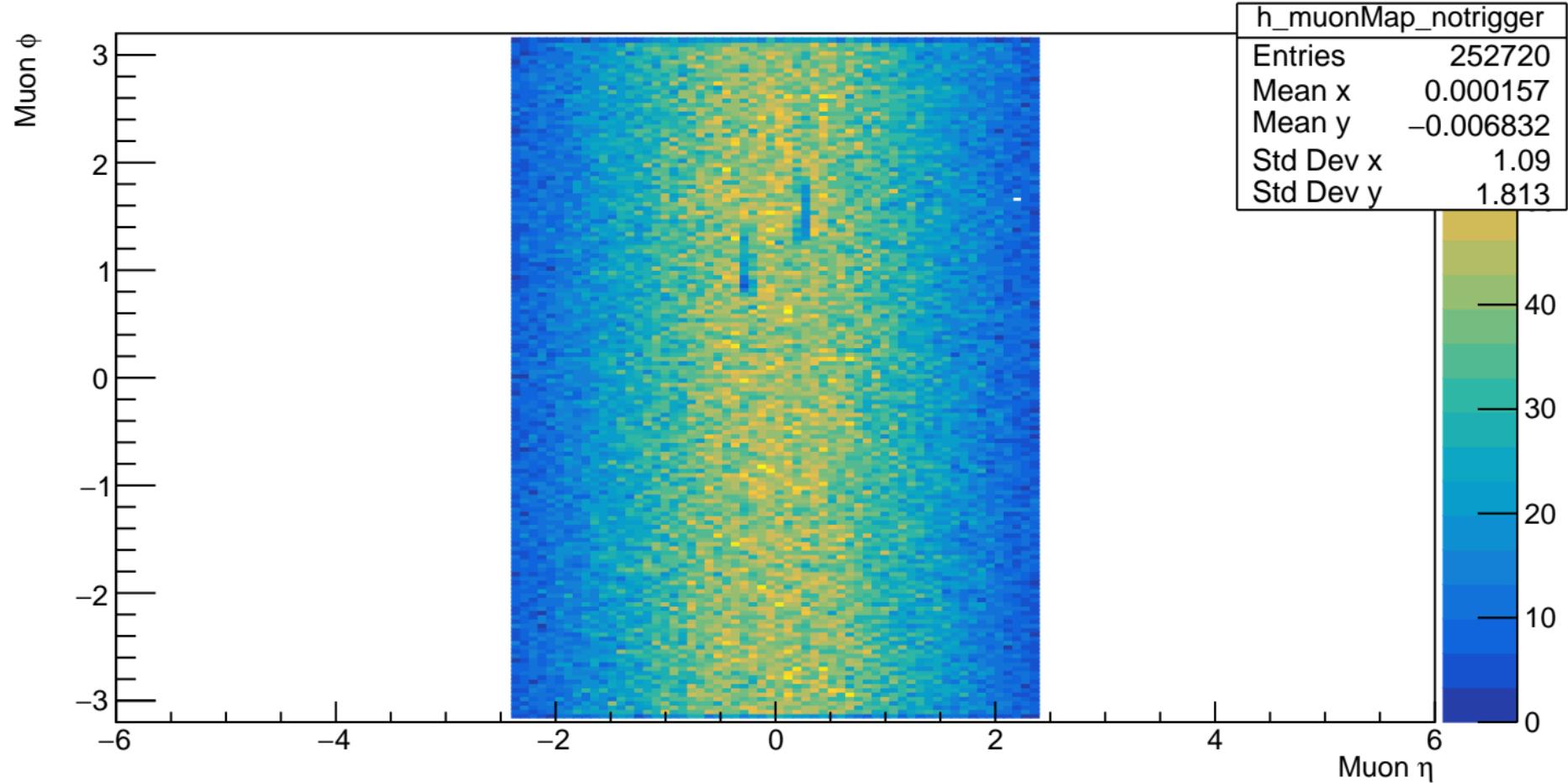
-3 -2 -1 0 1 2 3

Jet η

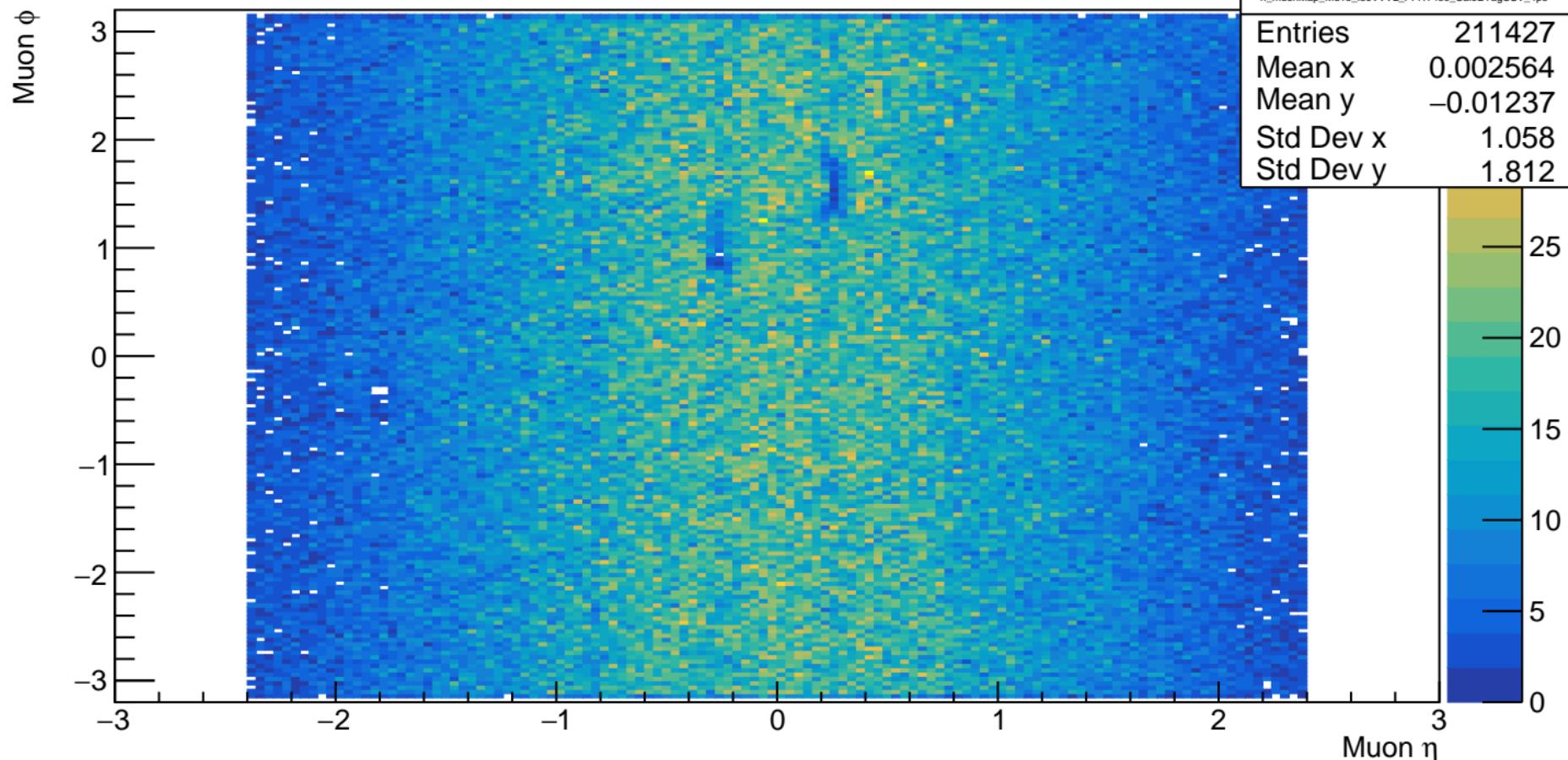
h_jetMap_IsoMu24	
Entries	2403378
Mean x	0.00237
Mean y	-0.00869
Std Dev x	1.314
Std Dev y	1.812

140
120
100
80
60
40
20
0

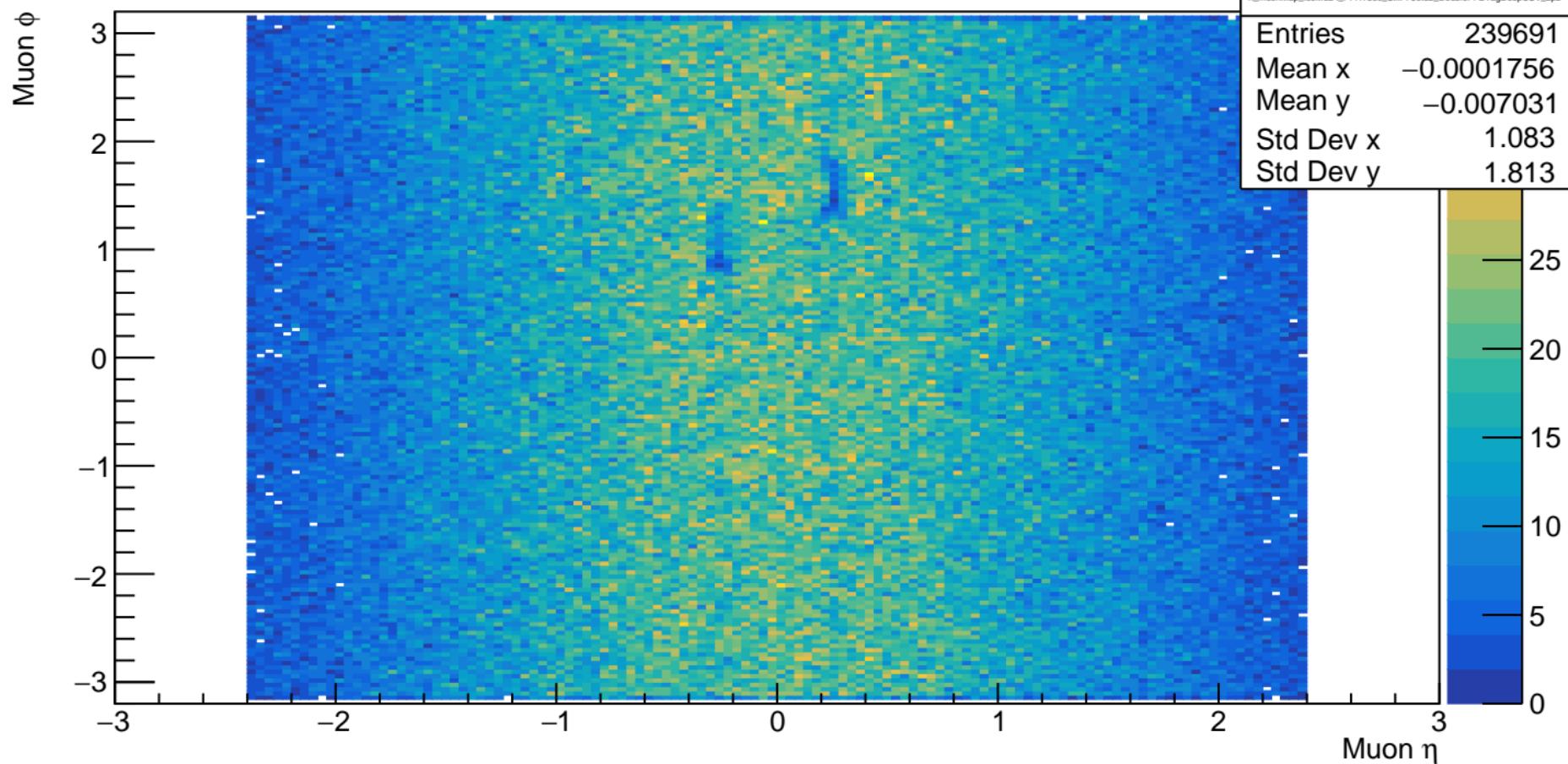
no trigger



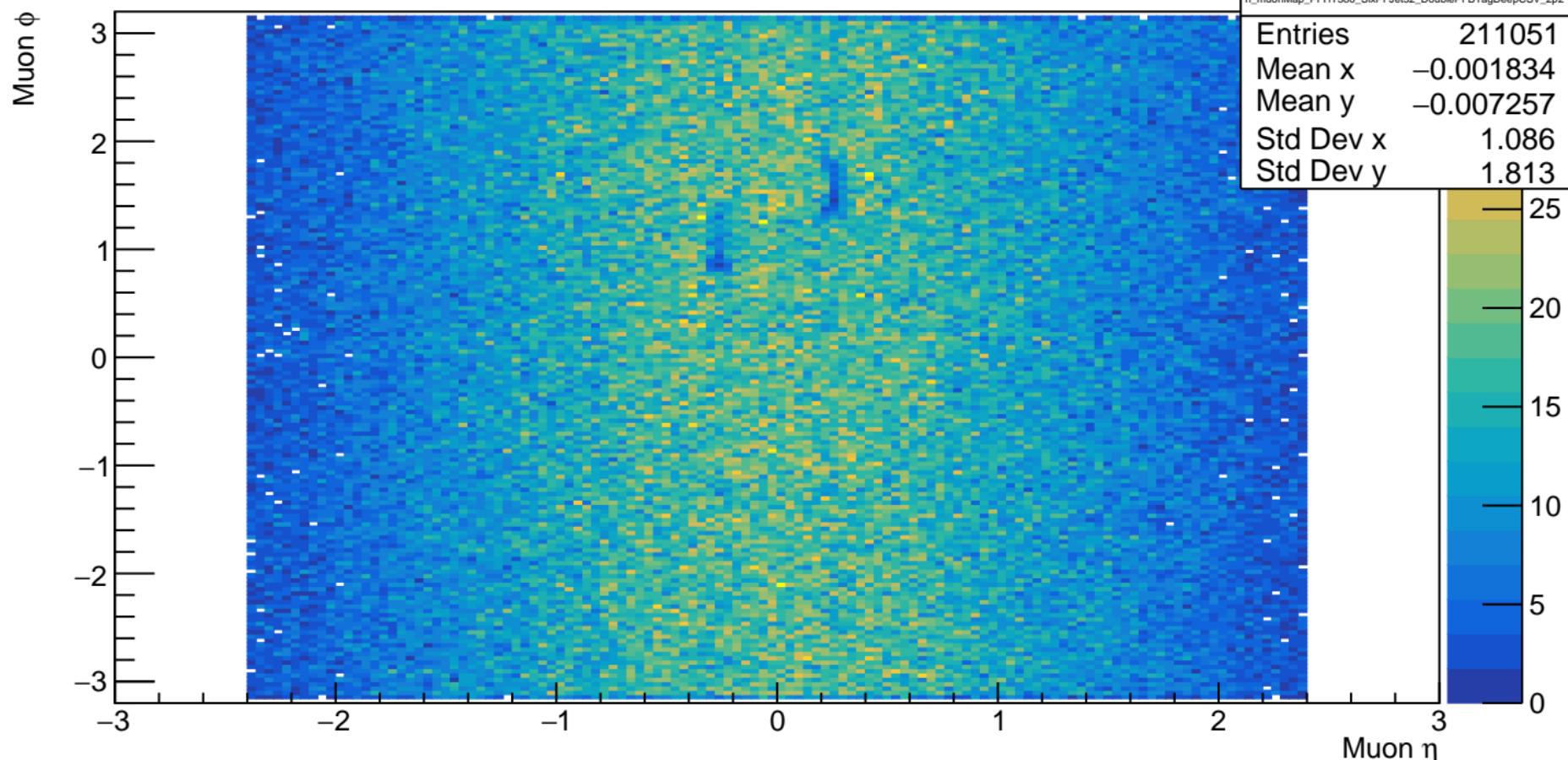
Mu15_IsoVVVL_PFHT450_CaloBTagCSV_4p5



IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



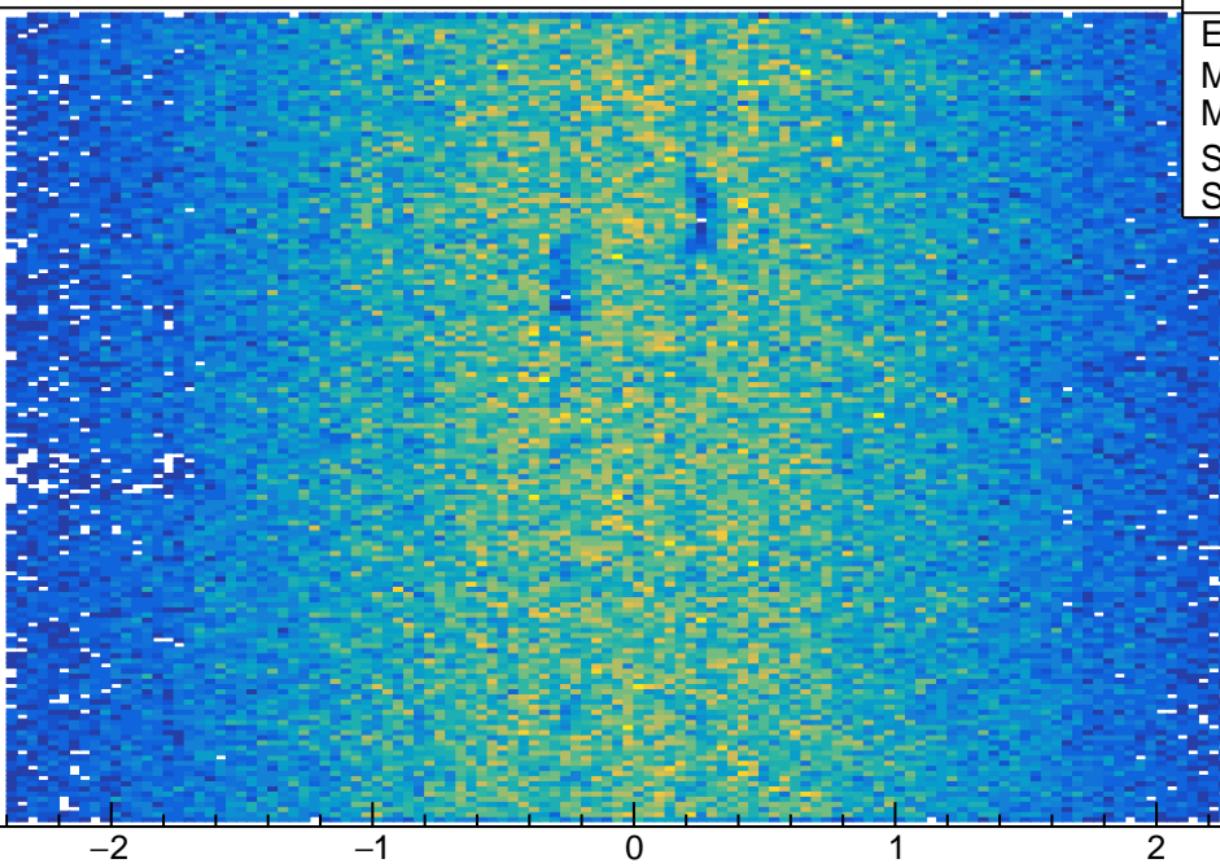
PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



IsoMu24

Muon ϕ

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 η

no trigger

Electron ϕ

3
2
1
0
-1
-2
-3

-6 -4 -2 0 2 4 6

Electron η

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 ϕ



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

Electron η

IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2

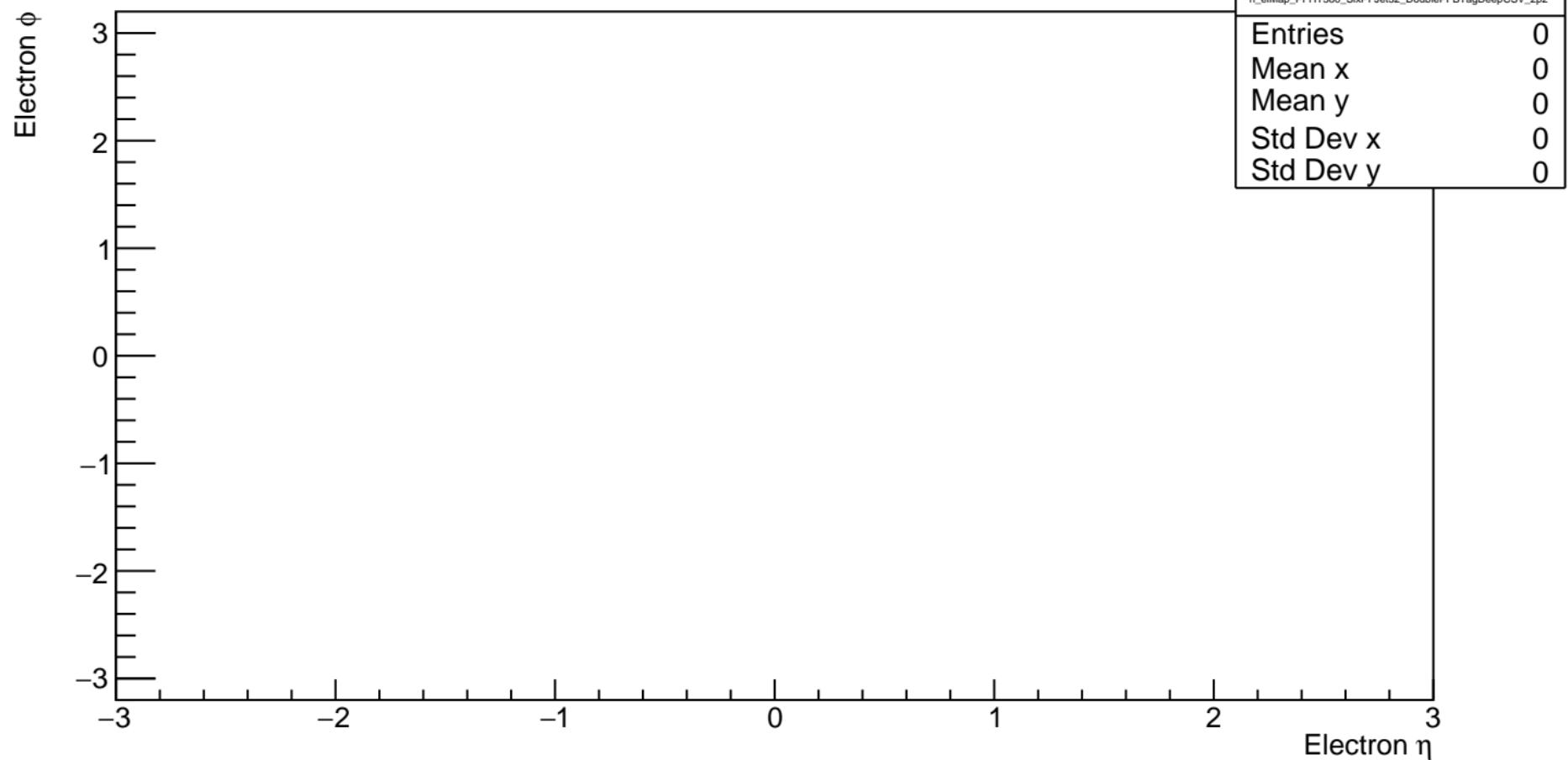
Electron ϕ



Electron η

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

PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



IsoMu24

Electron ϕ

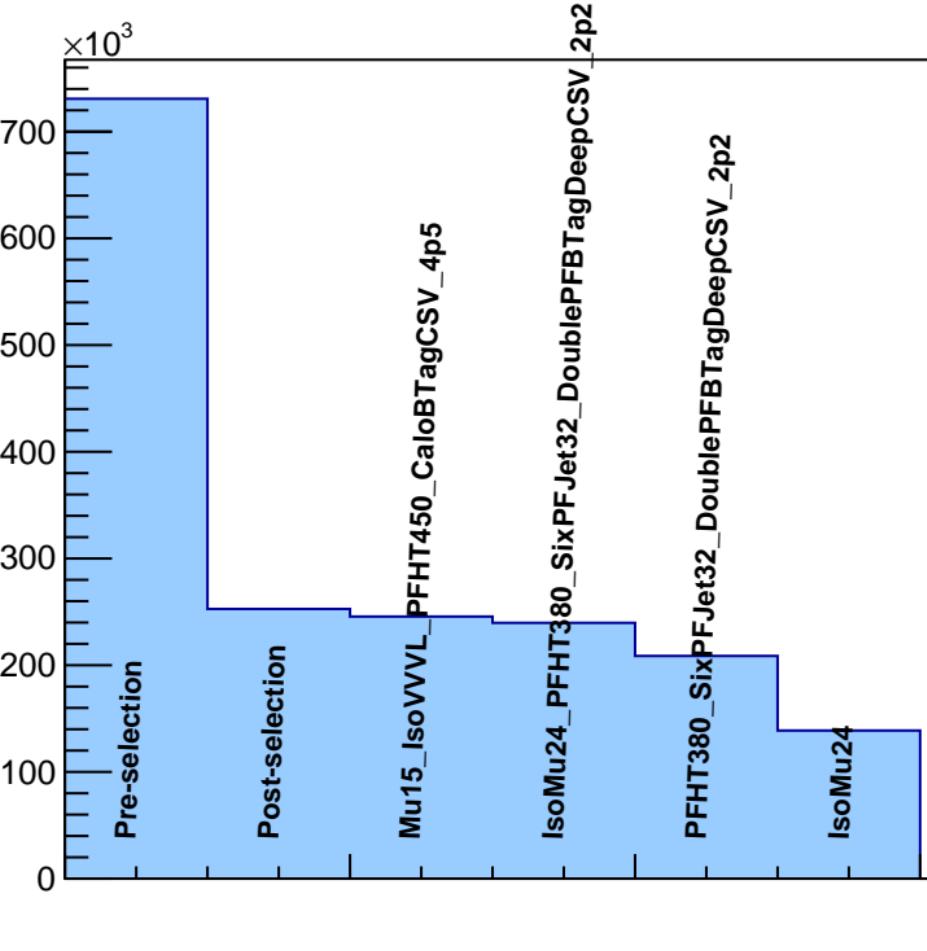
3
2
1
0
-1
-2
-3

-3 -2 -1 0 1 2 3

Electron η

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

Cuts and Triggers