

On-line (pre-)selection Requisites for:

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

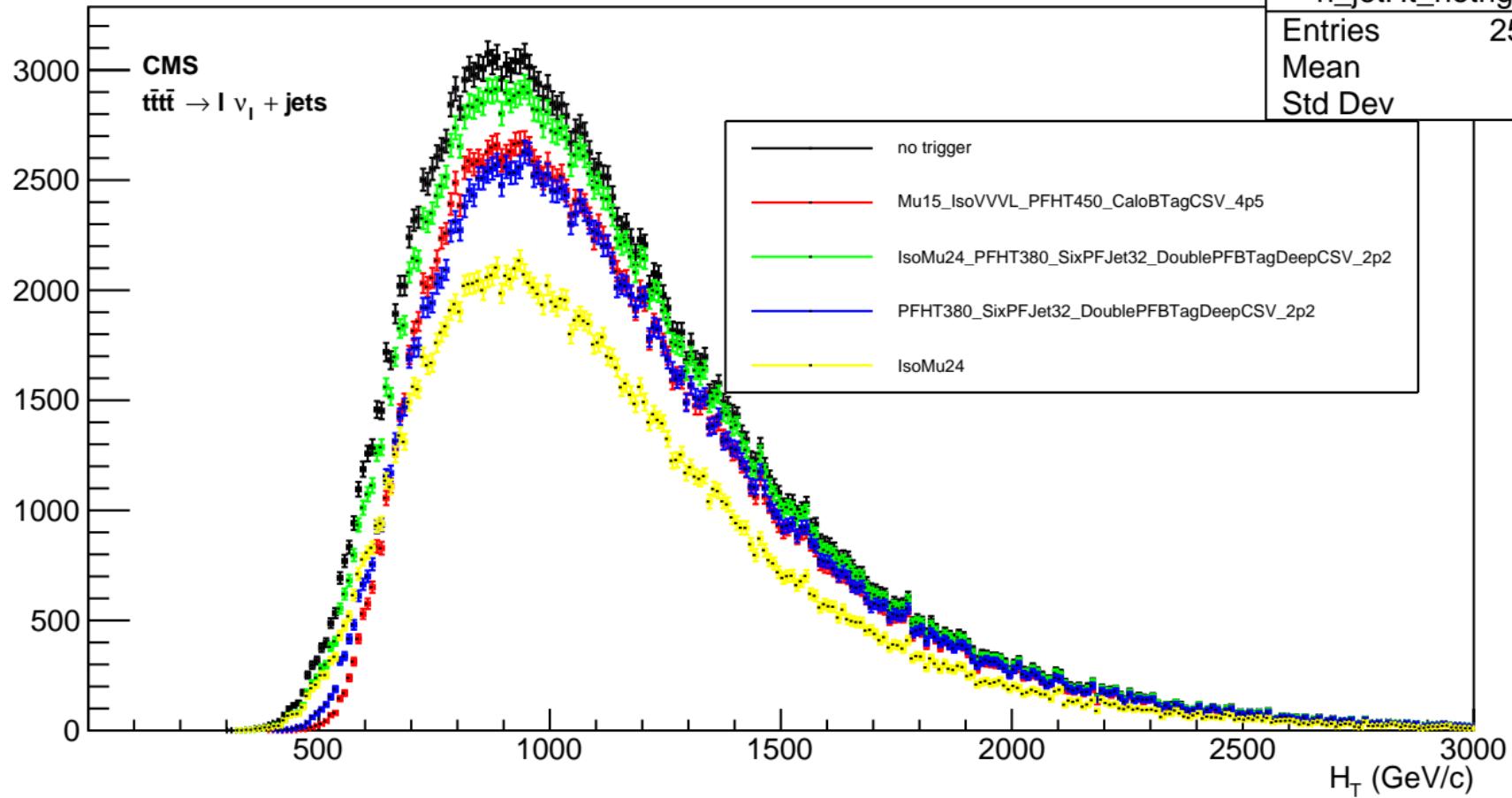
Event Limit: None (see last page)

Off-line (post-)selection Requisites for:

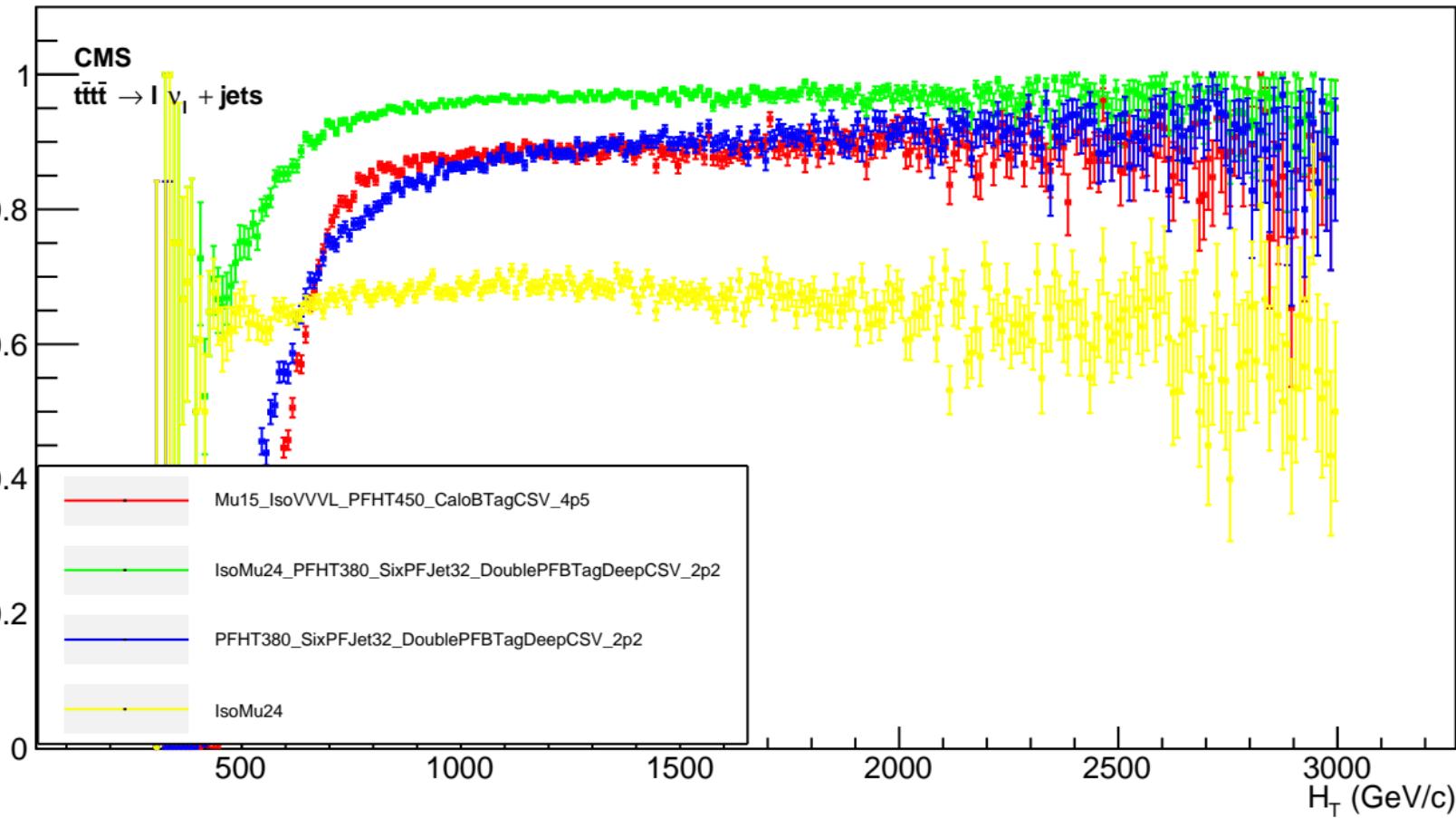
- **Jets:** jetId > 2 , $p_T > 30$ and $|\eta| < 2.4$ (for at least 6)
 $btagDeepFlavB > 0.7489$ (for at least one jet)
- **Muons:** has tightId, $|\eta| < 2.4$ and $\text{miniPFRellso_all} < 0.15$ (for at least 1)

no trigger

Number of Events per 10 GeV/c

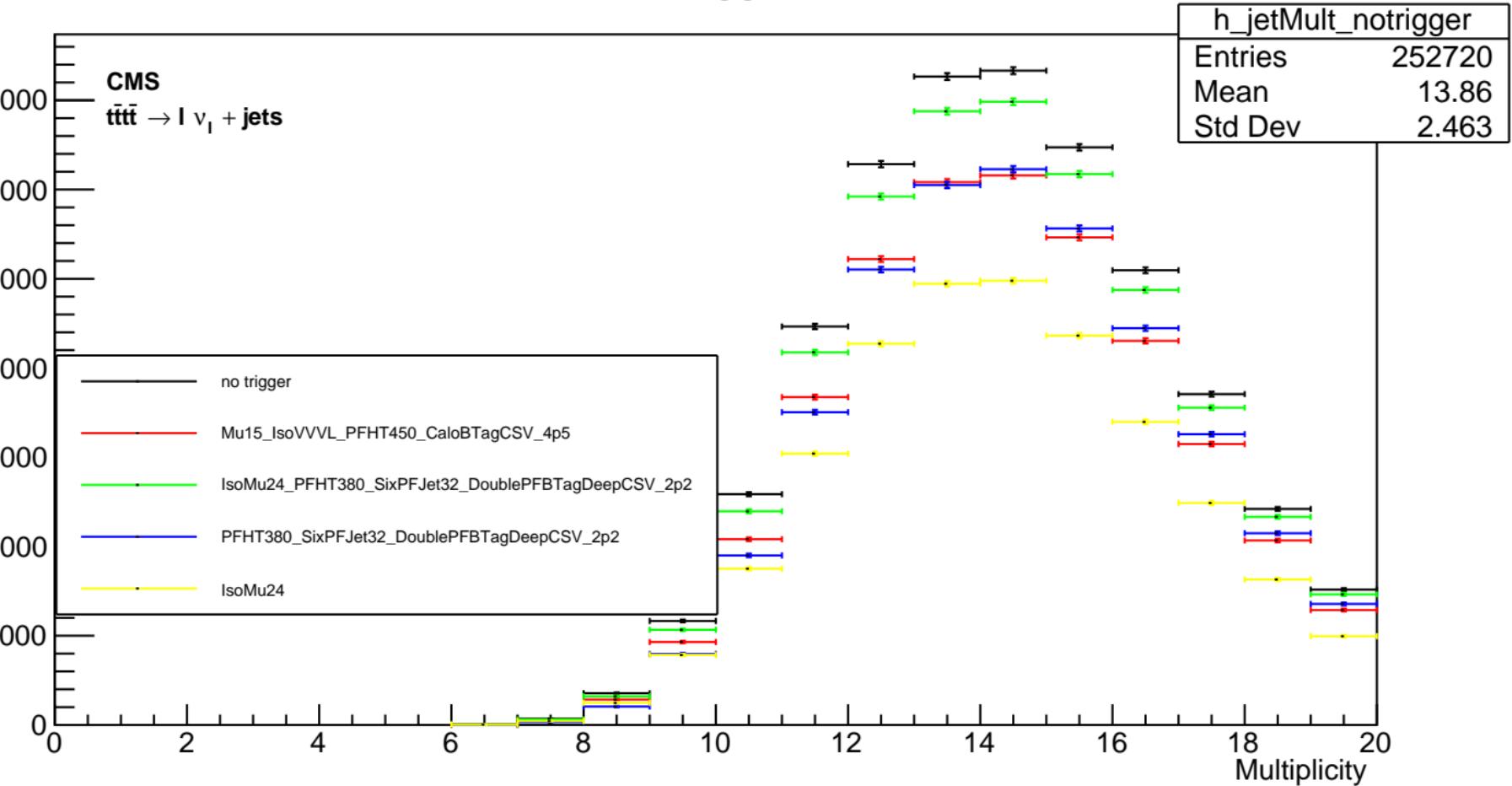


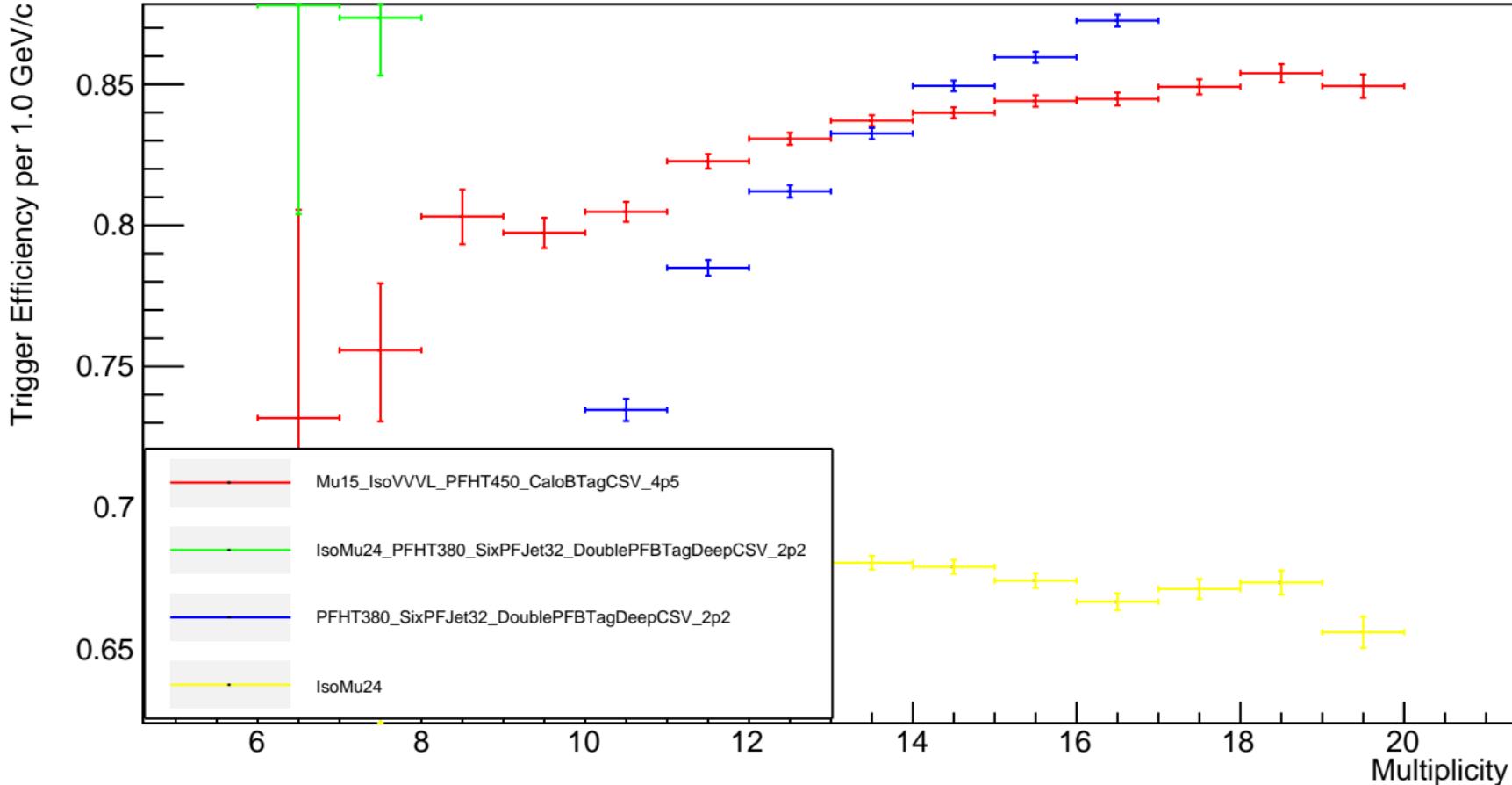
Trigger Efficiency per 9.99666666667 GeV/c



no trigger

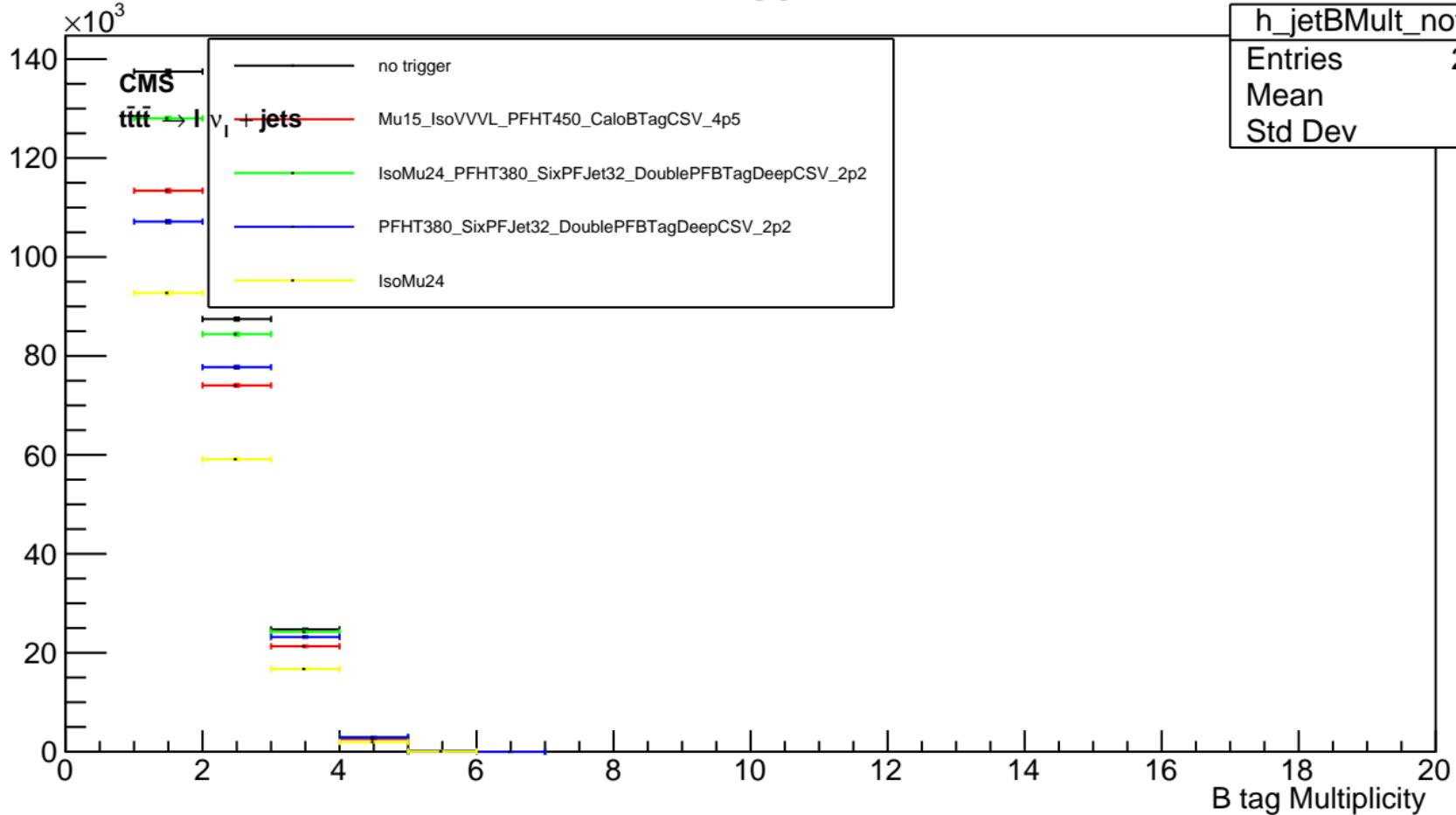
Number of Events per Number of Jets





no trigger

Number of Events per Number of Jets



| h_jetBMult_notrigger | |
|----------------------|--------|
| Entries | 252720 |
| Mean | 1.578 |
| Std Dev | 0.7174 |

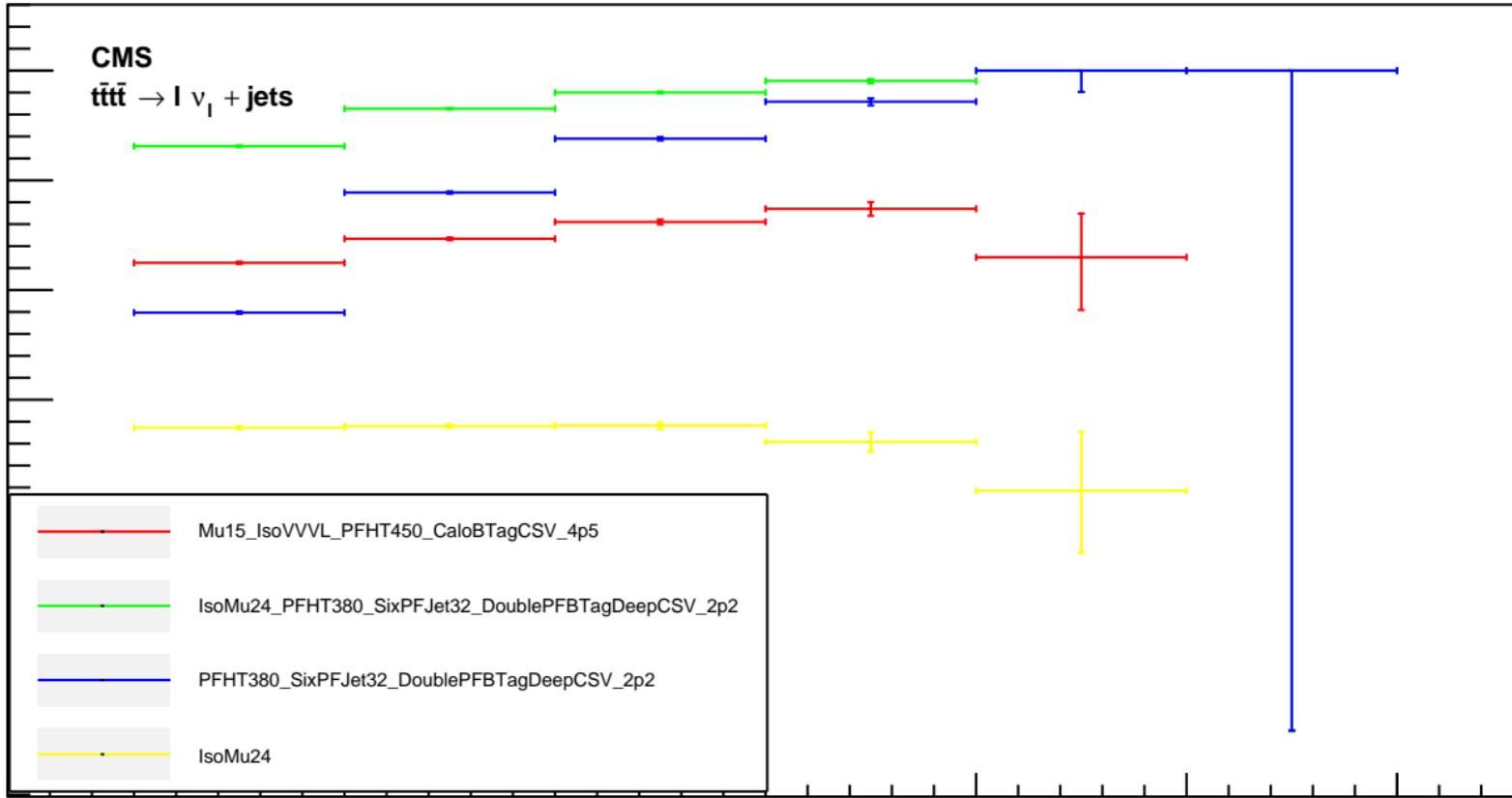
Trigger Efficiency per 1.0 GeV/c

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

1 2 3 4 5 6 7

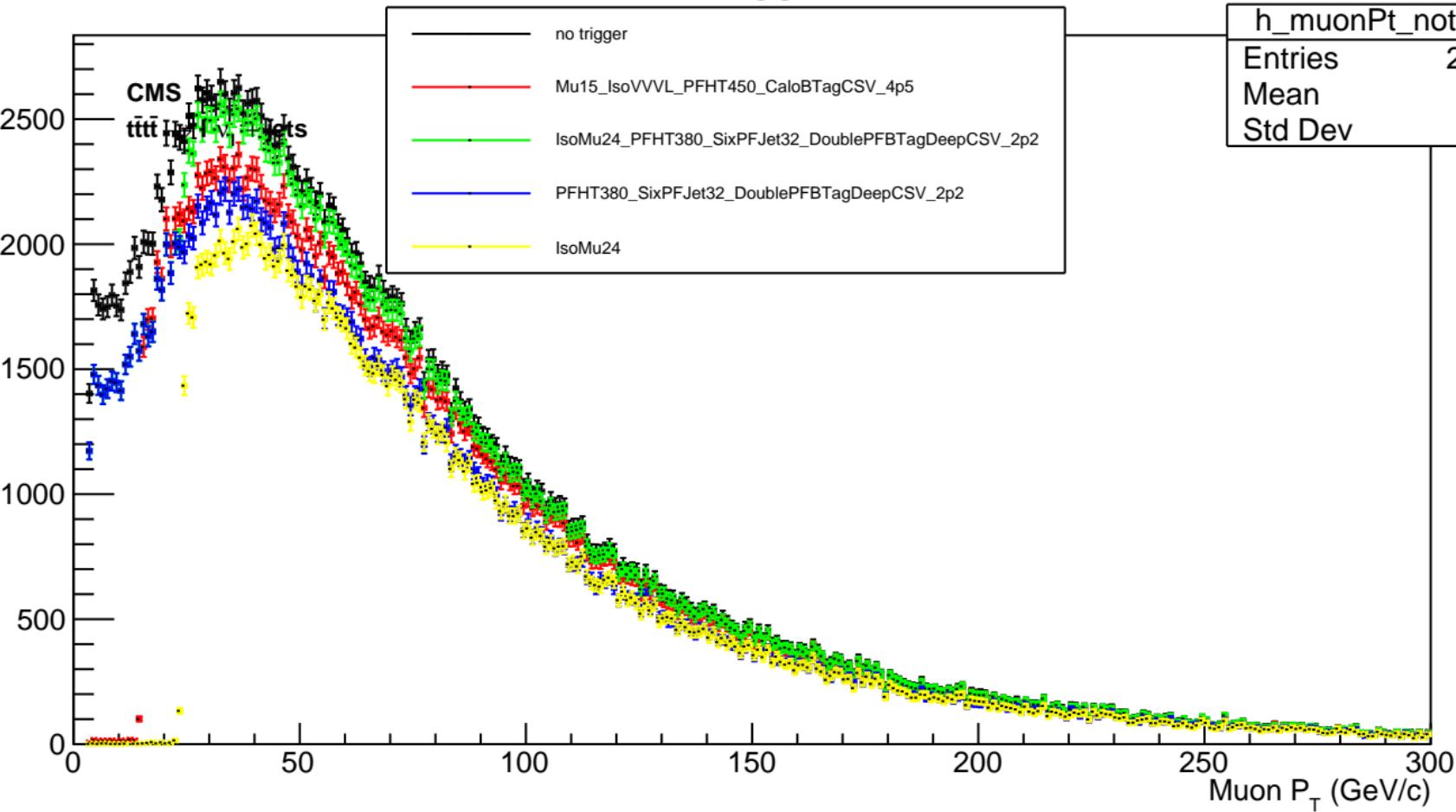
B tag Multiplicity

- Mu15_IsoVVVL_PFHT450_CaloBTagCSV_4p5
- IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
- PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
- IsoMu24



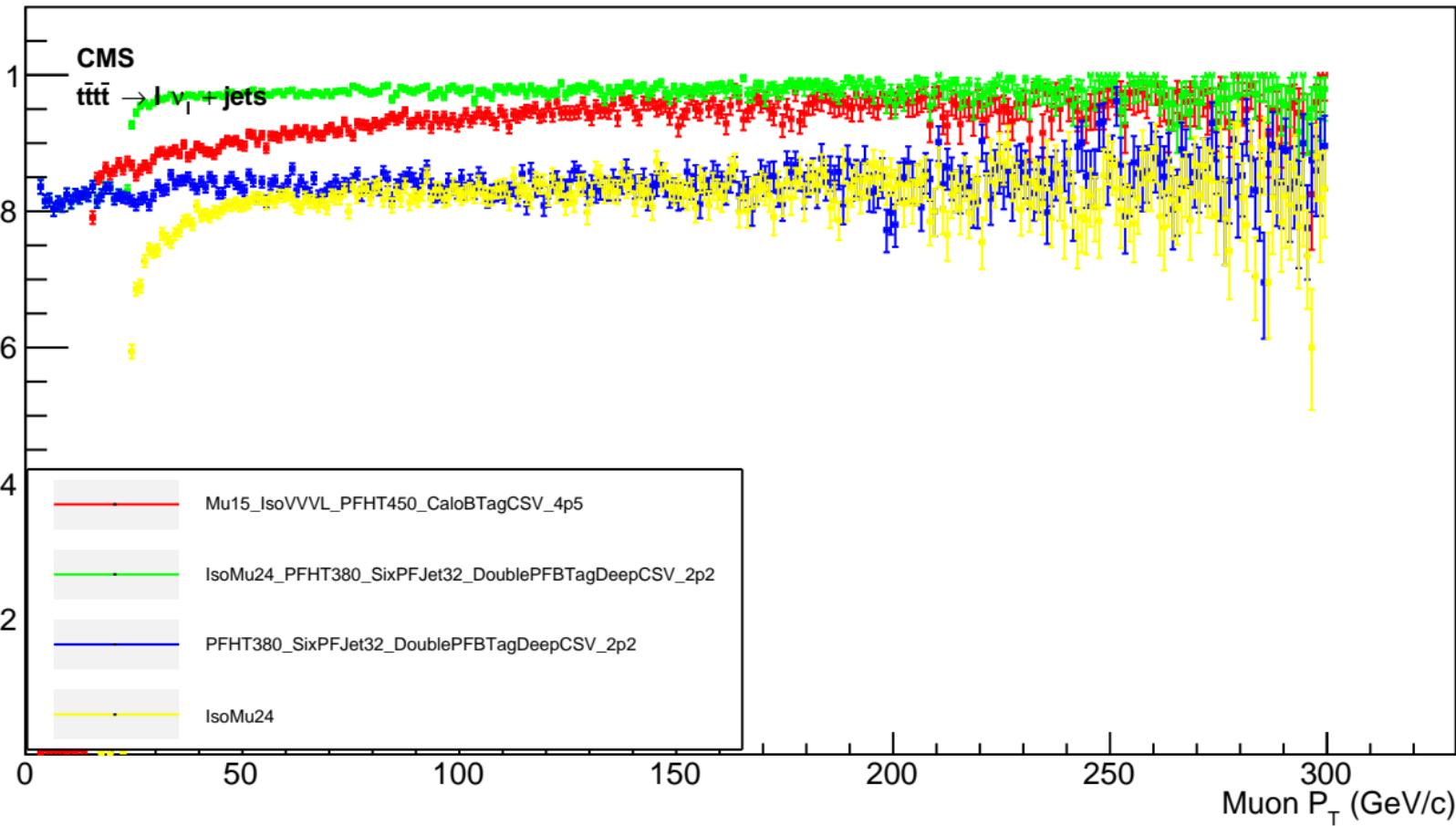
no trigger

Number of Events per 1 GeV/c



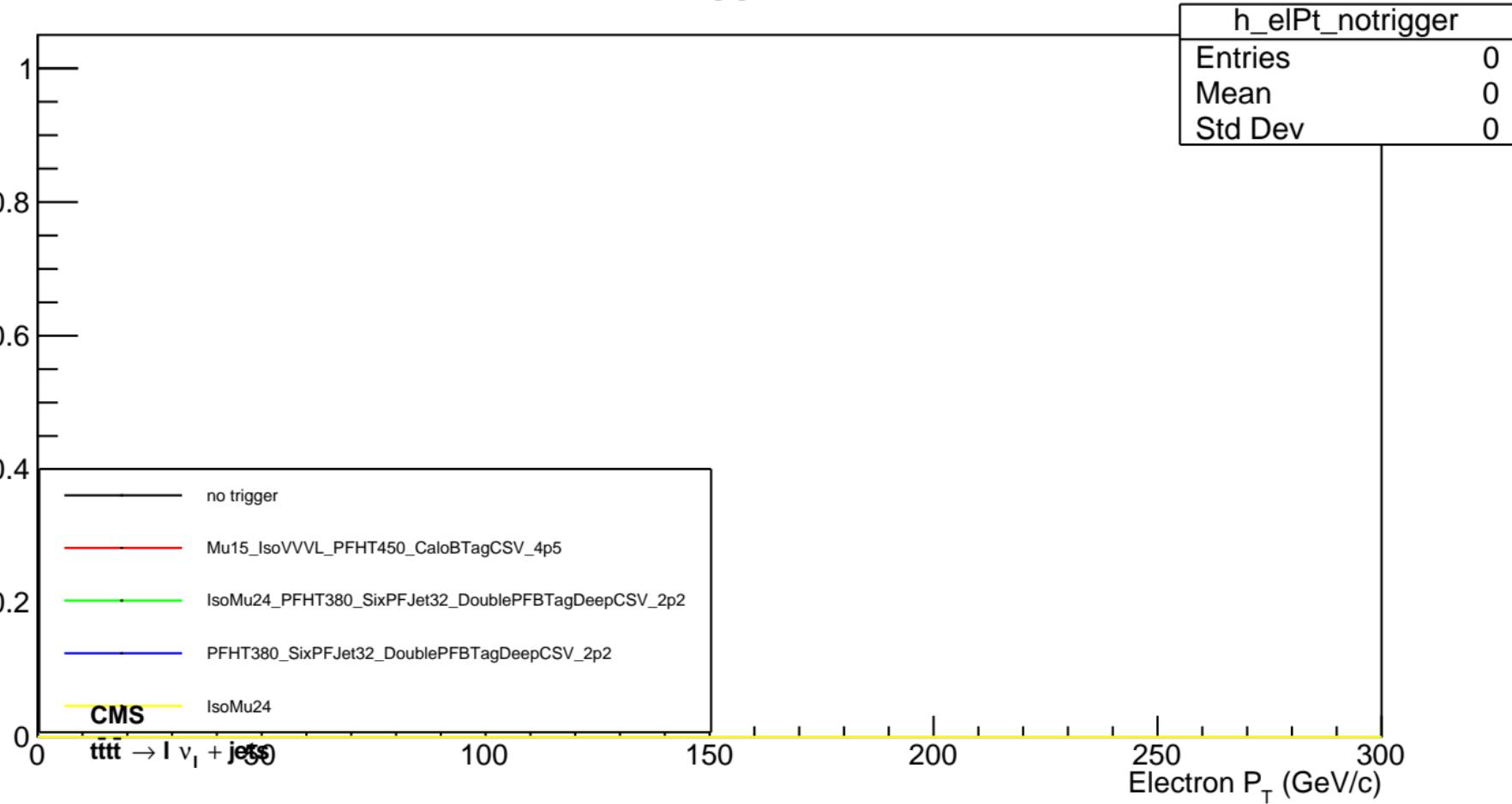
| h_muonPt_notrigger | |
|--------------------|--------|
| Entries | 252720 |
| Mean | 72.96 |
| Std Dev | 55.72 |

Trigger Efficiency per 1.0 GeV/c



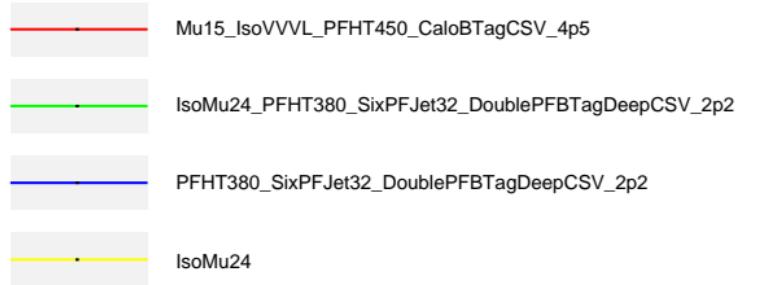
no trigger

Number of Events per 1 GeV/c



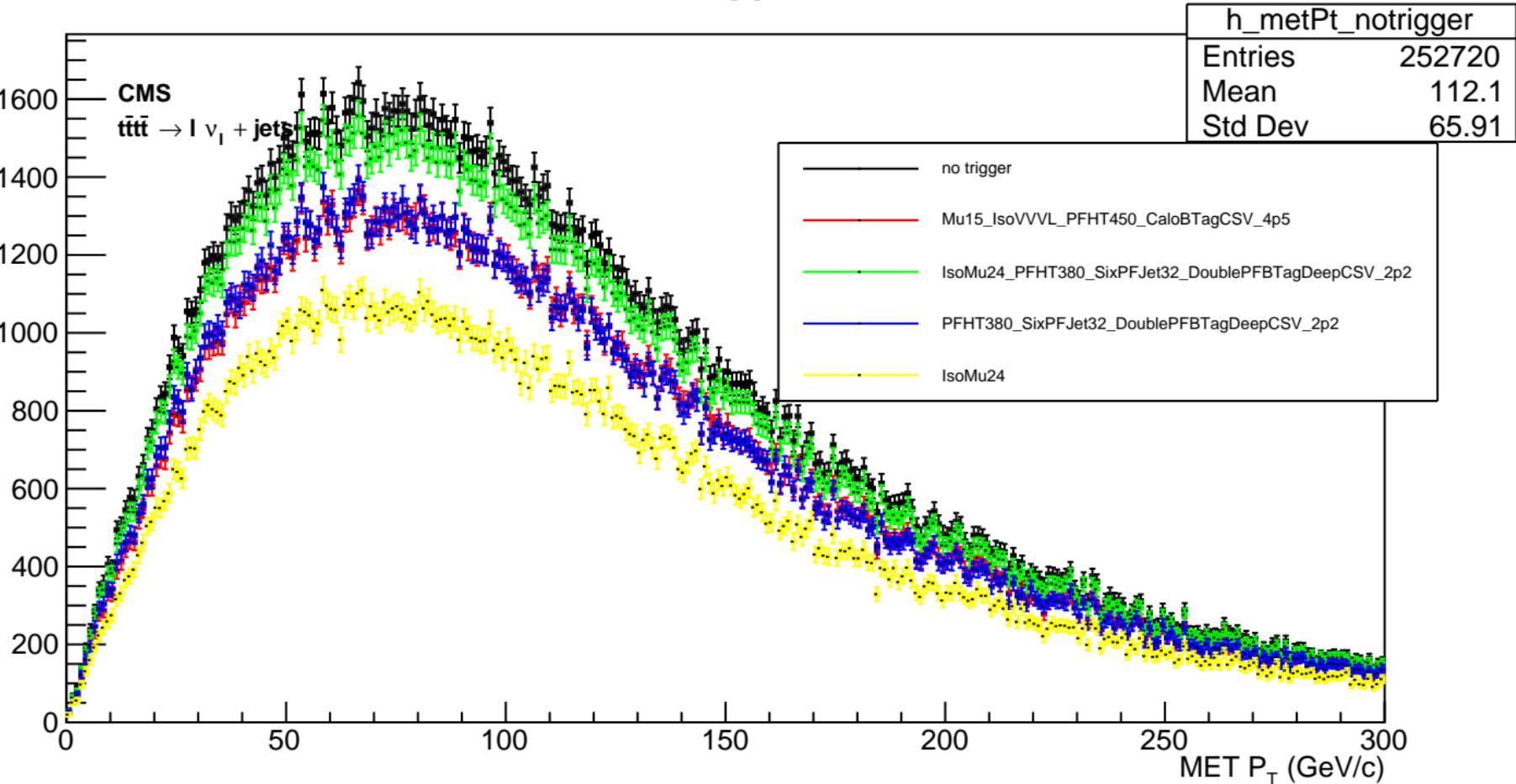
CMS

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



no trigger

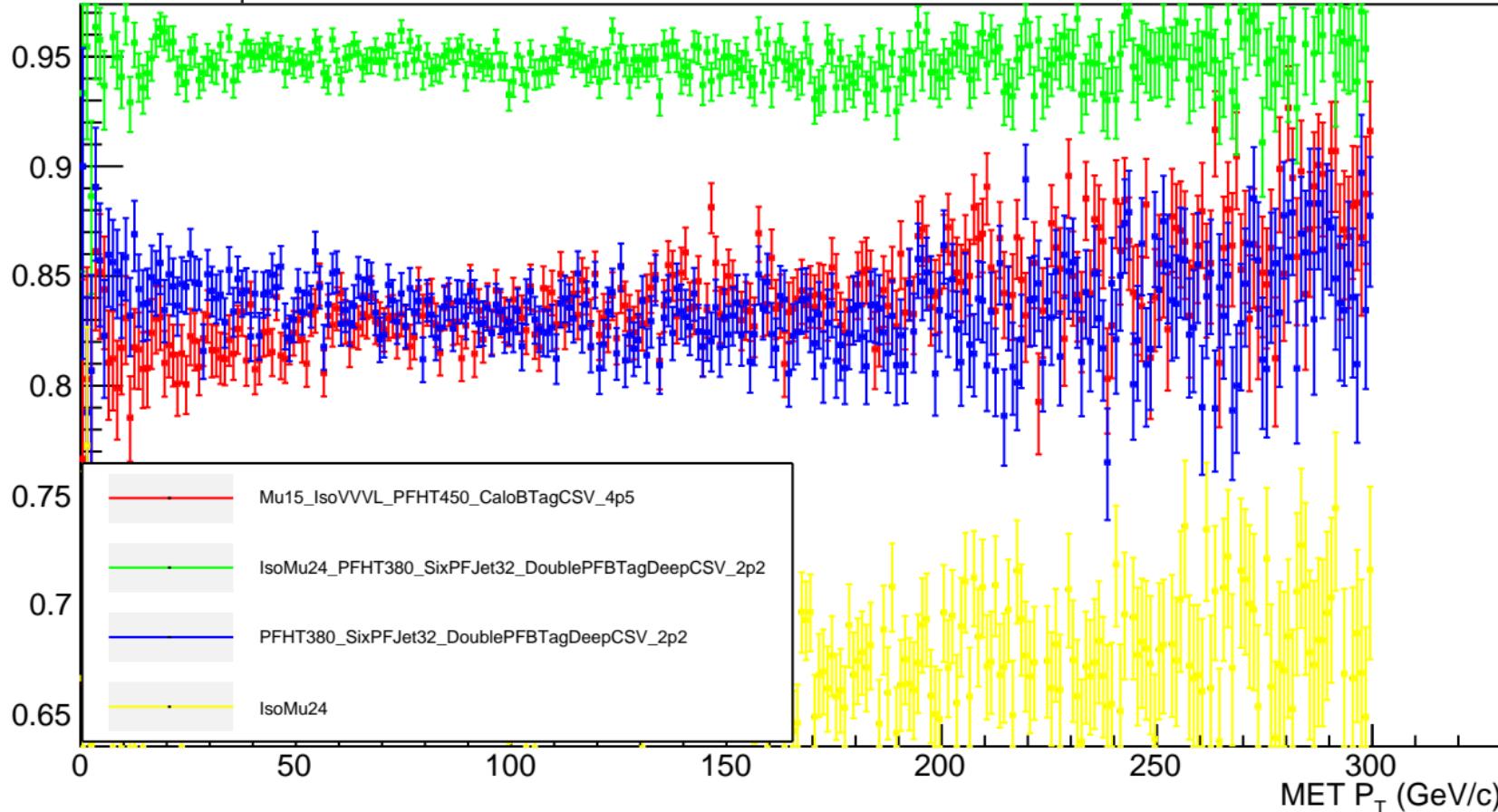
Number of Events per 1 GeV/c



CMS

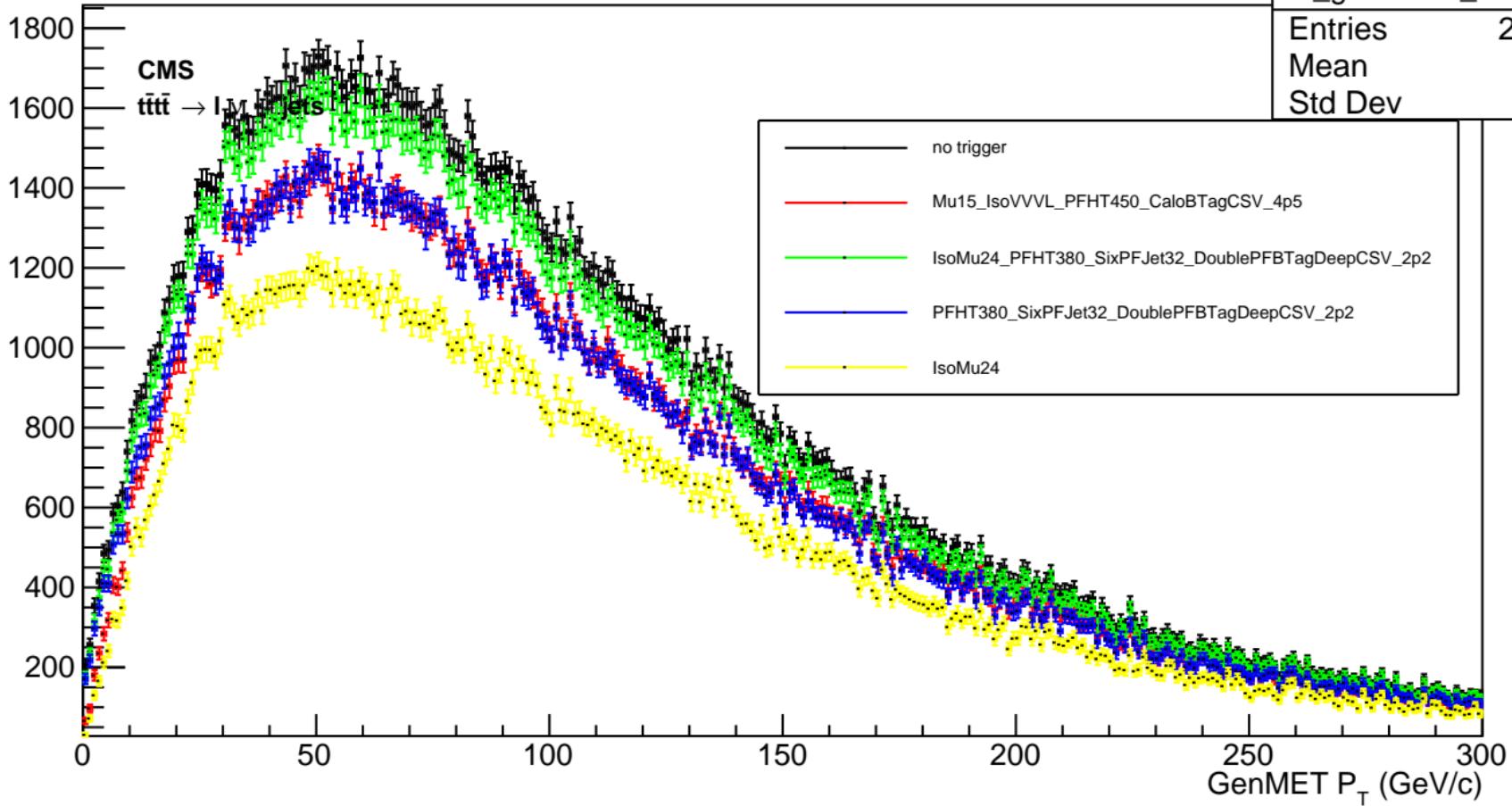
 $t\bar{t}t\bar{t} \rightarrow l\nu_l + \text{jets}$

Trigger Efficiency per 1.0 GeV/c

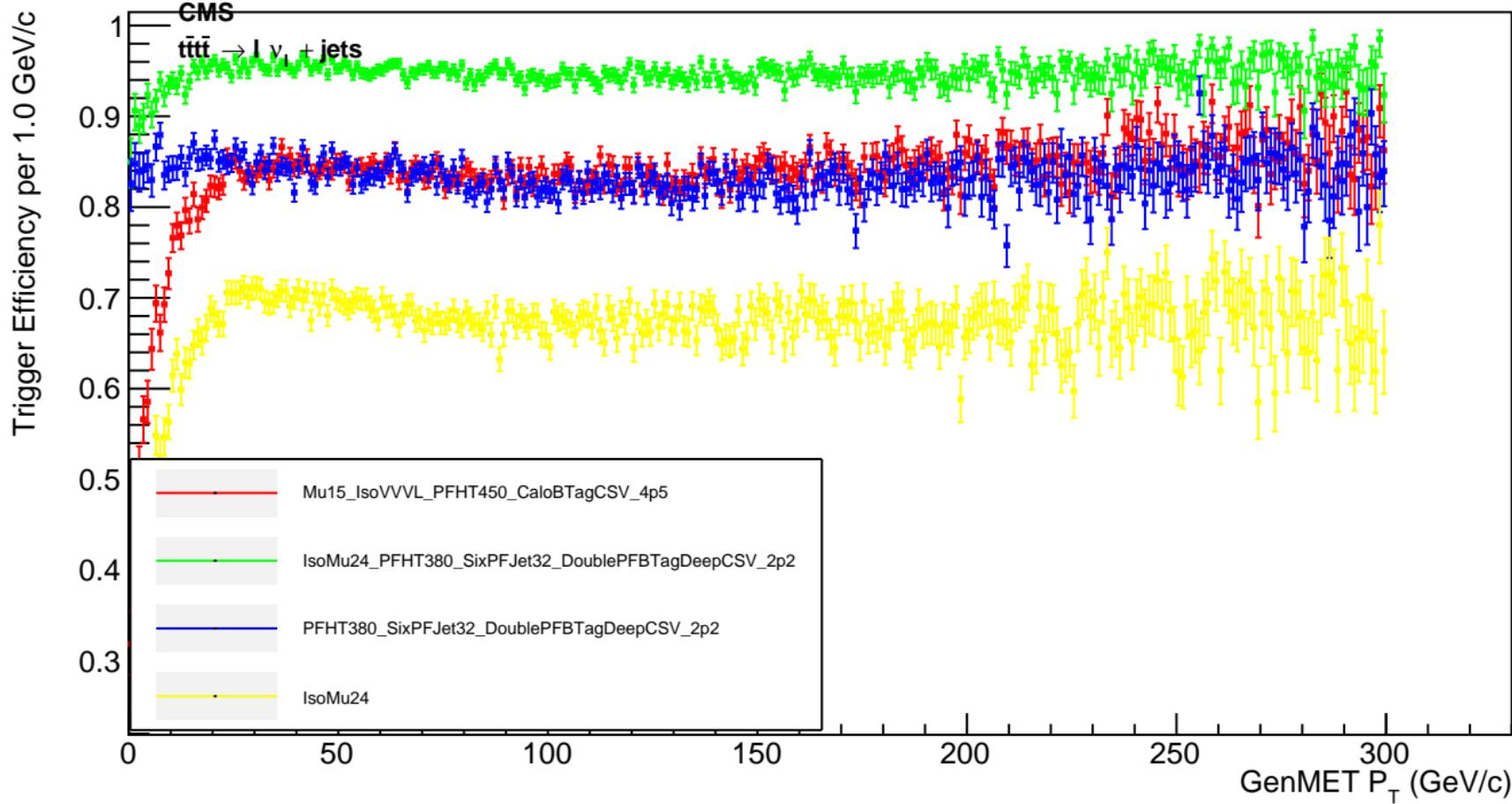


no trigger

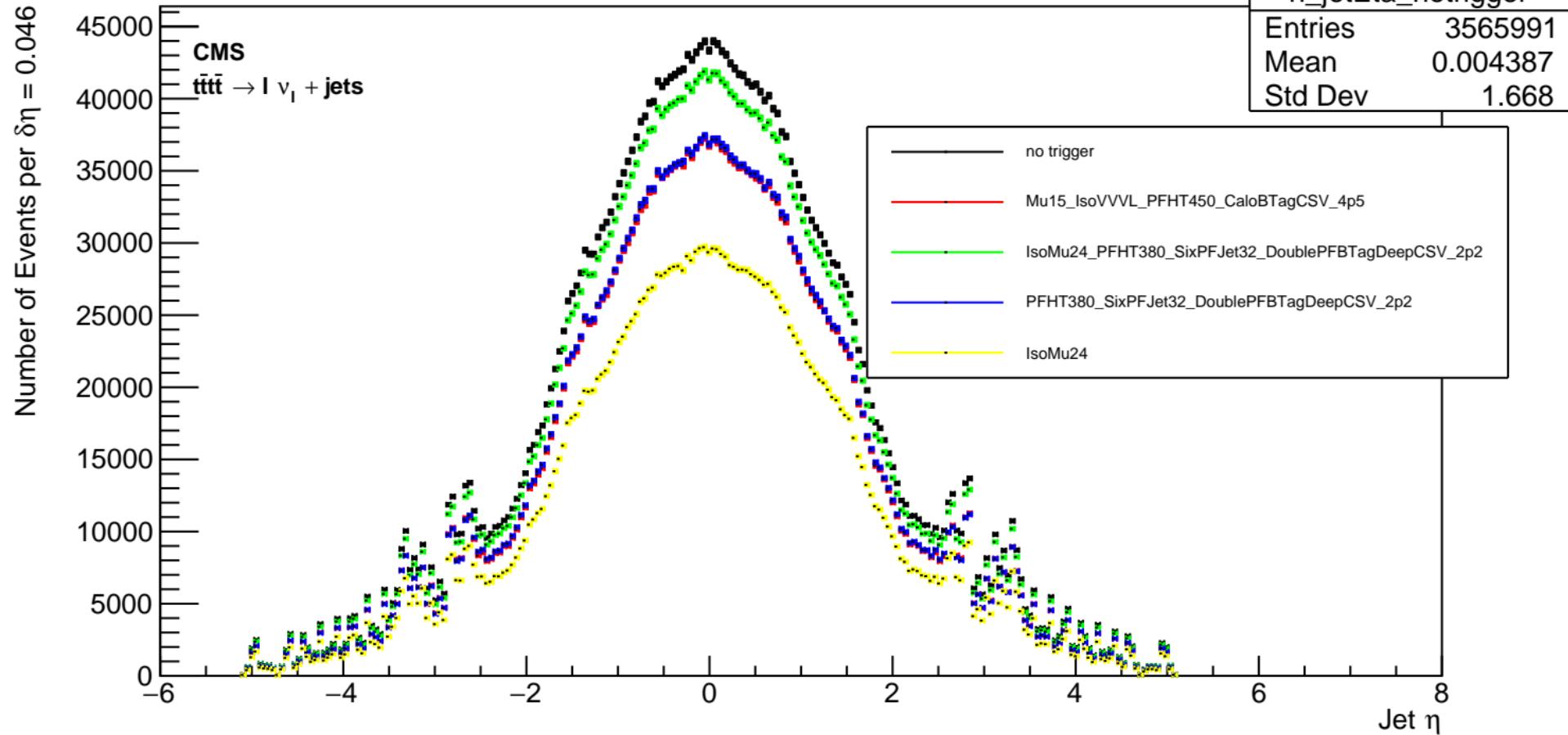
Number of Events per 1GeV/c



| | |
|----------------------|--------|
| h_genMetPt_notrigger | |
| Entries | 252720 |
| Mean | 101.8 |
| Std Dev | 66.1 |

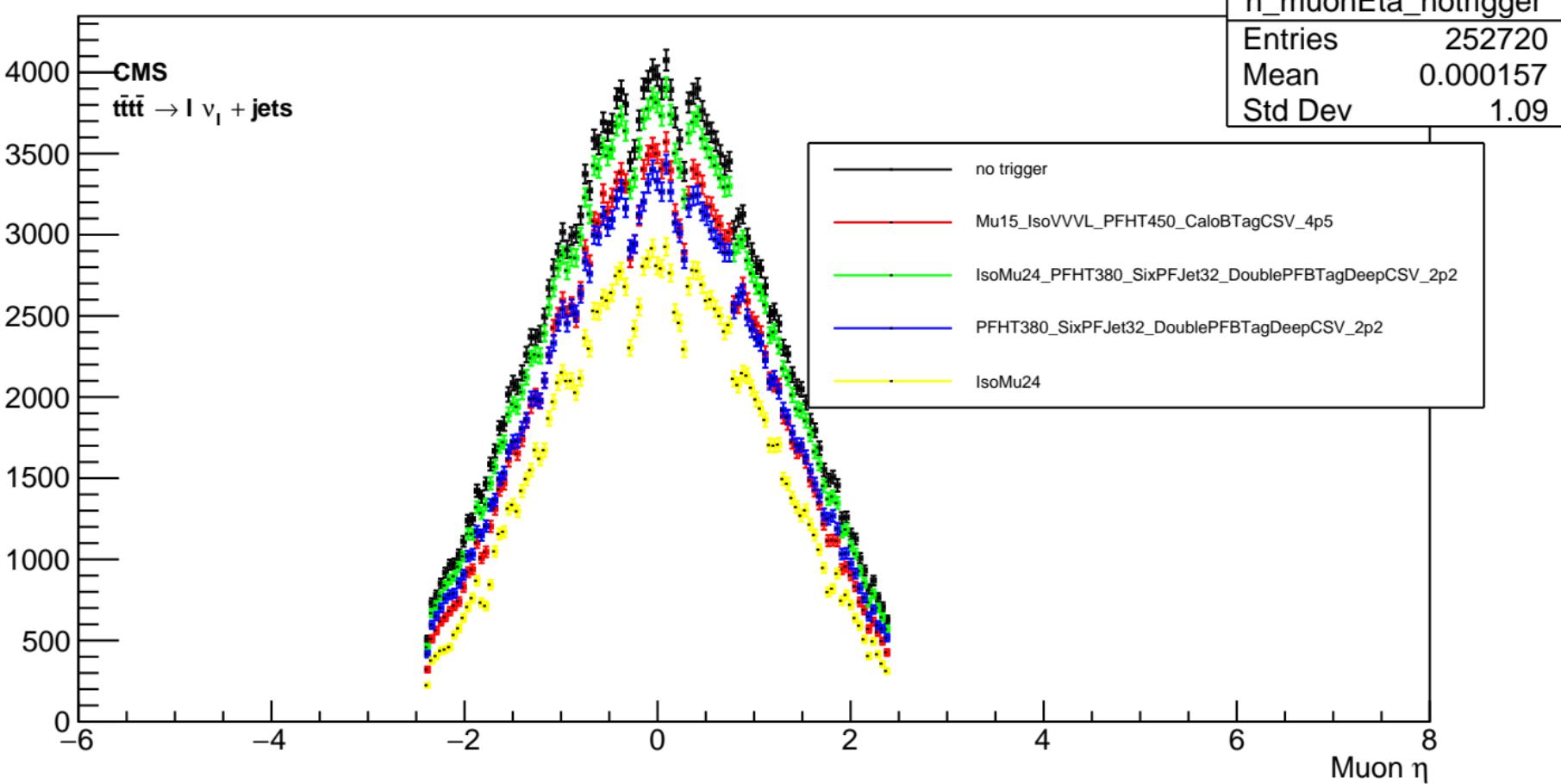


no trigger



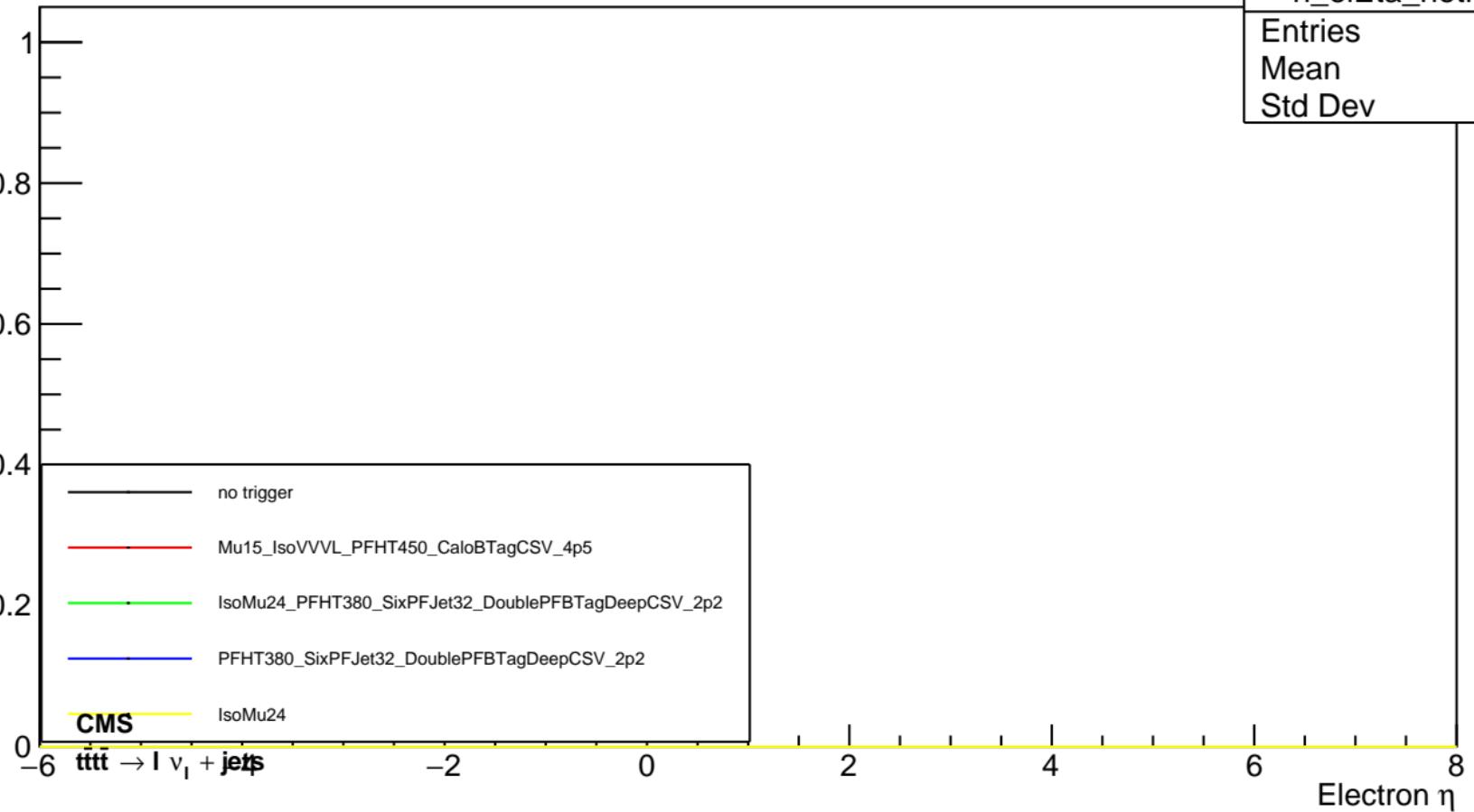
no trigger

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



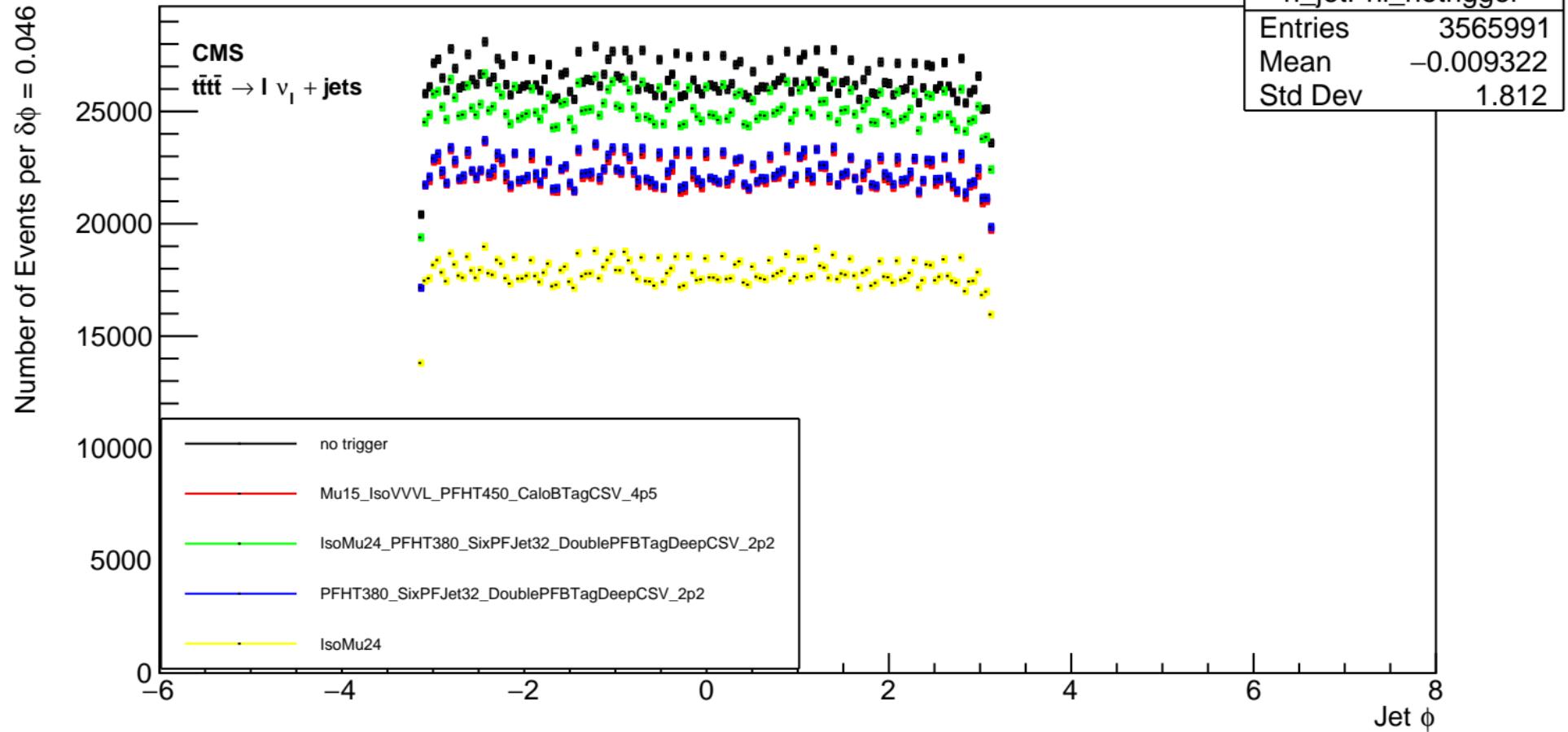
no trigger

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

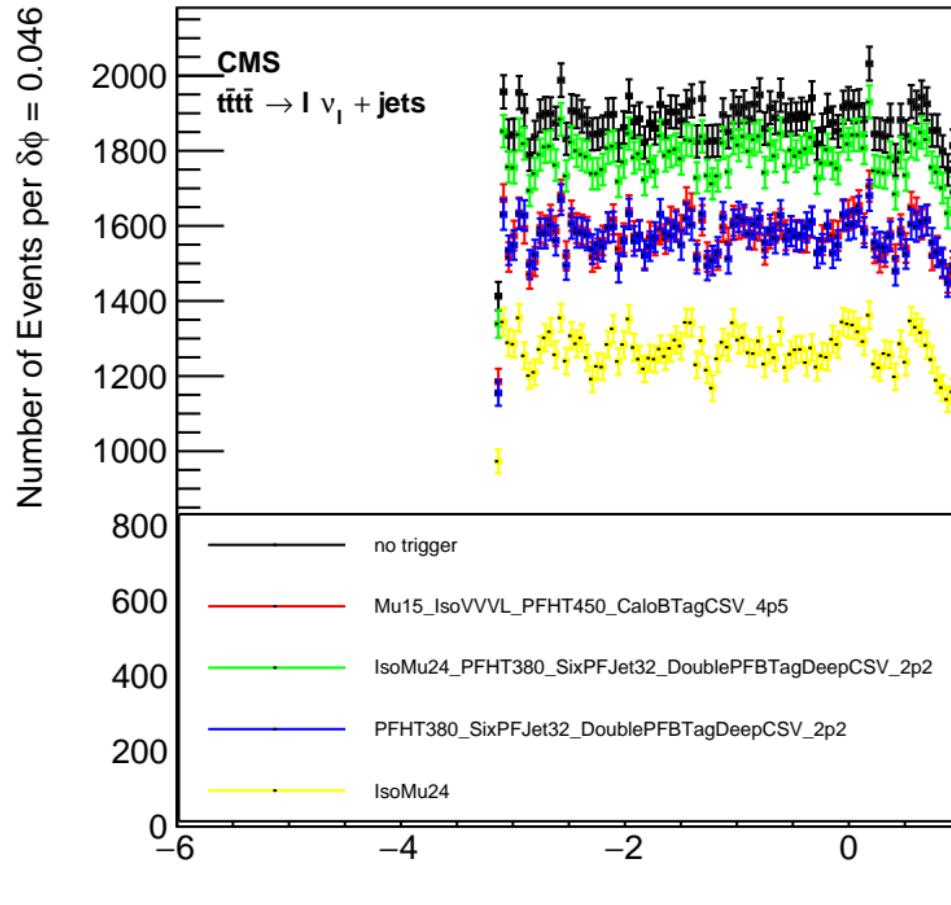


| h_elEta_notrigger | |
|-------------------|---|
| Entries | 0 |
| Mean | 0 |
| Std Dev | 0 |

no trigger



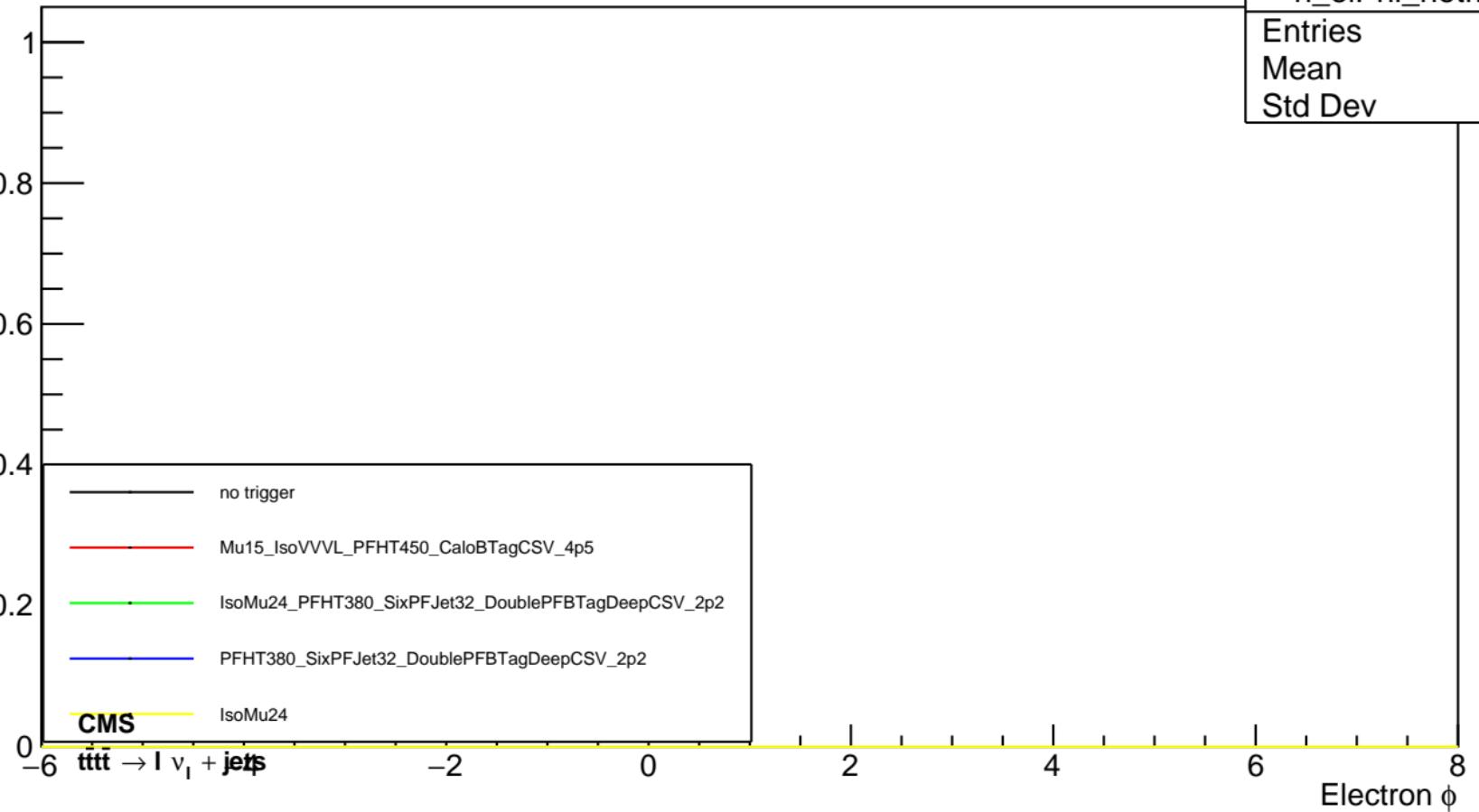
no trigger



| 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

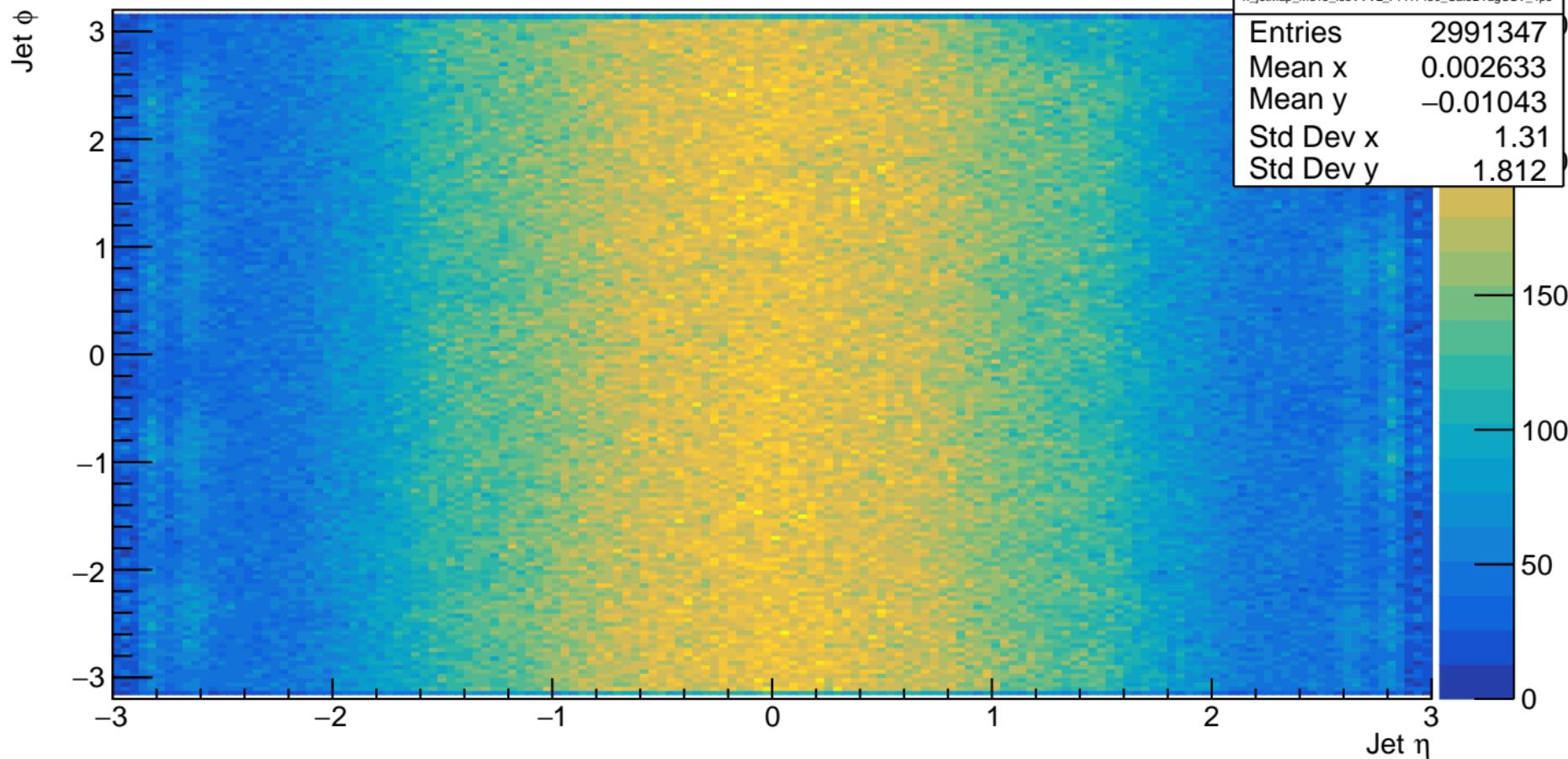
300

200

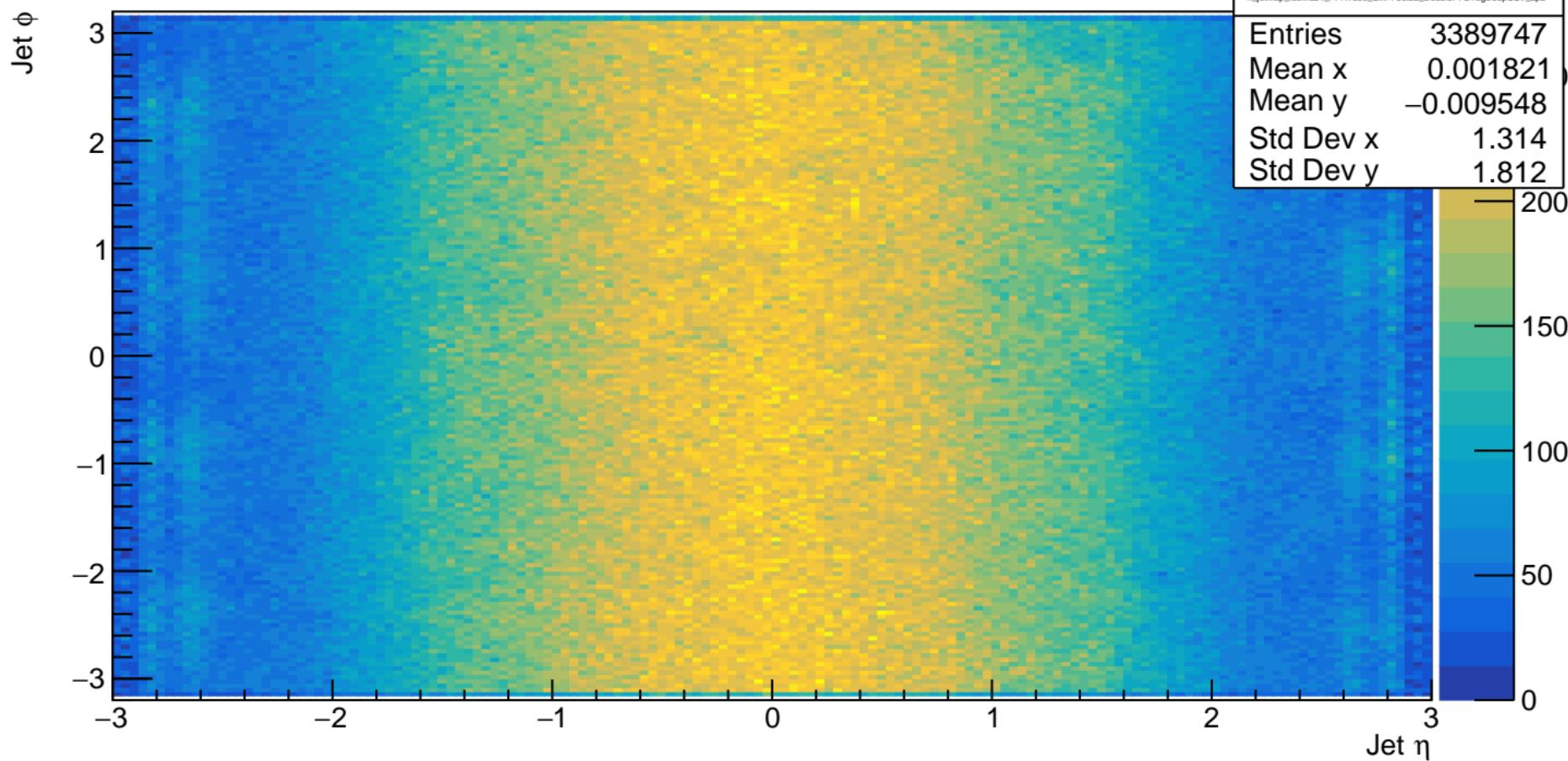
100

0

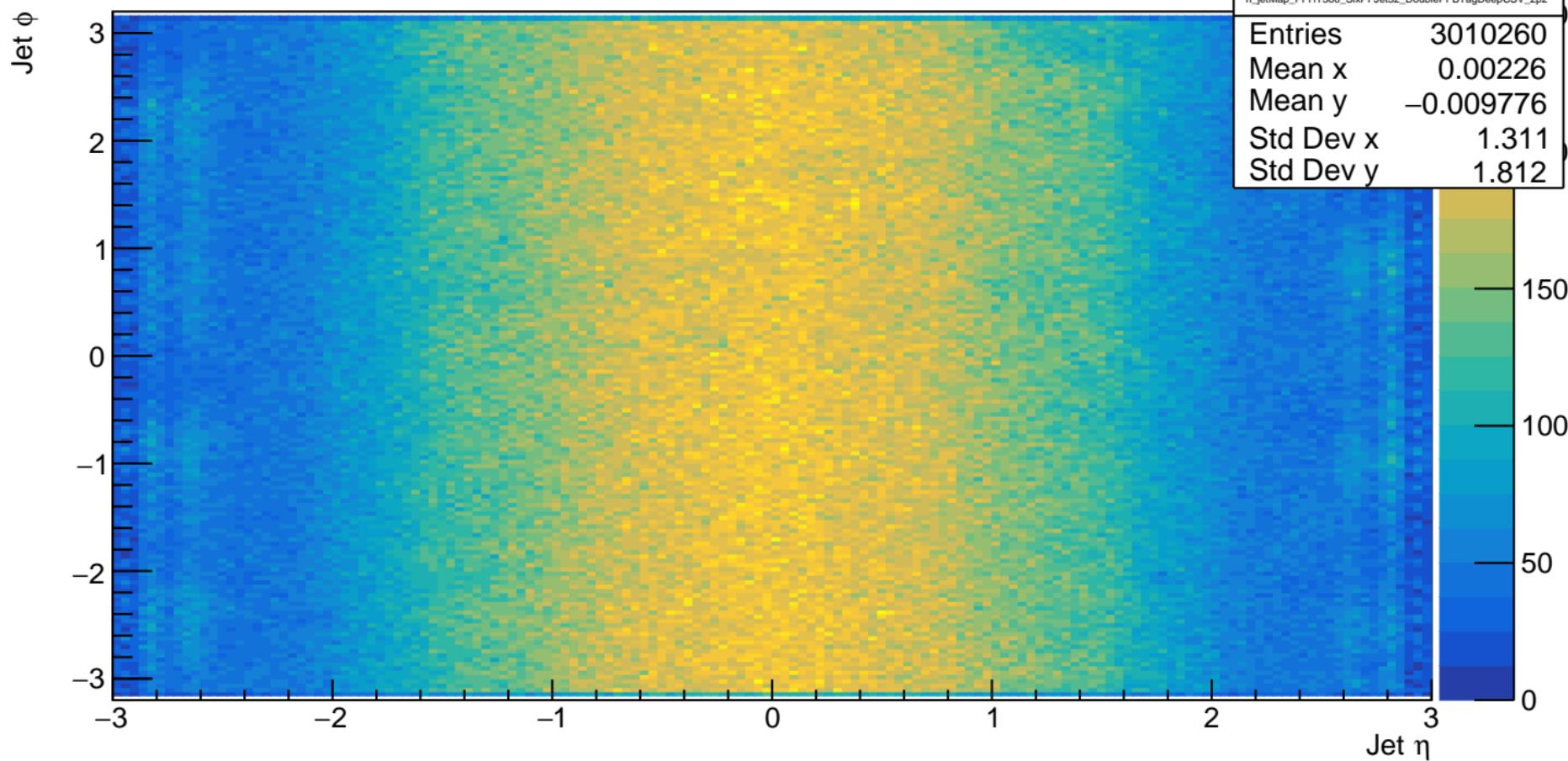
Mu15_IsoVVVL_PFHT450_CaloBTagCSV_4p5



IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



IsoMu24

Jet ϕ

3
2
1
0
-1
-2
-3

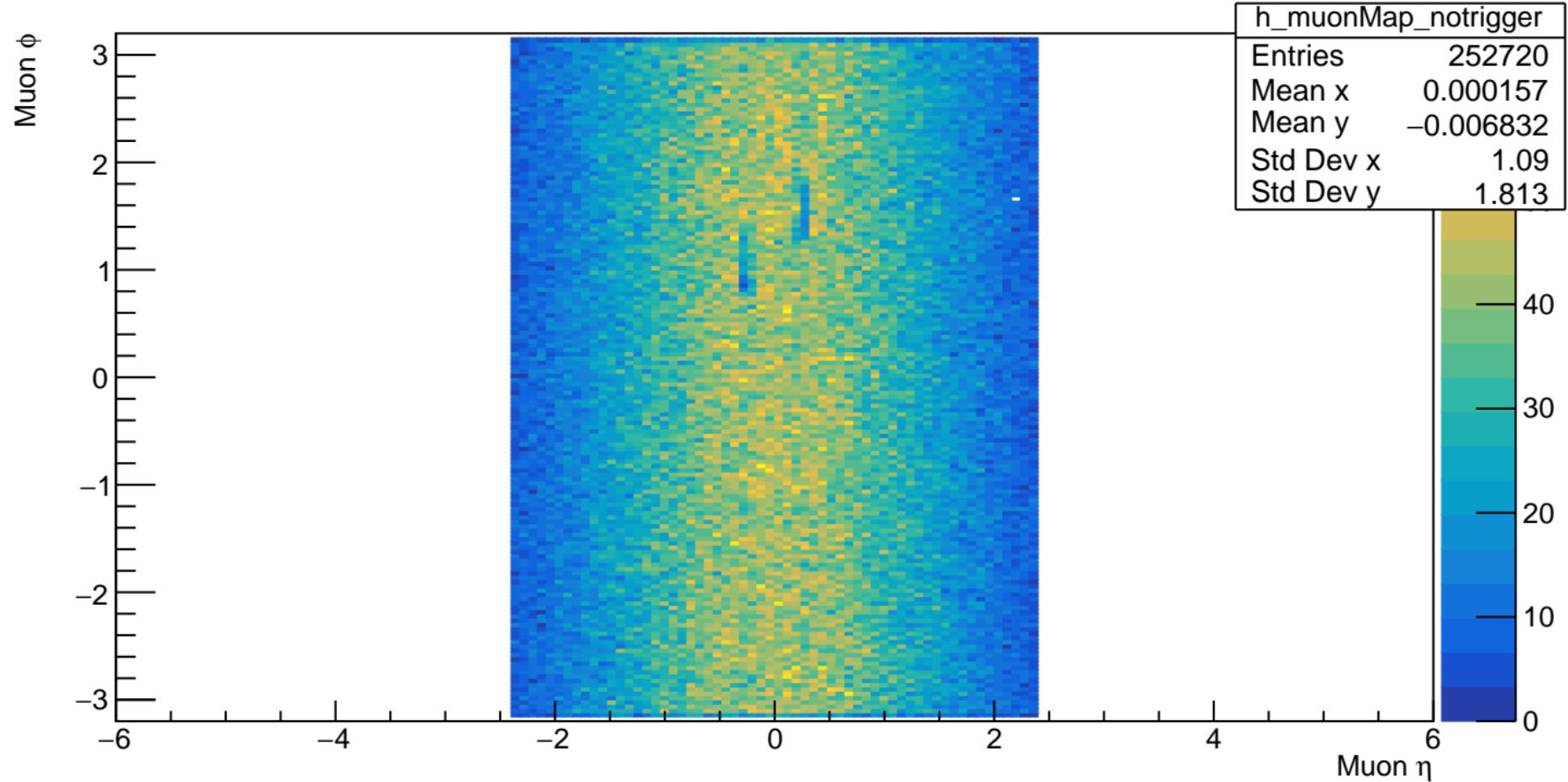
-3 -2 -1 0 1 2 3

Jet η

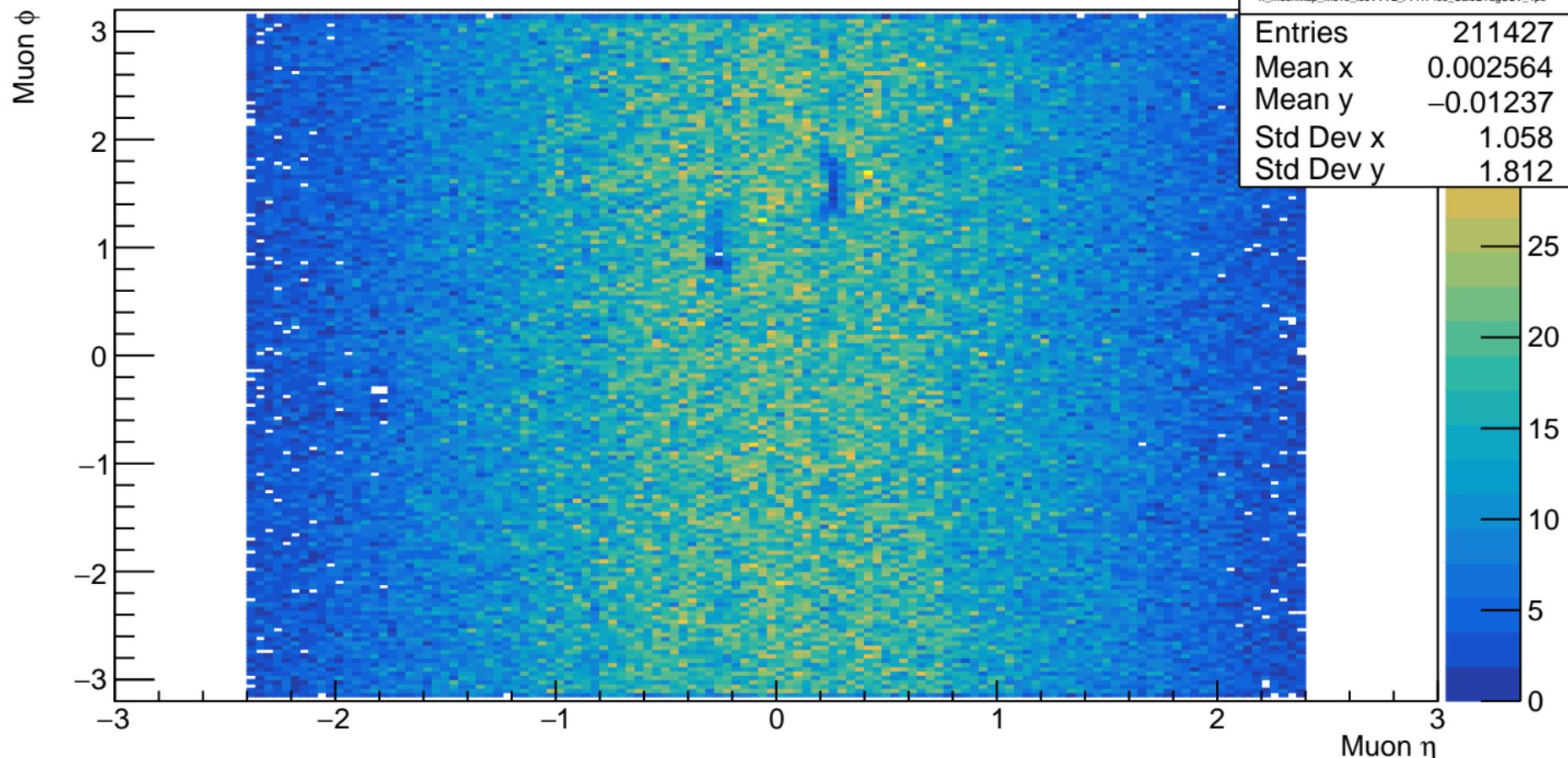
| h_jetMap_IsoMu24 | |
|------------------|----------|
| Entries | 2403378 |
| Mean x | 0.00237 |
| Mean y | -0.00869 |
| Std Dev x | 1.314 |
| Std Dev y | 1.812 |

140
120
100
80
60
40
20
0

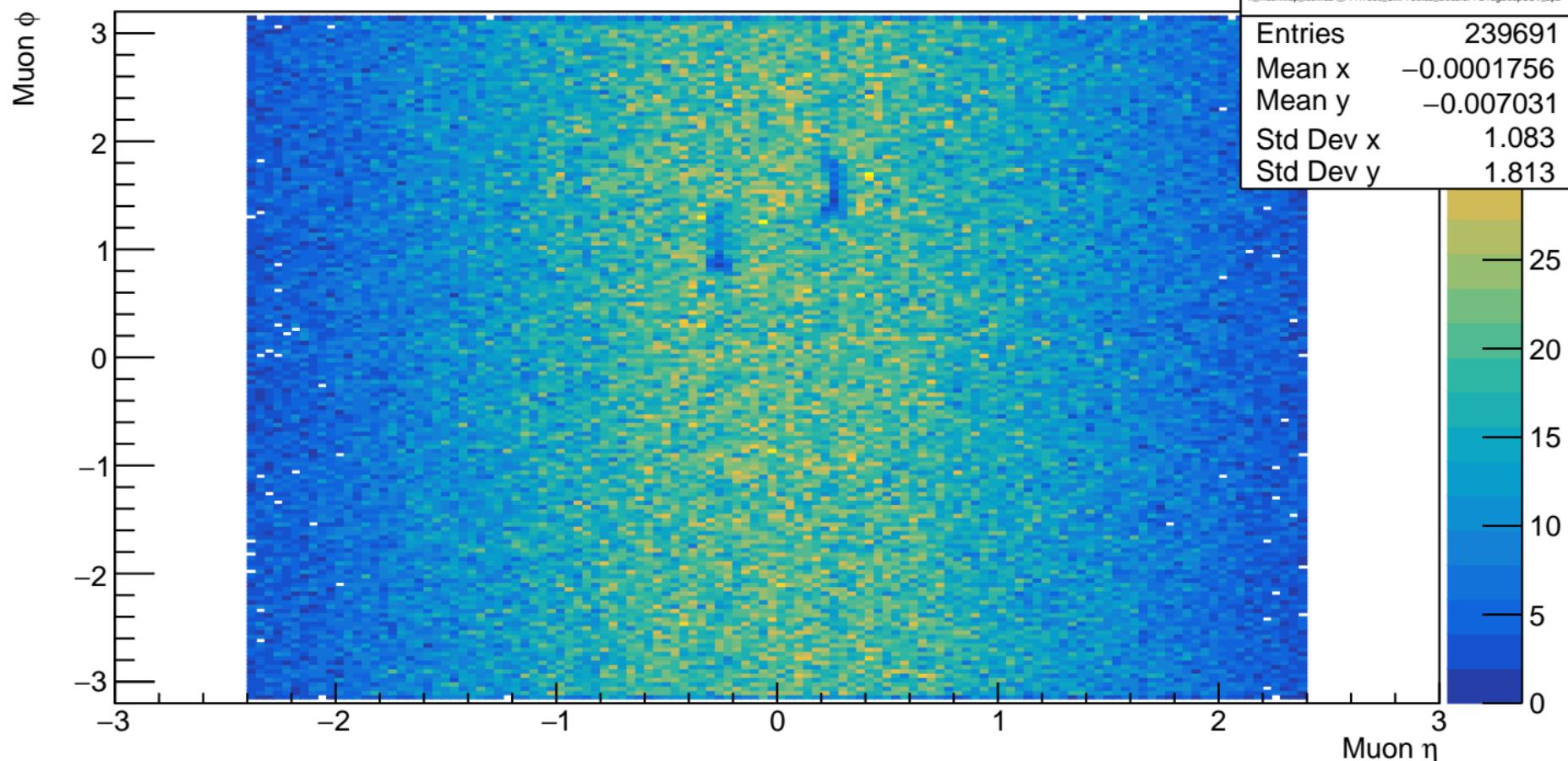
no trigger



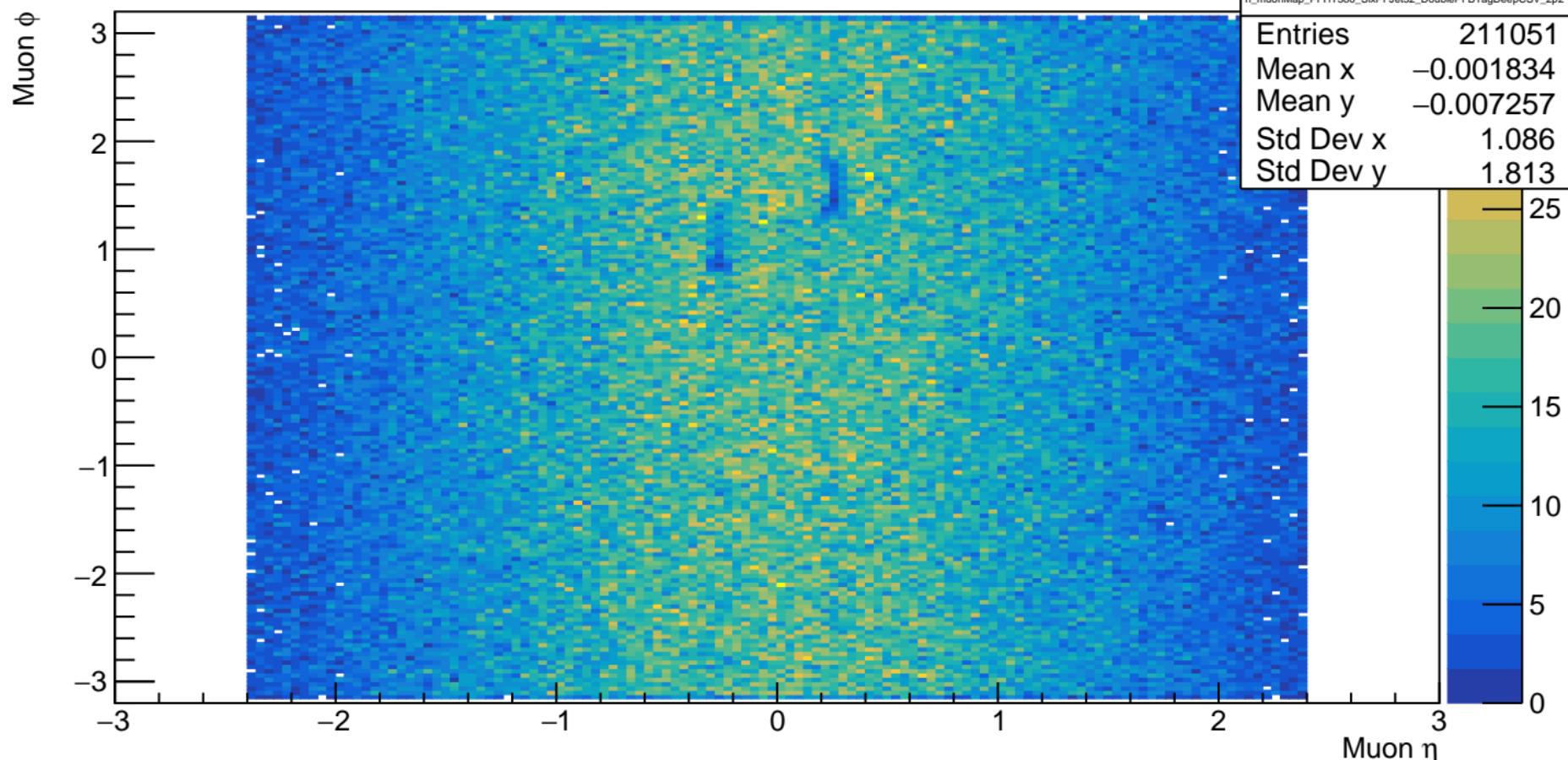
Mu15_IsoVVVL_PFHT450_CaloBTagCSV_4p5



IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



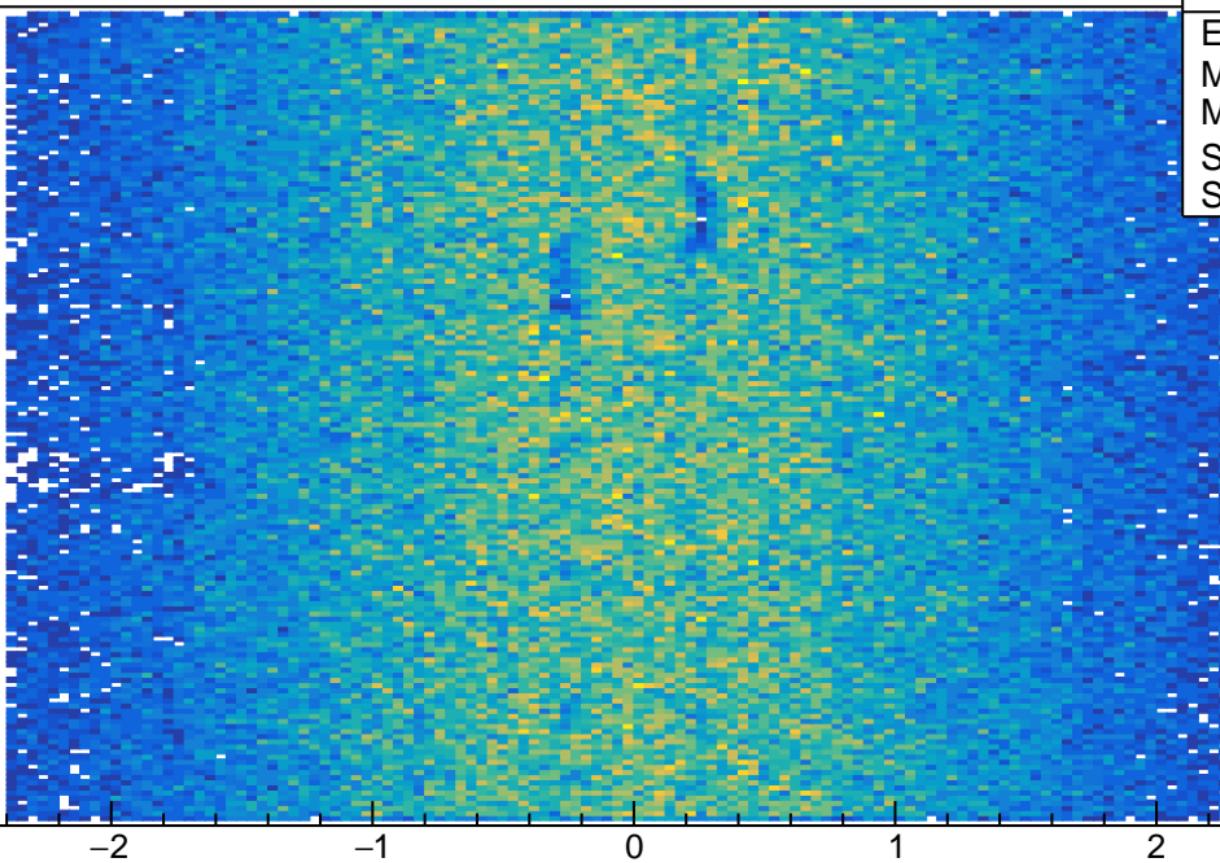
PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2



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



Electron η

| 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

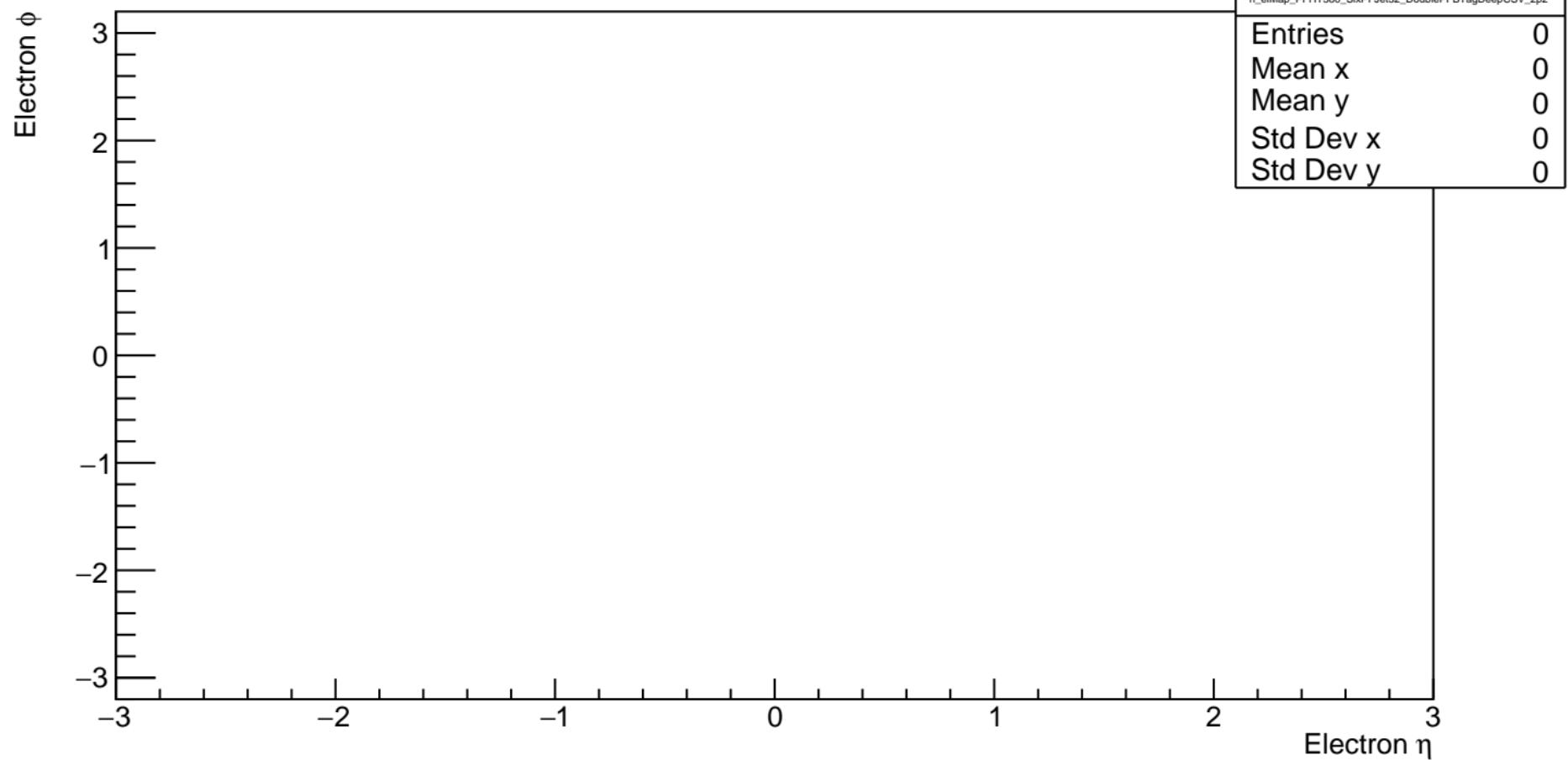
Electron ϕ



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

Electron η

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

