

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

- **Jets:** number  $> 5$
- **Muons:** number  $> 0$
- **Electrons:** number  $> 0$

**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 tightId,  $|\eta| < 2.4$  and  $\text{miniPFRellso\_all} < 0.15$  (for at least 1)

Number of Events per 10 GeV/c

1  
0.8  
0.6  
0.4  
0.2  
0

500

1000

1500

CMS

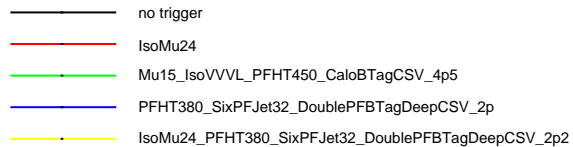
tttt → 200+ jets

2500

$H_T$  (GeV/c)

h\_jetHt\_notrigger

Entries	0
Mean	0
Std Dev	0



**CMS**

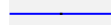
**$t\bar{t}t\bar{t} \rightarrow l \nu_l + \text{jets}$**



IsoMu24



Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p



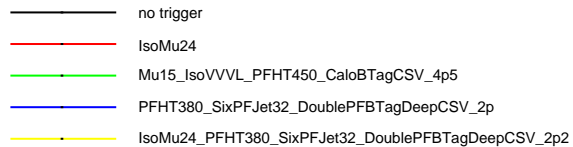
IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Number of Events per Number of Jets

1  
0.8  
0.6  
0.4  
0.2  
0

h\_jetMult\_notrigger

Entries	0
Mean	0
Std Dev	0



CMS

$t\bar{t} \rightarrow l \nu_l 1\text{ jets}$

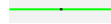
Number of Jets

**CMS**

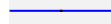
**$t\bar{t}\bar{t} \rightarrow l \nu_l + \text{jets}$**



IsoMu24



Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p



IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Number of Events per Number of Jets

1  
0.8  
0.6  
0.4  
0.2  
0

0

1

2

3

4

5

6

7

8

9

10

B tag Multiplicity

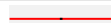
h\_jetBMult\_notrigger

Entries	0
Mean	0
Std Dev	0

no trigger	
IsoMu24	
Mu15_IsoVVVL_PFHT450_CaloBTagCSV_4p5	
PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p	
IsoMu24_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2	

**CMS**

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



IsoMu24



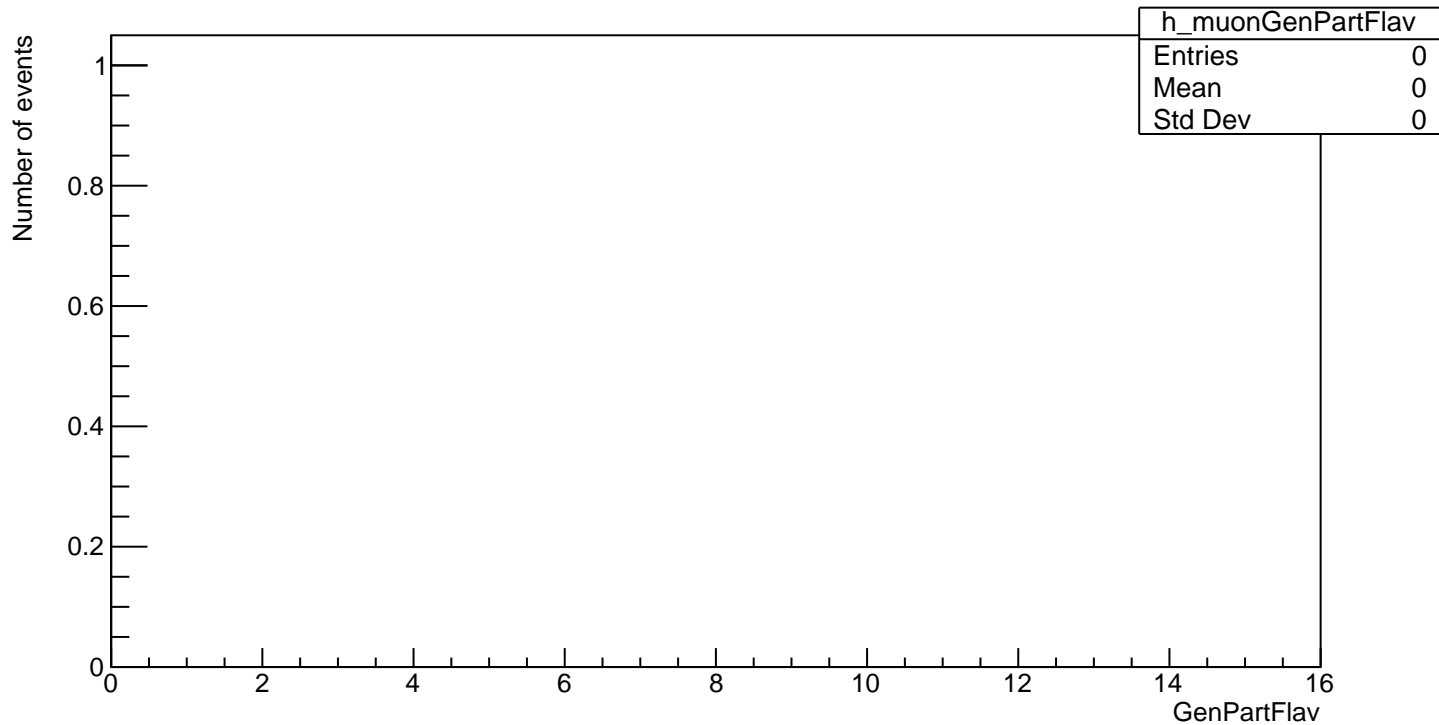
Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



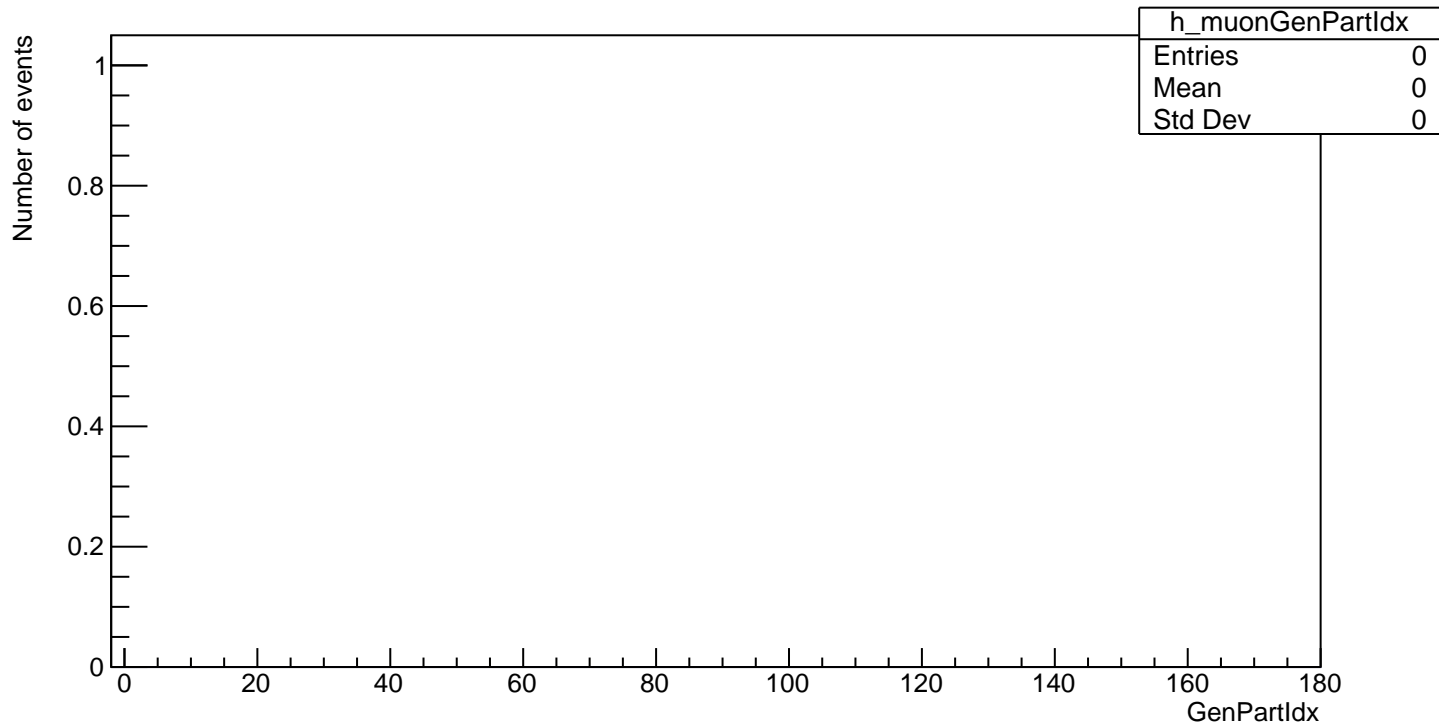
PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p

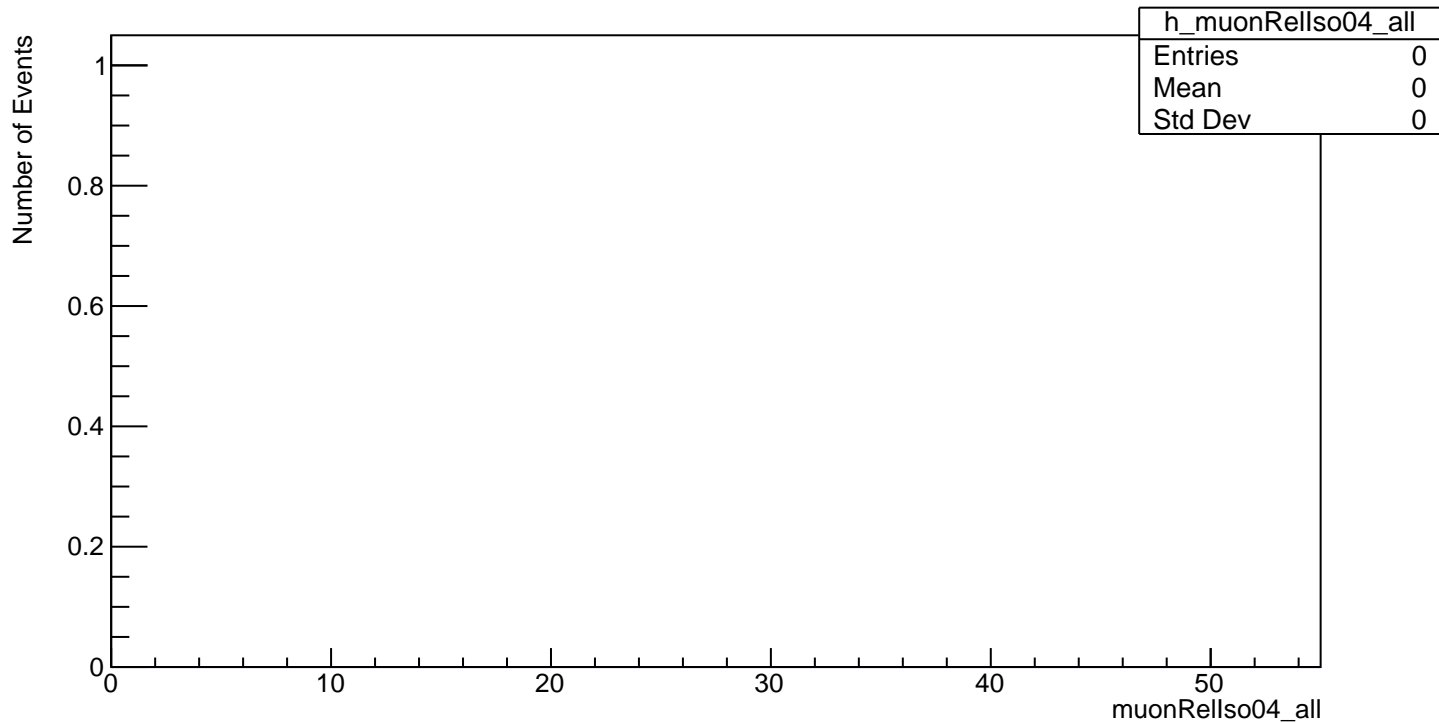


IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2







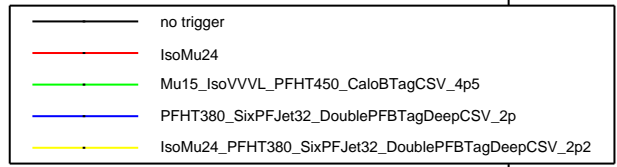


Number of Events per 1 GeV/c

1  
0.8  
0.6  
0.4  
0.2  
0

h\_muonPt\_notrigger

Entries	0
Mean	0
Std Dev	0



CMS

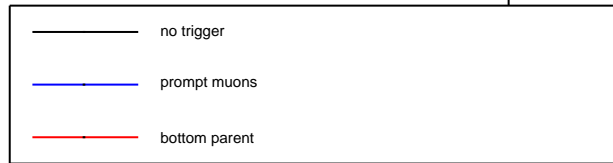
$t\bar{t} \rightarrow 2\ell + \text{jets}$

Muon  $P_T$  (GeV/c)

Number of Events per 1 GeV/c

1  
0.8  
0.6  
0.4  
0.2  
0

h_muonPt_notrigger	
Entries	0
Mean	0
Std Dev	0



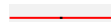
CMS

$t\bar{t} \rightarrow 100 + \text{jets}$

Muon  $P_T$  (GeV/c)

**CMS**

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



IsoMu24



Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p



IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Number of Events per 1 GeV/c

1  
0.8  
0.6  
0.4  
0.2  
0

0

50

100

150

CMS

$t\bar{t} \rightarrow 2\ell + \text{jets}$

200

250

$E_T^{\text{Miss}}$

300

h\_metPt\_notrigger

Entries

0

Mean

0

Std Dev

0

no trigger

IsoMu24

Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5

PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p

IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

**CMS**

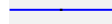
**$t\bar{t}t\bar{t} \rightarrow l \nu_l + \text{jets}$**



IsoMu24



Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p



IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

Number of Events per 1GeV/c

1  
0.8  
0.6  
0.4  
0.2  
0

0

50

100

150

CMS

$t\bar{t} \rightarrow 2\ell + \text{jets}$

200

Gen  $E_T^{\text{Miss}}$

250

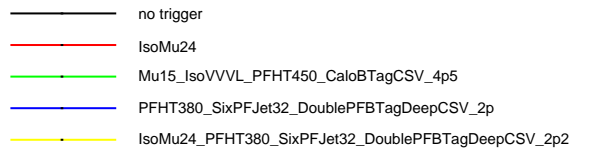
300

h\_genMetPt\_notrigger

Entries 0

Mean 0

Std Dev 0



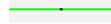


**CMS**

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



IsoMu24



Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5

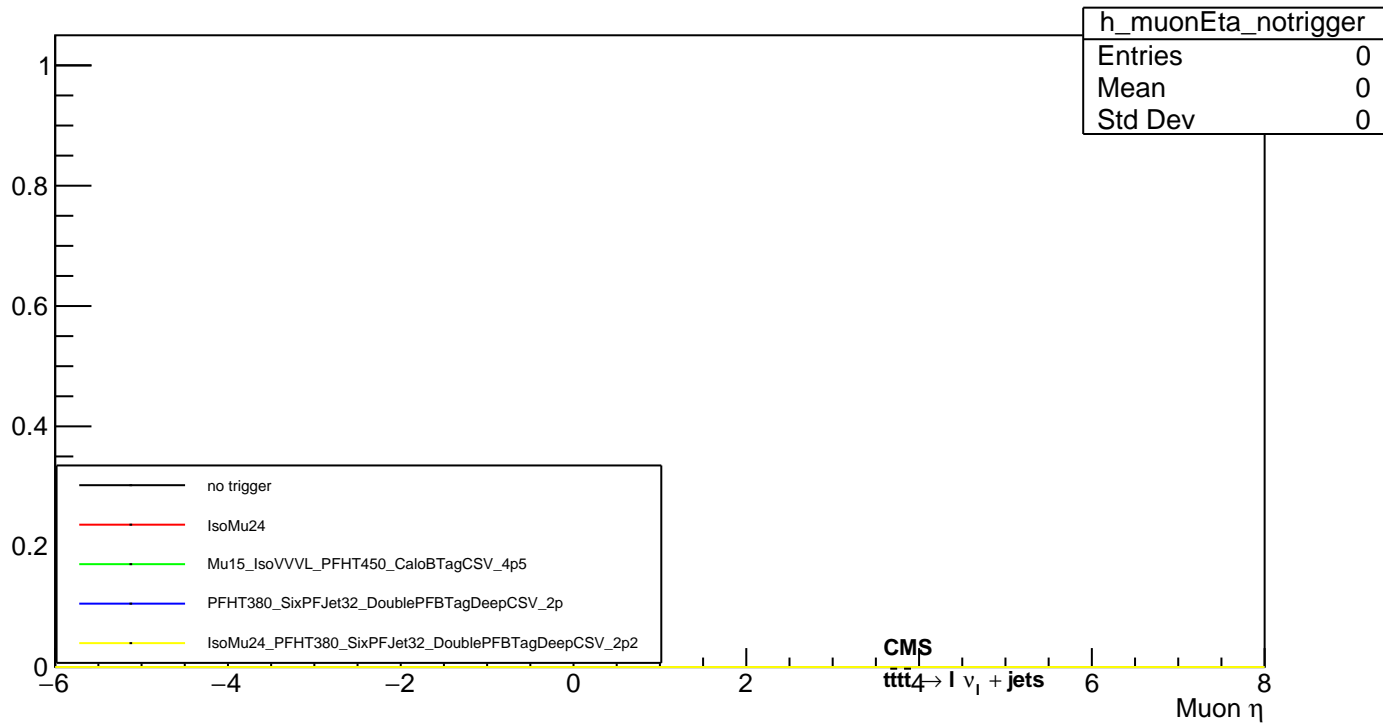


PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p



IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

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

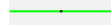


**CMS**

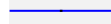
**$t\bar{t}\bar{t}$   $\rightarrow$  l  $\nu_l$  + jets**



IsoMu24



Mu15\_IsoVVVL\_PFHT450\_CaloBTagCSV\_4p5



PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p



IsoMu24\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

