

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

- **Jets:** number  $> 5$
- **Muons plus 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 jets)  
 $\text{btagDeepFlavB} > 0.7489$  (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

- no trigger
- PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2
- Ele28\_eta2p1\_WPTight\_Gsf\_HT150
- Ele32\_WPTight\_Gsf
- Ele35\_WPTight\_Gsf
- Ele38\_WPTight\_Gsf
- Ele32\_WPTight\_Gsf\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2
- Ele35\_WPTight\_Gsf\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2
- Ele38\_WPTight\_Gsf\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

**CMS**

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

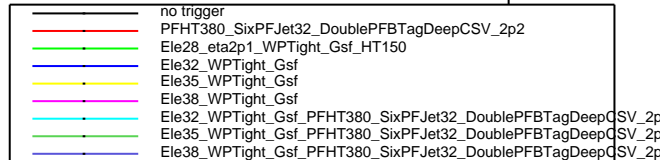
	PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele28_eta2p1_WPTight_Gsf_HT150
	Ele32_WPTight_Gsf
	Ele35_WPTight_Gsf
	Ele38_WPTight_Gsf
	Ele32_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele35_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele38_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2

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

$t\bar{t} \rightarrow l \nu_l 4j$

Number of Jets

**CMS**

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

	PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele28_eta2p1_WPTight_Gsf_HT150
	Ele32_WPTight_Gsf
	Ele35_WPTight_Gsf
	Ele38_WPTight_Gsf
	Ele32_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele35_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele38_WPTight_Gsf_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

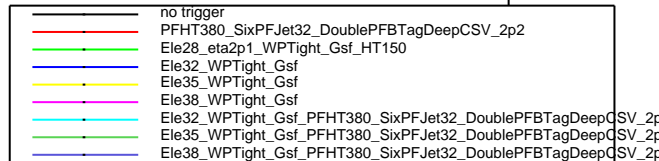
B tag Multiplicity

h\_jetBMult\_notrigger

Entries 0









Mean 0

Std Dev 0



**CMS**

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

	PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele28_eta2p1_WPTight_Gsf_HT150
	Ele32_WPTight_Gsf
	Ele35_WPTight_Gsf
	Ele38_WPTight_Gsf
	Ele32_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele35_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele38_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2

Number of Events per 1 GeV/c

1  
0.8  
0.6  
0.4  
0.2  
0

h\_elPt\_notrigger

Entries	0
Mean	0
Std Dev	0

- no trigger
- PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2
- Ele28\_eta2p1\_WPTight\_Gsf\_HT150
- Ele32\_WPTight\_Gsf
- Ele35\_WPTight\_Gsf
- Ele38\_WPTight\_Gsf
- Ele32\_WPTight\_Gsf\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2
- Ele35\_WPTight\_Gsf\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2
- Ele38\_WPTight\_Gsf\_PFHT380\_SixPFJet32\_DoublePFBTagDeepCSV\_2p2

CMS









tttt → 200+ jets

Electron  $P_T$  (GeV/c)

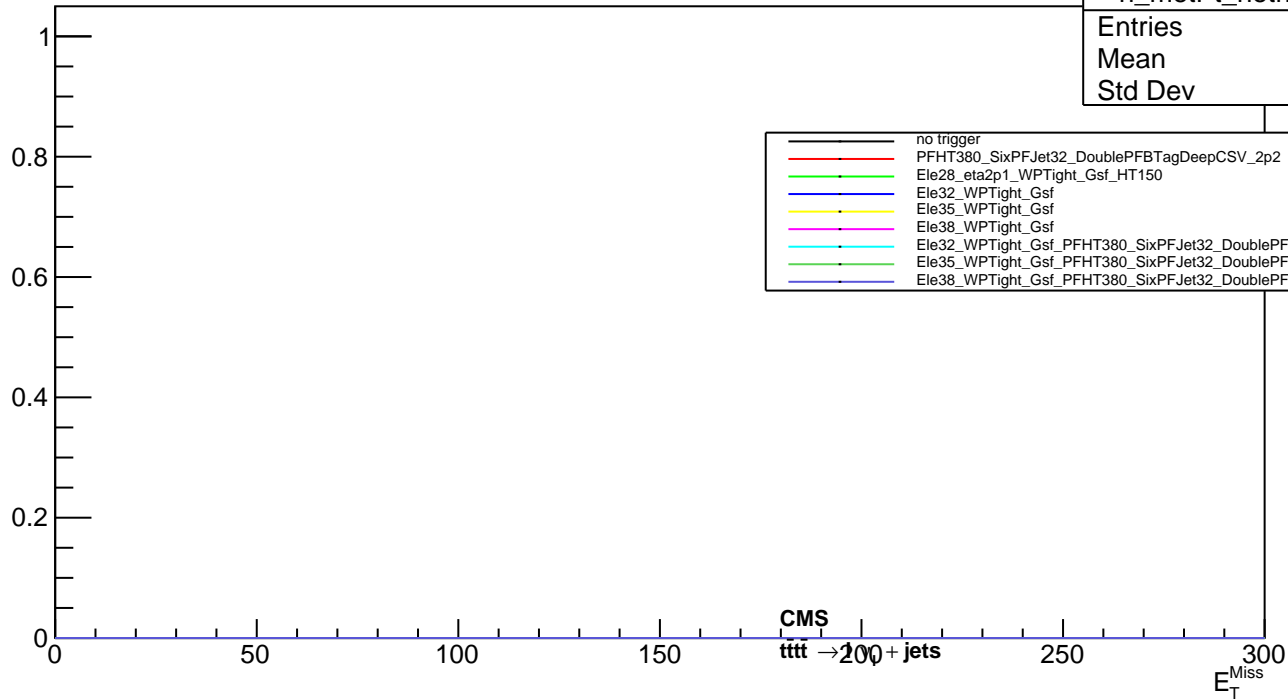


**CMS**

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









	PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele28_eta2p1_WPTight_Gsf_HT150
	Ele32_WPTight_Gsf
	Ele35_WPTight_Gsf
	Ele38_WPTight_Gsf
	Ele32_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele35_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele38_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2

Number of Events per 1 GeV/c



**CMS**

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

	PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele28_eta2p1_WPTight_Gsf_HT150
	Ele32_WPTight_Gsf
	Ele35_WPTight_Gsf
	Ele38_WPTight_Gsf
	Ele32_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele35_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele38_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2

Number of Events per 1GeV/c

1  
0.8  
0.6  
0.4  
0.2  
0

0

50

100

150

200

250

300

CMS

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

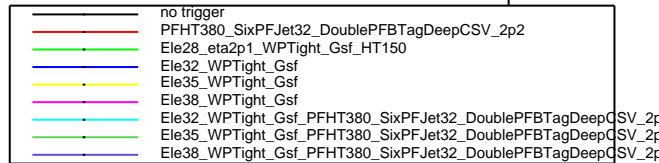
Gen  $E_T^{\text{Miss}}$

h\_genMetPt\_notrigger

Entries 0









Mean 0

Std Dev 0

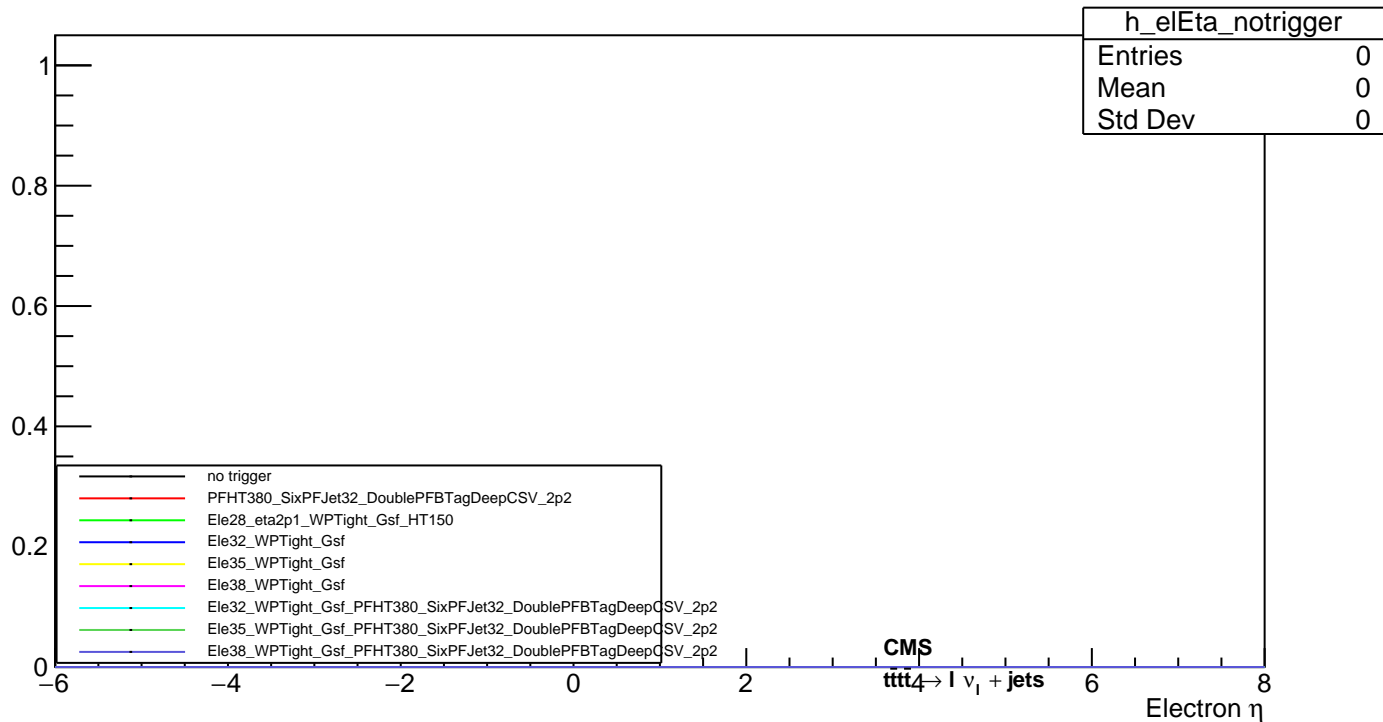


**CMS**

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









	PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele28_eta2p1_WPTight_Gsf_HT150
	Ele32_WPTight_Gsf
	Ele35_WPTight_Gsf
	Ele38_WPTight_Gsf
	Ele32_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele35_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele38_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2

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



**CMS**

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

	PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele28_eta2p1_WPTight_Gsf_HT150
	Ele32_WPTight_Gsf
	Ele35_WPTight_Gsf
	Ele38_WPTight_Gsf
	Ele32_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele35_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2
	Ele38_WPTight_Gsf_PFHT380_SixPFJet32_DoublePFBTagDeepCSV_2p2

