

$TZ \rightarrow 3\ell$ : single top +  $t\bar{t}$

$\mathcal{L} = 100 \text{ fb}^{-1}$  with  $K_{tZu} = 2 \cdot 10^{-4}$  (the best limit)

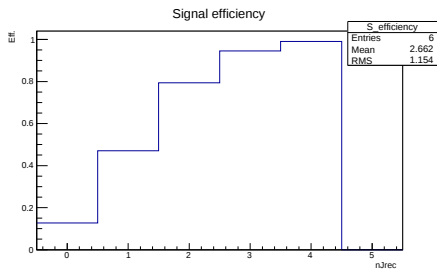
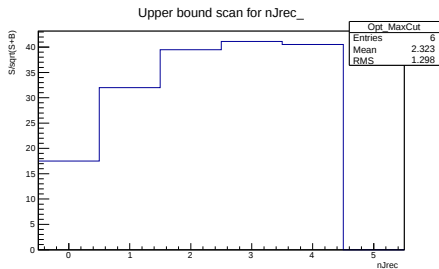
$\mathcal{L} = 100 \text{ fb}^{-1}$  with  $K_{tZc} = 6 \cdot 10^{-3}$  (same xs)

Lorenzo Basso

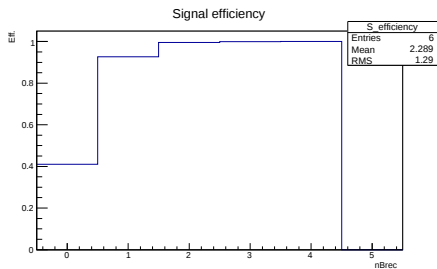
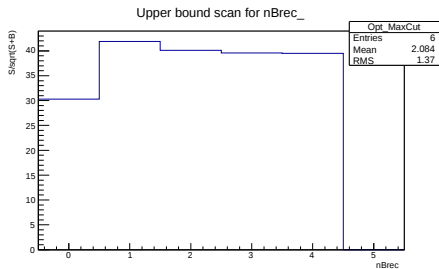
# Optimisation

- $p_\ell^T > 20 \text{ GeV}$ ,  $p_j^T > 40 \text{ GeV}$
- isolation: CONE03?4? with threshold = 0.15?0.20?
- $N_J \geq 1$  ( $J$  = light and b jets)  
 $N_J \leq 3$  slightly reduces  $ttZ$  but no real gain
- $N_b \geq 1$  to reduce  $WZ$ ,  $N_b \leq 1$  once  $WZ$  is removed  $\Rightarrow N_b \equiv 1$
- $Z$  candidate as pair of  $e^+e^- (\mu^+\mu^-)$  closest to  $M_Z$   
and  $|M_{\ell\ell} - M_Z| < 20 \text{ GeV}$
- loose  $W$  reco:  $10 < M^T(\ell_W)/\text{GeV} < 150$
- loose top reco:  $M^T(b\ell_W)/\text{GeV} < 215$

# Optimisation - nJ (w/o WZ)

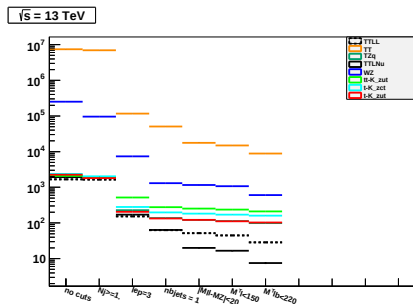


# Optimisation - nB (w/o WZ)

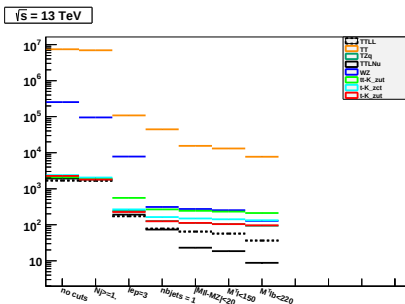


# CutFlow - CVSL vs CVS

CVSL, cone04,  $I_{rel} > 0.2$

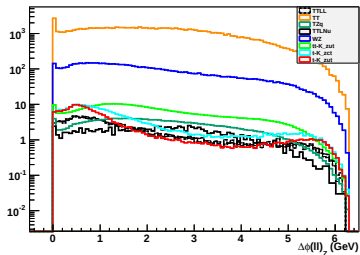


CSVM, cone03,  $I_{rel} > 0.15$

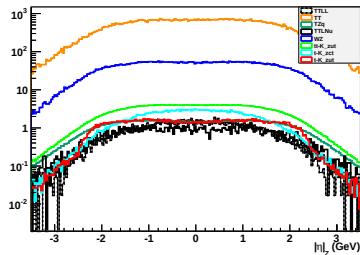


# (Some) variables for MVA

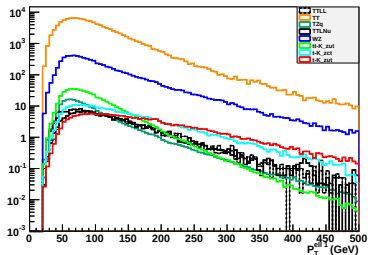
$\sqrt{s} = 13 \text{ TeV}$



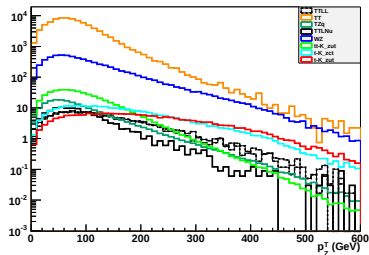
$\sqrt{s} = 13 \text{ TeV}$



$\sqrt{s} = 13 \text{ TeV}$



$\sqrt{s} = 13 \text{ TeV}$



# Fakes - isolation problem

$\sqrt{s} = 13 \text{ TeV}$

