

SS Dimuon selection

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Data sets

- CMSSW version: 3_3_6
- Signal: $1/R=300$ GeV
- Background: ttbar, Z+jets ($Z \rightarrow \mu^+ \mu^-$)
total: 225000 events
- Signal and ttbar events to obtain selection criteria
- Blind selection applied to Zjets data

Data Sets

- Background cross-sections are comparable

$$\sigma_{Z+jets} \sim 3\sigma_{t\bar{t}}$$

- SS dimuon fractions:

Signal, Z+jets: $\sim 1\%$

t \bar{t} : $\sim 5\%$

$$N_{t\bar{t}}^{SSdimuon} \propto 5\% \times \sigma_{t\bar{t}}$$

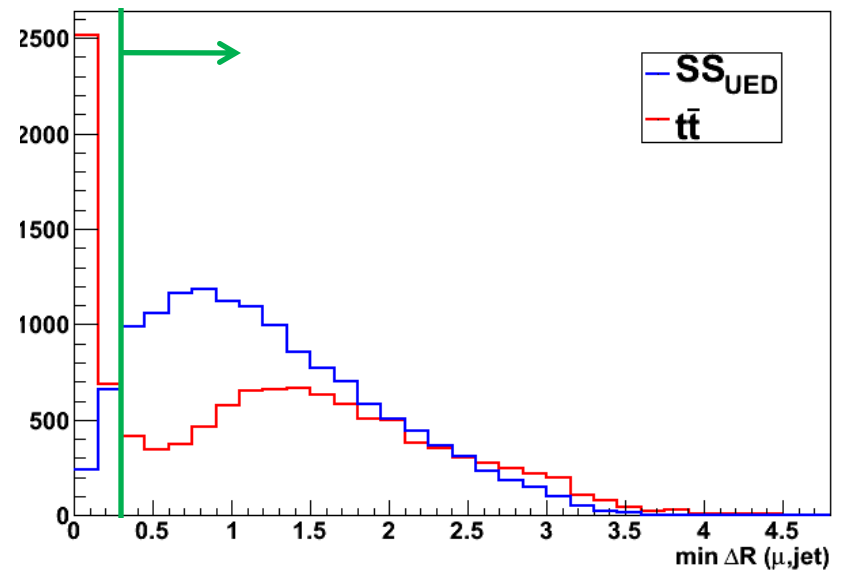
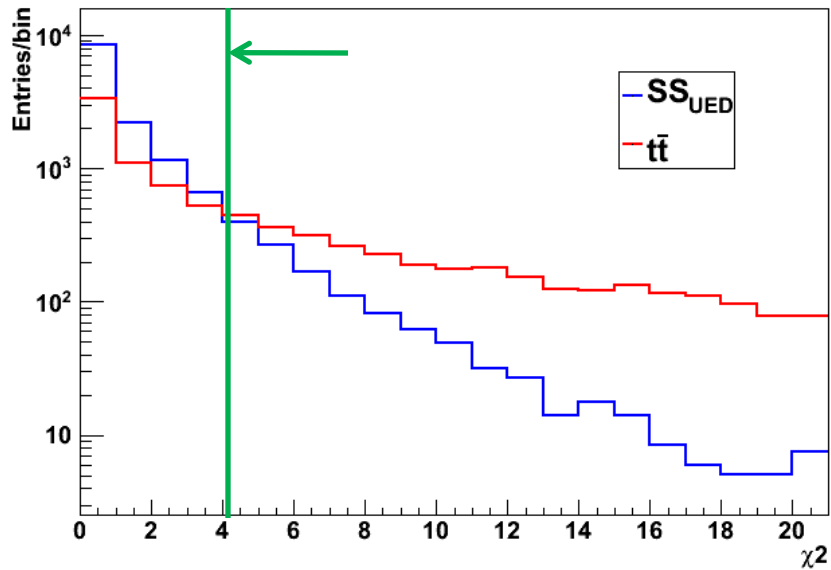
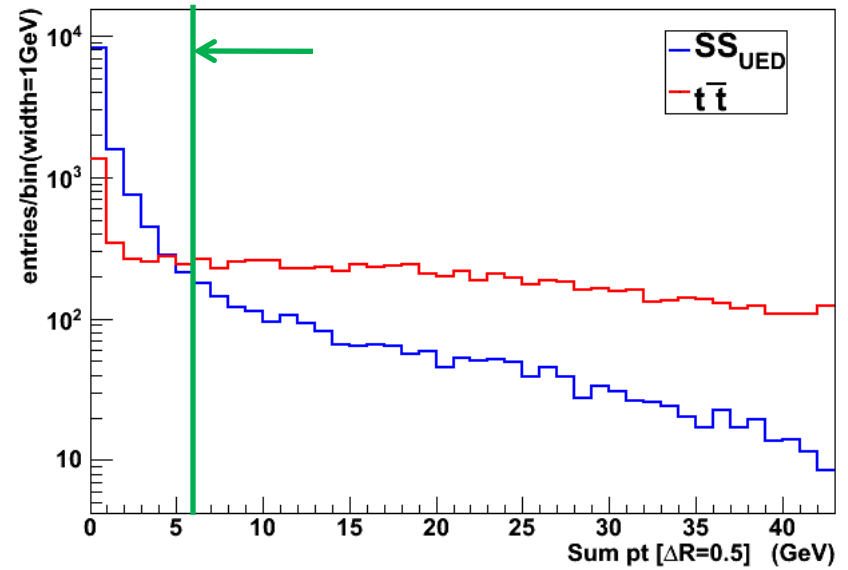
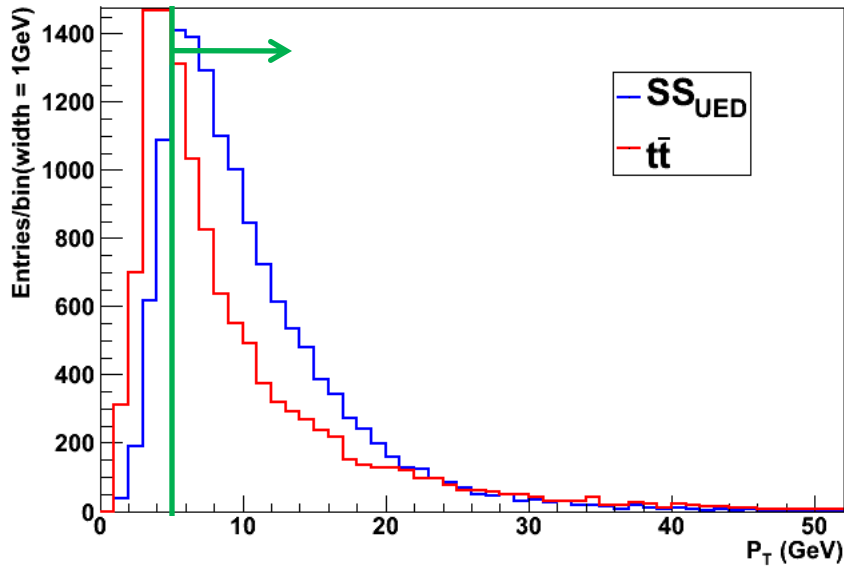
$$N_{Z+jets}^{SSdimuon} \propto 1\% \times \sigma_{Z+jets} \rightarrow N_{Z+jets}^{SSdimuon} \propto 3\% \times \sigma_{t\bar{t}}$$

Selection variables

- Simplest procedure variable comparison
- Number of variables to a minimum
- Cuts on: single muon, dimuon, jets

Variable	Cut
Leading μ : p_T	> 7.0 GeV, < 35.0 GeV
Leading μ : track p_T sum ($\Delta R=0.5$)	< 6.0 GeV
Leading μ : min ΔR (μ , jets)	> 0.2
Next μ : p_T	> 5.0 GeV
Next μ : track p_T sum ($\Delta R=0.5$)	< 8.0 GeV
Next μ : min ΔR (μ , jets)	> 0.3
Dimuon: vertex χ^2/ndof	< 4.0
Jets: n jets ($p_T > 25.0$ GeV)	> 1

Selection variables



Event Yields (100pb^{-1})

- Only statistical uncertainties
- Signal selection efficiency high:

$$N_{\text{sel}}/N_{\text{reco}} = 46\% \rightarrow 247 \text{ events}$$

- Background rejection:

Z+jets: [0.06:0.7] CL=90%,

ttbar: 2.5 ± 0.3

- Background must be dominated by QCD.
- bbar major component?

Xsection too high. Cut factorization?

Next steps: $pp \rightarrow b\bar{b}$, $pp \rightarrow \mu X$, $pp \rightarrow W+\text{jets}$