H->WW->lvj selection

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Object Selection

- Electron:

  20 GeV < ET < 50 GeV

  |η| < 2.47 without 1.37 < |η| < 1.52(transition region between barrel and endcap)

  |d0/σ_{d0} | < 10 and|z0| < 1 mm

  Isolated: (E_T^{calo})/p_T^e <0.14 in ΔR<0.3

- Muon

  pT > 20 GeV

  |η| < 2.4

  |d0/σ_{d0} | < 3.

  Isolated: (E_T^{calo})/p_T^{μ} <0.14 in ΔR<0.3 and (P_T^{track})/p_T^{μ} <0.15 in ΔR<0.4 for all tracks pT >1GeV

- Jet

pT > 25 GeV

|η| < 4.5

None b-jet if|η| < 2.8

Event slection

- Events divides into two category by number of jets

- H+0j

- H+1j

H+0j & H+1j

- One lepton pT > 40 GeV,
- no additional leptons with pT > 20 GeV, E_T^{miss} >40 GeV,
- Jets:

  pT > 40 GeV |η| < 4.5

  exactly two jets (ℓν j j + 0 jet sample)

  or exactly three jets (ℓν *j j* +1 jet sample)

  for W jets

  |η| < 2.8

  leading jet pT > 60 GeV.

  71 GeV < mj j <91 GeV

  ΔR_{jj} < 1.3

  no b-jets

H+2j

- p^{T}_{lepton} >30GeV
- E^{t}_{miss} >30GeV
- At least 4 jets pT > 25 GeV |η| < 4.5
- 2 W jets:

  71 GeV < $m_{j\,j}$ <91 GeV |η| < 2.8
- the 2 big jets:

  $\eta_{j1} \cdot \eta_{j2} < 0$ & $\eta_{j\,j} = |\eta_{j1} - \eta_{j2}| > 3$ & the lepton is between them

  no jet between them

  $m_{j\,j}$ > 600 GeV)

Background

dominated by ***W*+jets production**

Others are:

Z+jets, $t\bar{t}$, single top quark, diboson (*WW*,*WZ*, *ZZ*, *W*γ and *Z*γ) production, and multijets