

## First Look At Control Plots

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## Overview

- ▶ First look at control plots with data driven backgrounds after pre-selection
- ▶ Go through minor changes to preselection

## Change to Pre-selection

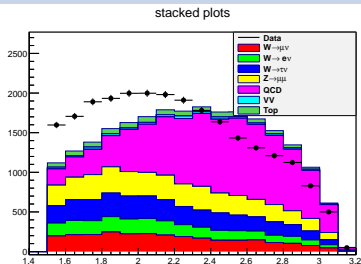
- ▶ Used pre-selection to get data driven W backgrounds: all ok
- ▶ Tried to do the same for Z backgrounds: found no events in control region!
  - $Z \rightarrow \mu\mu$  events have very low met significance and different jet to met angles
- ▶ Updated pre-selection to:  $\min \Delta\phi_{jet-metnomu} > 1.5$ ,  $metnomu - sig > 3.0$ ,  $\Delta\eta_{jj} > 3.6$ 
  - $metnomu - sig$  is defined as  $met - sig \cdot \frac{met}{metnomu}$
- ▶ Now have  $\tilde{350}$  events in Z control region after pre-selection
  - Also have a skim with new pre-selection in dcache (505MB)

## Data Driven Backgrounds

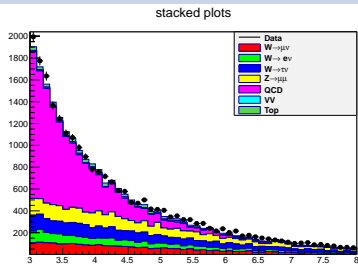
- ▶ W,Z and QCD data driven background first pass done
  - W and Z control regions same as prompt analysis
  - QCD control region is  $dijetmet_p tfraction > 0.6$
- ▶ Control plots shown below are for signal region
  - First draft only finished this morning
  - No axis labels, preliminary colour scheme

## Control Plots

jetmetnomu\_mindphi

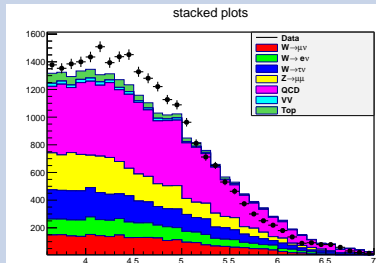


metnomu\_sig

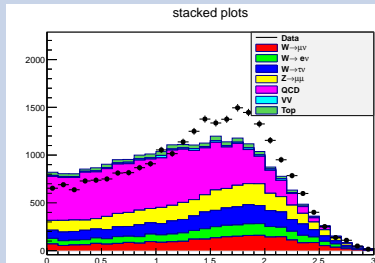


## Control Plots

dijet\_deta



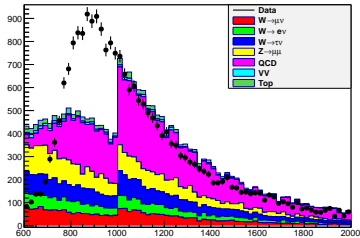
dijet\_dphi



## Control Plots

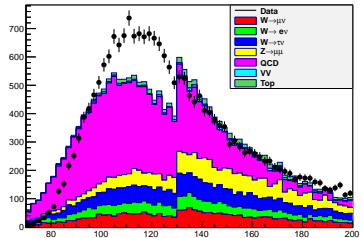
mjj

stacked plots



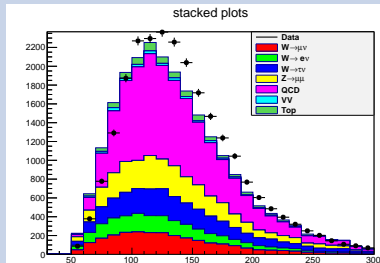
metnomu

stacked plots

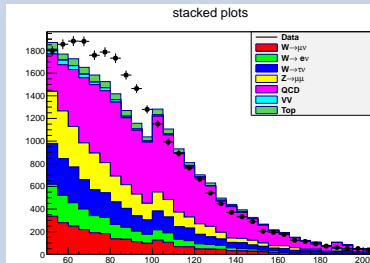


## Control Plots

jet1pt



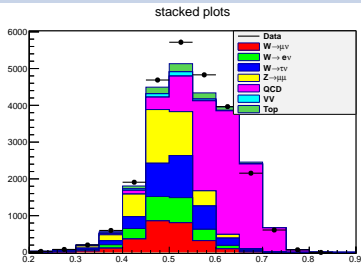
jet2pt



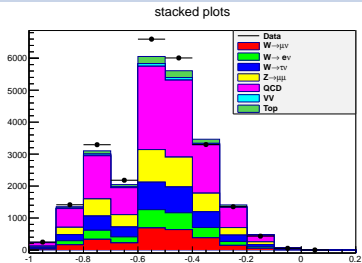


## Control Plots

dijetmetnomu\_ptfraction



BDT-Trained on MC with  
parked weights



## Conclusions

- ▶ New pre-selection doesn't kill all of Z background
- ▶ Control plots in signal region show some Data MC disagreements
  - Steps at trigger weight bin thresholds
  - Only a first look, to be refined
- ▶ Full code to do background estimates and make plots runs in under a minute
- ▶ Instructions and info [here](#)
- ▶ Light Ntuples are in DCache for prompt analysis preselection and both new preselections

## Backup