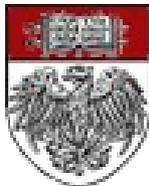


# Zbb Initial State Radiation

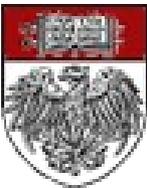
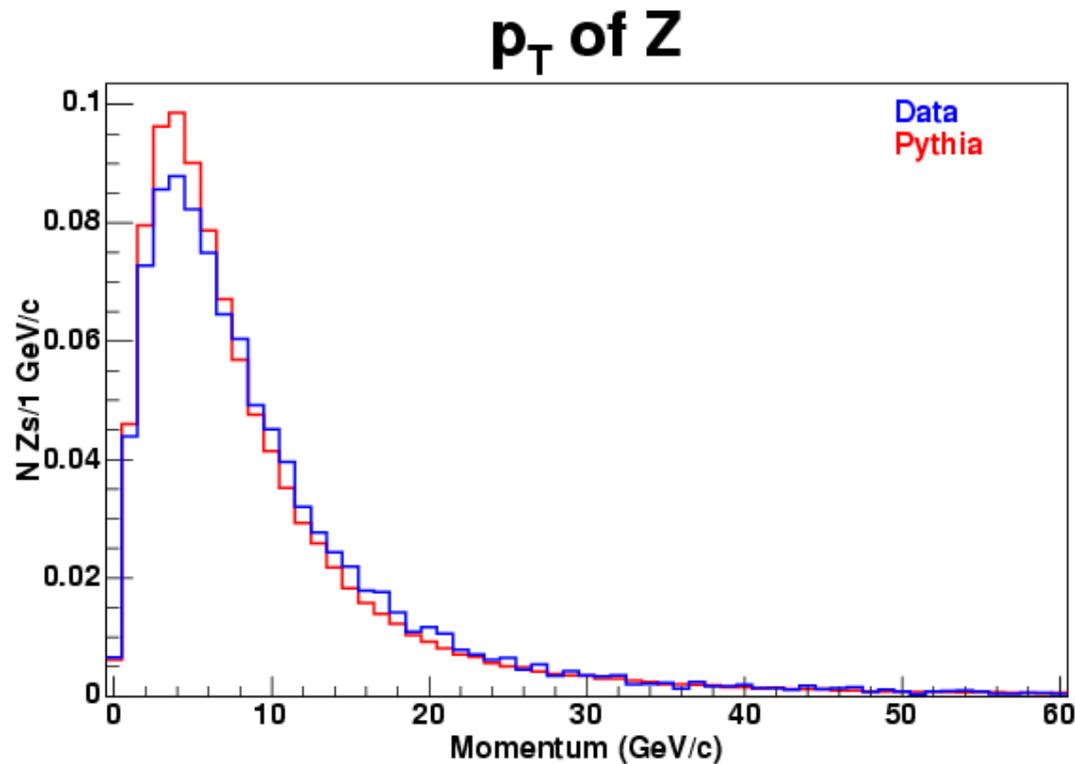
- ▶ We've been studying the effects of Initial State Radiation (ISR) on the kinematic cuts that Julien has made on the  $Z \rightarrow b\bar{b}$  analysis.
- ▶ To that end we have looked at  $Z \rightarrow ee$  and  $Z \rightarrow \mu\mu$  Pythia MC and high  $p_T$  electron and muon data.
  - ▶ Unfortunately I have been having problems with the muon data
  - ▶ I will be showing some preliminary electron data results
- ▶ We perform the canonical Z analysis.
  - ▶ We reject events offline if there is a TL2D cluster with  $\eta > 1.1$  and  $E_T > 5$  GeV
    - ▶ The  $Z \rightarrow b\bar{b}$  trigger path has a jet veto that rejects events with L2 clusters in the plug
  - ▶ Look for one tight lepton and one loose lepton in every event
  - ▶ Z boson requirements:
    - ▶ At least one tight and one loose lepton
    - ▶  $76 < M_{ee/\mu\mu} < 106$
    - ▶  $\Delta\Phi > 5$  degrees
    - ▶ Total charge of the two leptons equals zero (0)
  - ▶ The two leptons have  $p_T$  greater than 24.4 GeV/c; this mimics the  $Z \rightarrow b\bar{b}$  requirement that the two tagged jets have a Level-5 corrected  $E_T > 22$  GeV.
- ▶ Count the number of events which pass the two kinematic cuts we are investigating
  - ▶ Leading jet  $E_T > 15$  GeV; mimics the  $E_T^3$  cut
  - ▶  $\Delta\Phi > 3.0$  radians



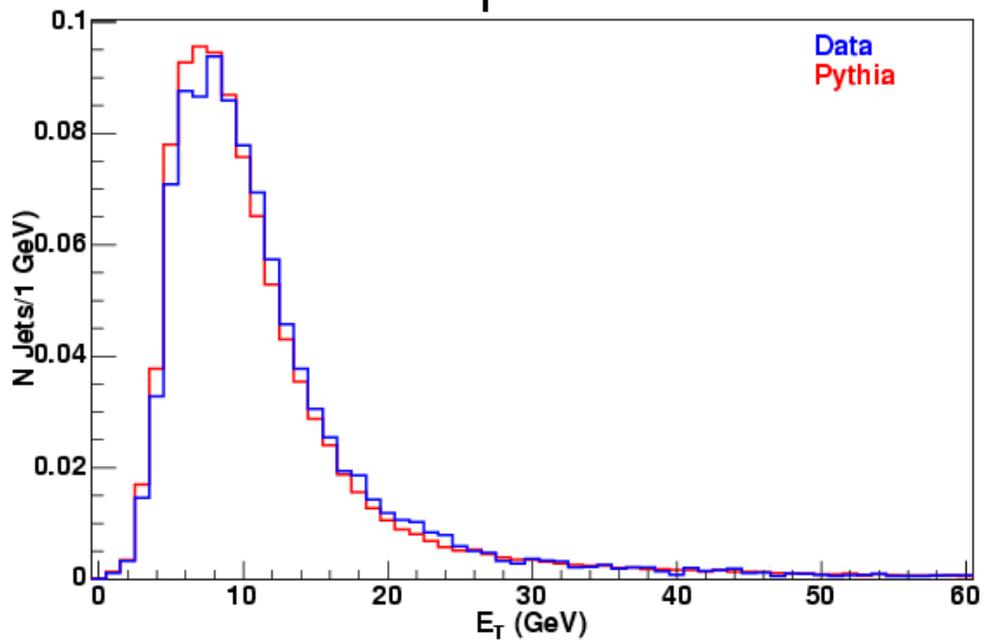
# Zbb Kinematic Variables

Histograms shown are

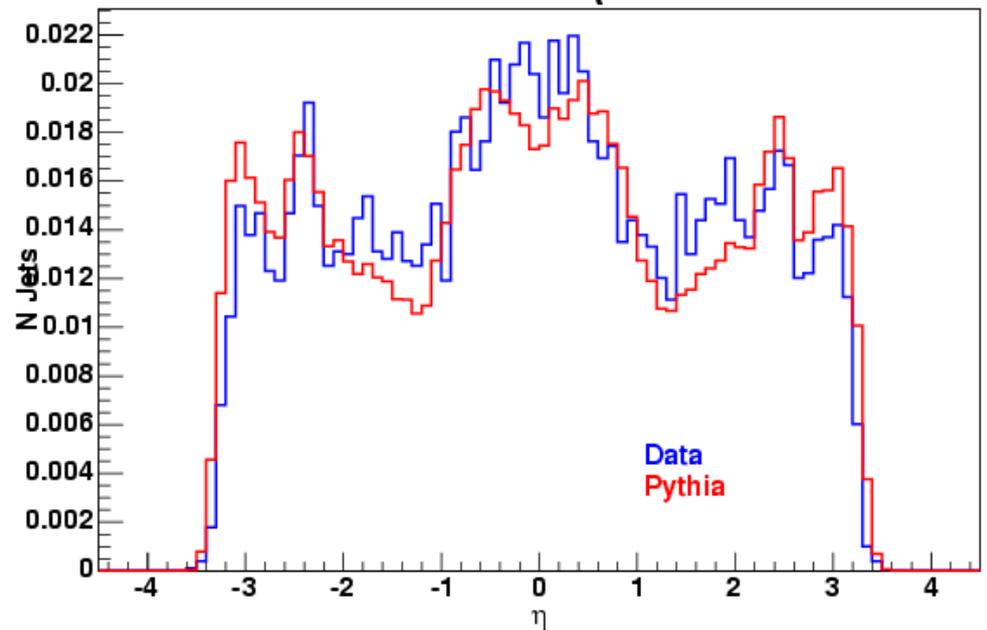
- $p_T$  of the Z boson,
- $\Delta\Phi$  of the lepton pair,
- $E_T$  of the leading jet,
- $\eta$  of the leading jet, and
- $\Delta R$  between the lepton legs and the leading 9 jets in each events.



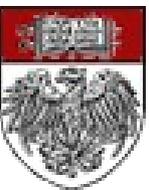
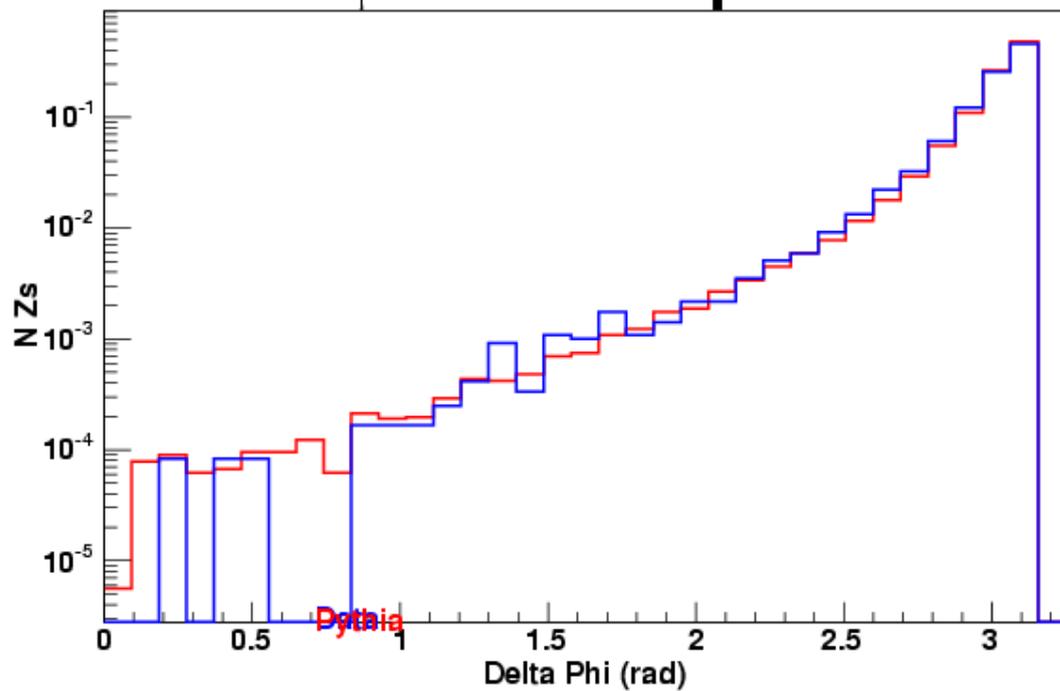
# Jet $E_T$ : Level 5



# Jet $\eta$

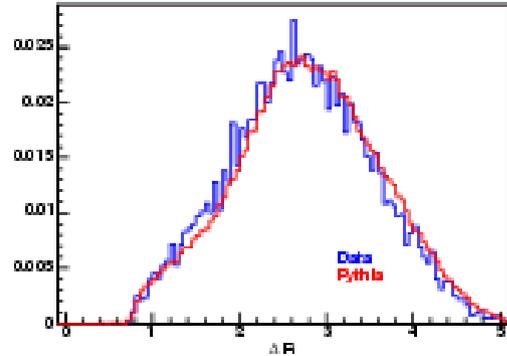


# $\Delta \phi$ between leptons

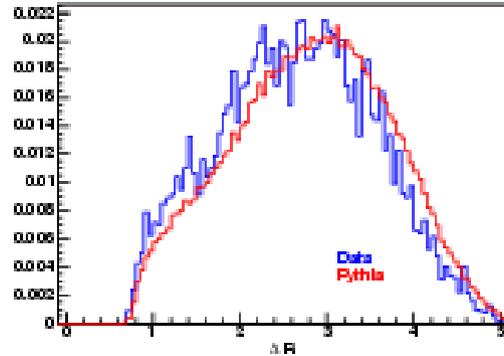


# $\Delta R$ of 1st lepton and jets

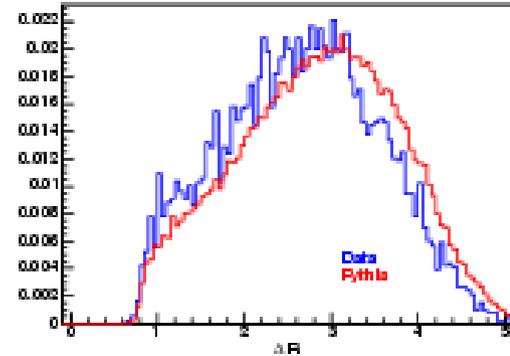
$\Delta R$  between First lepton and 1st jet



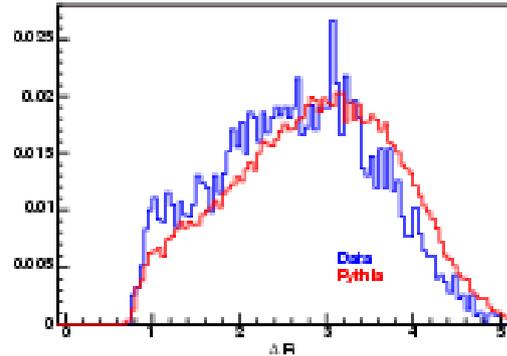
$\Delta R$  between First lepton and 2nd jet



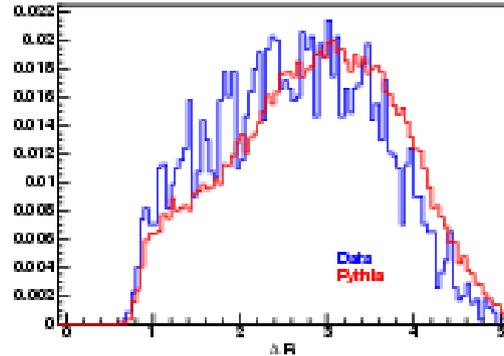
$\Delta R$  between First lepton and 3rd jet



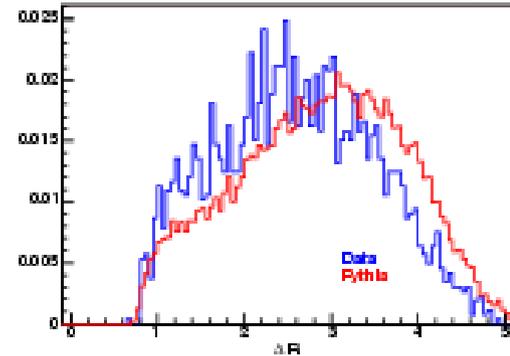
$\Delta R$  between First lepton and 4th jet



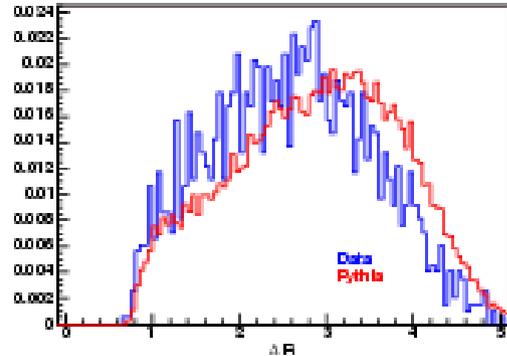
$\Delta R$  between First lepton and 5th jet



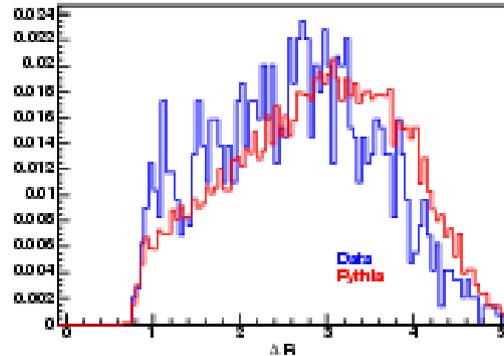
$\Delta R$  between First lepton and 6th jet



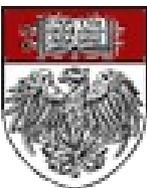
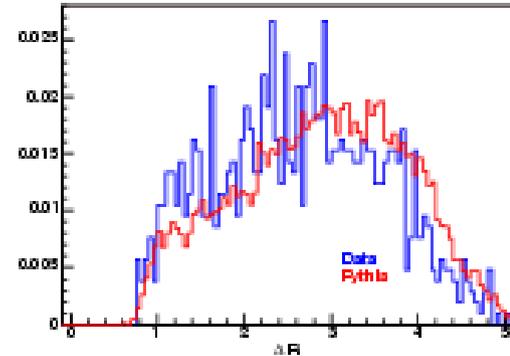
$\Delta R$  between First lepton and 7th jet



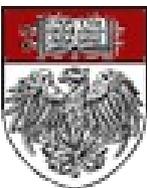
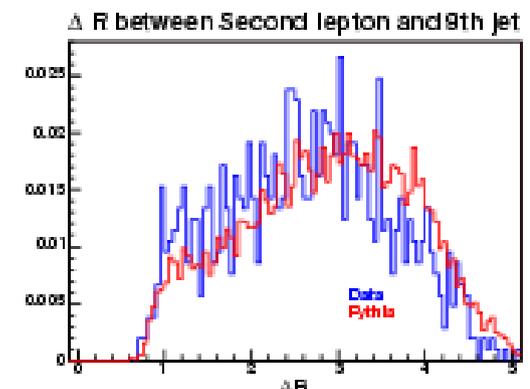
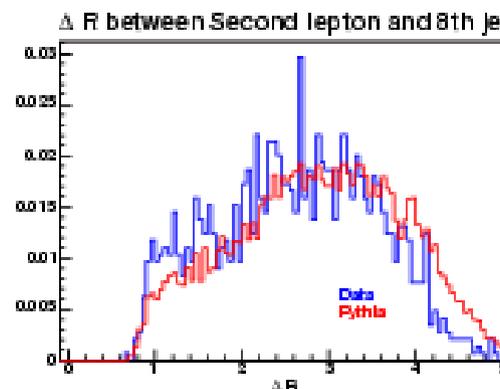
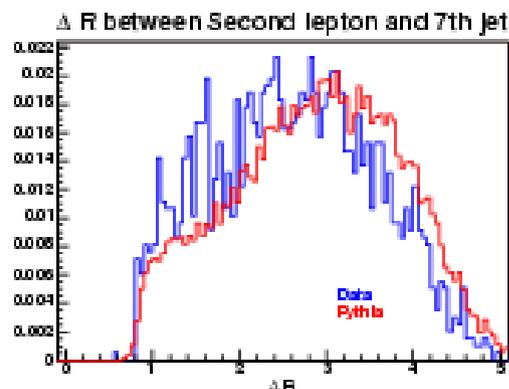
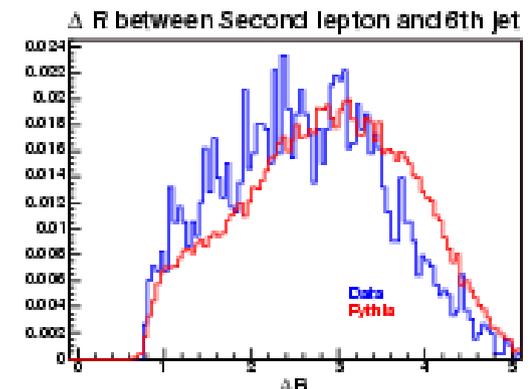
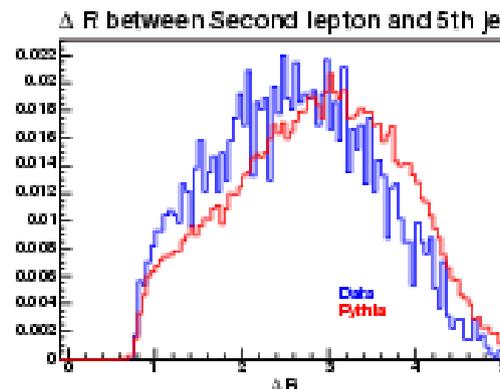
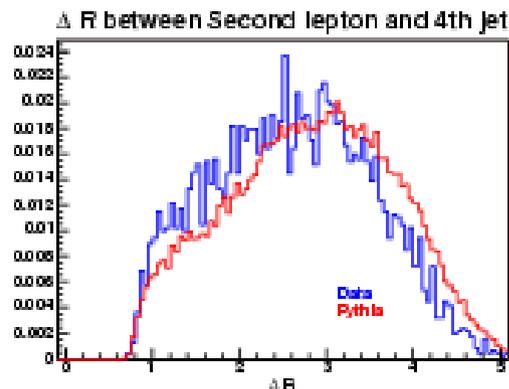
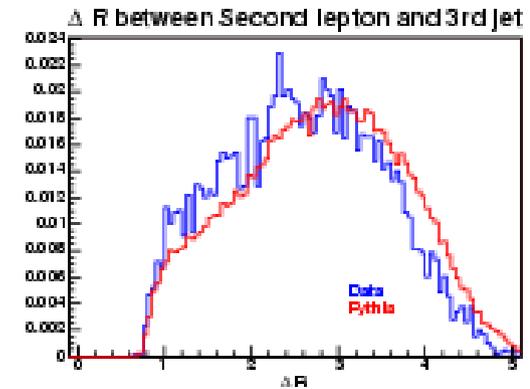
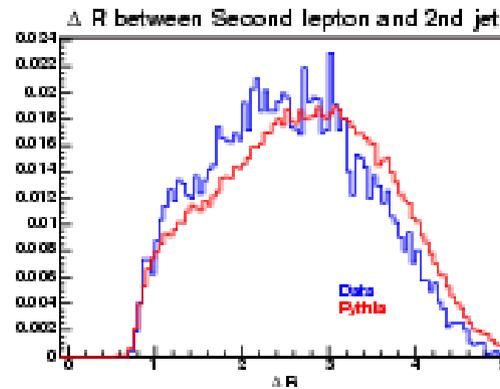
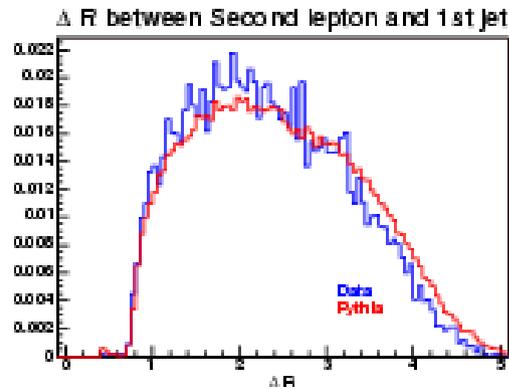
$\Delta R$  between First lepton and 8th jet



$\Delta R$  between First lepton and 9th jet



# $\Delta R$ of 2nd lepton and jets



# Acceptance Table (Prelim.)

- ▶ Table below is are the number of events that pass the kinematic cuts. This table is for electron data and MC.
- ▶ As of last night some are still running on the CAF.
- ▶ In conclusion we are still finishing up this table for the acceptance numbers.
- ▶ Also need to perform the same analysis using muon data and MC.

Category	Data	Monte Carlo
Events produced in the Z mass window		2,644,600
Z bosons found in the above Z mass window	running on CAF	running on CAF
Z bosons found above with jet veto in the plug	12,100	180,301
$E_T$ and $\Delta\Phi$ cuts (call it X)	595	8,496
X with MC reweighted to the data Z $p_T$ distribution		ToDo
X MC reweighted to the data leading $E_T$ distribution		ToDo
X MC reweighted to the data $\Delta\Phi$ distribution		ToDo

