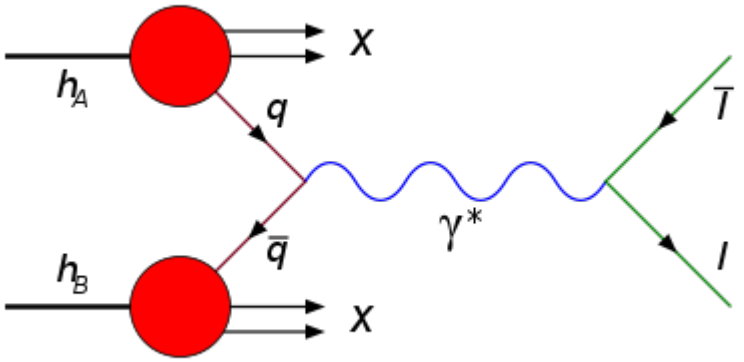
REU Update

Marshall Rogers



What I've done so far...

- Electron identification using the loose cut
- Modified myAnalysis.cxx to show electrons that were passing “anti-loose” and unpaired, to get background.
  - Now I'm showing the right counts!
- Made a script to put my histograms together and normalize them.
- I've been using the Drell-Yan sample
- Modified myAnalysis.cxx to use all of the mass bins
- My website: nevis.columbia.edu/~mar2194/results.html

Cuts

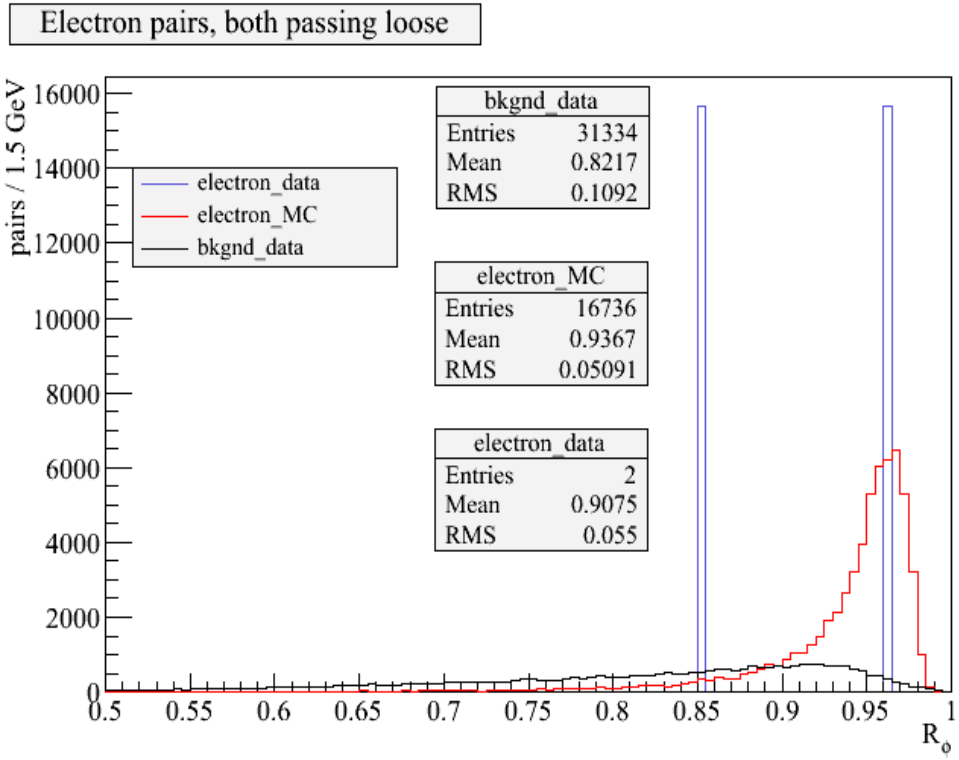
- Used the same author cuts for all three data sets: Author = 1 & Author = 3 & Author = 8 (forward calorimeter)
- Cut out eta between 1.37 and 1.52 (crack)
- Pt cut of 10 GeV

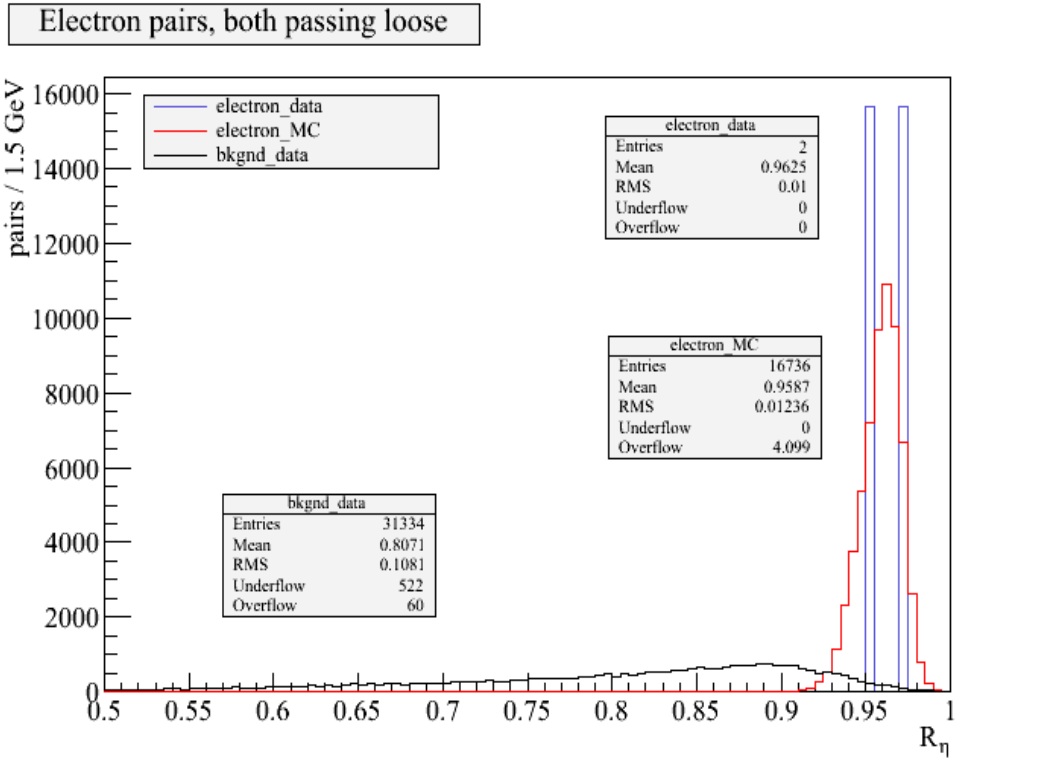
  For Background:

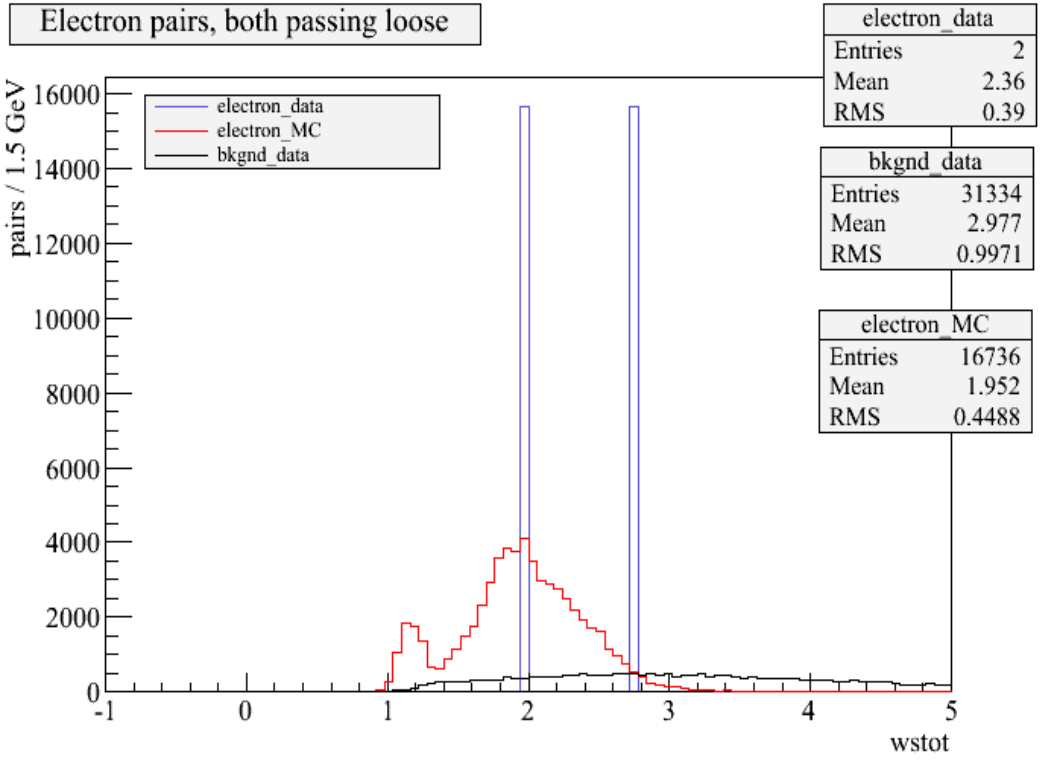
- Same Pt, eta and author cuts, but set “loose=0” and removed pair requirement on electrons

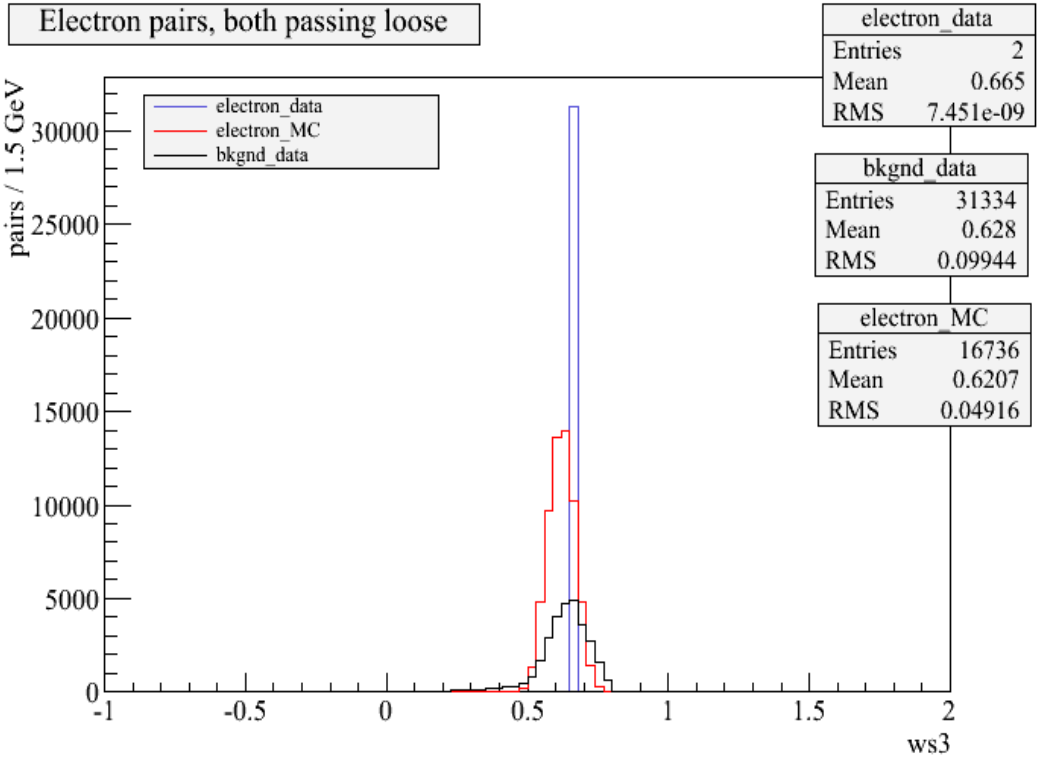
The Variables

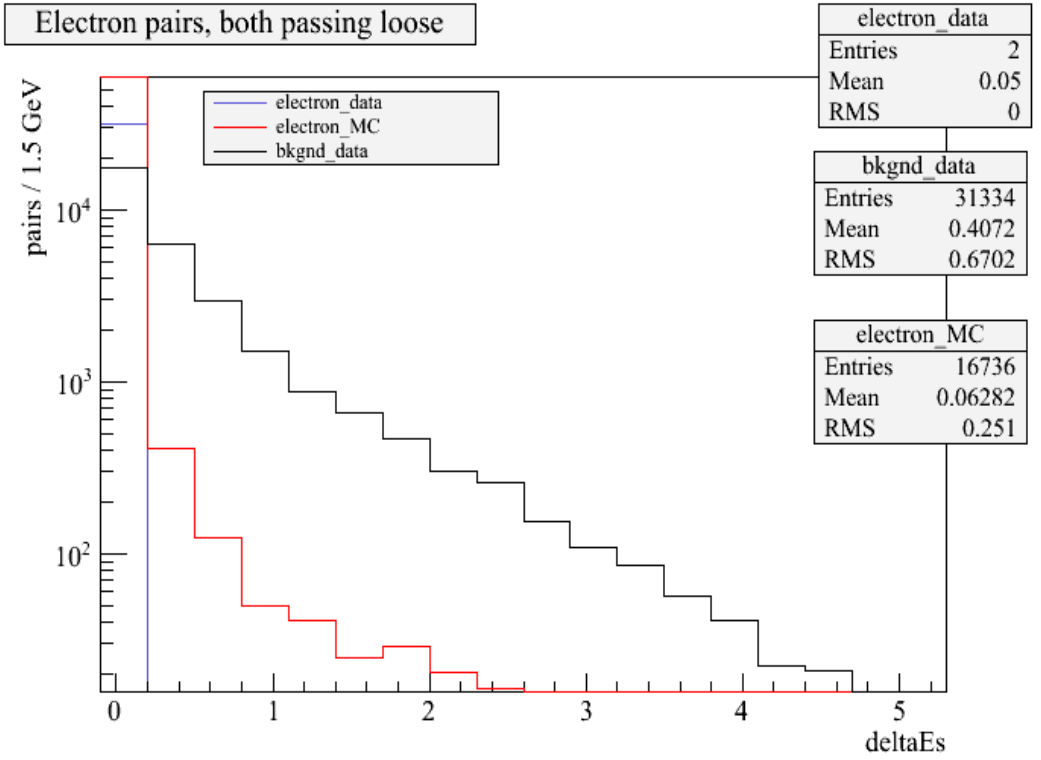
- The variables I've been looking at are for the medium and loose cuts:
  - R_{η} - Ratio in η of cell energies in 3 x 7 versus 7 x 7 cells
  - R_{Φ} - Ratio in Φ of cell energies in 3 x 3 versus 3 x 7 cells
  - W_{stot} - Width of the shower
  - W_{s3} - Shower width for three strips around maximum strip
  - E_tHad1 – Transverse energy in the first layer of the Hadronic calorimeter.
  - E_t -Transverse Energy
  - Δe_s - Difference between energy associated with the second largest energy deposit.

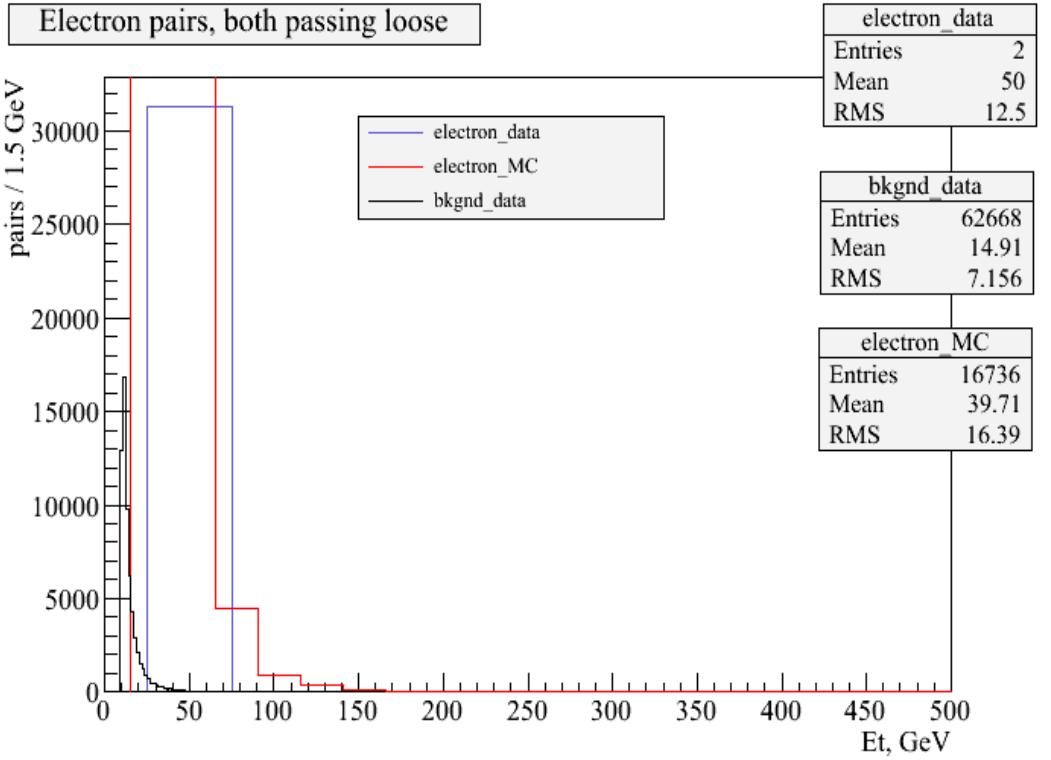

Electron pairs, both passing loose
pairs / 1.5 GeV
electron_data
electron_MC
bkgnd_data
bkgnd_data
Entries 31334
Mean 0.8217
RMS 0.1092
electron_MC
Entries 16736
Mean 0.9367
RMS 0.05091
electron_data
Entries 2
Mean 0.9075
RMS 0.055
R_ϕ

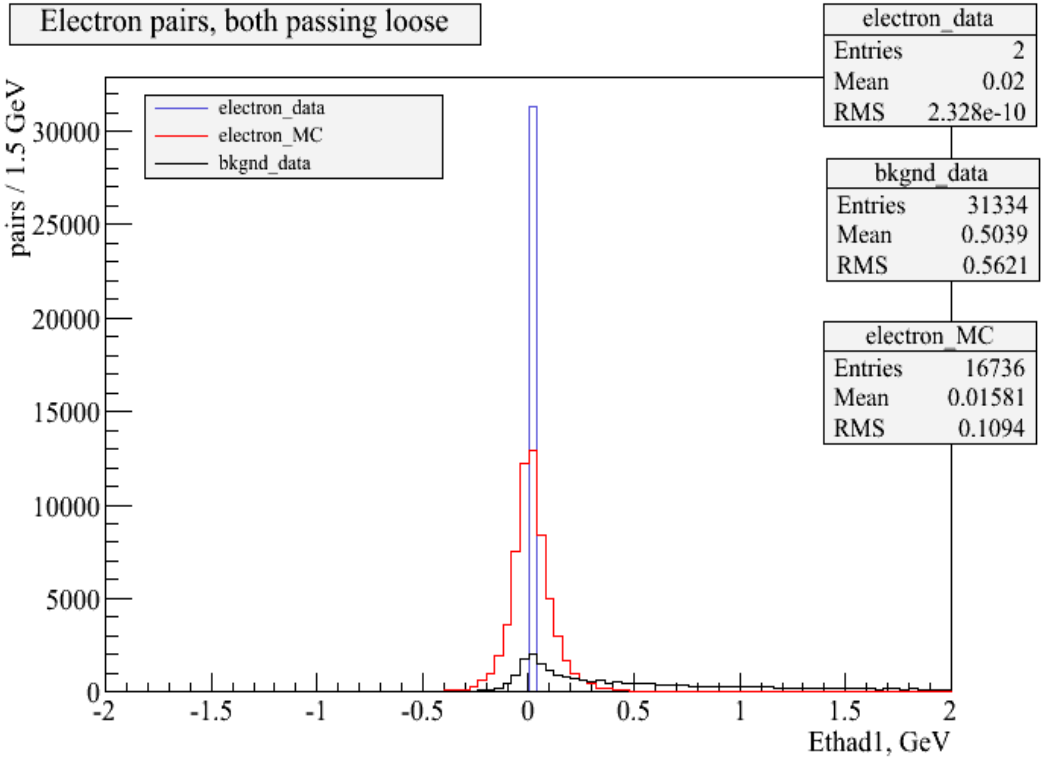

Electron pairs, both passing loose
pairs / 1.5 GeV
electron_data
electron_MC
bkgnd_data
electron_data
Entries 2
Mean 0.9625
RMS 0.01
Underflow 0
Overflow 0
electron_MC
Entries 16736
Mean 0.9587
RMS 0.01236
Underflow 0
Overflow 4.099
bkgnd_data
Entries 31334
Mean 0.8071
RMS 0.1081
Underflow 522
Overflow 60
R_η


Electron pairs, both passing loose
pairs / 1.5 GeV
electron_data
electron_MC
bkgnd_data
electron_data
Entries 2
Mean 2.36
RMS 0.39
bkgnd_data
Entries 31334
Mean 2.977
RMS 0.9971
electron_MC
Entries 16736
Mean 1.952
RMS 0.4488
wstot


Electron pairs, both passing loose
pairs / 1.5 GeV
electron_data
electron_MC
bkgnd_data
electron_data
Entries 2
Mean 0.665
RMS 7.451e-09
bkgnd_data
Entries 31334
Mean 0.628
RMS 0.09944
electron_MC
Entries 16736
Mean 0.6207
RMS 0.04916
ws3


Electron pairs, both passing loose
electron_data
Entries 2
Mean 0.05
RMS 0
bkgnd_data
Entries 31334
Mean 0.4072
RMS 0.6702
electron_MC
Entries 16736
Mean 0.06282
RMS 0.251
electron_data
electron_MC
bkgnd_data
pairs / 1.5 GeV
deltaEs


Electron pairs, both passing loose
electron_data
Entries 2
Mean 50
RMS 12.5
bkgnd_data
Entries 62668
Mean 14.91
RMS 7.156
electron_MC
Entries 16736
Mean 39.71
RMS 16.39
electron_data
electron_MC
bkgnd_data
pairs / 1.5 GeV
Et, GeV


Electron pairs, both passing loose
electron_data
Entries 2
Mean 0.02
RMS 2.328e-10
bkgnd_data
Entries 31334
Mean 0.5039
RMS 0.5621
electron_MC
Entries 16736
Mean 0.01581
RMS 0.1094
electron_data
electron_MC
bkgnd_data
pairs / 1.5 GeV
Ethad1, GeV

Some Values

Monte-Carlo

- Rη = .9587
- RΦ = .9367
- Ethad1 = .01581

Data

- Rη = .9625
- RΦ = .9075
- Ethad1 = .02

Goals/What's Next

- Obtain and analyze more data from LHC so I have more counts/meaningful results
- With more data, continue my analysis with not only loose cuts, but medium and tight as well.