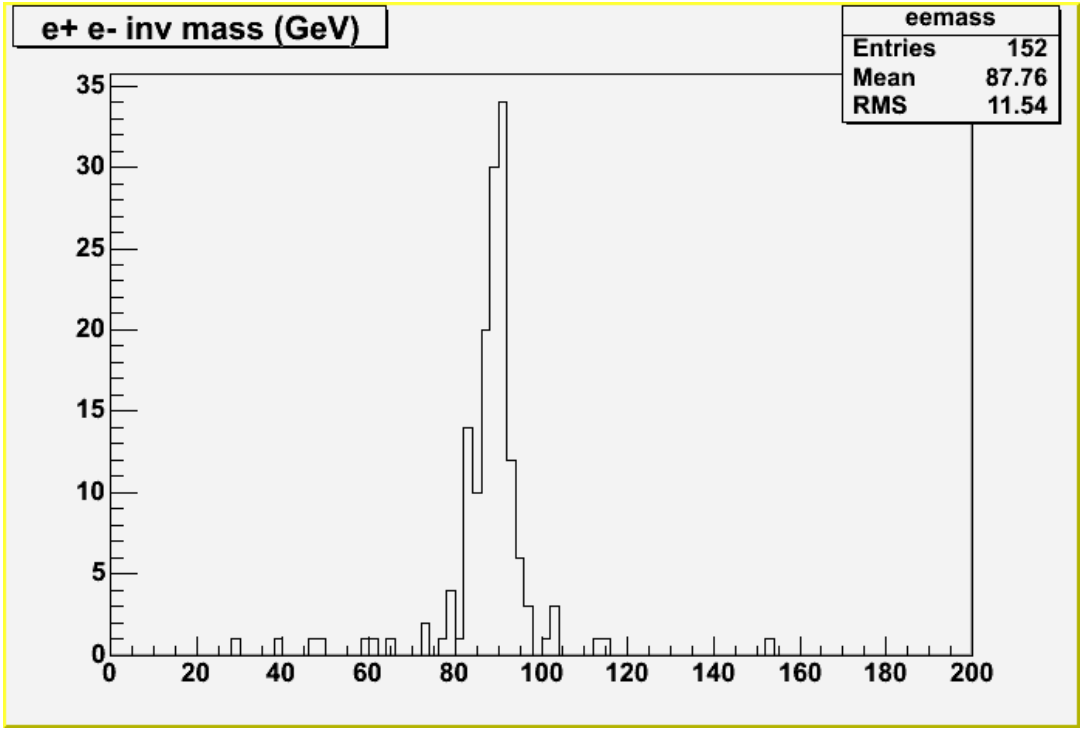
Athena – A Novice's View

Pythia: Z-> e+ e-; Pt(Z) > 100GeV;

DC1 Generation; Release 8.2.0 Simulation & Reconstruction



RecoCBNT used to "analyze" and fill histograms

It Works !

J. Proudfoot
June 18, 2004

But Harder than Expected

- Release 7.0.3 -> 8.0.0 -> 8.1.0 -> 8.2.0
- CBNT variable names (and therefore header file) changes
- Change in RecoCBNT code to chain input files (eventually traced and fixed by Hong Ma)
- Mistakes on my part (e.g. not checking the version number of package to be used for a particular release)
- JobOptions -> Python Scripting

Observations so far

- Limitations
  - Athena reconstruction is slow (~1min per event)
  - Log file is enormous
- Things still to try out or do
  - Work out how to process multiple input files (not much of an issue since it takes an 8hour job to process 600 events)
  - Switch off parts of the reconstruction and output to the CBNT
  - Improve figure captions

Example RecoCBNT Code

- This is in ~proud/public/RootExample/ on lxplus
  - **Simple setup file (t3333init)**
  - **Makefile**
  - **.C code**
  - **README file (let me know if it needs to be improved)**
  - **A few TEST ntuples –I keep my real ones elsewhere**
- Good to get your feet wet
- Linked from our MidWest web page

README

Example of code to analyze the CBNT Ntuple
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First write out your Athena Root file. In this directory, ntuple.root was written by athena using release 8.2.0. Do this following the instructions in the tutorials on the web.

Into the directory in which you wish to build and run the root analysis:

Copy the ntuple.root file written out by the Athena job on lxplus
Copy all the files in ~proud/public/RootExample on lxplus

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In the directory in which you want to build and run the root analysis:

Make the tree class and header files for t3333 using the script t333init. This script runs root and uses the root file ntuple.root to create the t3333.C and t3333.h file. It then runs the perl script fixt3333 to make some necessary changes tot3333.C.To execute this script at the command prompt give:

t3333init

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Build the executable at the command prompt give:

gmake analysis

run it. At the command prompt give:

./analysis

and answer the questions.

There is a file.list in this area showing an analysis of 2 files.

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If successful, you will end up with a postscript file as well as the root file with the name you specified when you ran the analysis program

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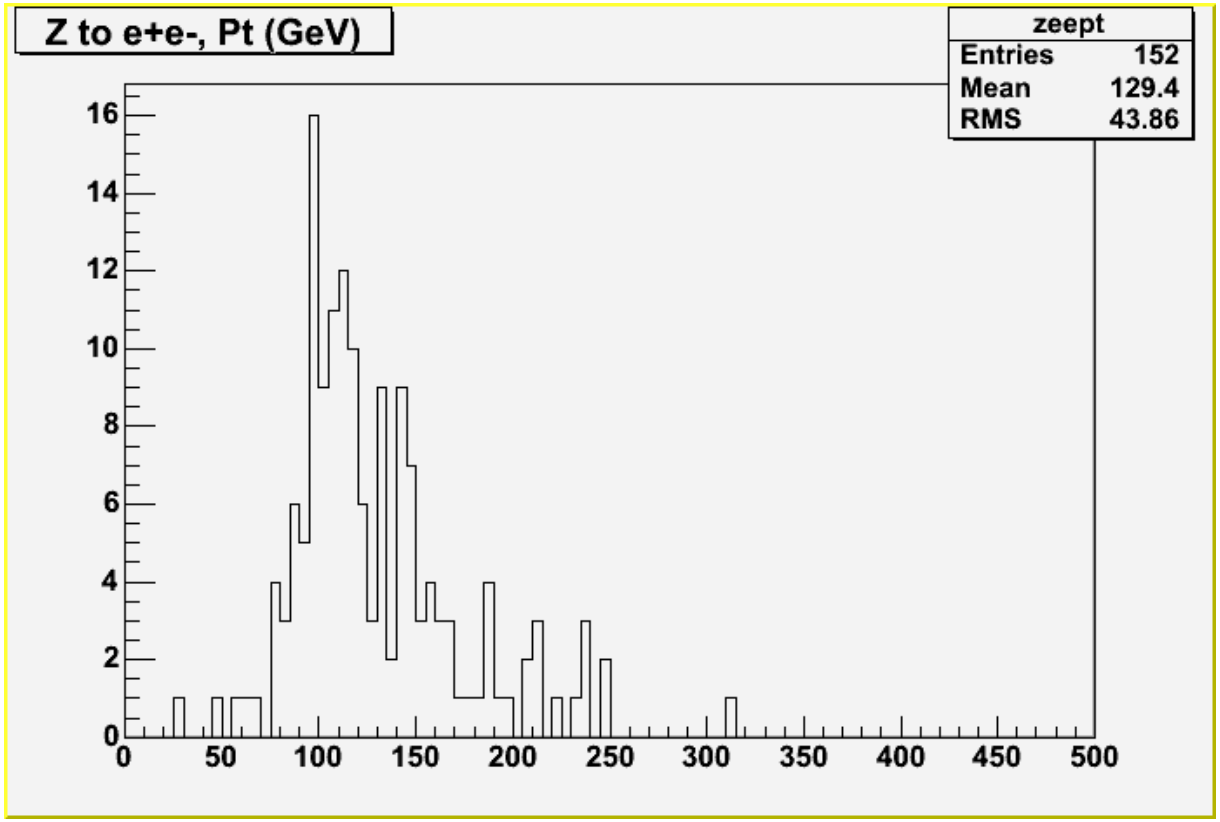
A little “ROOT”

- I (!) even started a simple analysis based on this example code
  - Added new histograms
  - Computed and histogrammed Pt(Z)

```
TLorentzVector Zee_p;
...
...
Zee_p = ve_p[0] + ve_m[0];
double zpt = Zee_p.Perp();
m_h_zeept->Fill(zpt/1000.); //Fill Pt in Gev
m_h_zetmiss>Fill((float)nt.ETmiss_H1_calib/1000.);
```

  - This is a good example of the power of the Root physics library (libPhysics) – Chapter 15

Check the Pt Spectrum



Yes indeed it looks like Pt(Z)>100GeV

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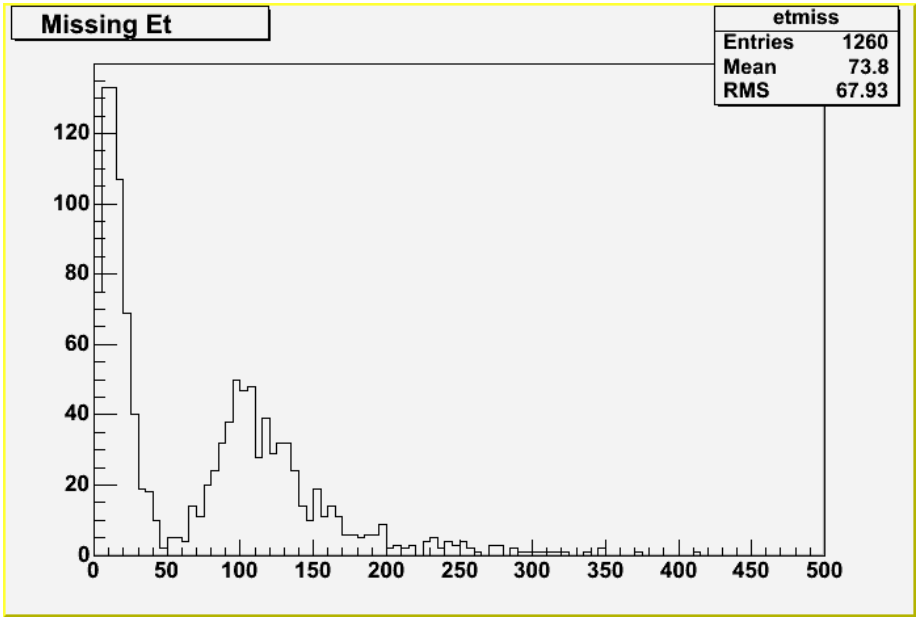
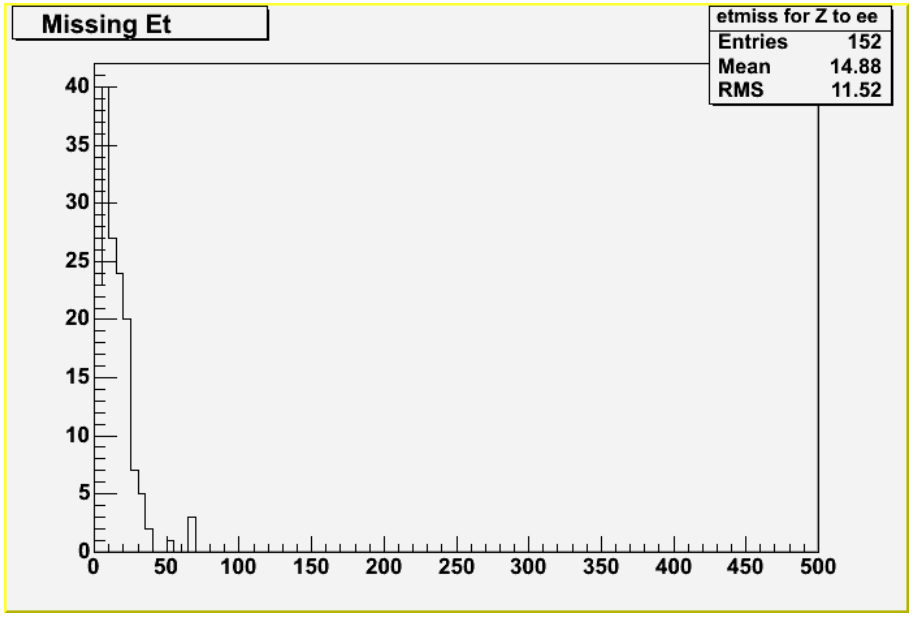
Real Analysis Plots

All Events in Ntuple



ONLY Z->e+e- Events



Suspect something odd in Z-> mu+ mu- ?

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Summary

- We have what we think is a very straightforward way to get at the Atlas simulation data
- Now need to start on more focused PHYSICS tasks e.g.:
  - Z + Jet Balancing
  - Gamma + Jet balancing
  - Compare DC1 simulation to DC2 simulation
- Check out AOD format and follow that discussion

Come and Enjoy the Fun

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June 18, 2004