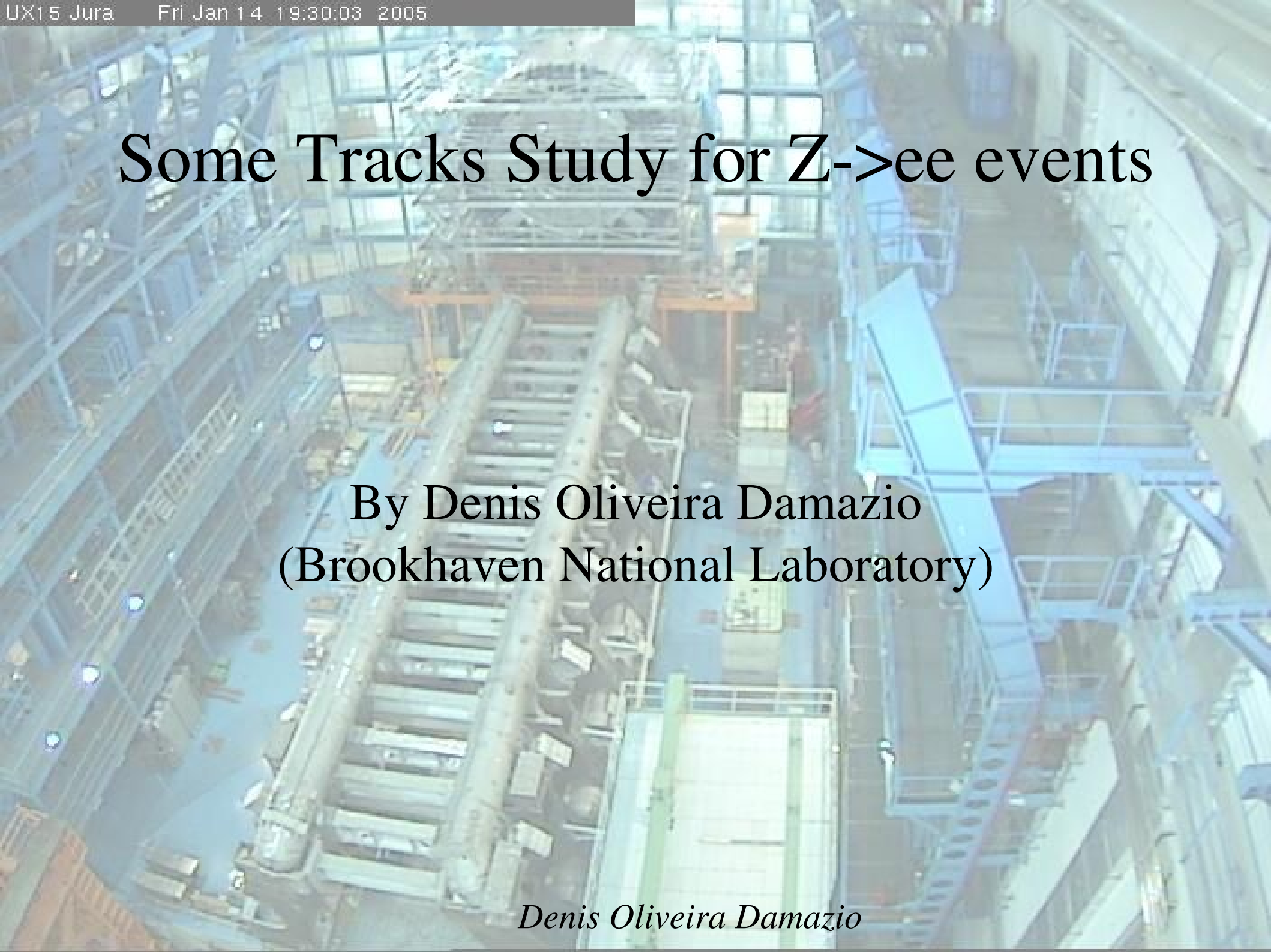


Some Tracks Study for Z->ee events

By Denis Oliveira Damazio
(Brookhaven National Laboratory)

Events Used

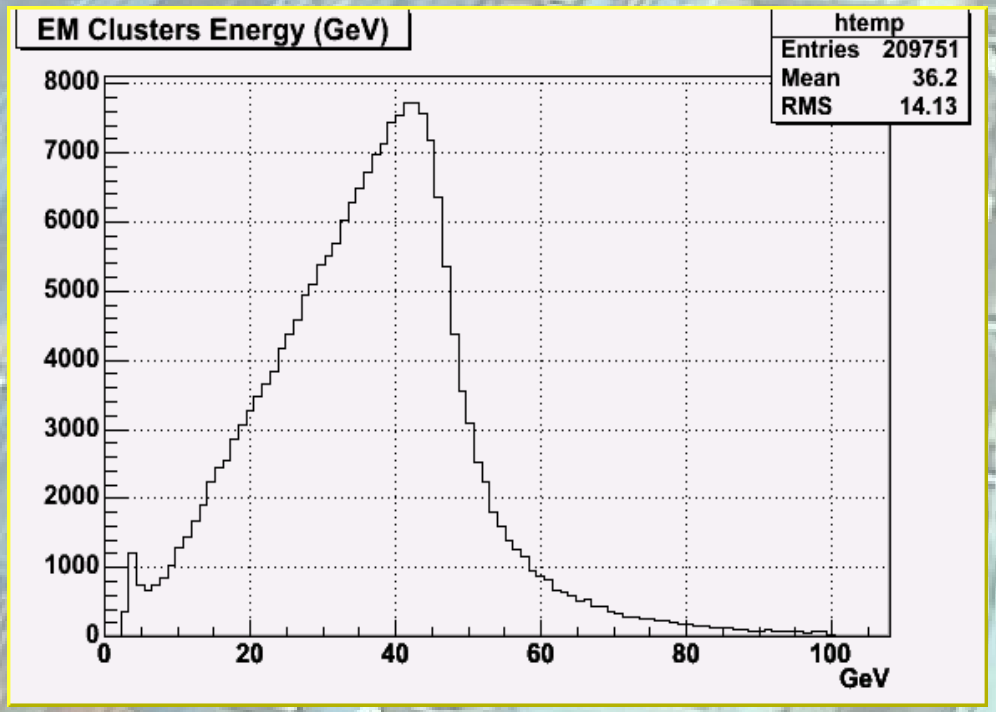
- Events from the run 003007 (DC2 Z->ee).
- Reconstructed with Offline version 9.0.3 with xKalman on.
- Checks made through roottuples.
- Other analysis (e.g. Calorimeter) also being performed. Check the web site :

http://www.usatlas.bnl.gov/~damazio/log/

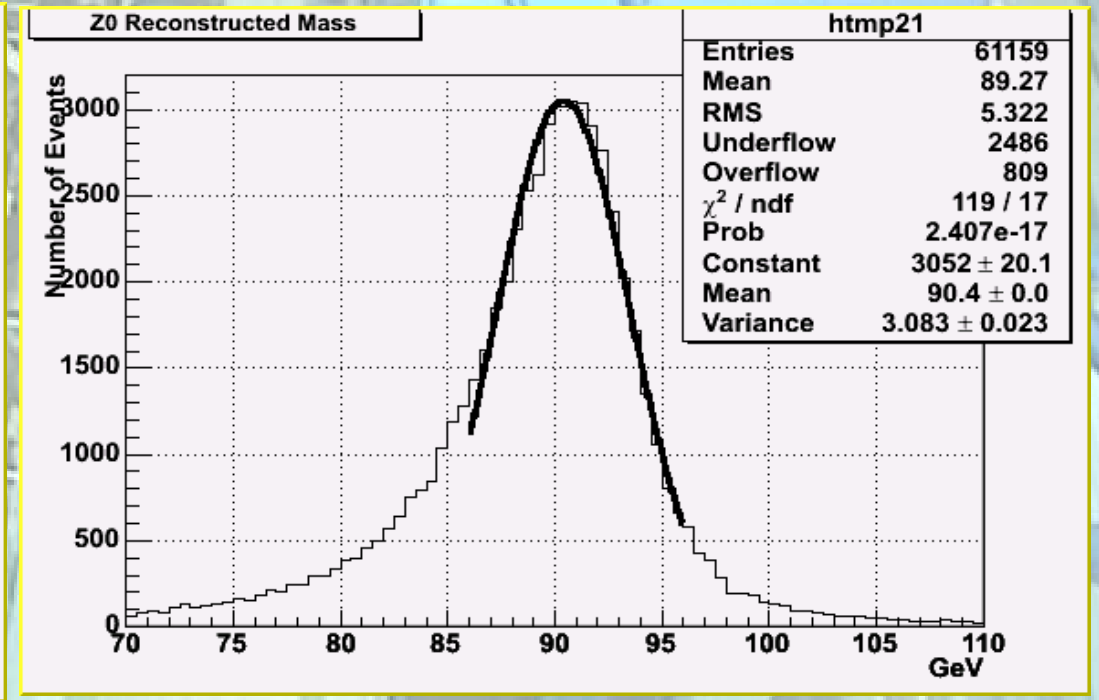
Clusters Pt and Z0 Mass (recovered from clusters)

These plots help to validate the data sample. Also, Note the 40-45 GeV peak for the electrons Pt distribution. This also can be seen in the tracks Pt.

Clusters Pt distribution



Z0 Mass from the clusters



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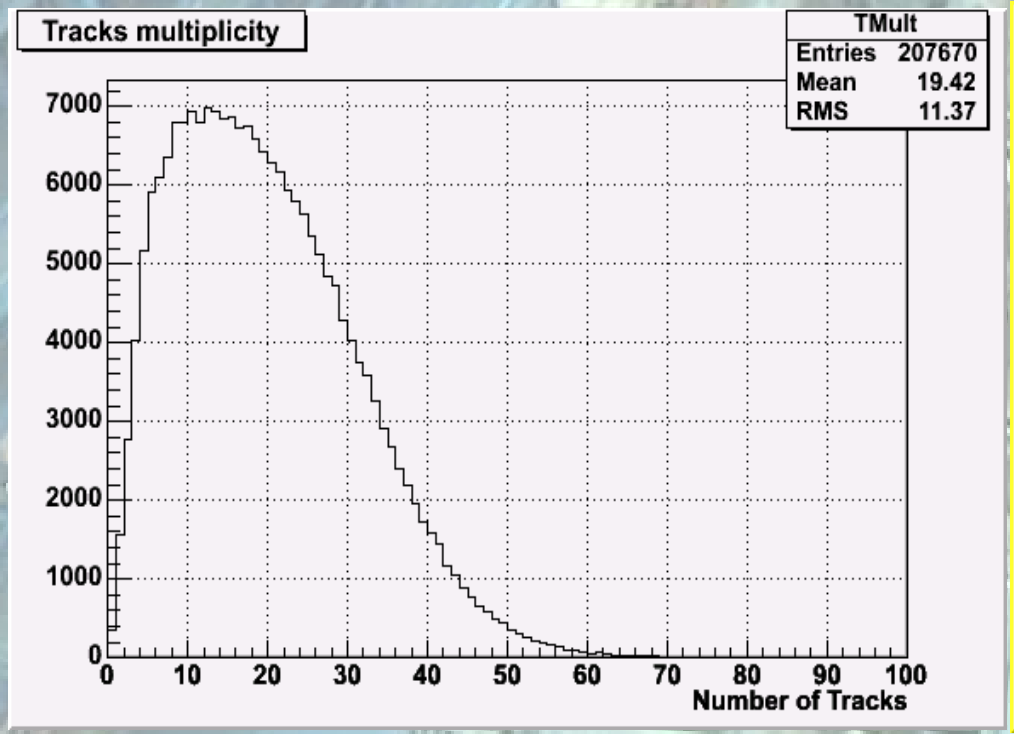
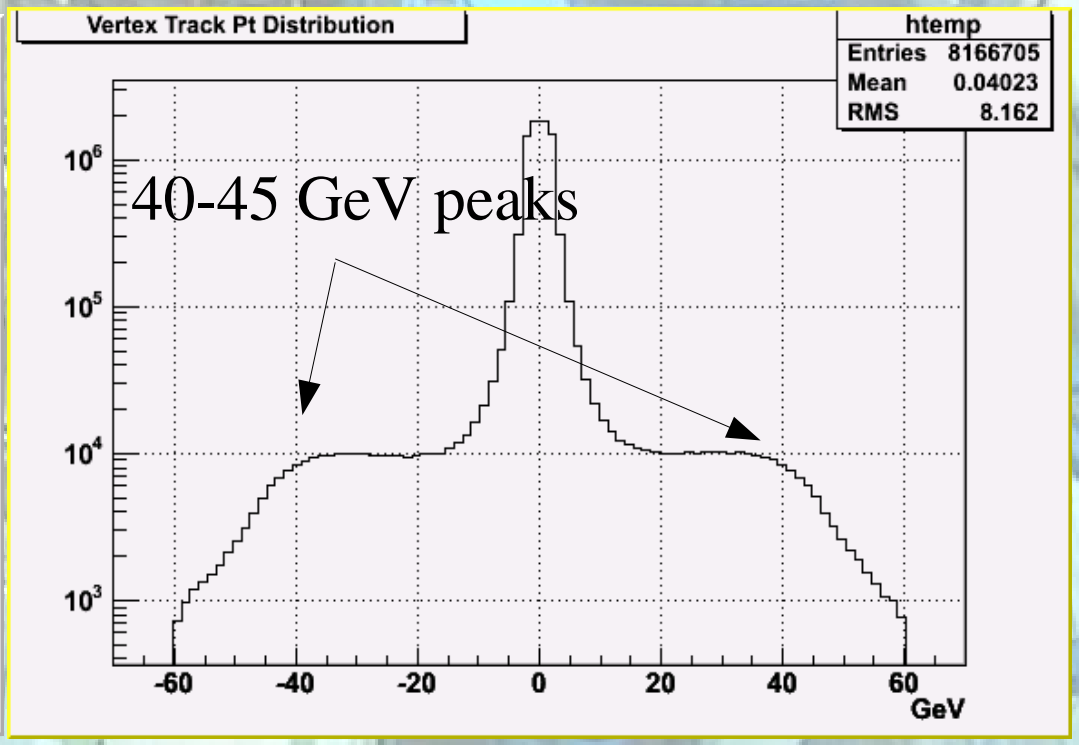
Tracks Variables showing regular profile

Multiplicity (no pile-up)



Pt distribution



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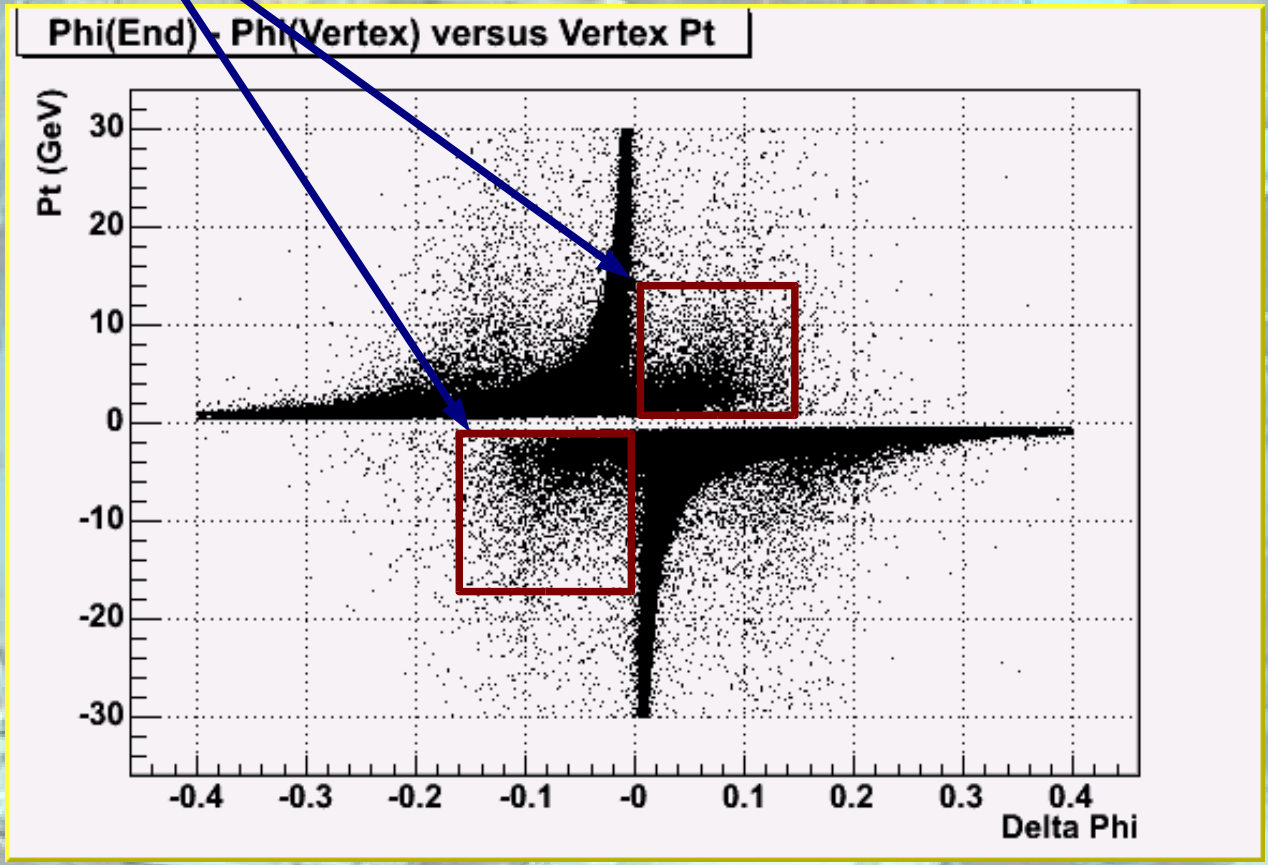
Bending of the Tracks

Wrong bending?!

Proportional to Pt



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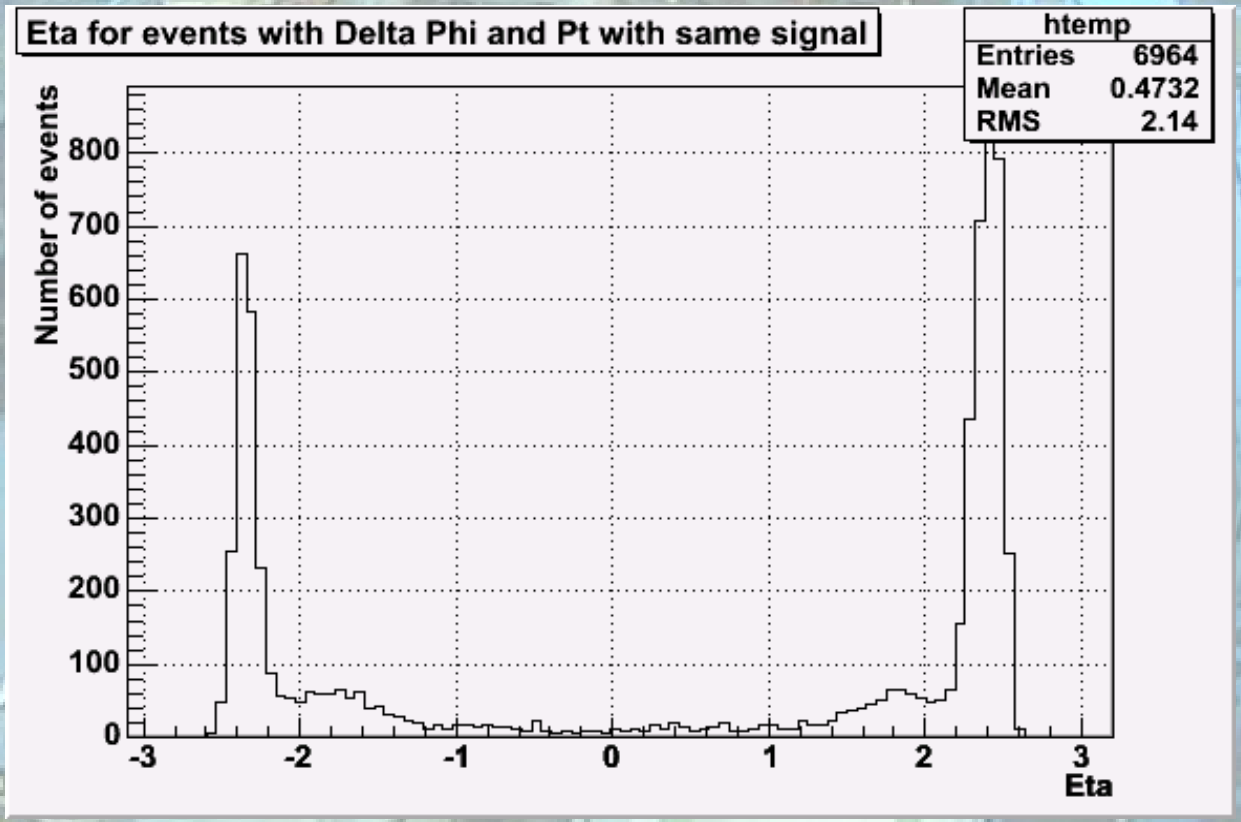
Some Tracks have wrong Bending

Part of the tracks with wrong bending are in eta close to 2.5 (magnetic field?!?!)



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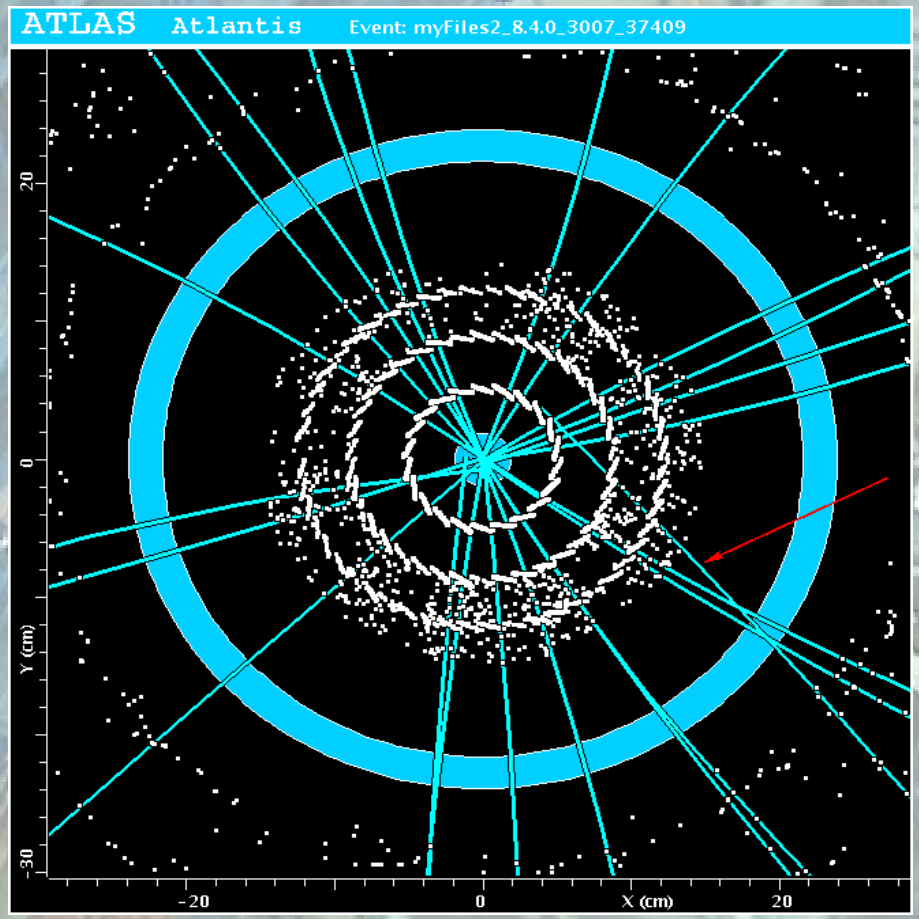
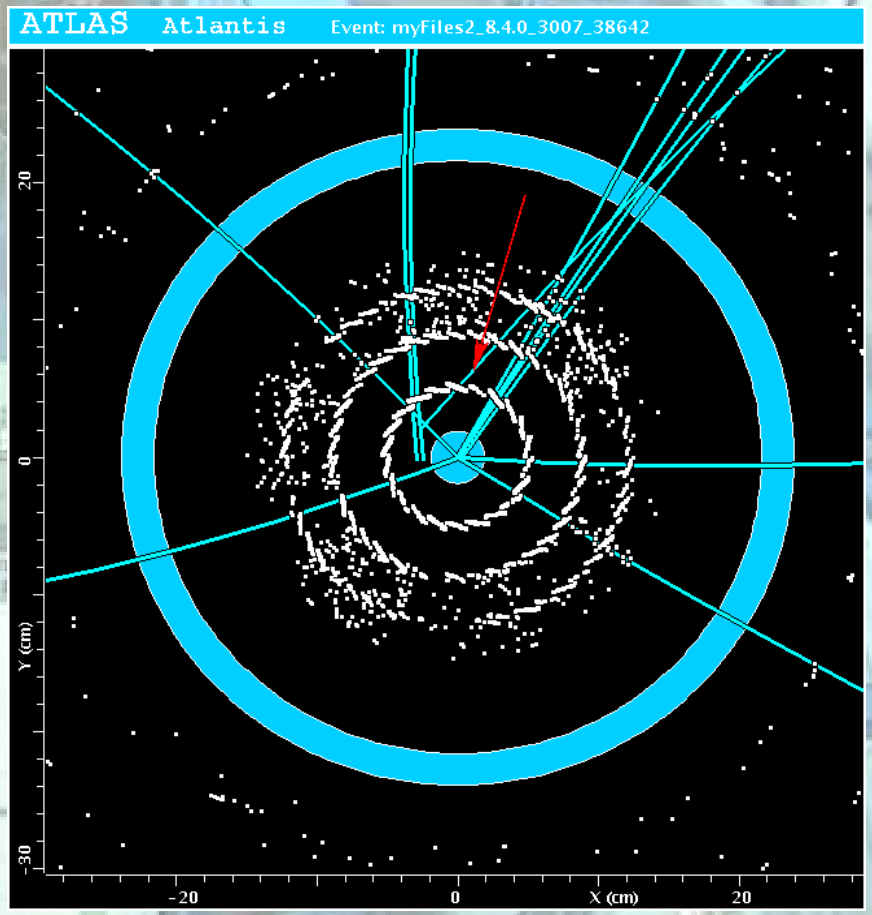
Looking at the wrong Bending

Selecting only tracks with reasonable Chi-Square (smaller than two), we visualize two examples (marked with red arrow):

Eta=2.458, A0=5.421



Eta=-1.988, A0=3.269



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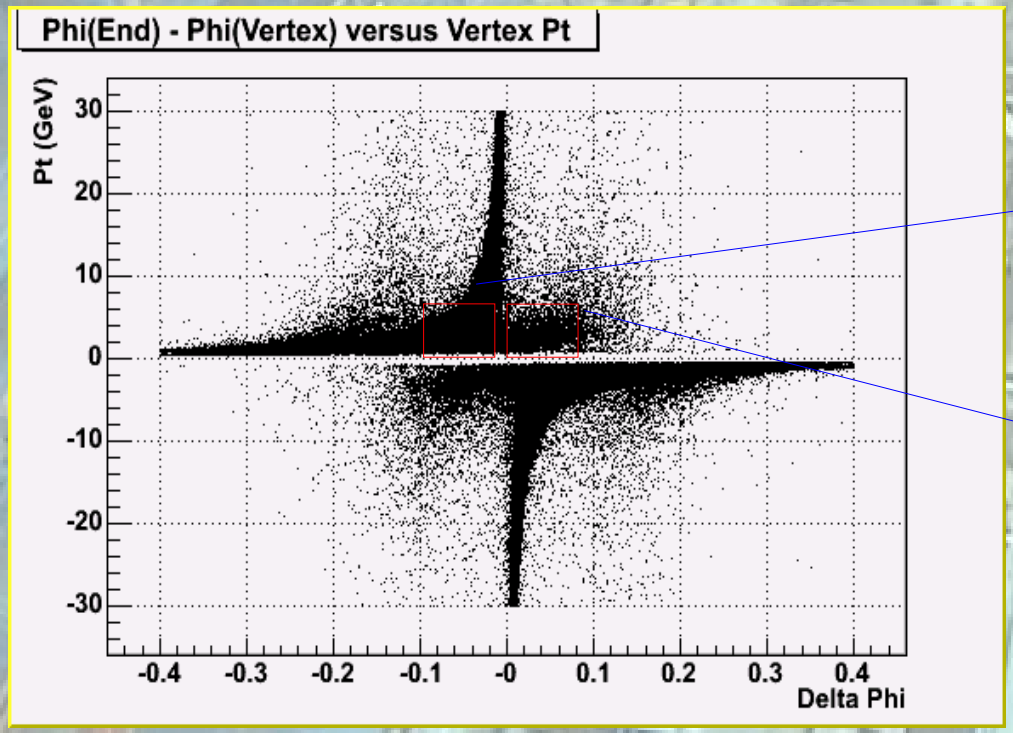
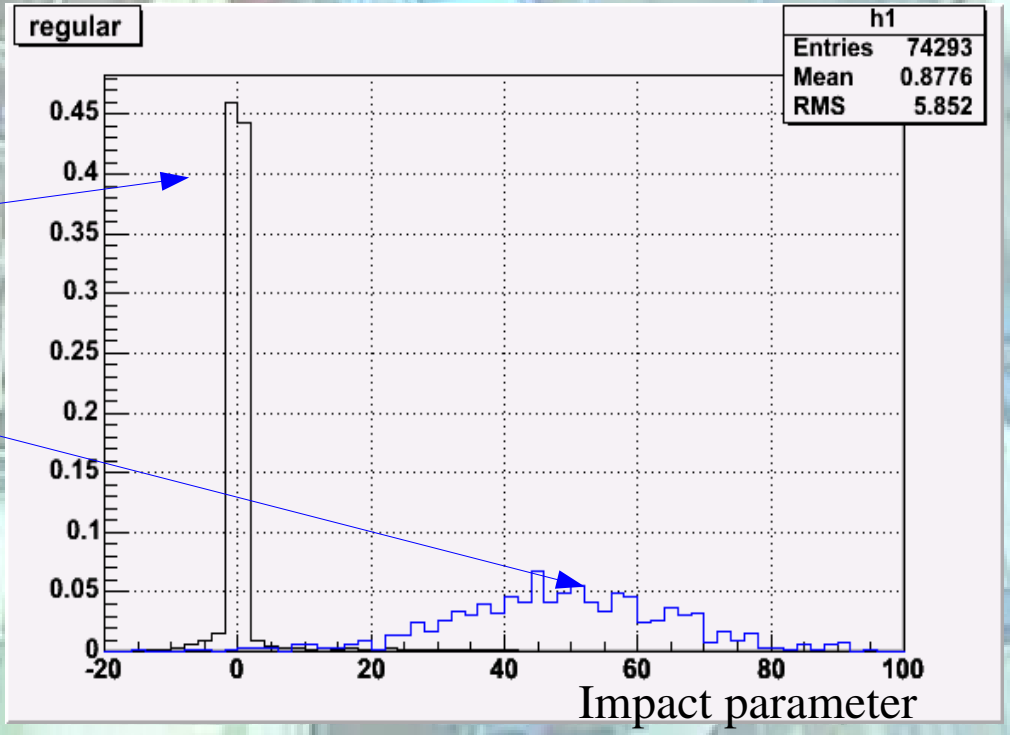
Looking at the Wrong Bending

For the tracks with Chi-Square < 2, we selected both regions below (-0.1<DeltaPhi<-0.01 & 0<Pt<5GeV and the opposite DeltaPhi region) in the first plot and studied the impact parameter of all tracks in those regions.





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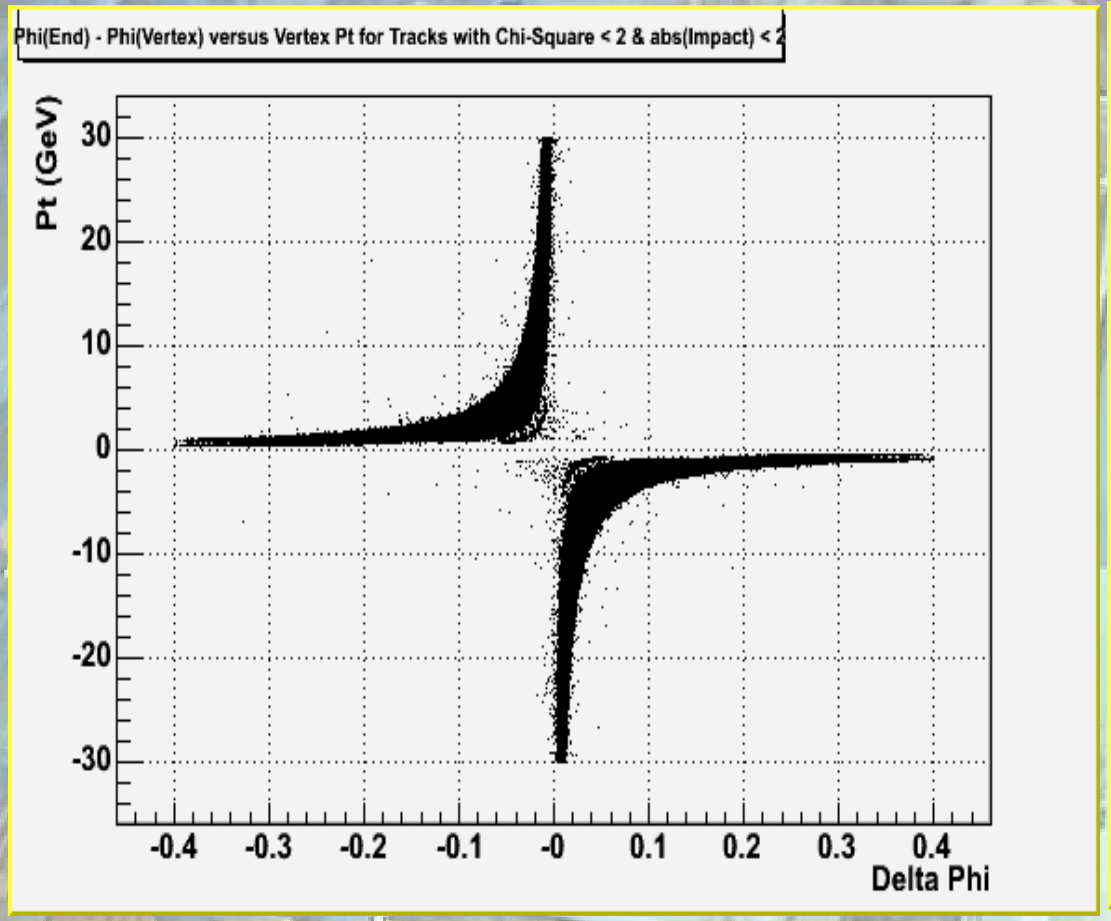
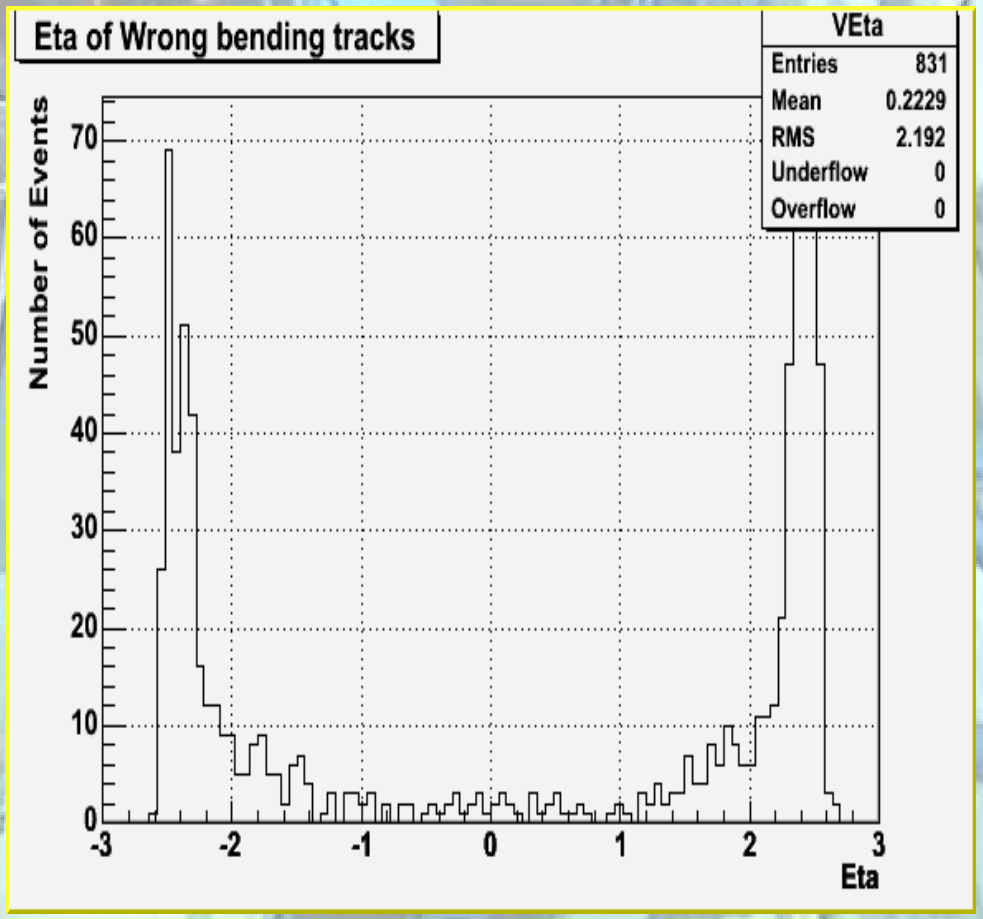
Cutting in the Impact Parameter

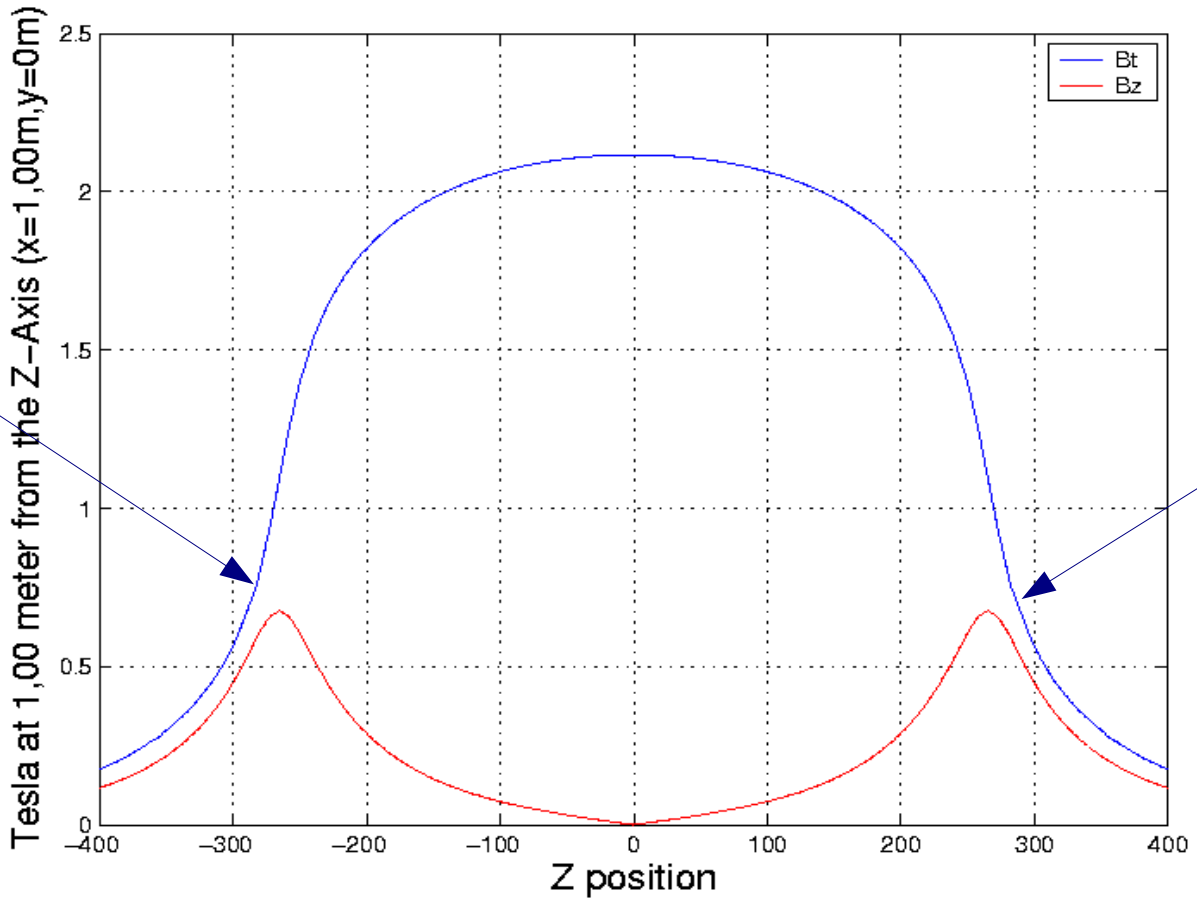
Now the plot looks like it should



The remaining tracks are at large eta



Magnetic Field plots



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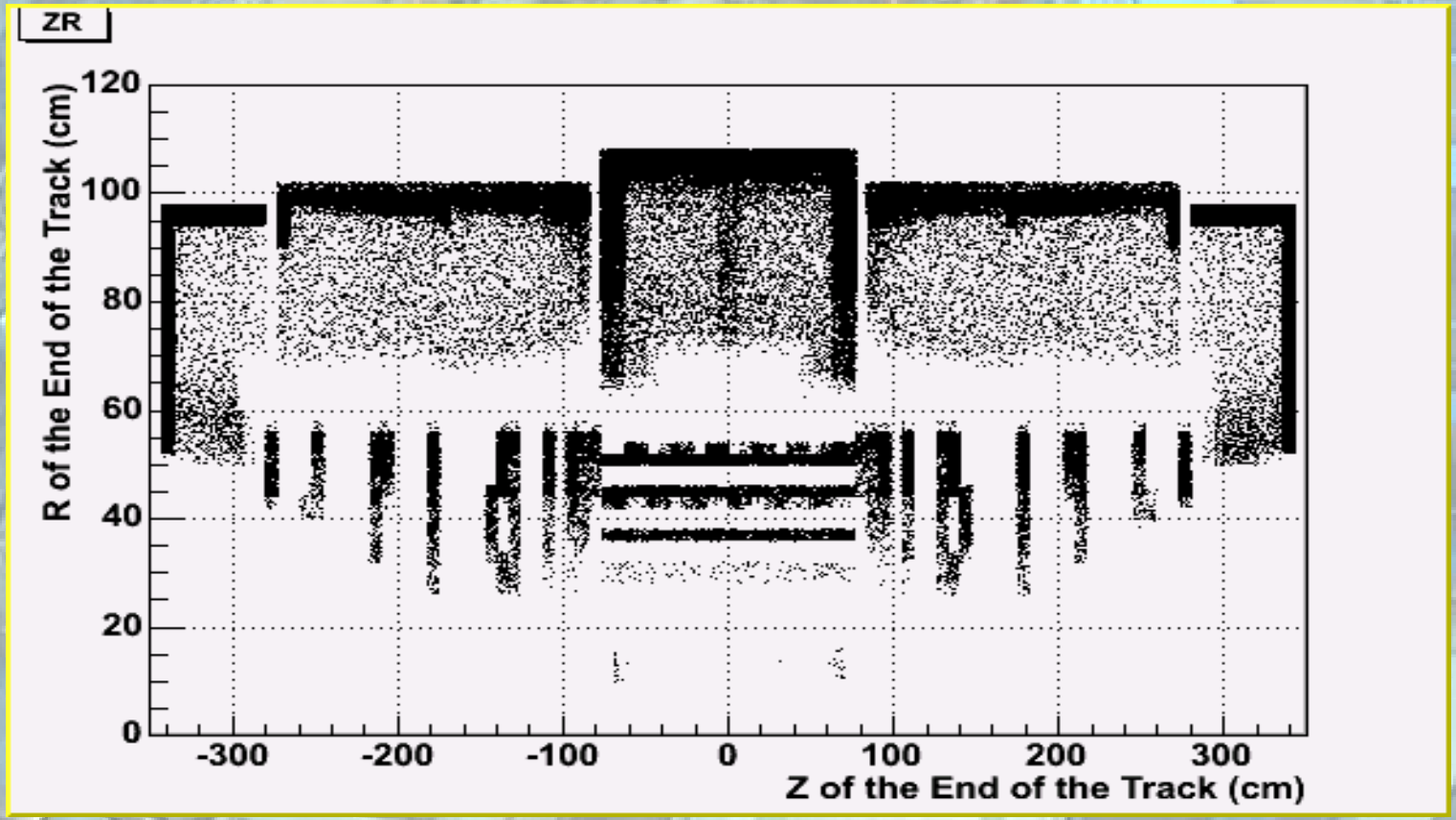
End of the Tracks

Many different R's to finish tracks.



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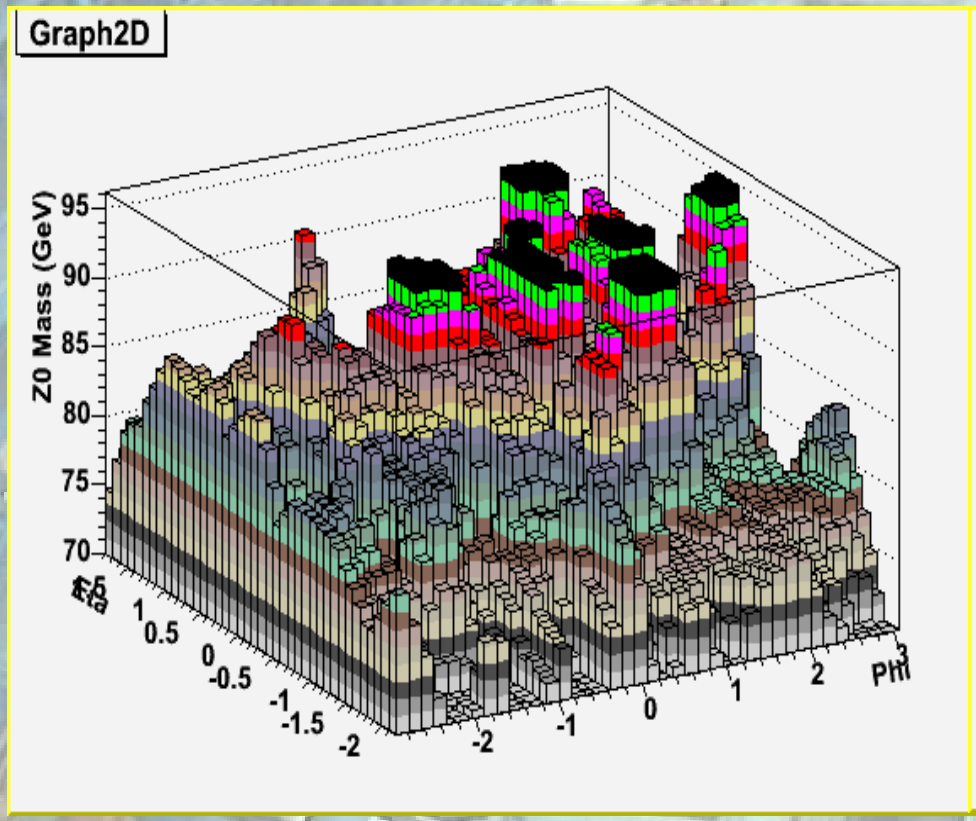
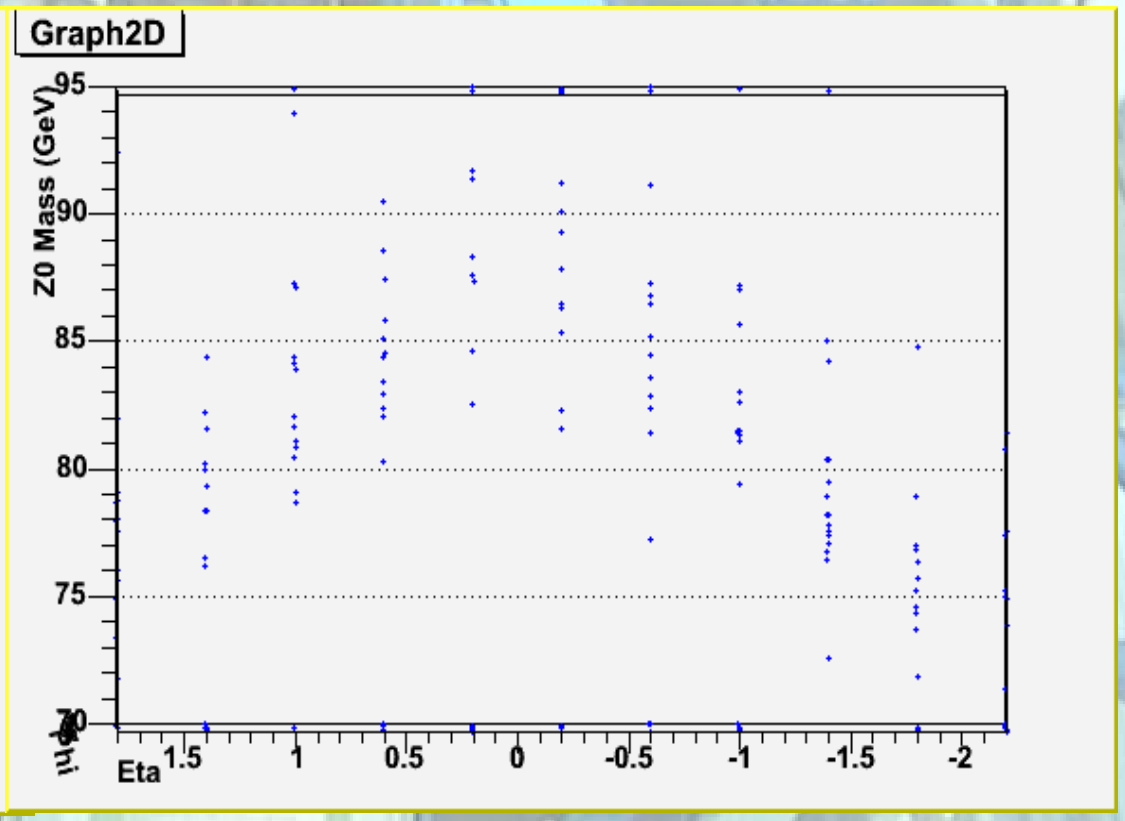
Tracks Z0 Mass reconstruction

For the two leading tracks. One has to fall in the 0.4/0.4 region in order to have its Z0 Mass accumulated in the histogram. The Z0 Mass decays with eta. One can clearly see the necessity for a calibration at the higher abs(eta) range.





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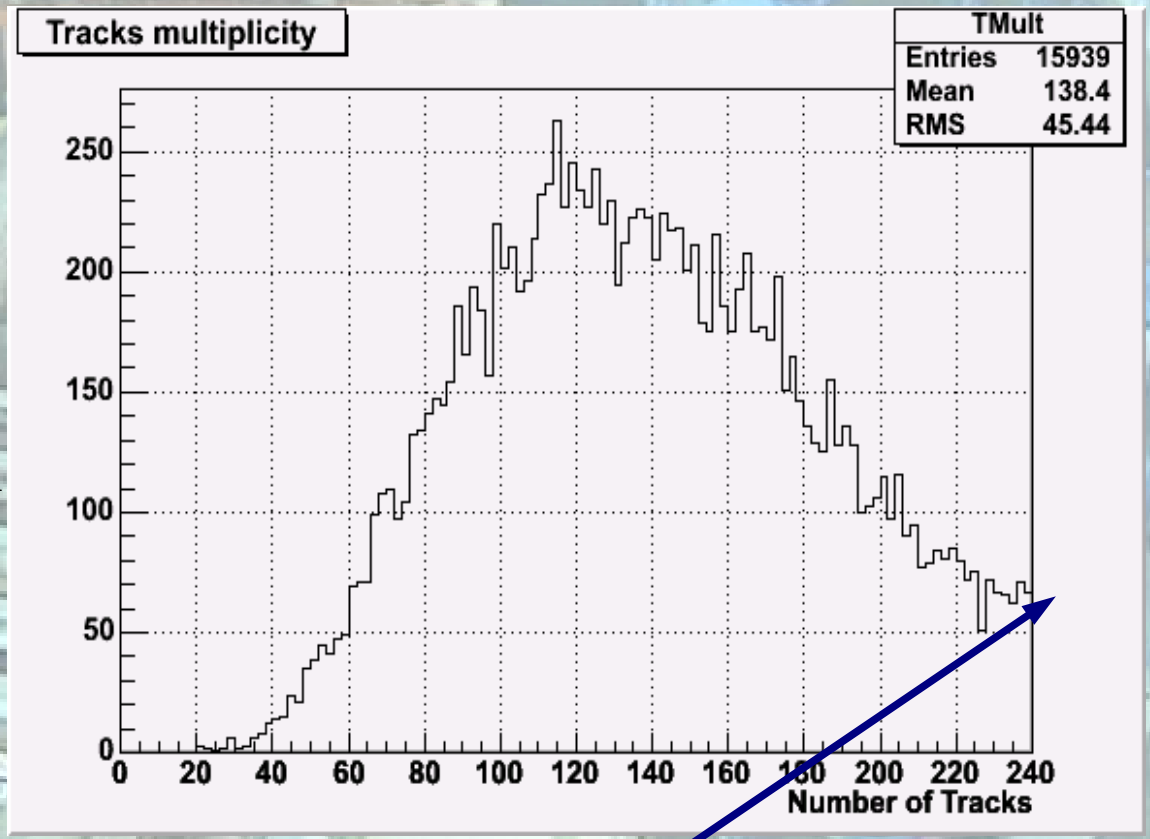
Pile-up Run

- Not much analysis performed so far.
- Same run from DC2.
- Just check the multiplicity.



Too high multiplicity!!

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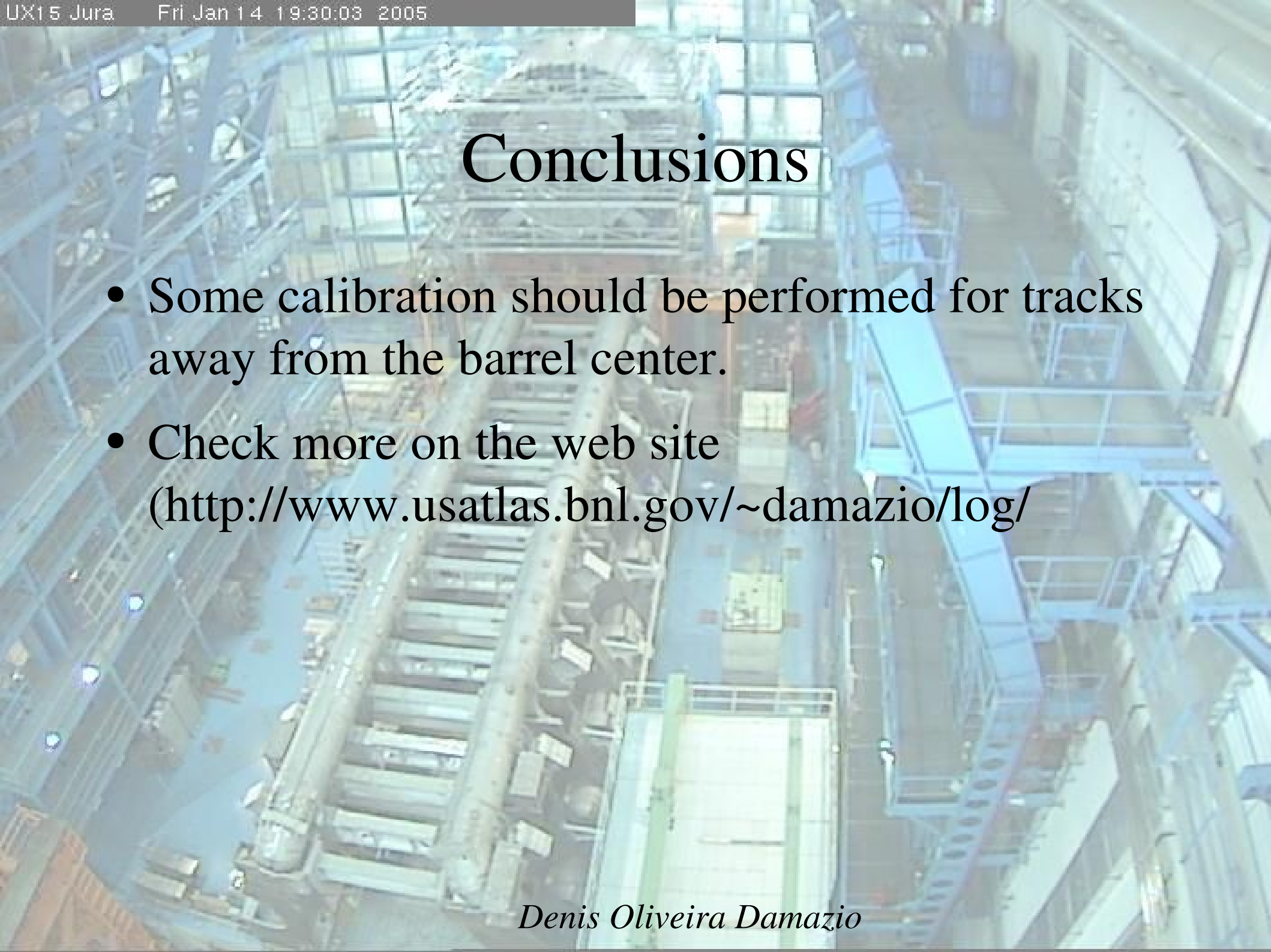
Conclusions

- In general xKalman seems to be working as it should.
- Some tracks present a weird bending.
- Finally, some have a higher impact parameter (outside the pipe line!) -> This is the decisive factor to solve the problem.
- Now, I think, I know how to plot the magnetic field.



Conclusions

- Some calibration should be performed for tracks away from the barrel center.
- Check more on the web site (http://www.usatlas.bnl.gov/~damazio/log/