First look at data/MC comparison for period 8 reference runs

LAr H8 Analysis meeting 11/04/06

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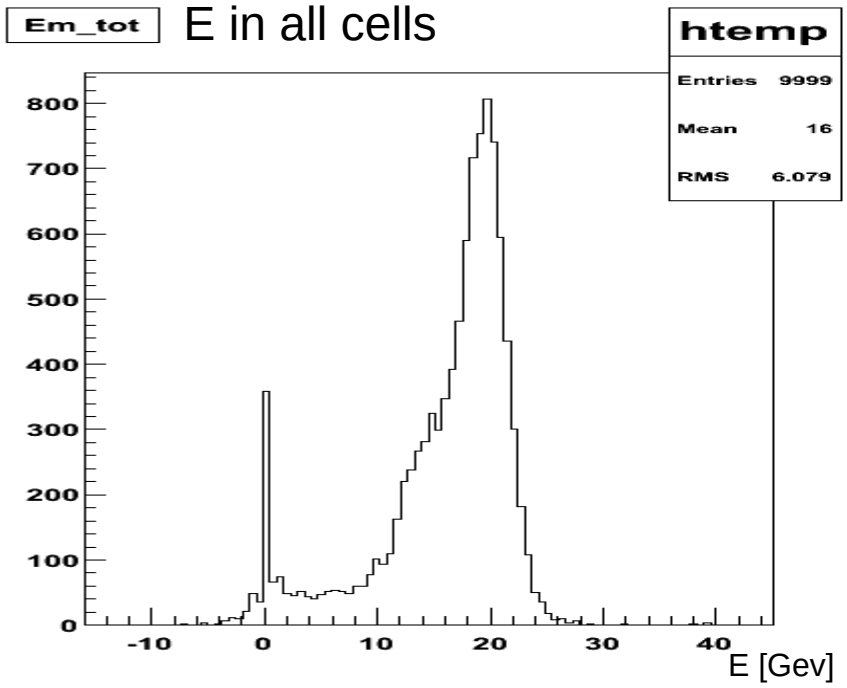
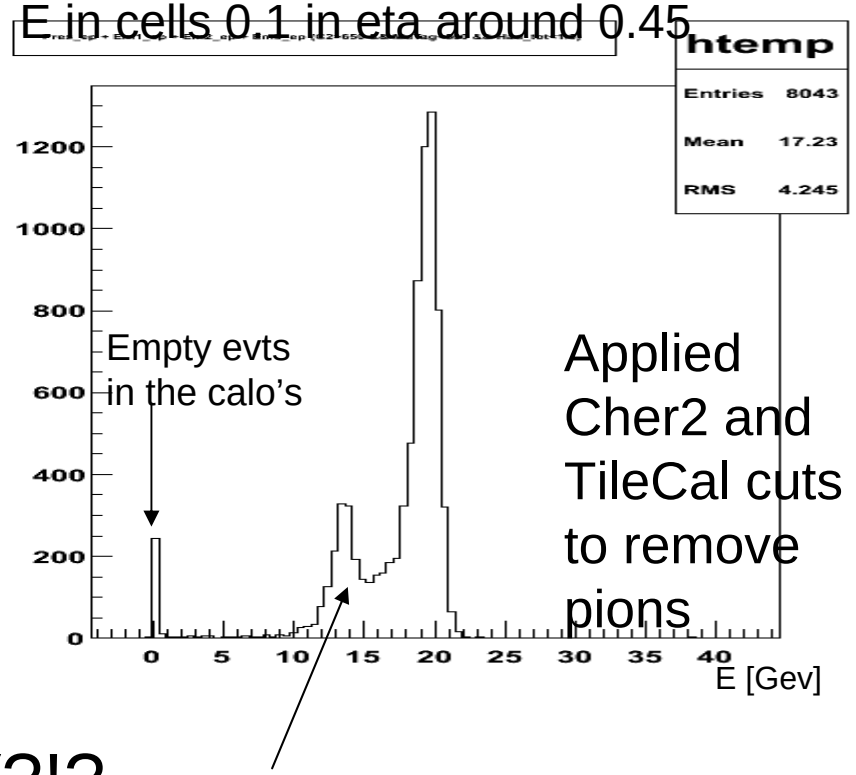
Introduction

- Want to study the effects of upstream material with combined ID+LAr info.
- Using data and MC at different configurations, as energies and ID magnetic fields
- Using the latest version, 11.4.0, both for MC and data, which is interesting in itself since it includes the new LAr geometry (more correct description of the changes of thicknesses at cold).
- First look is for 20 GeV electrons, with and without magnetic field.
- However, I have had a lot of problems with both the reconstruction and CASTOR the latest week, so have small statistics. So started to use 11.0.2 data at first…

Run 2102413, 20 GeV, eta=0.45 data, B=1.4T, 11.0.2





- Strange peak at 12 GeV?!?
- This is, as we will see later, not seen in 11.4.0.
- So have I missed something?! I thought this version was actually ok…

Data and MC info for the runs used henceforth

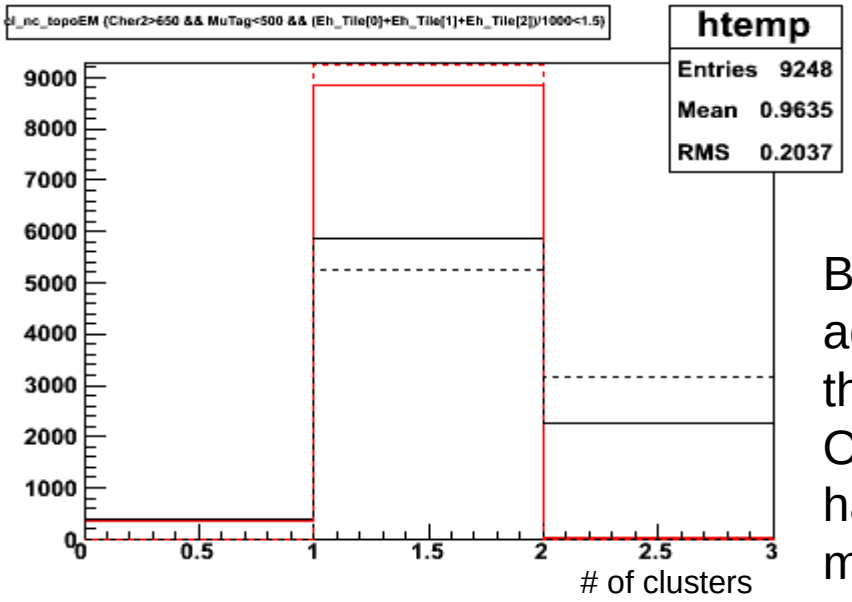
- Using 11.4.0, but no ID or Track info
  (had to run interactively and took to long time…so low statistics…)
- Data runs:
  - 2102397 B=0T, 20 GeV, eta=0.45, 10k evts
  - 2102413 B=1,4T, 20 GeV, eta=0.45, 10k evts
- MC runs:
  - “2102397”, no extra material, 5k evts
  - “2102413”, far upstream material = 0.15X0, 5k evts

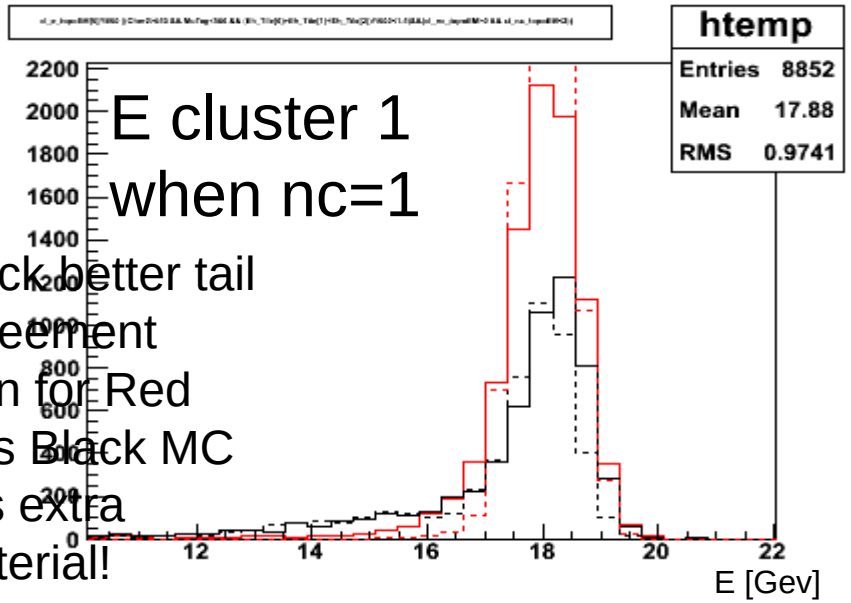
- Using topocluster to have a first look at the data

Red B=0
Full line data
Dashed MC

Energy comparison

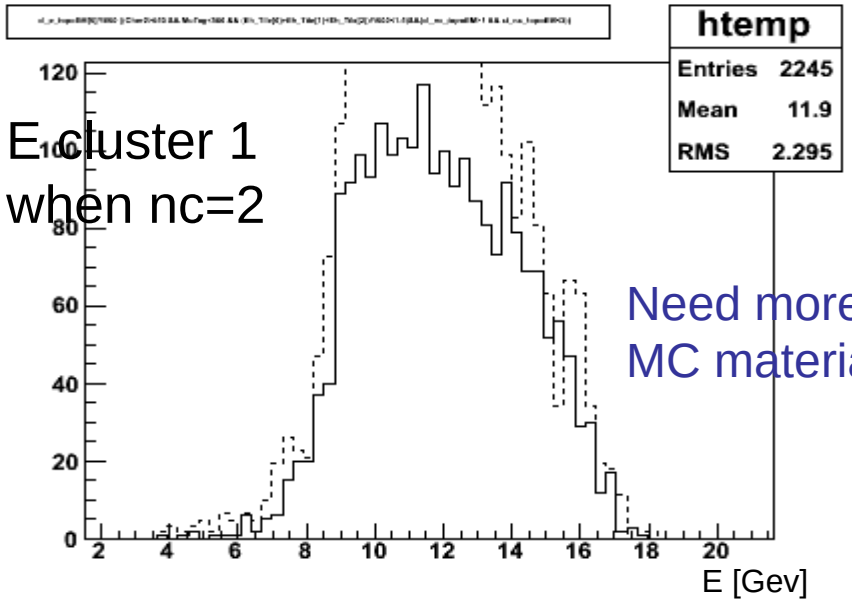
Black B=1.4T
Full line data
Dashed MC



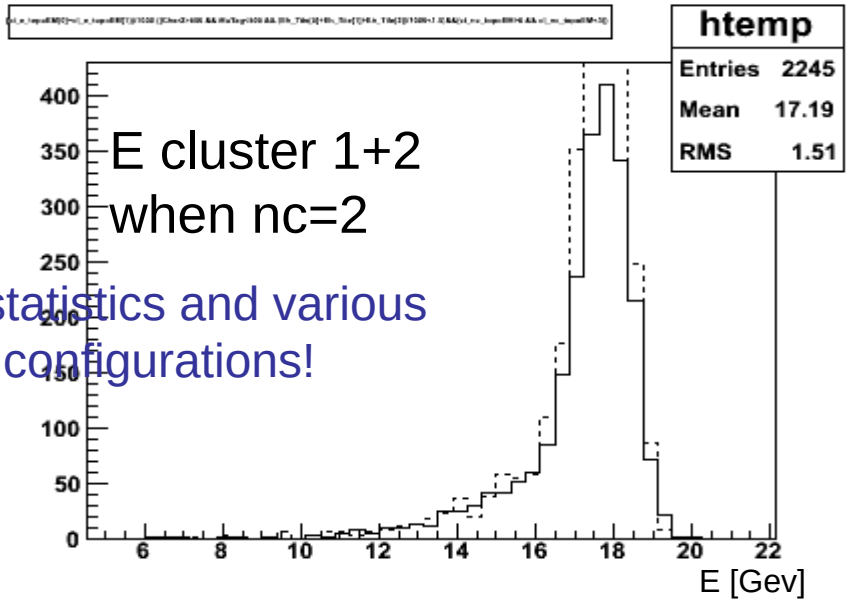


E cluster 1
when nc=1

Black better tail agreement than for Red Obs Black MC has extra material!



E cluster 1
when nc=2



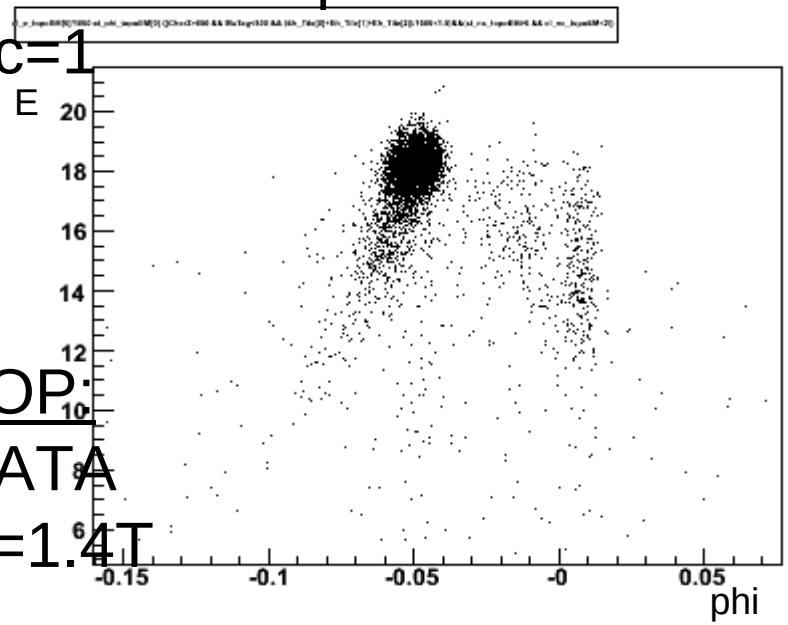
E cluster 1+2
when nc=2

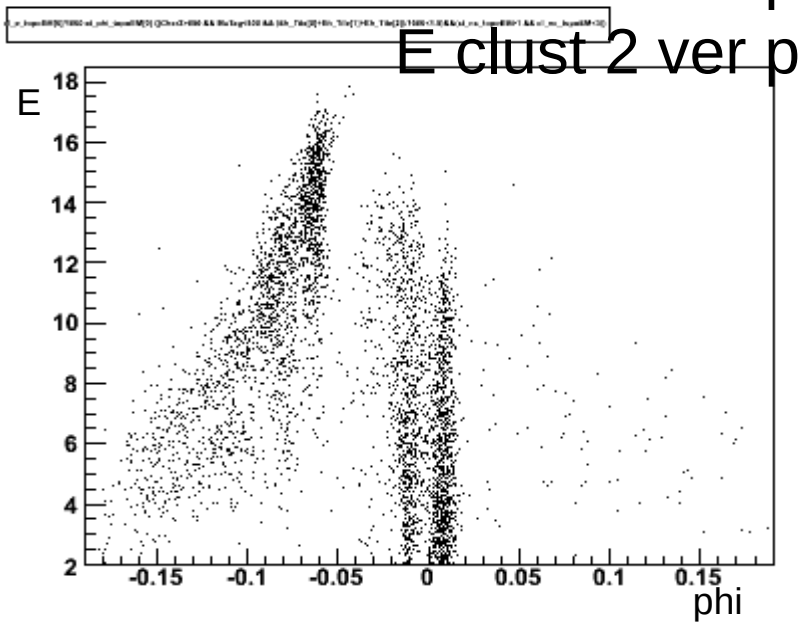
Need more statistics and various MC material configurations!

Energy versus Phi

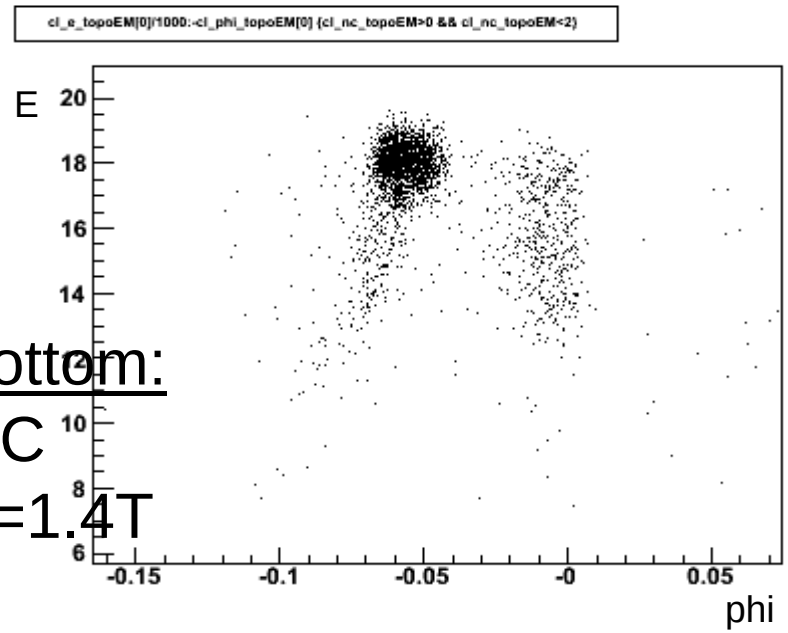
Left:
E clust 1 ver phi1
Nc=1

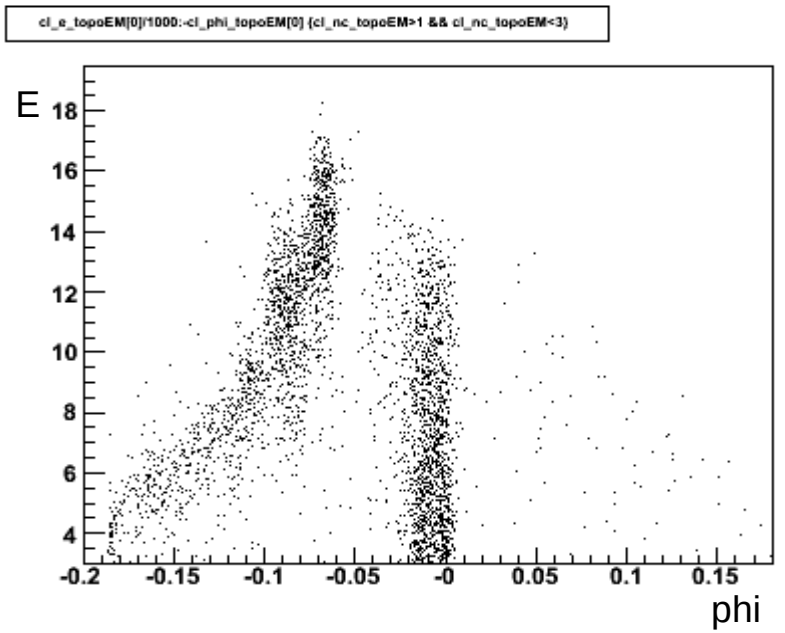
Right:
E clust 1 ver phi1+
E clust 2 ver phi2





TOP:
DATA
B=1.4T





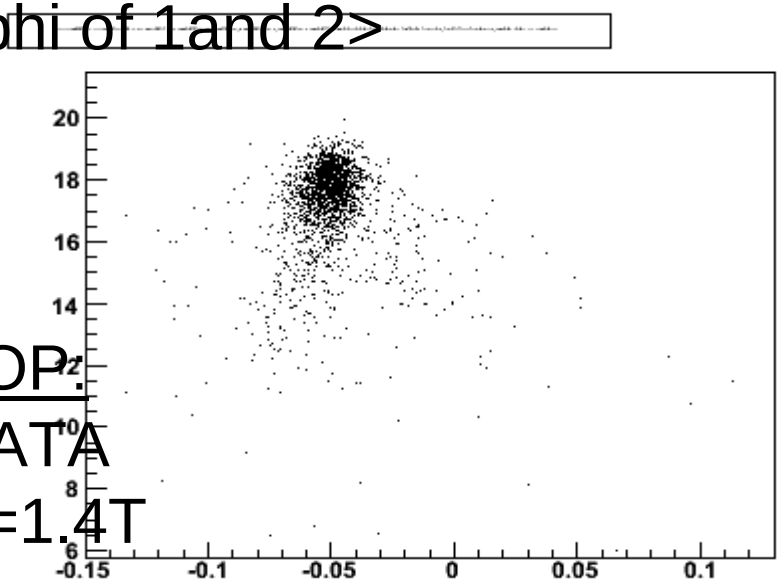
Bottom:
MC
B=1.4T

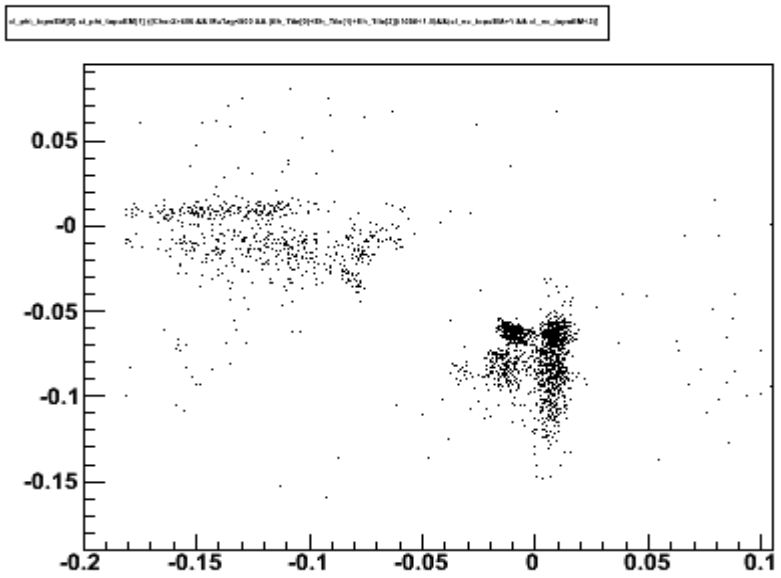
Energy versus phi cont'

Left:
E clust 1+2 ver
<phi of 1and 2>

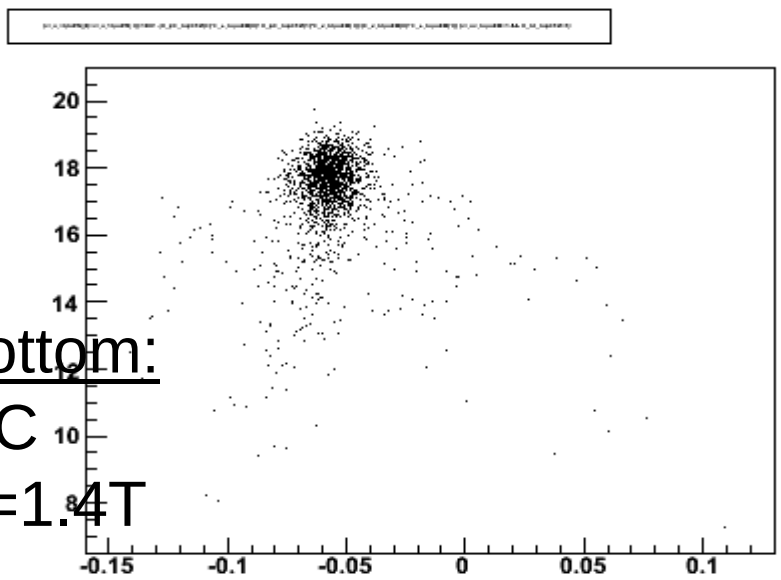
Right:
phi1 versus phi2

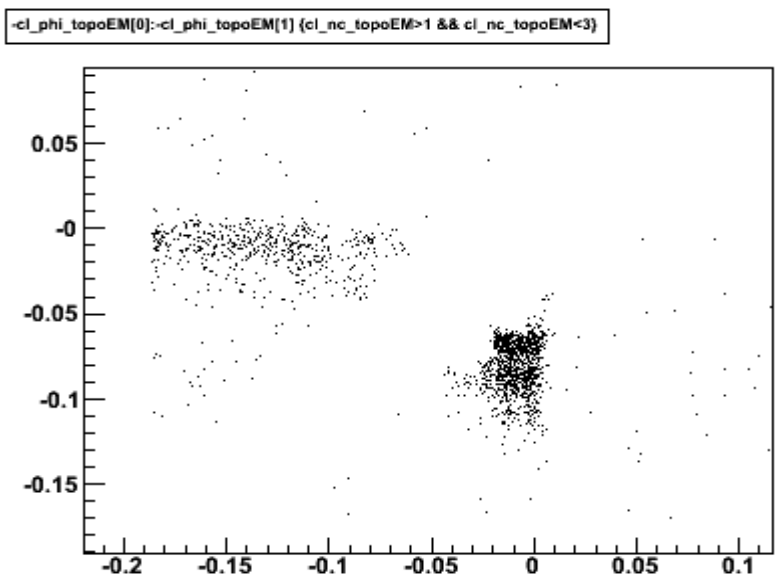
TOP:
DATA
B=1.4T





Bottom:
MC
B=1.4T





Summary

- Version 11.0.2 seems to have some reco problem, or I at least have some problems with it…
- Comparison of Data and MC for 11.4.0, for 20 GeV electrons, eta=0.45, B=0 or 1.4 T, seems reasonable with the low statistics I have.
- However, the MC with extra upstream material seems to reproduce the tail better for the B=1.4T run, than the MC without extra material manage to reproduce the tail for the B=0T run.
- The number of clusters for the B=1.4T run is different, more events with 2 clusters in the MC.
- The energy and phi distributions also seems okay, although in the data there is a gap at phi=0 that is not reproduced in the MC.

Conclusion and outlook

- Need more data statistics, we have I believe 70 and 100k evts for the data at 20 GeV, and also have a look at other energies.
- More MC statistics with different configurations.
- Also reconstruct with ID and track info!
- More closer look at the data, for example the energy distributions in the different layers with and without material (new LAr geometry), use the ID info to compare MC/Data as E/p.
- This will hopefully tell us about the amount of material upstreams.