The University Of Sheffield.

Discussion on Combined (ID+LAr) Material Studies action plan

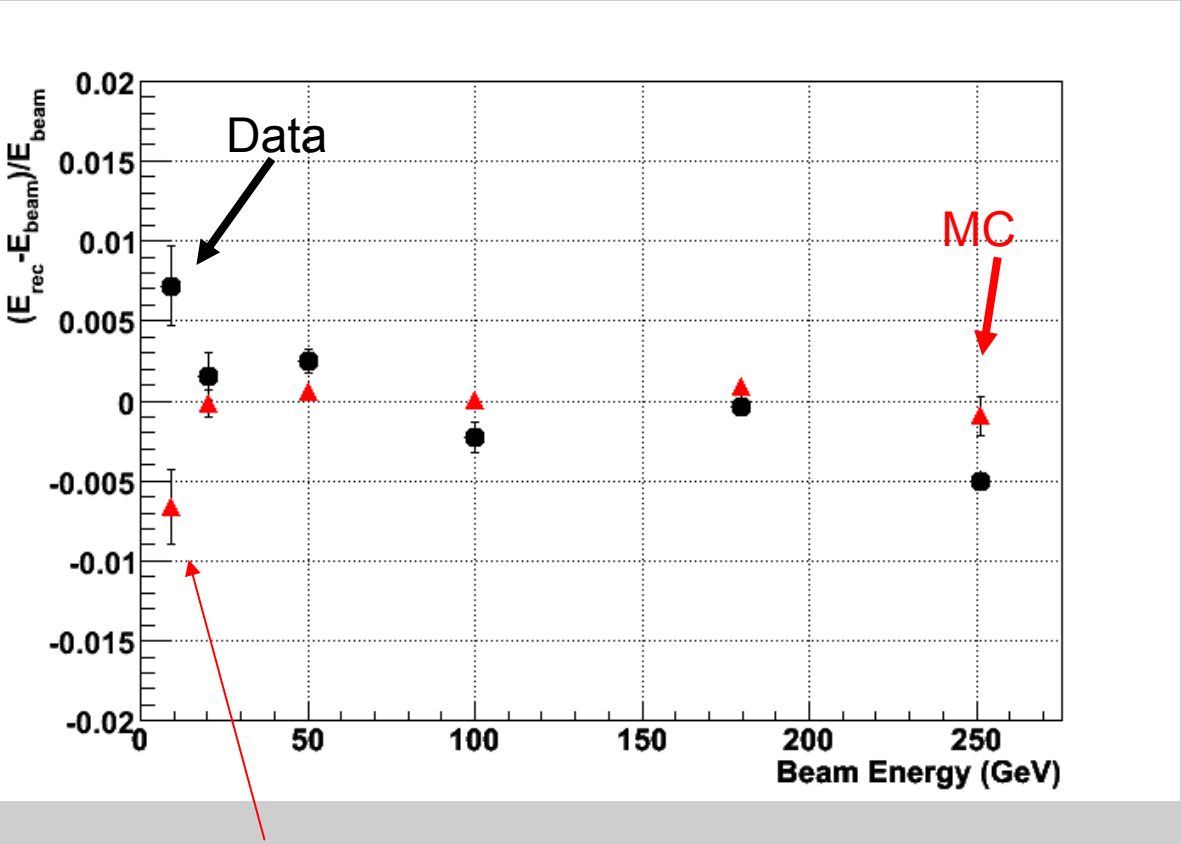
- Latest LAr linearity plot from period 5
- Discussion on test MC run production

Summary

- Main issue: question on the need of extra material in front of the cryostat (about 0.15X0s)
- During last LAr week the effect of a number of systematics on the layer response was discussed: some of them cause shifts to S1/S2 similar to the way extra material does
  - However, extra material produces tails + may have different E-dependence
- After the LAr week calculations done by Martin and G.Unal show significant change of the layer dimensions at cold (in our Sim we have the measured lengths).
  - The change impacts the S1/S2 the same way extra material would
- Necessary to rerun with a new geometry
- Another point: new G4 v4.8 will soon be part of the Atlas releases. This has significant impact on the PS response but smaller impact on S1/S2. The accordion SF is larger.

Linearity (just an example, periods 5+6)

For details on what has happened in 2005: see Walter Lampl's thesis



My latest check-plot following the MC vs Data comparison presented in Feb LAr week, agrees with Walter's conclusions.

Calibration is fully based on MC (calibration hits)

9GeV MC: charge collection corrections vs phi not fully studied

New effort

- Form a group of people from both LAr and ID groups to collectively address the MC description:
  - Effects of far upstream material (about 0.13X0, mostly air)
  - Effects of extra material inside the ID
  - MC description of the LAr
  - Geant4 validation
- Define a number of runs to be simulated and used for comparisons.
- Discuss analyses sensitive to particular effects
  - Example: number of tracks or hits in the ID vs upstream material
  - Non-gaussian tails in the LAr etc

Future: proposed runs (T.Atkinson + all)

- 9GeV (e/pi composite beam)
  - 2107 (no extra ID material)
  - 2150 (with extra ID material)
- 20GeV (electrons)
  - 2413 (no extra ID material)
  - 2295 (with extra ID material)
  - 2300 (with extra ID material) NO FIELD
  - 2397 (no extra ID material) NO FIELD
- 180GeV (electrons)
  - 2463 (no extra ID material) Reference + top priority
  - 2195 (with extra ID material)
  - 2182 (with extra ID material) NO FIELD
  - 2461 (no extra ID material) NO FIELD Reference + top priority

Offline Releases

- Our best bet: 11.4.0 to be built this Thursday
  - Has new LAr geometry (contraction in cold)
  - Has “old” Geant4 sim v4.7
    - Disadvantage: MCS treated better in the new v4.8
    - Advantage: allows LAr to check the transition to the new geometry using the same G4 version (v4.7).
- Rerun with a latest version which will have G4 v4.8
  - Is this 12.0.0 ?