Tilecal response to pions and protons: testbeam data and Geant3/Geant4 simulation

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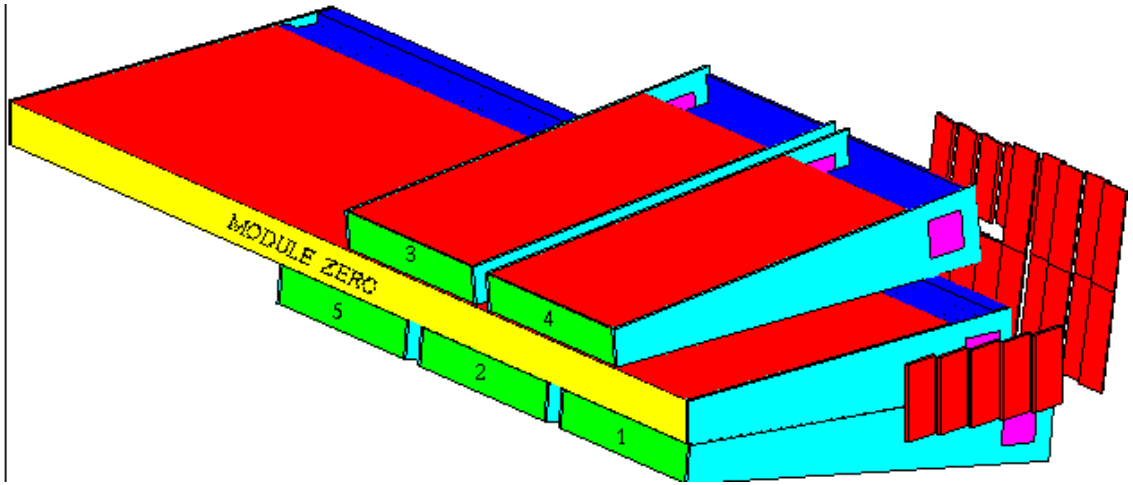
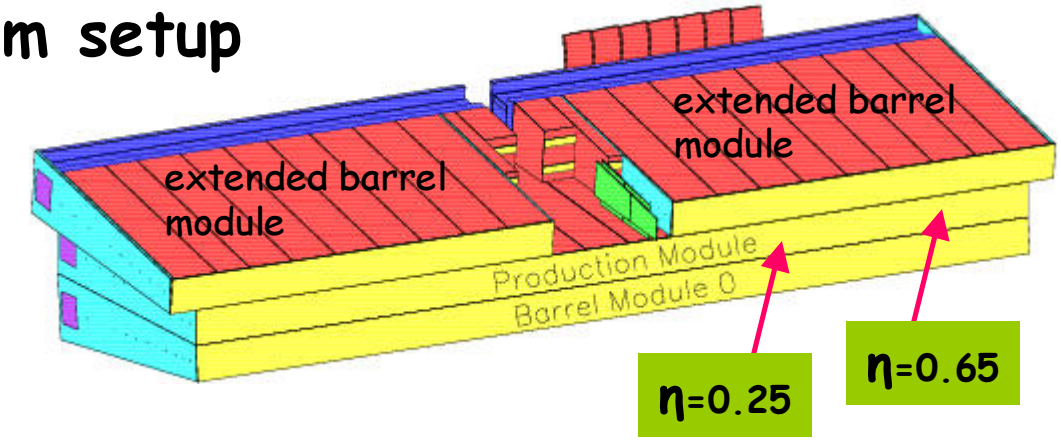
1998 test-beam data and Geant3

Comparative analysis of the ATLAS Tile hadronic calorimeter response to pions and protons, ATL-TILECAL-2001-005:

- a higher response and a better linearity for pions
- a better resolution for protons

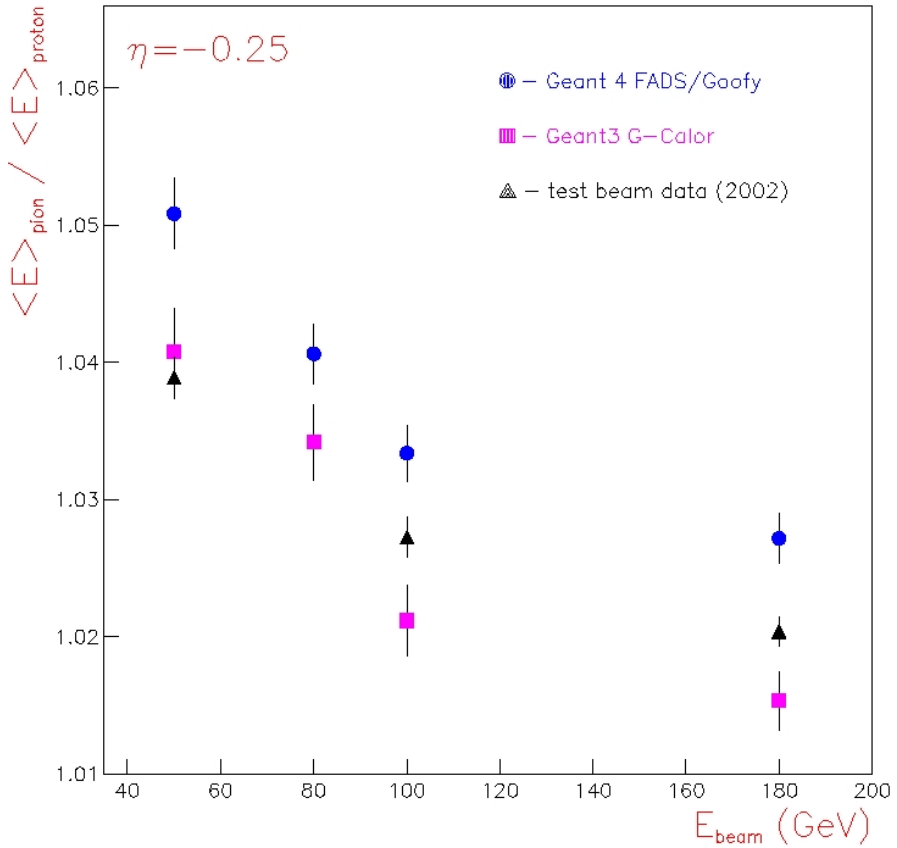


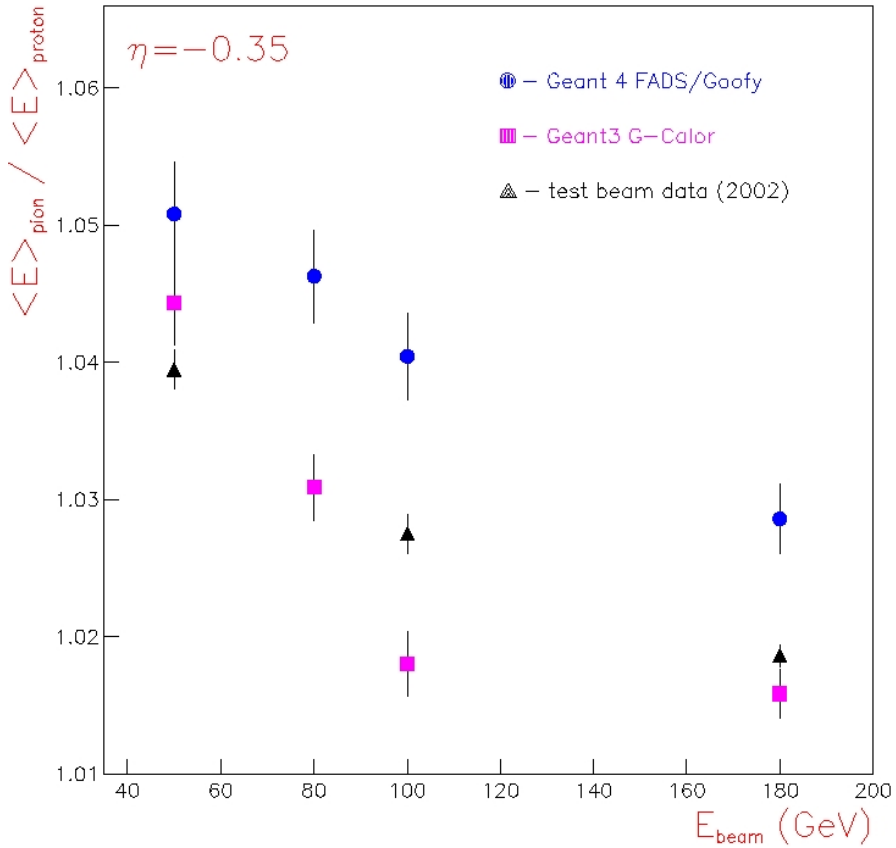
2002 test beam setup



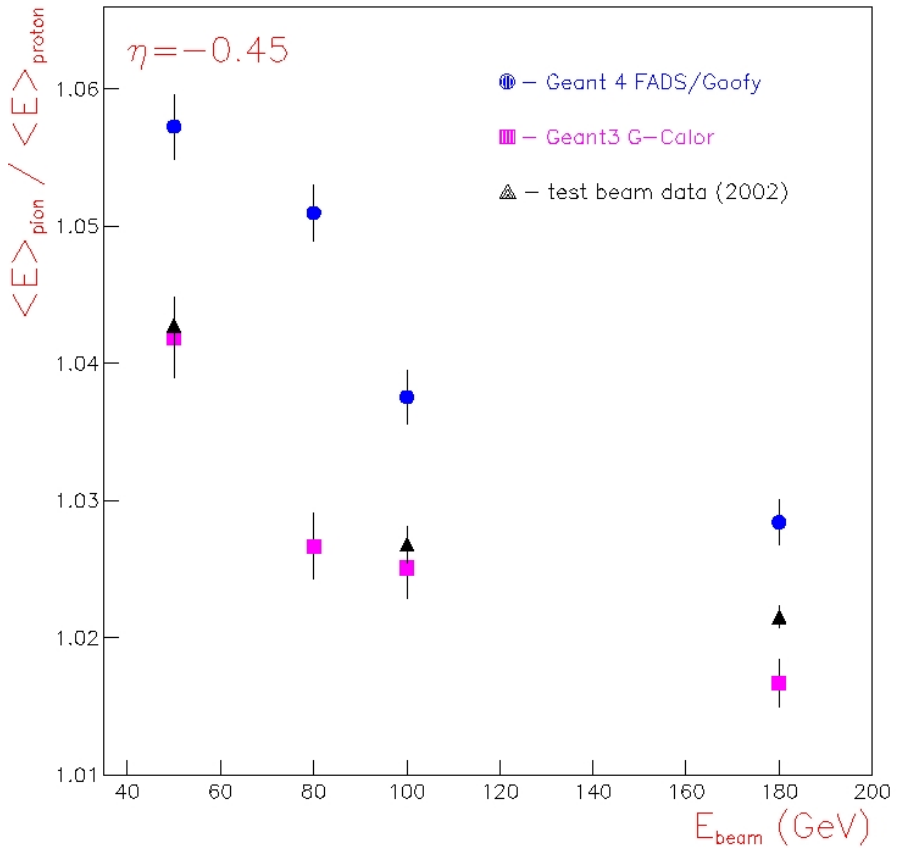
- 2002 test beam data (no weighted data)
  - **En: 50, 100, 180 GeV**
  - **η: 0.25, 0.35, 0.45, 0.55, 0.65**
- geant 3: G-Calor
  - En: 50, 80, 100, 180 GeV
  - η: 0.25, 0.35, 0.45, 0.55, 0.65
- geant 4: version 333 and FADS/Goofy 111
  - En: 50, 80, 100, 180 GeV
  - η: 0.25, 0.35, 0.45, 0.55, 0.65

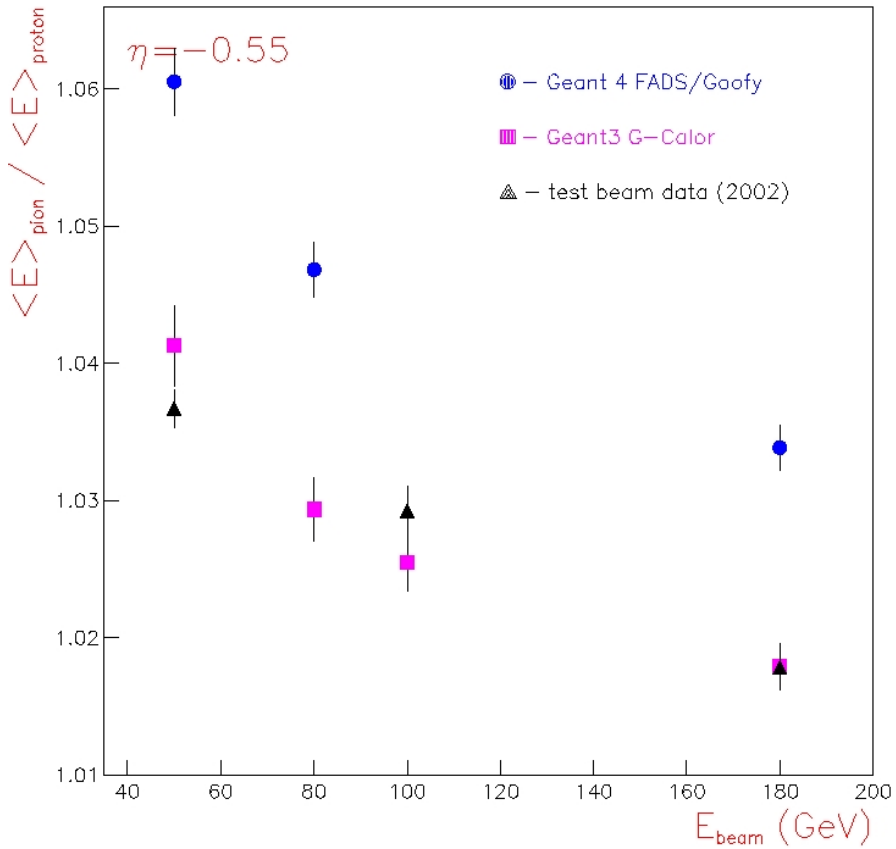
π/p ratio E_{beam} dependence



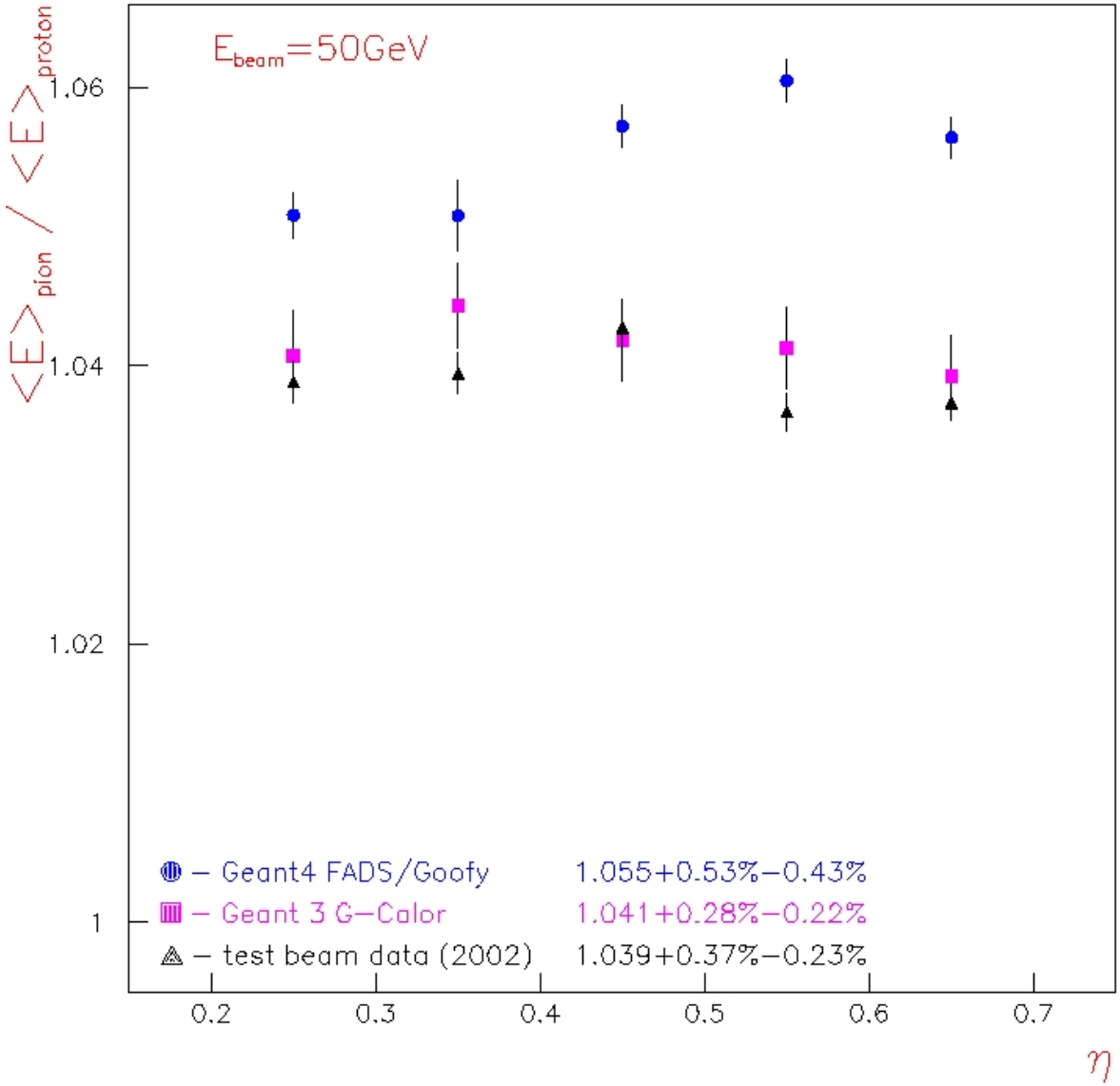


π/p ratio E_{beam} dependence

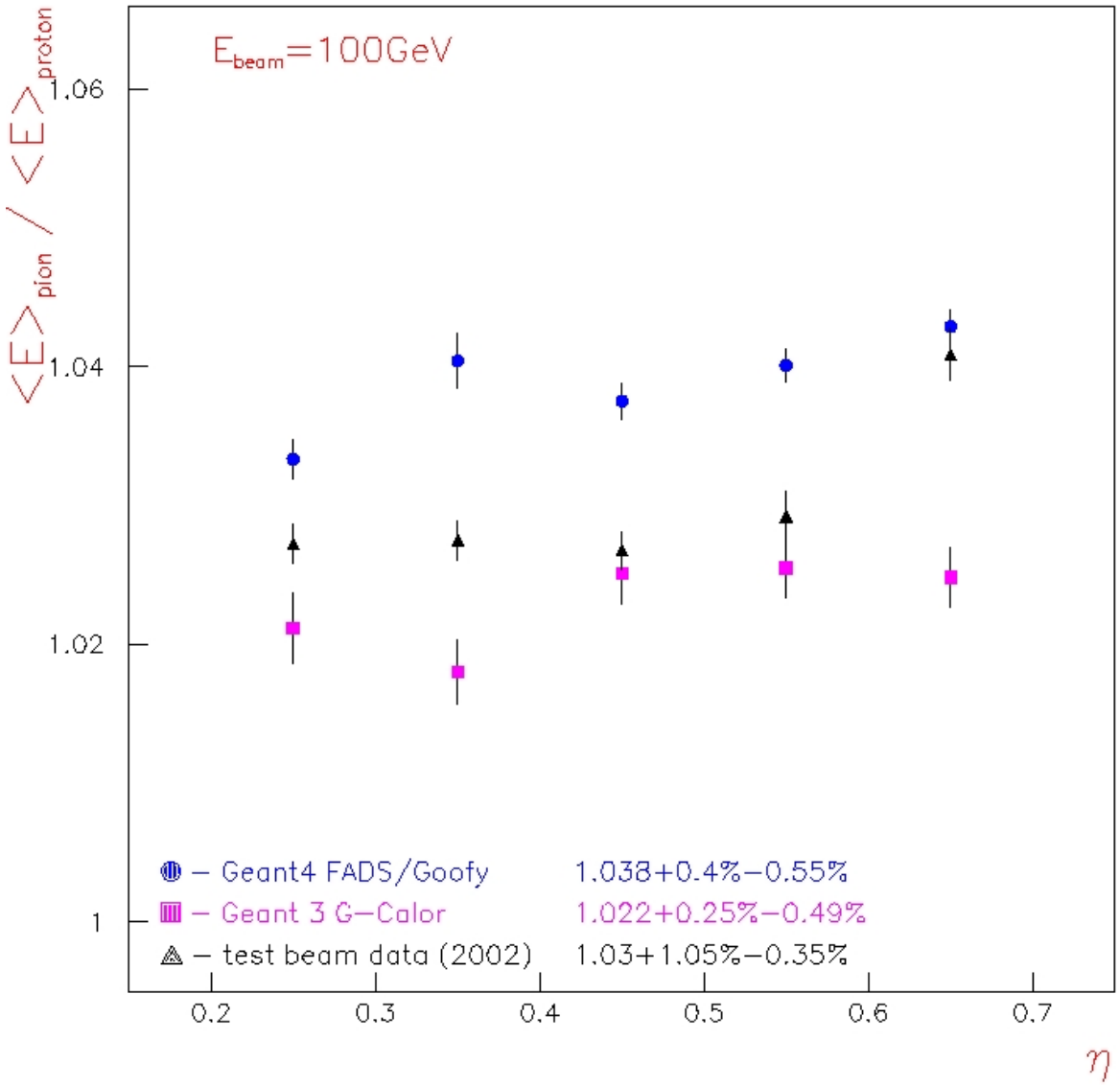




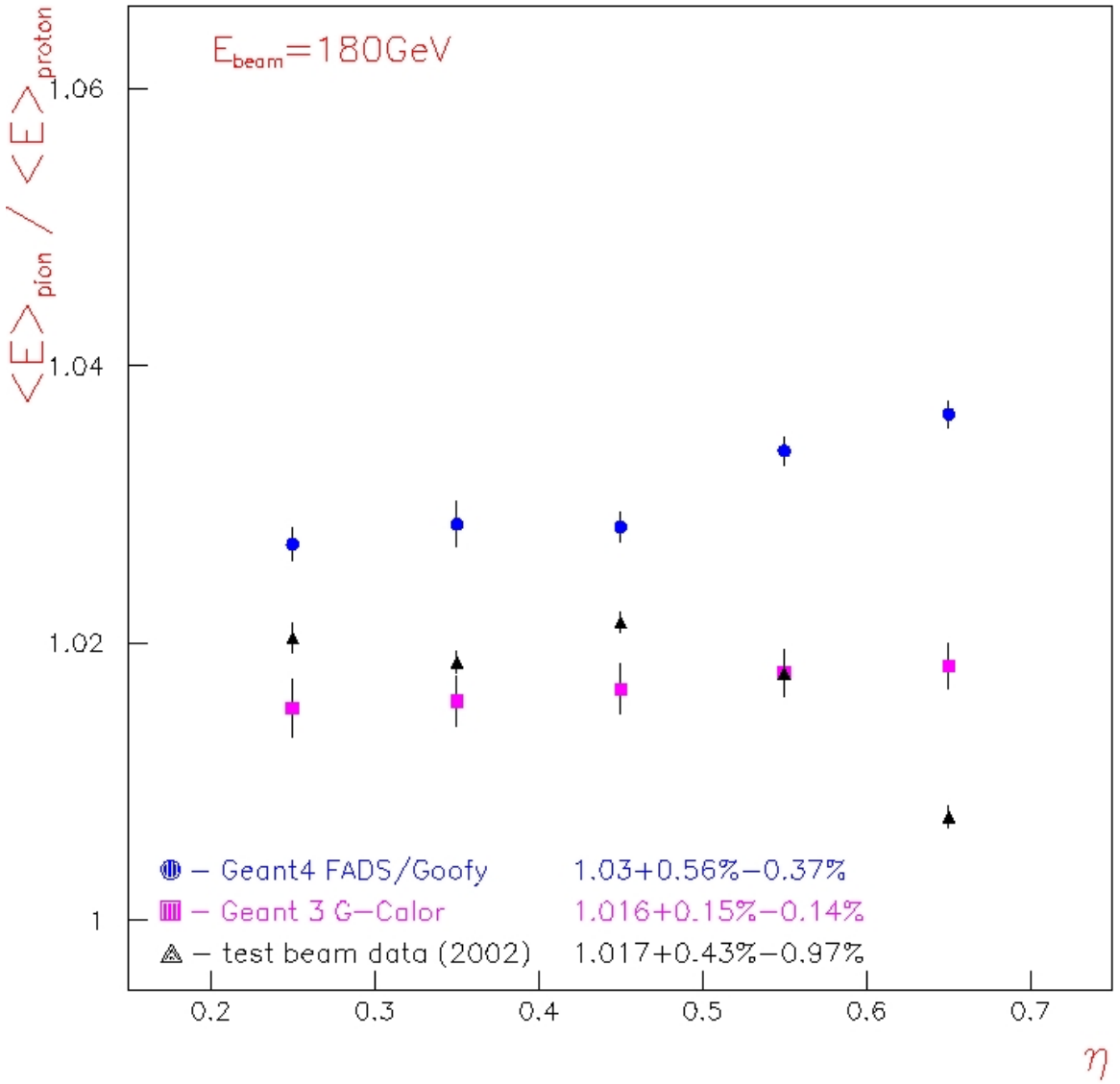
π/p ratio η dependence



π/p ratio η dependence

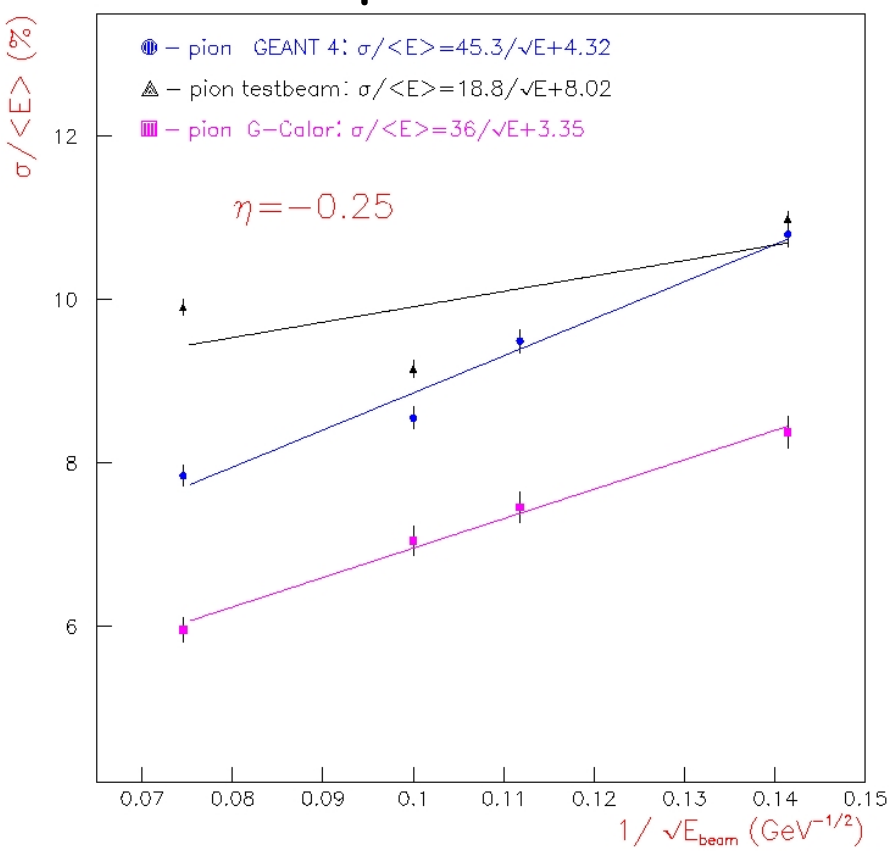


π/p ratio η dependence

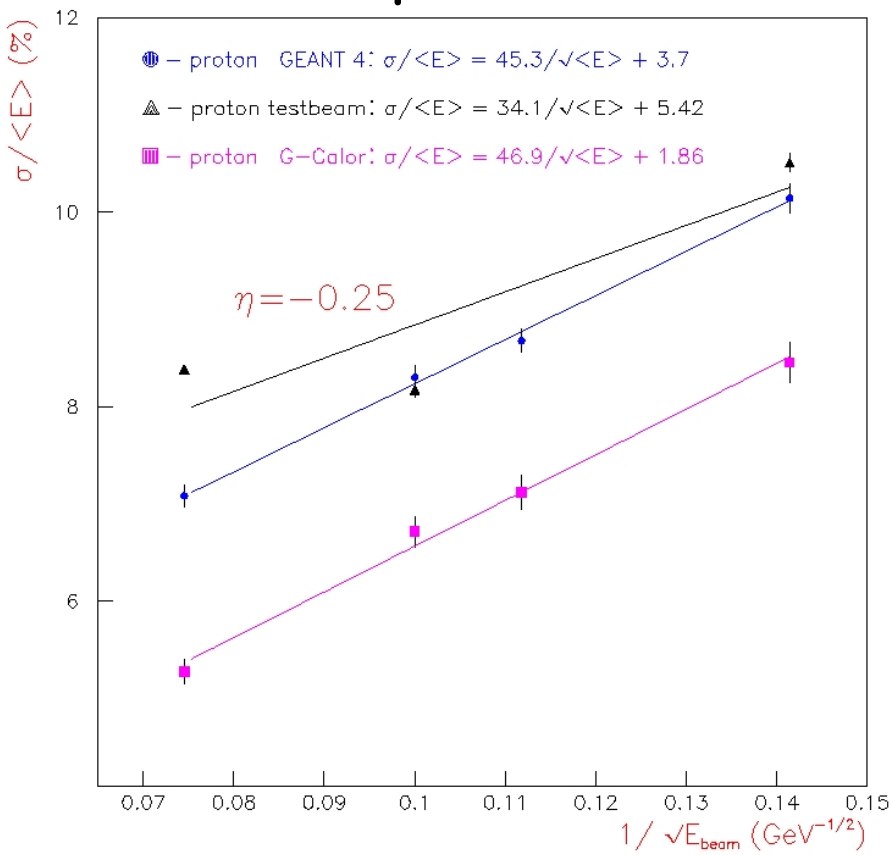


resolution

pions

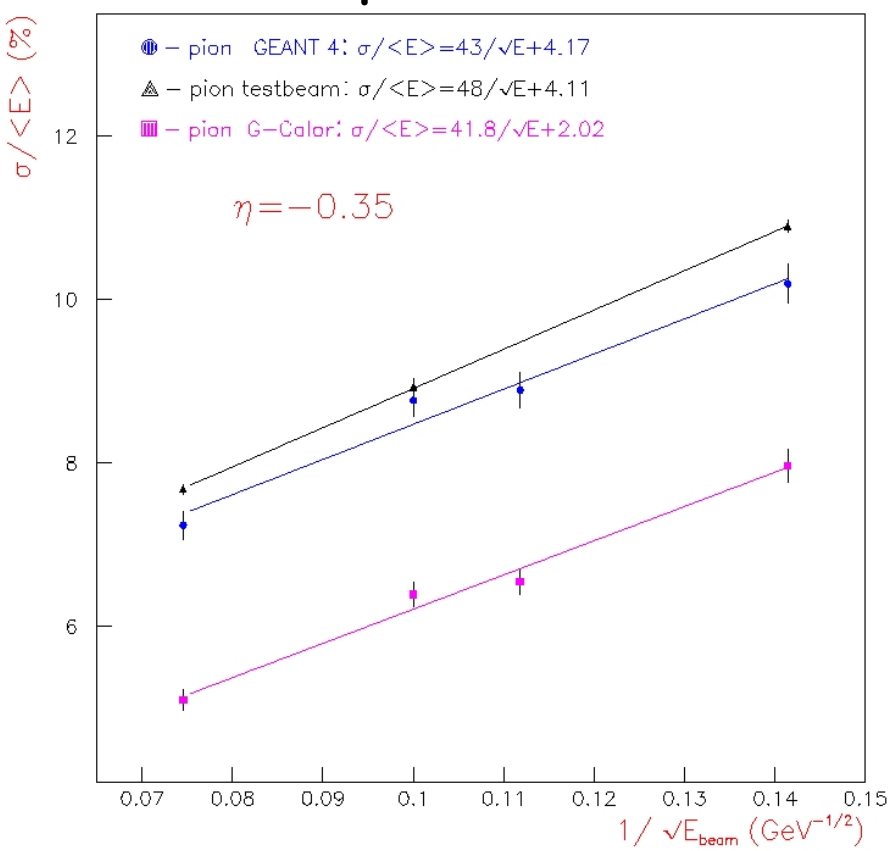


protons

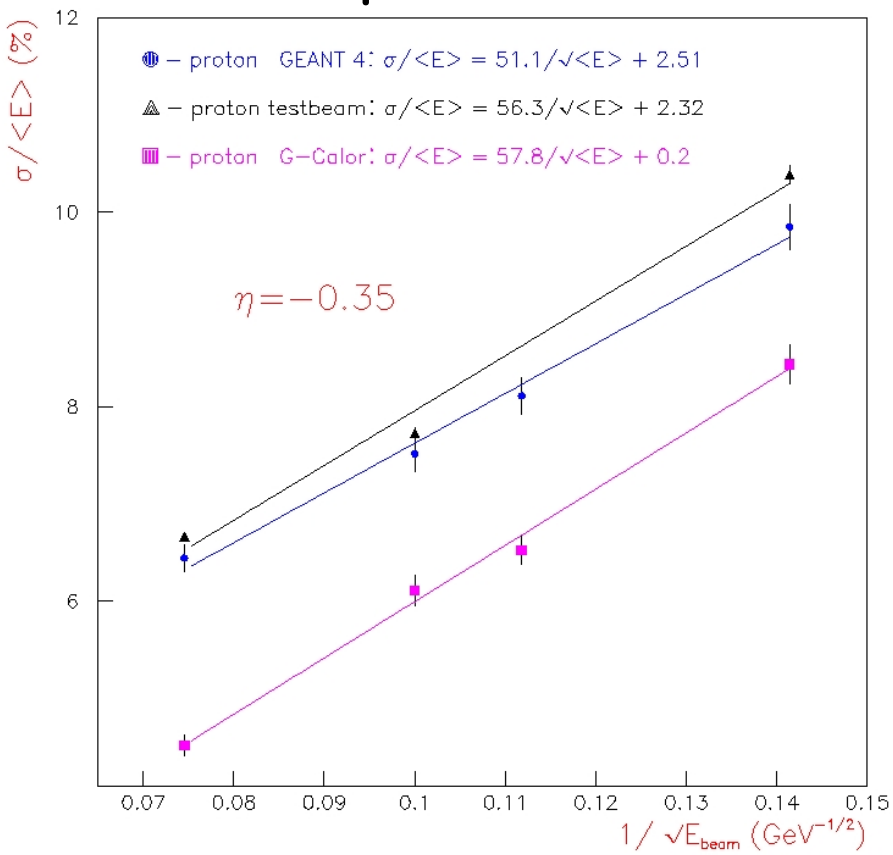


resolution

pions



protons



resolution

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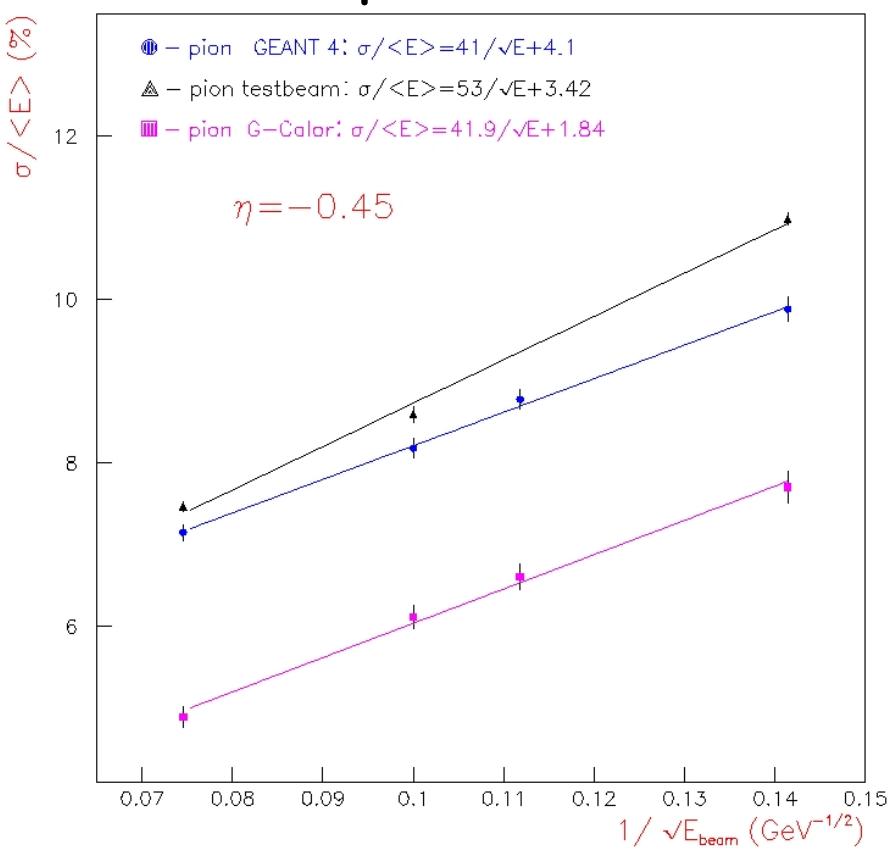
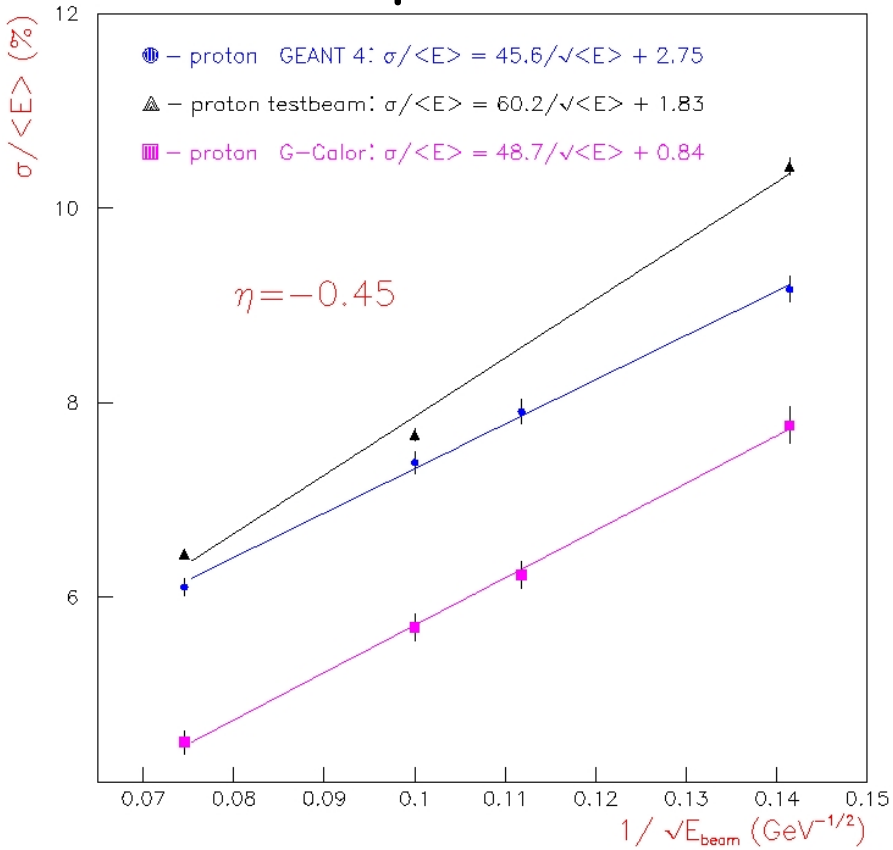
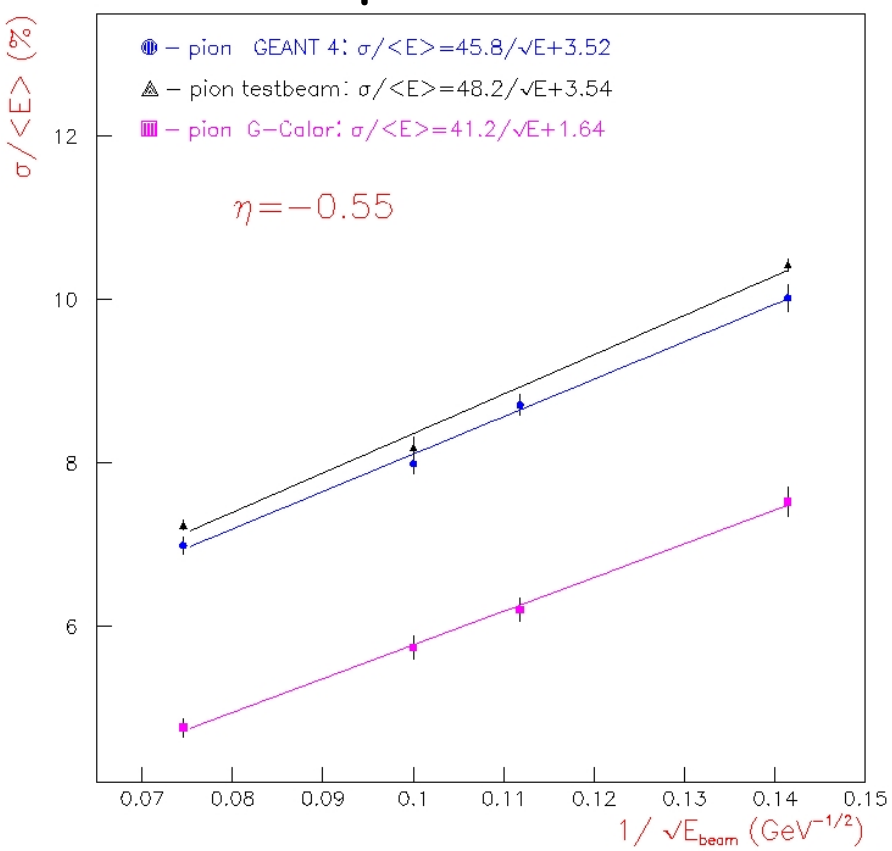


protons

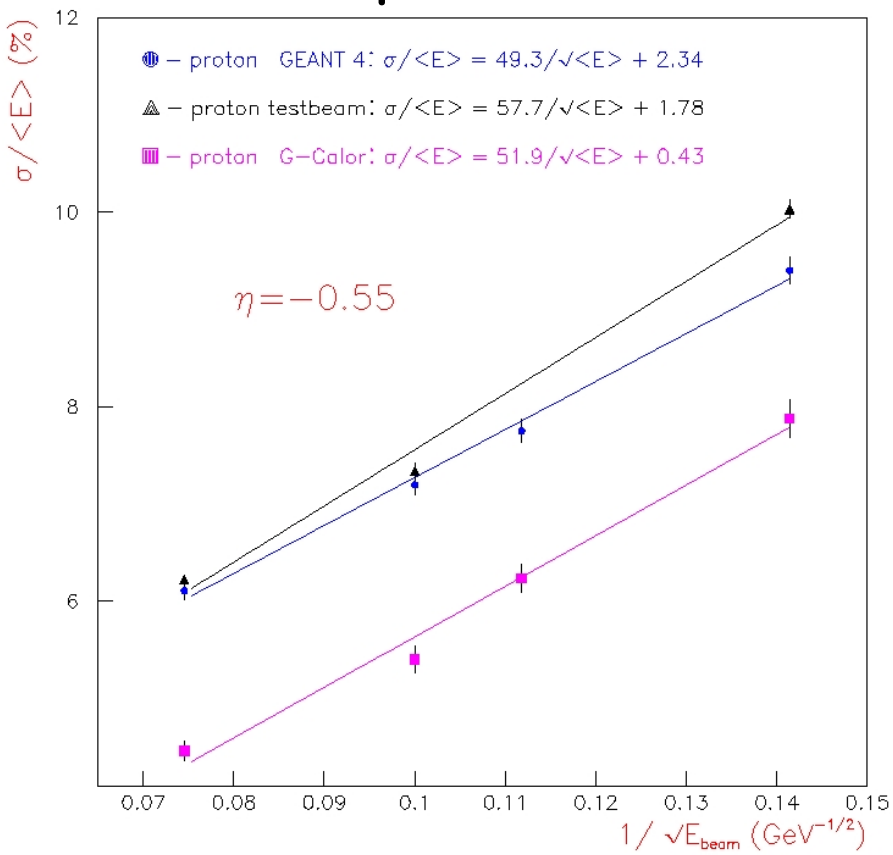


resolution

pions

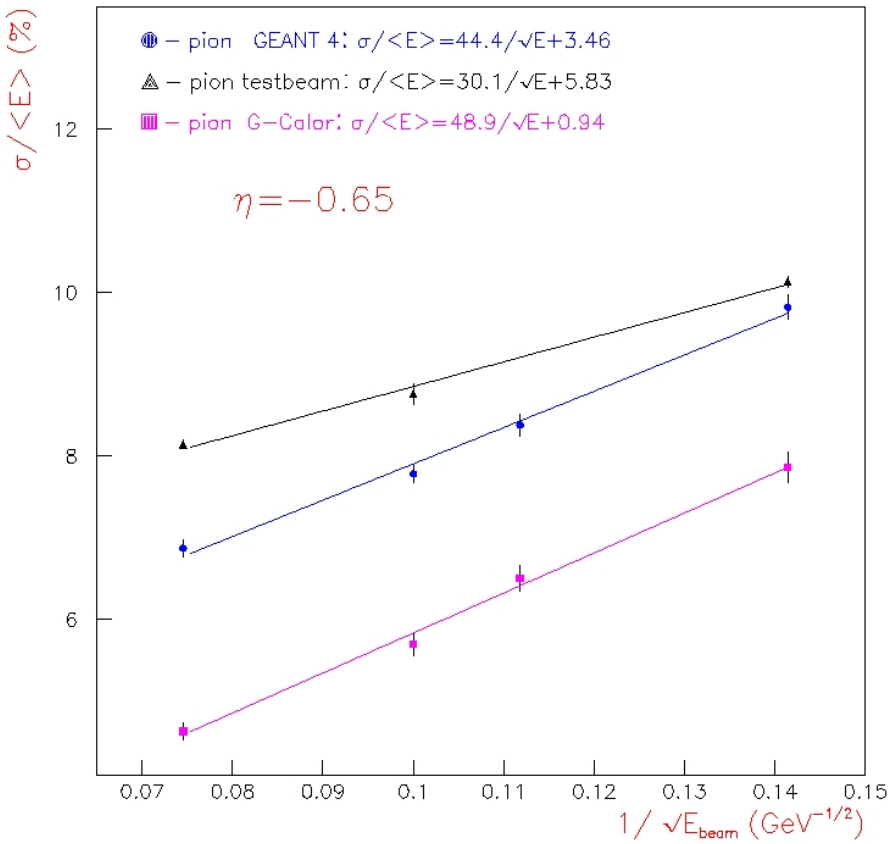


protons

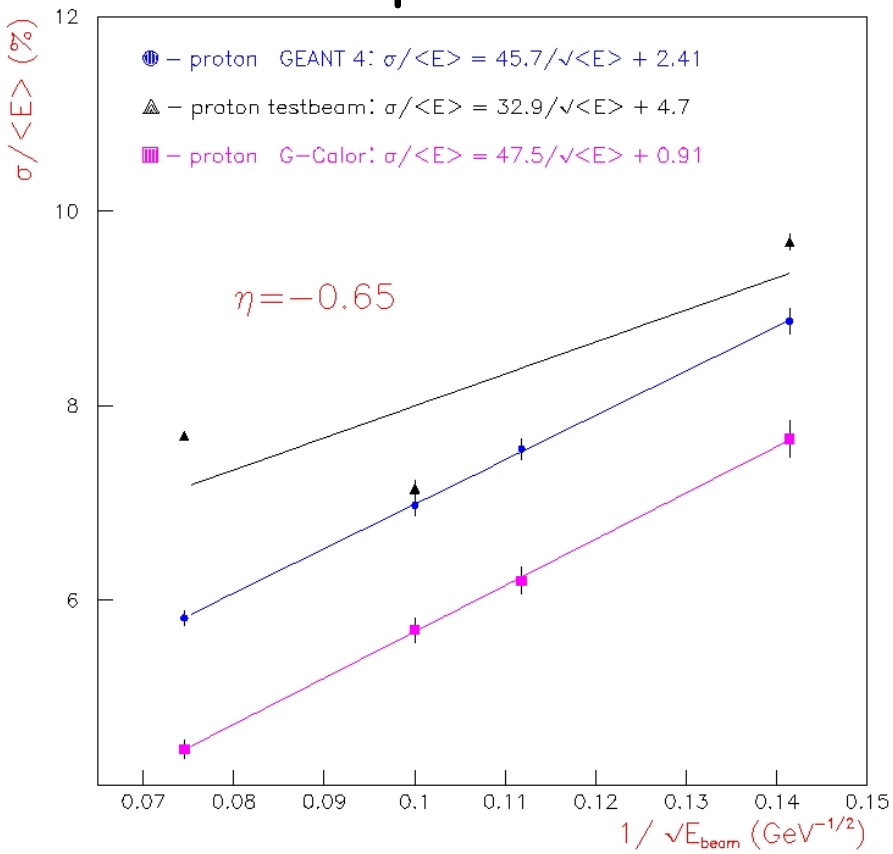


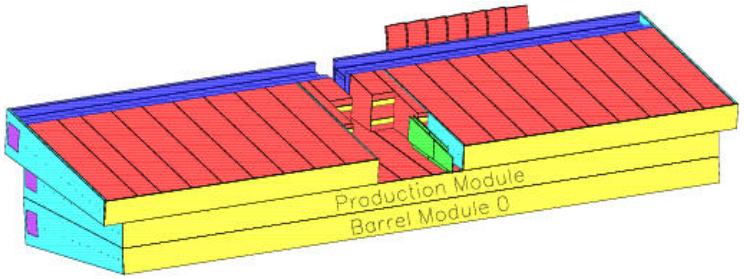
resolution

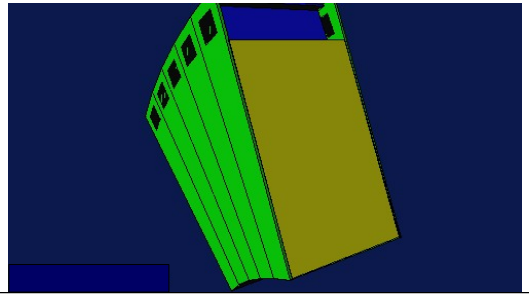
pions



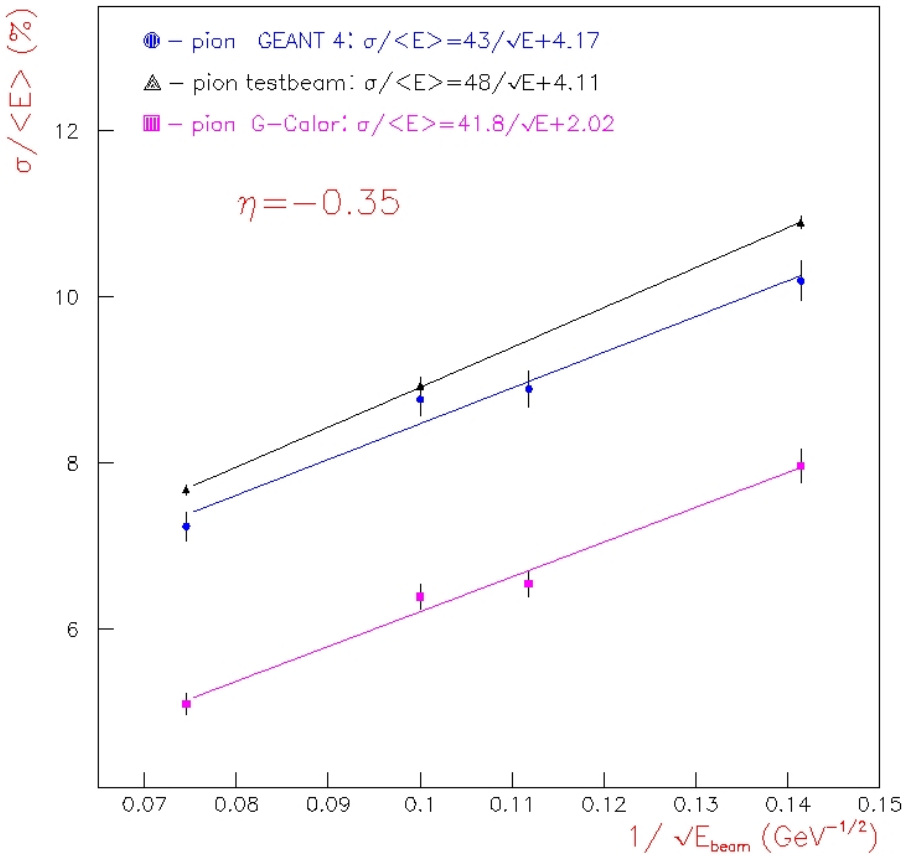
protons



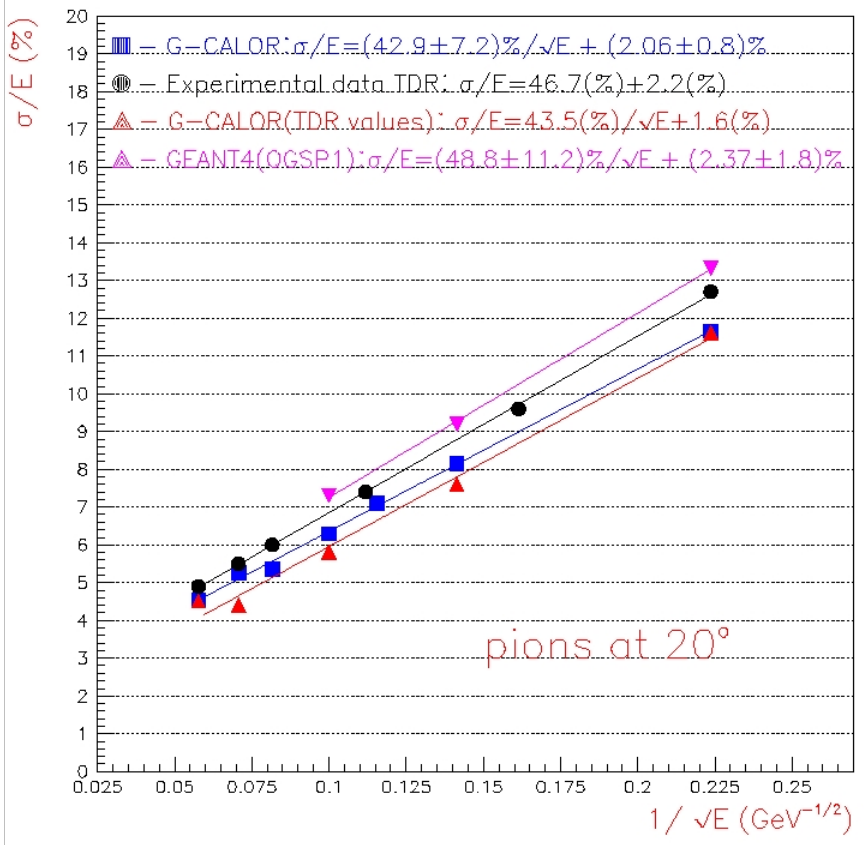




2002 setup



1995 setup



summary and conclusions

π/p ratio:

- better in geant3
- geant4 ratio is greater (1.0%-2.0%) than test-beam uncorrected data

π and p resolution:

- better in geant4, both stochastic and constant terms
- geant3 has a very low constant term