Comparison of physics lists for ATLAS Tilecal

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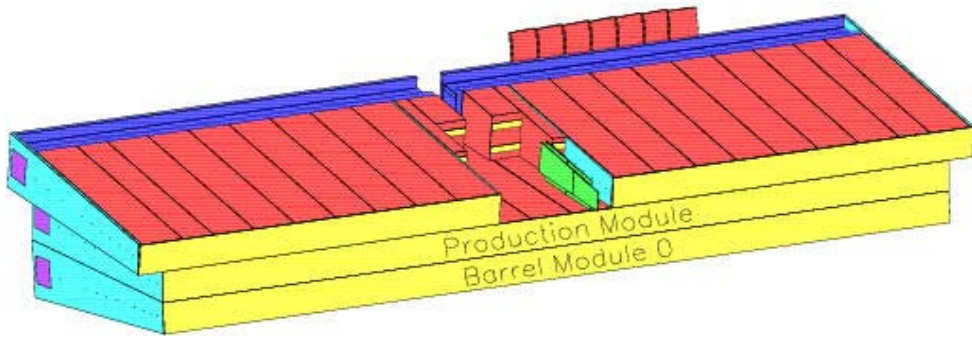
Pions and protons: TB data, Geant3 and Geant4

- Geant4.5.2 (FADS/Goofy):
  - QGSP 2.3 and QGSP 2.7: theory driven modeling
  - LHEP 3.6: LEP and HEP parameterized models
- Geant3: G-Calor
- 2002 test beam data

The moment we can convince ourselves that LHEP can describe the test-beam data, it will therefore be the preferred solution for calorimeter simulation. HPW

- 2002 test beam data (no corrections)
  - E_{beam}: 50(e), 100(π), 180(π) GeV
  - **η**: 0.25, 0.35, 0.45, 0.55, 0.65



- Geant3: G-Calor (no noise)
  - E_{beam}: 50, 80, 100, 180 GeV
  - **η**: 0.25, 0.35, 0.45, 0.55, 0.65

- Geant4.5.2: QGSP 2.3 and 2.7 and LHEP 3.6 (no noise)
  - E_{beam}: 50, 80, 100, 180 GeV
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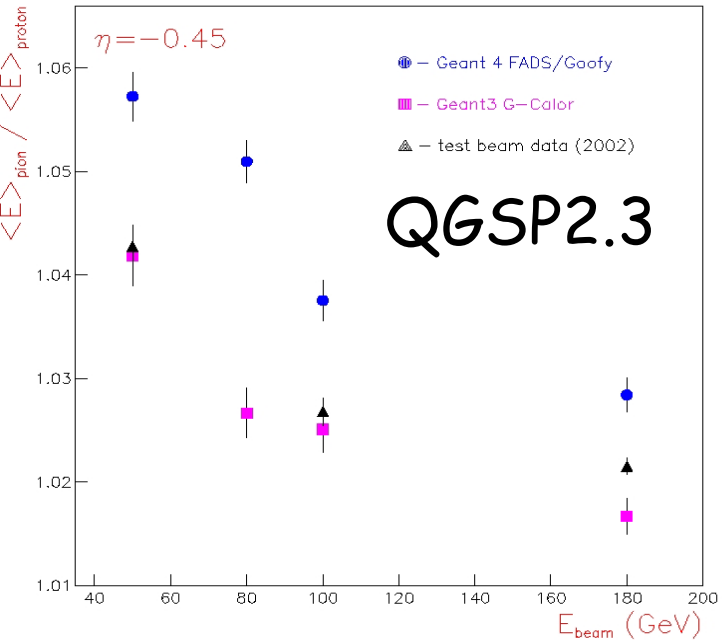
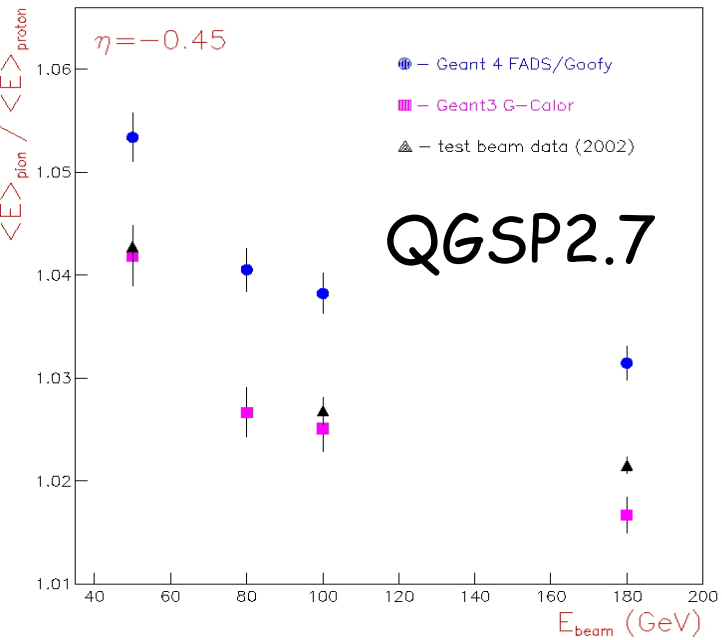
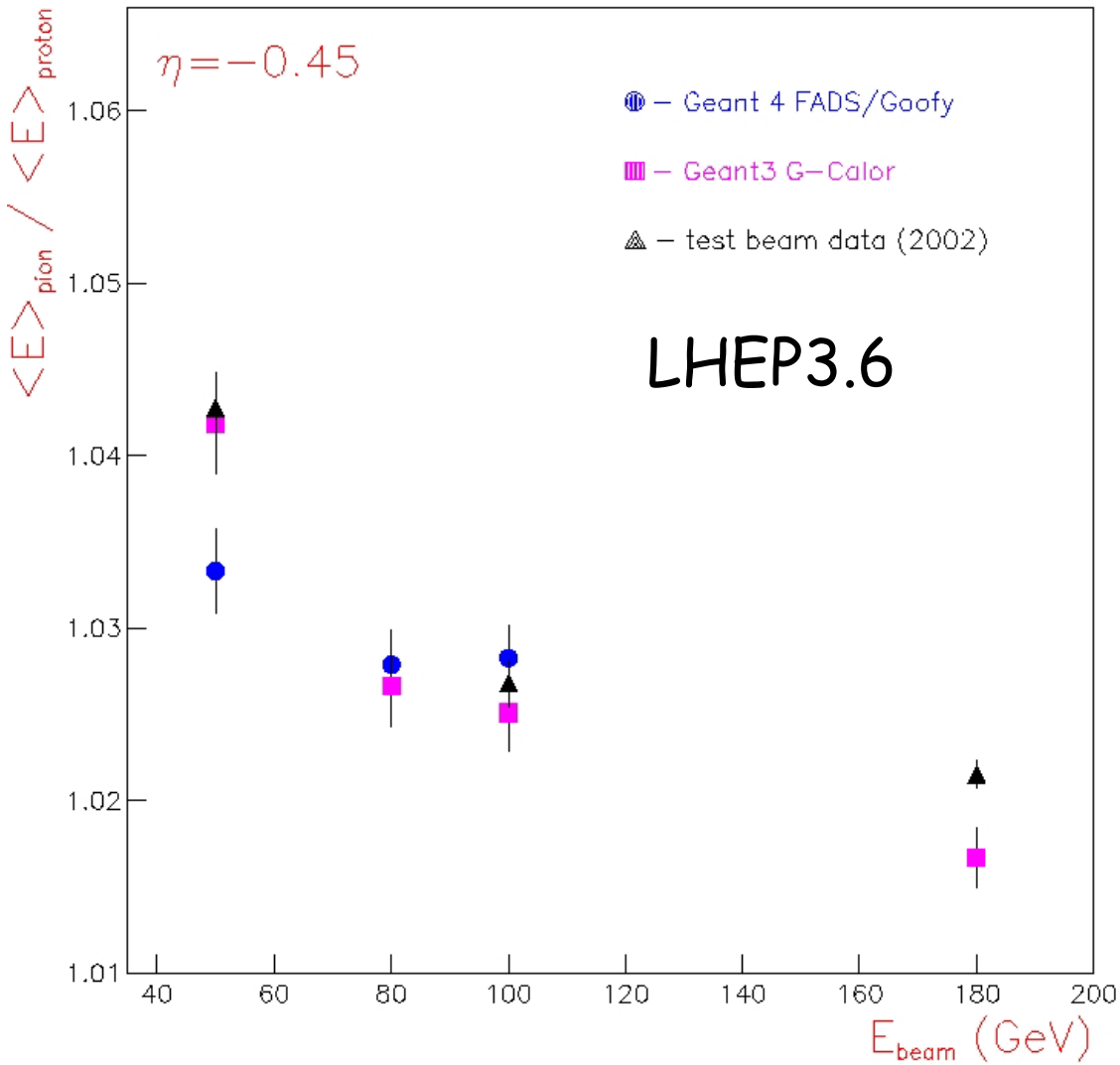
E_{beam} dependence of the π/p ratio







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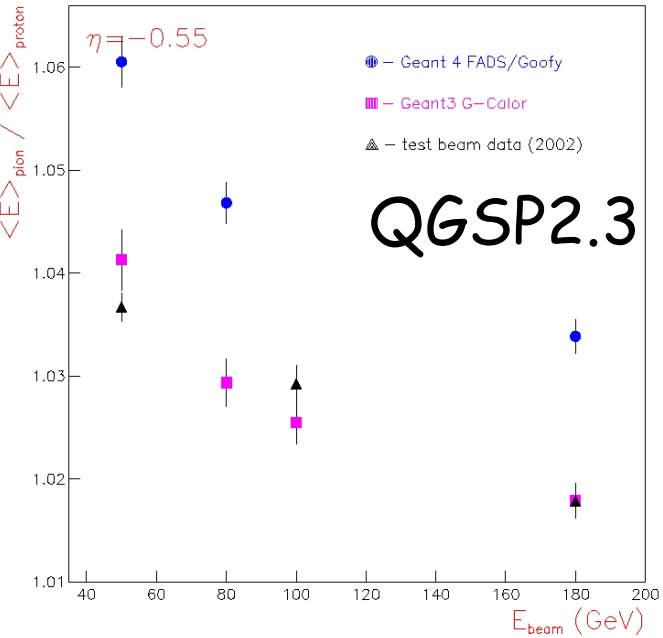
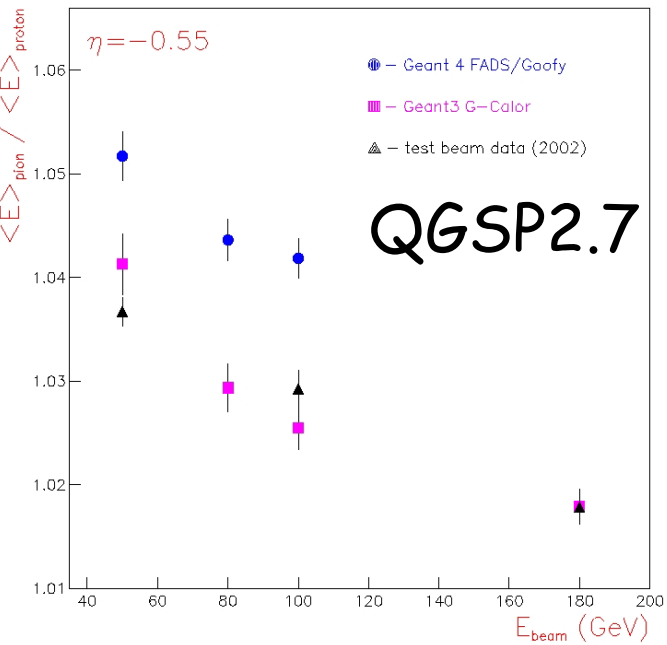
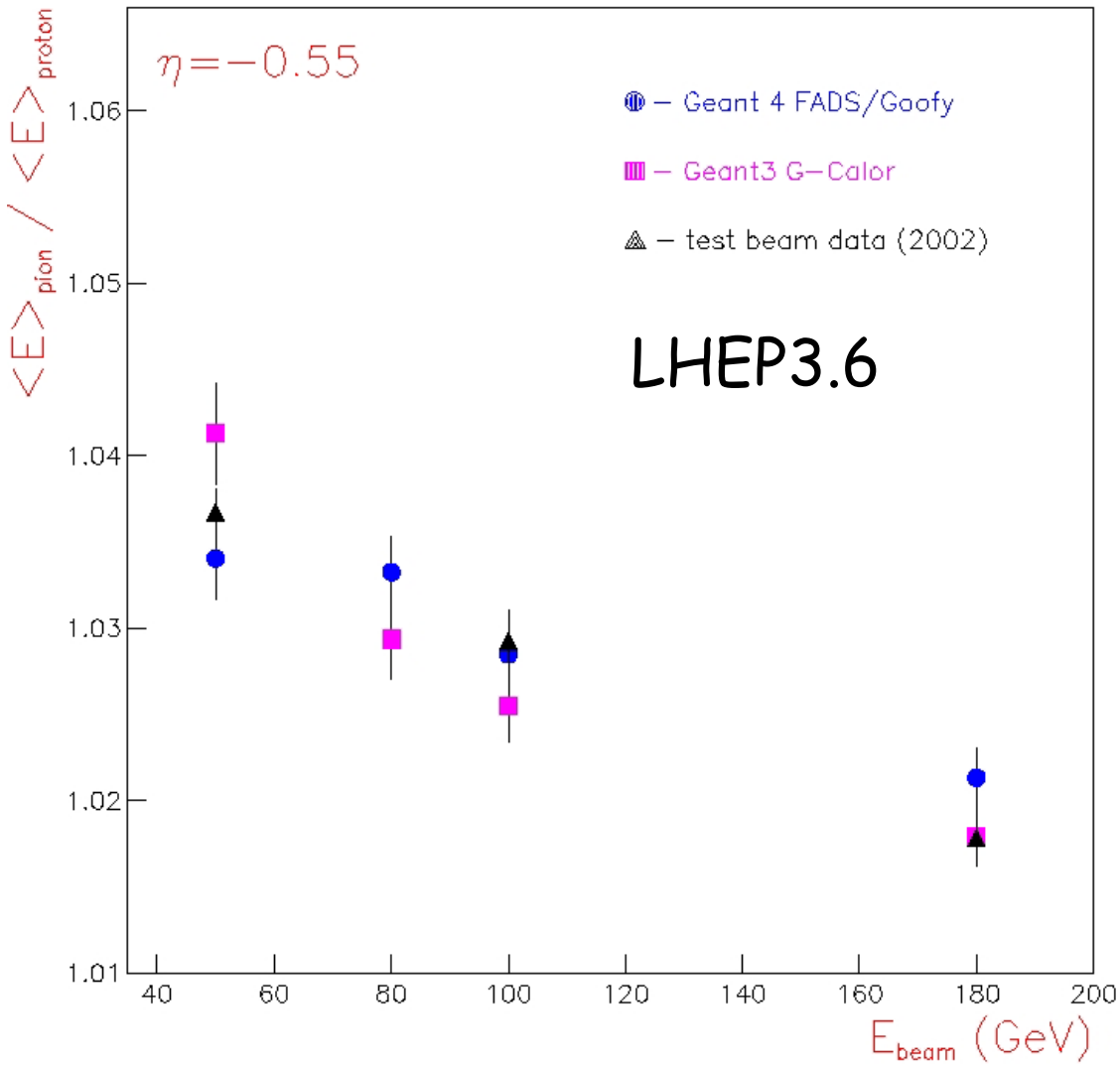
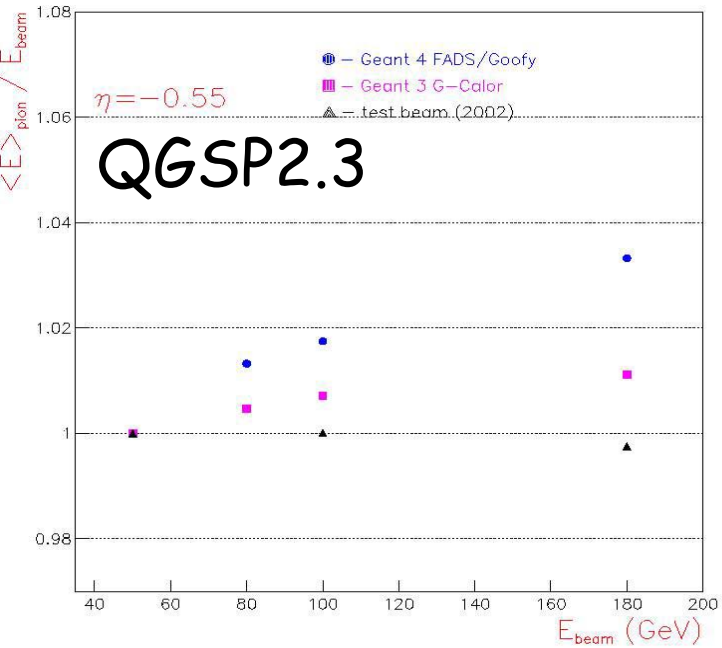


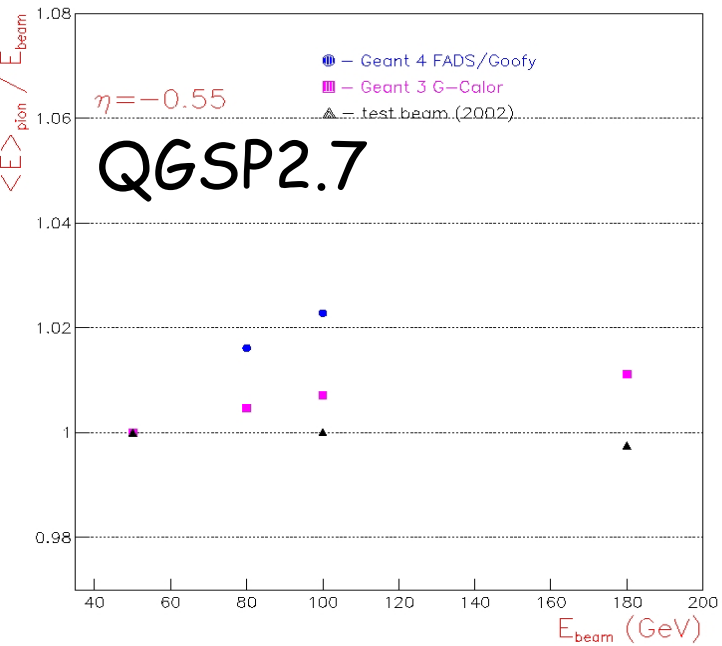


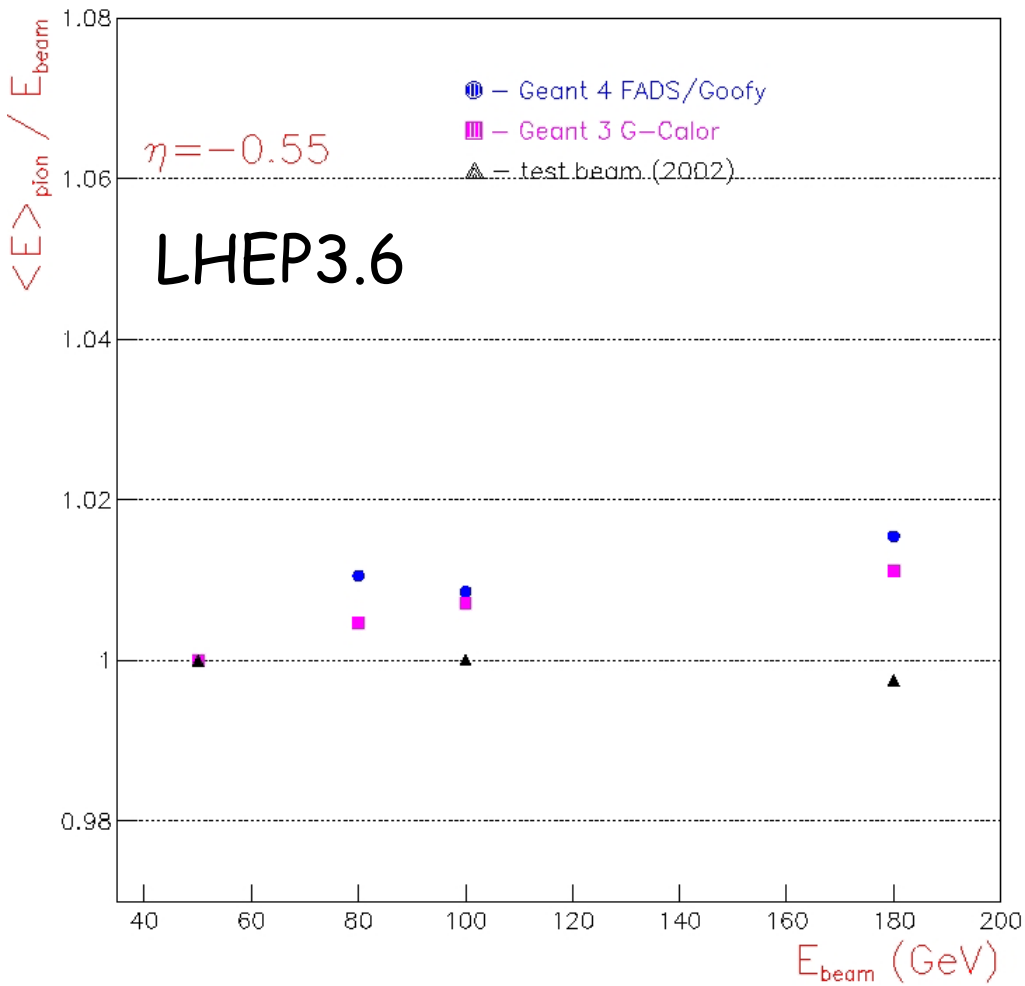


pion energy response vs E_{beam}

(normalization is at the 50 GeV point)

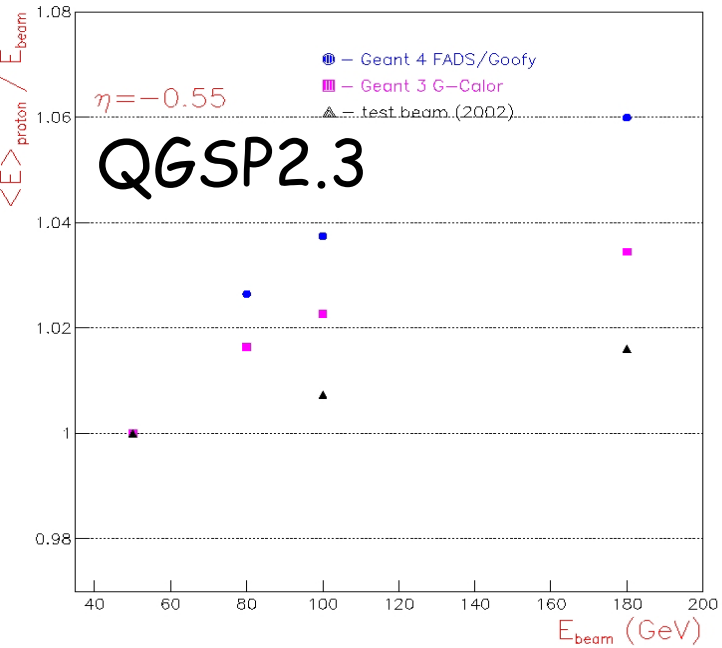


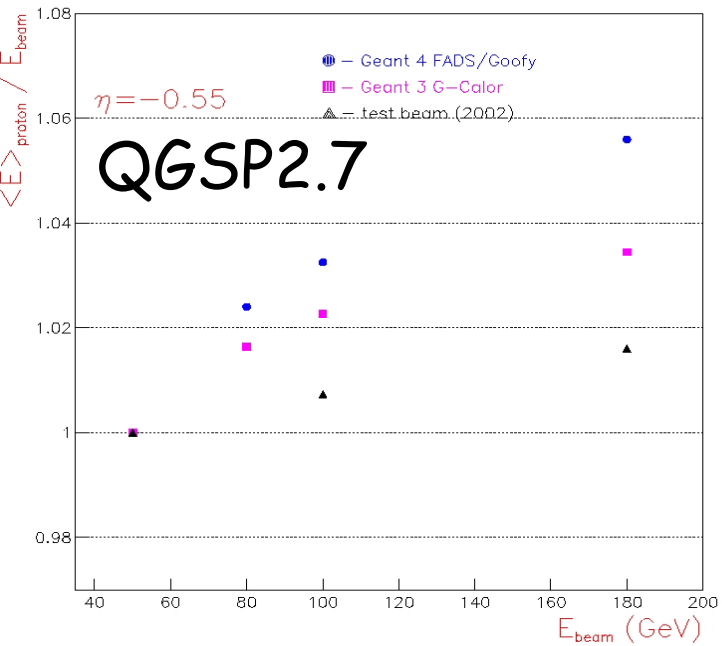


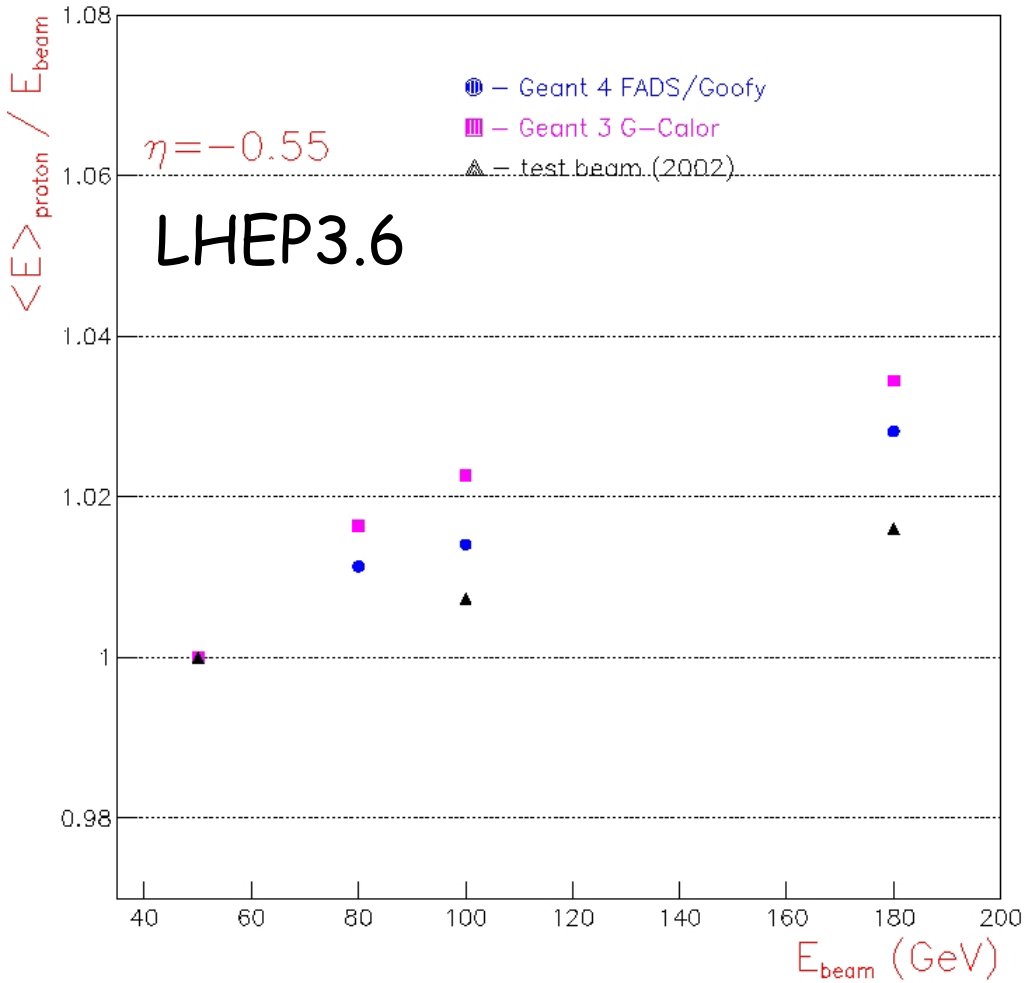


proton energy response vs E_{beam}

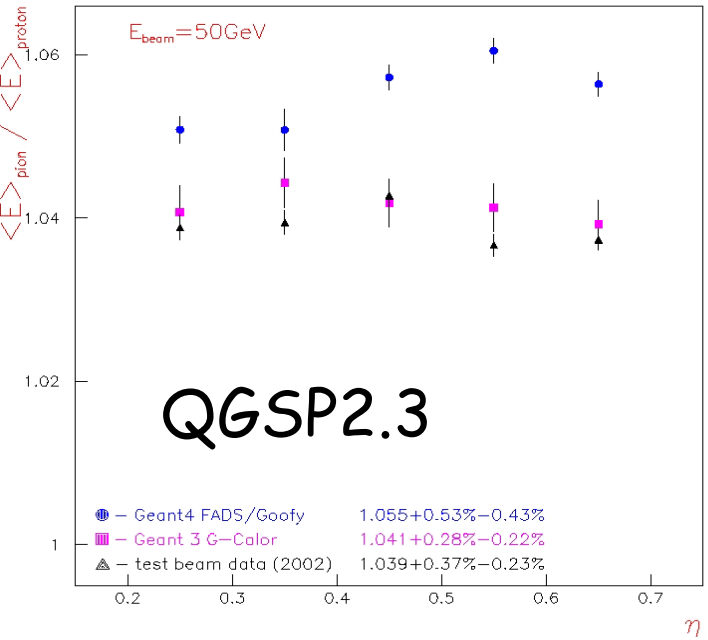
(normalization is at the 50 GeV point)

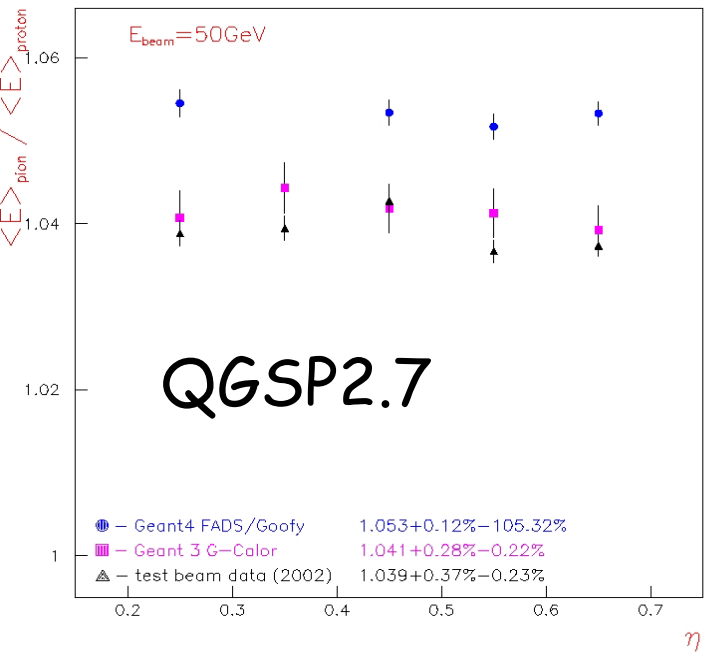


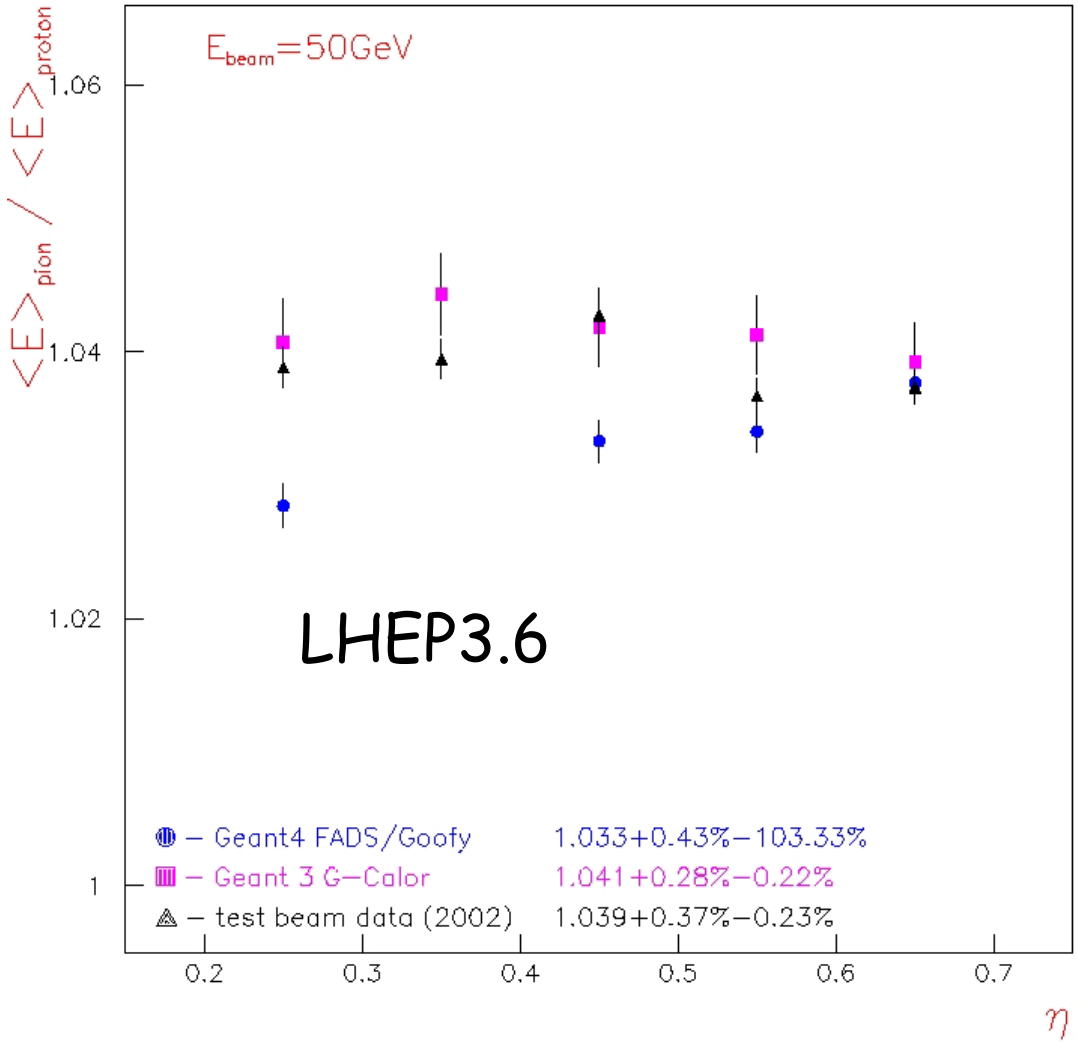




η dependence of the π/p ratio







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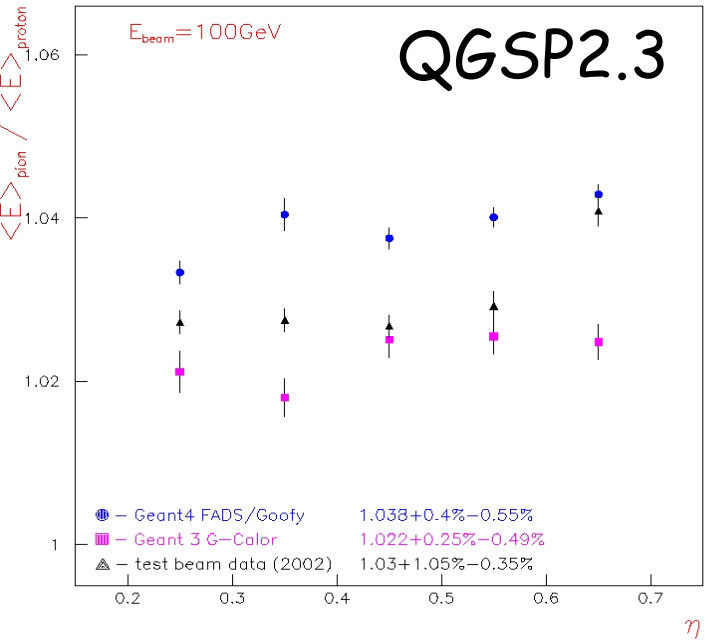
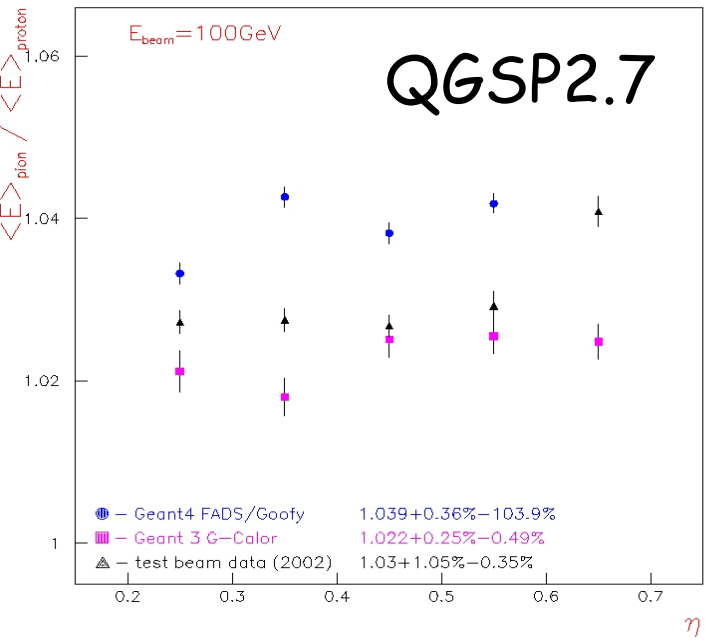
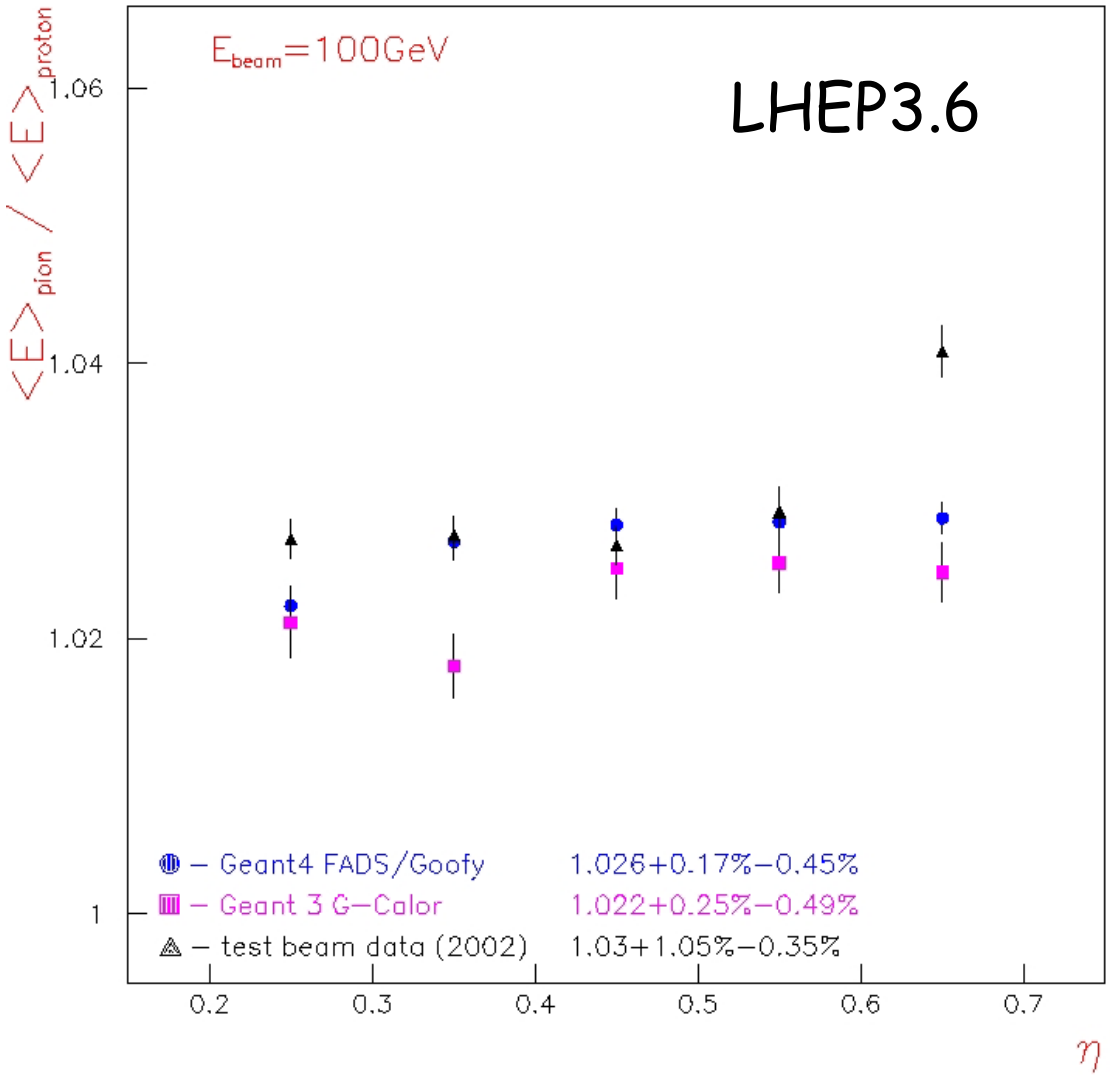
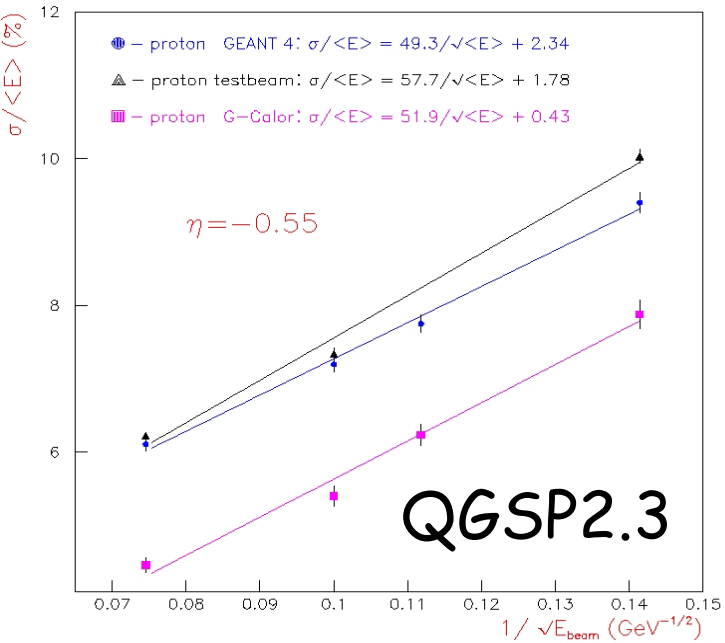
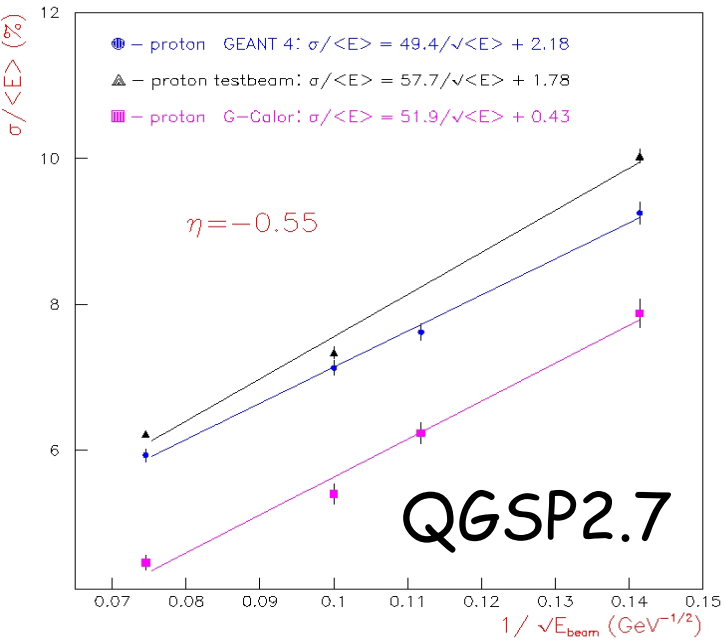


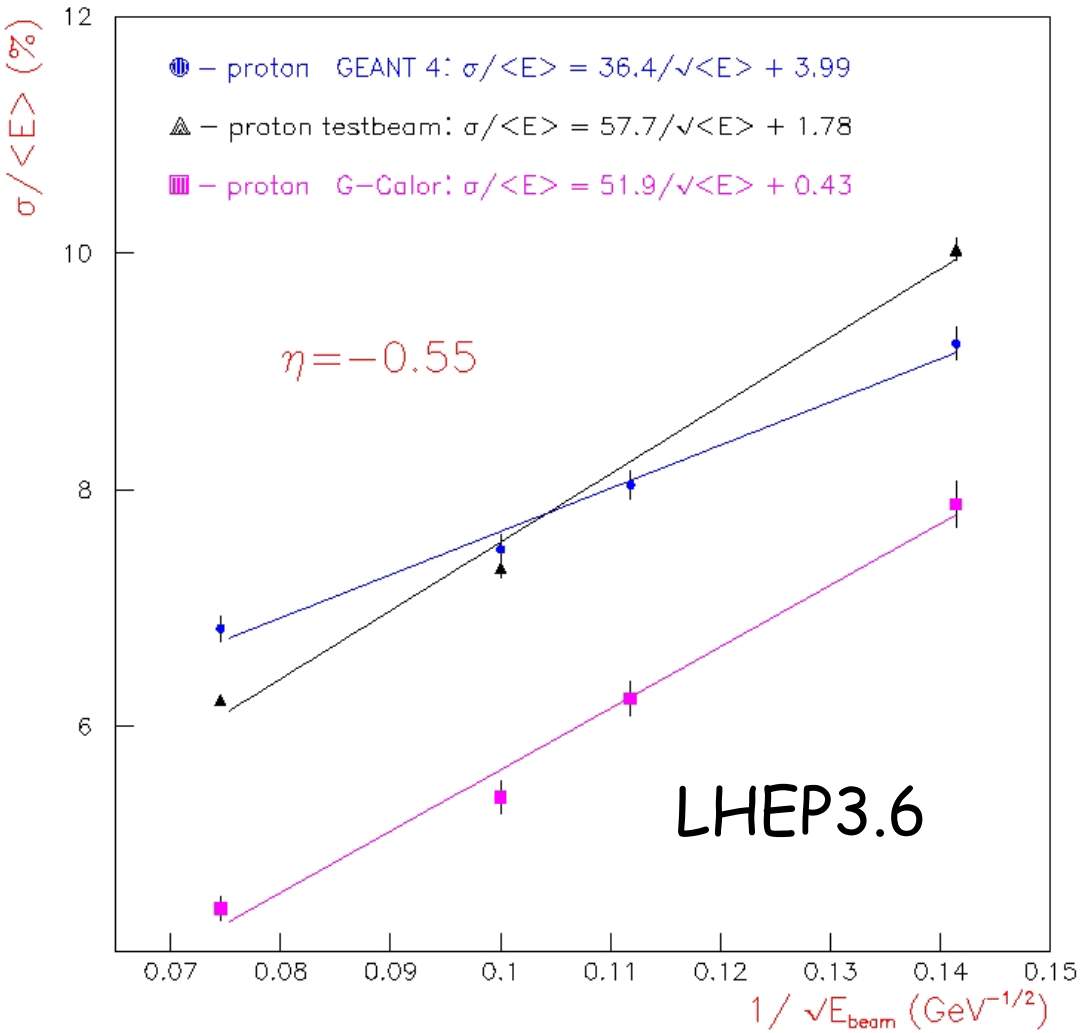




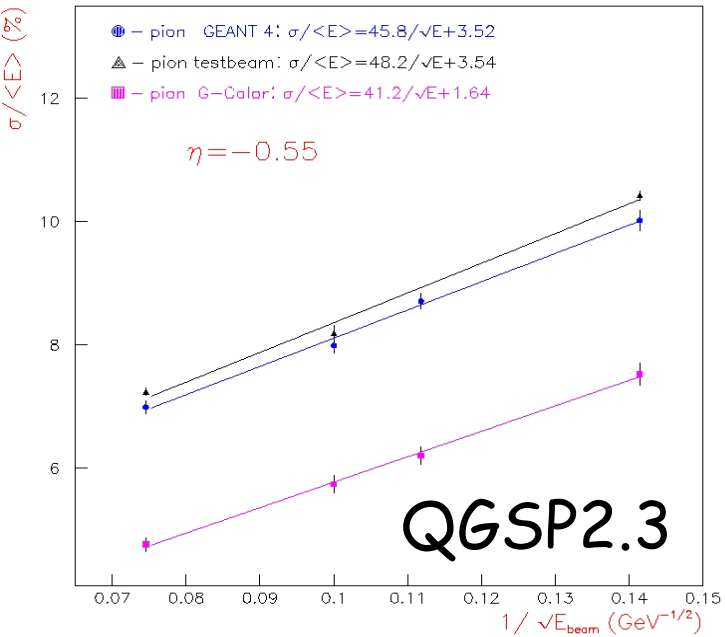
proton resolution

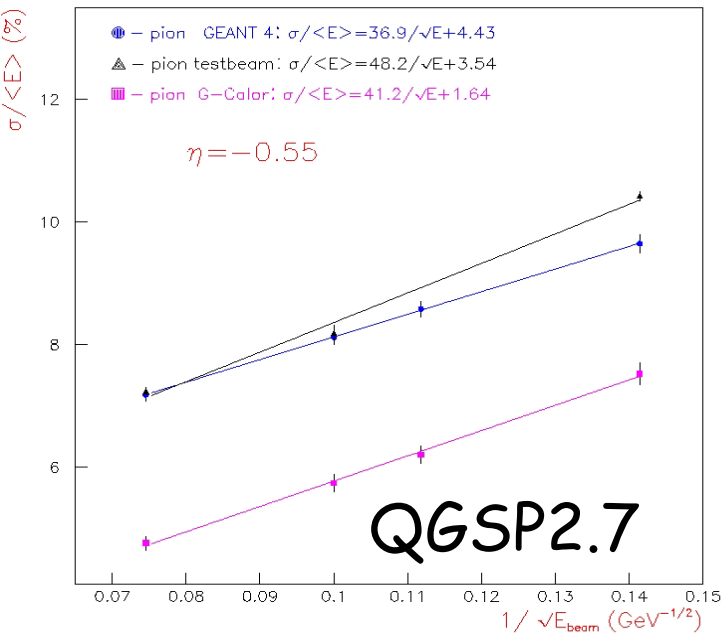


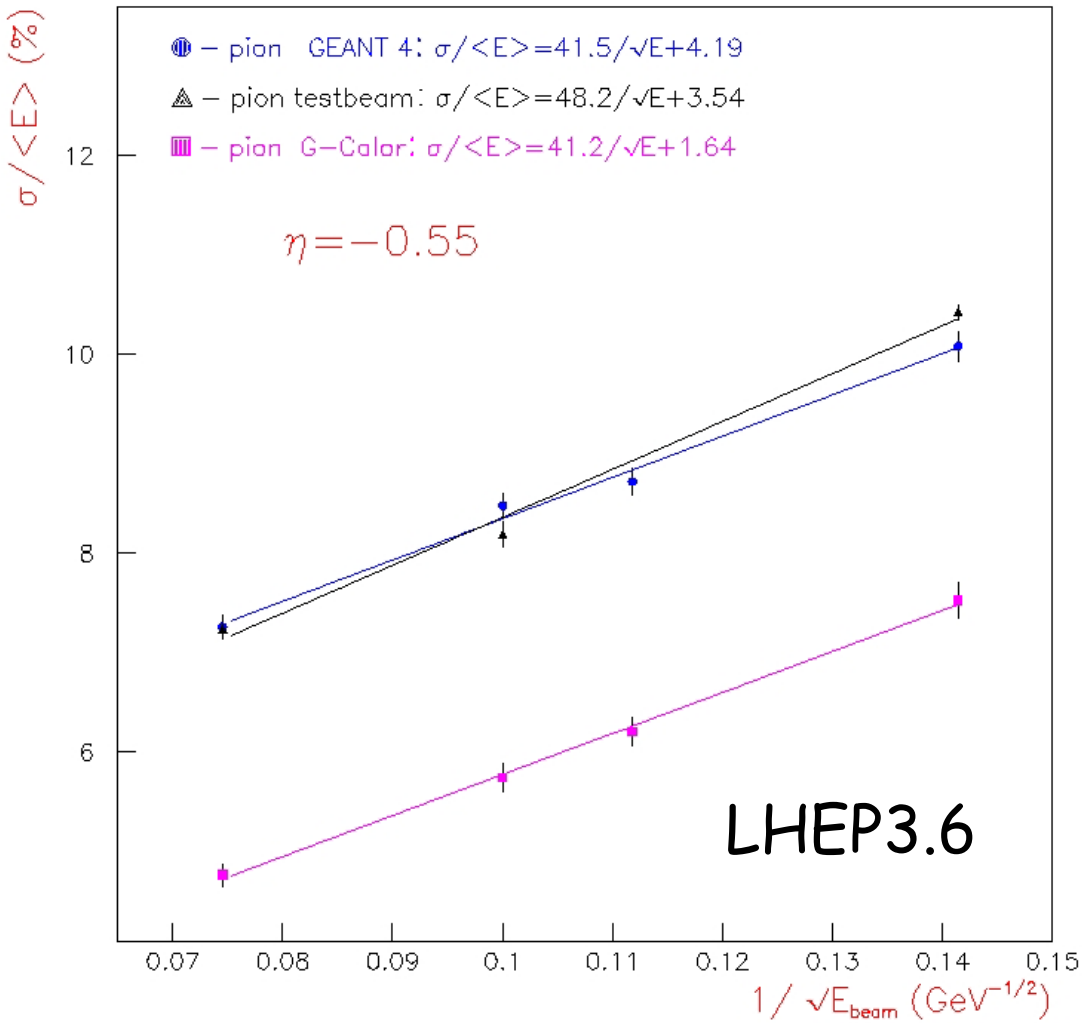




pion resolution







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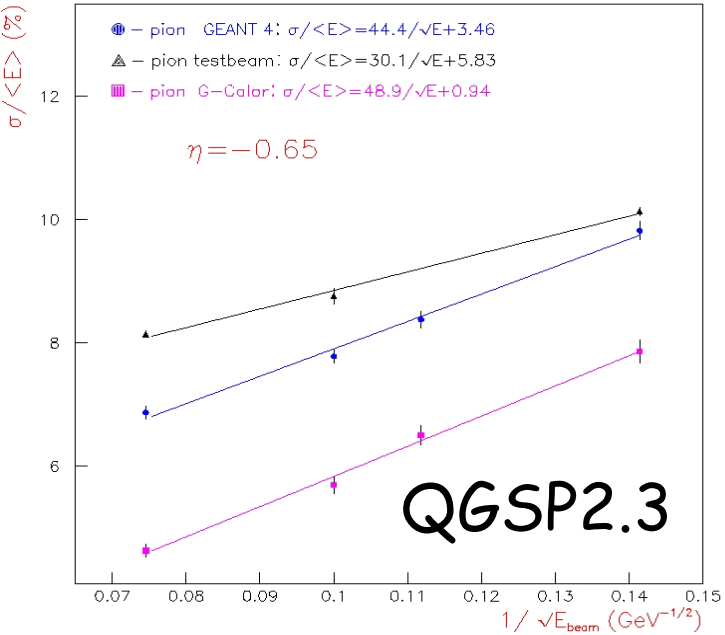

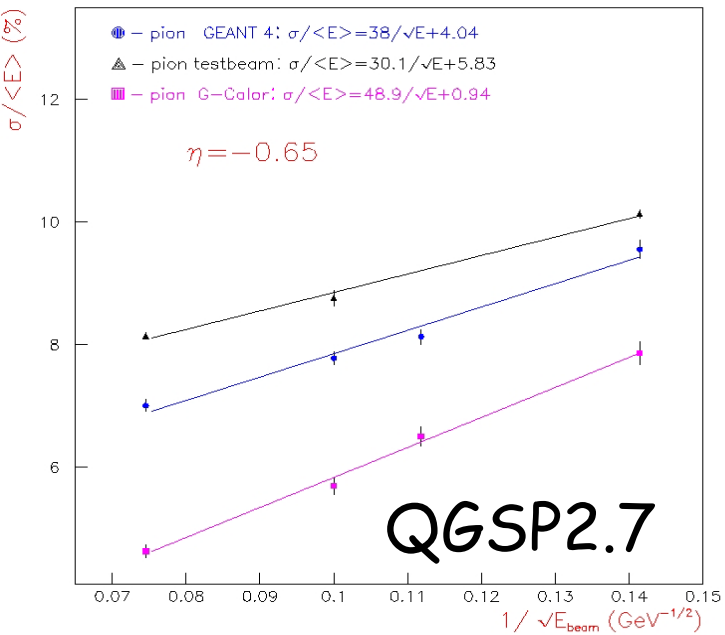

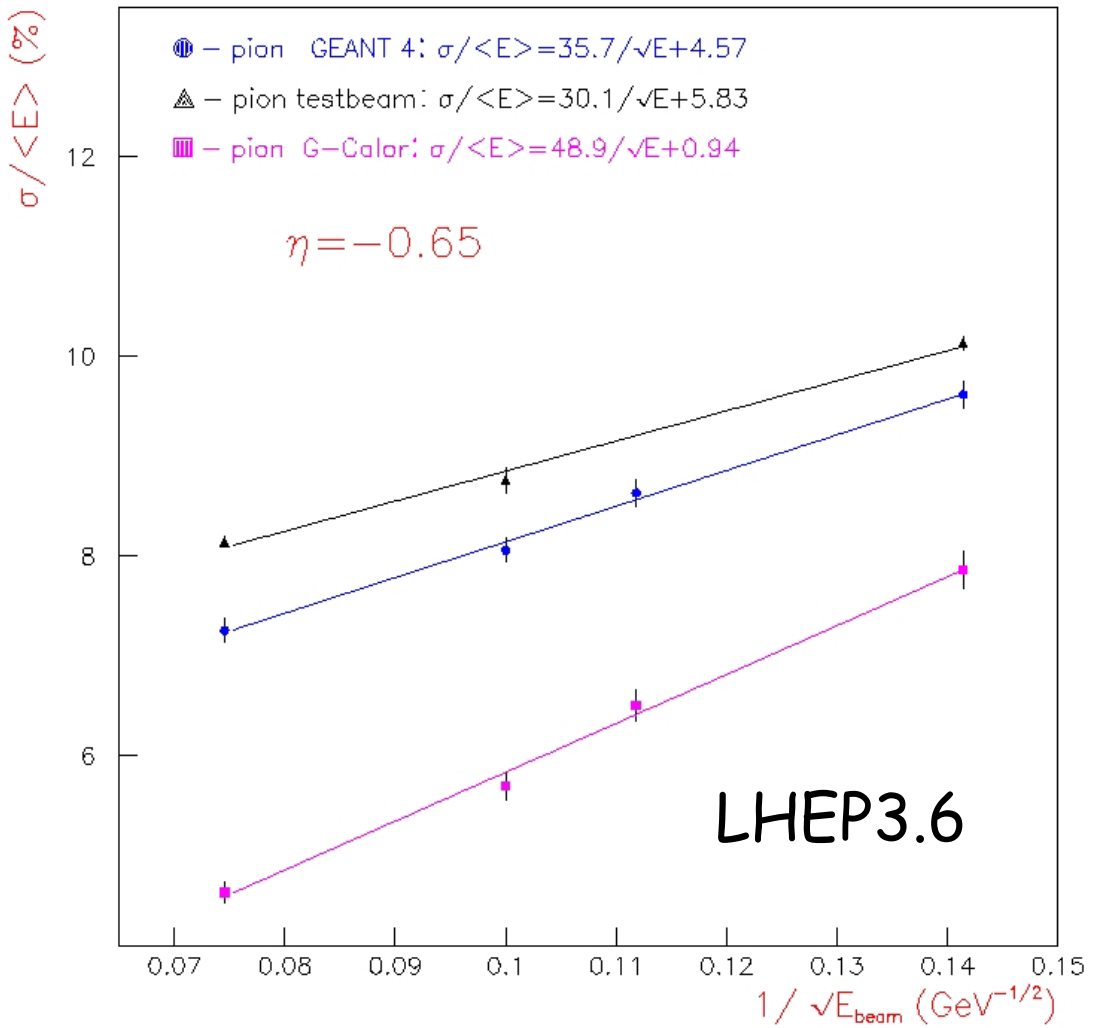

conclusions:

- no major differences between QGSP 2.3 and QGSP 2.7
- LHEP3.6 give better description of test-beam data

future plans:

- 2003 test beam data: 1, 2, 3, 5 and 9 GeV beams
- improve the analysis:
  - take only cells in the beam direction
  - noise simulation
- ATHENA & DC2