Validation of G4 hadronic physics lists with ATLAS Tilecal

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Pions and protons: TB data, Geant3 and Geant4

- Geant4.5.2 (FADS/Goofy):
  - QGSP 2.7: theory driven modeling
  - LHEP 3.6: LEP and HEP parameterized models
- Geant3: G-Calor
- 2002 and 2003 test beam data

- 2002 test beam data:

(π is normalized to e response for each energy and rapidity)

  - E_{beam}: 50(e), 100(π), 180(π) GeV
  - **η**: 0.25, 0.35, 0.45, 0.55, 0.65

- 2003 test beam data:

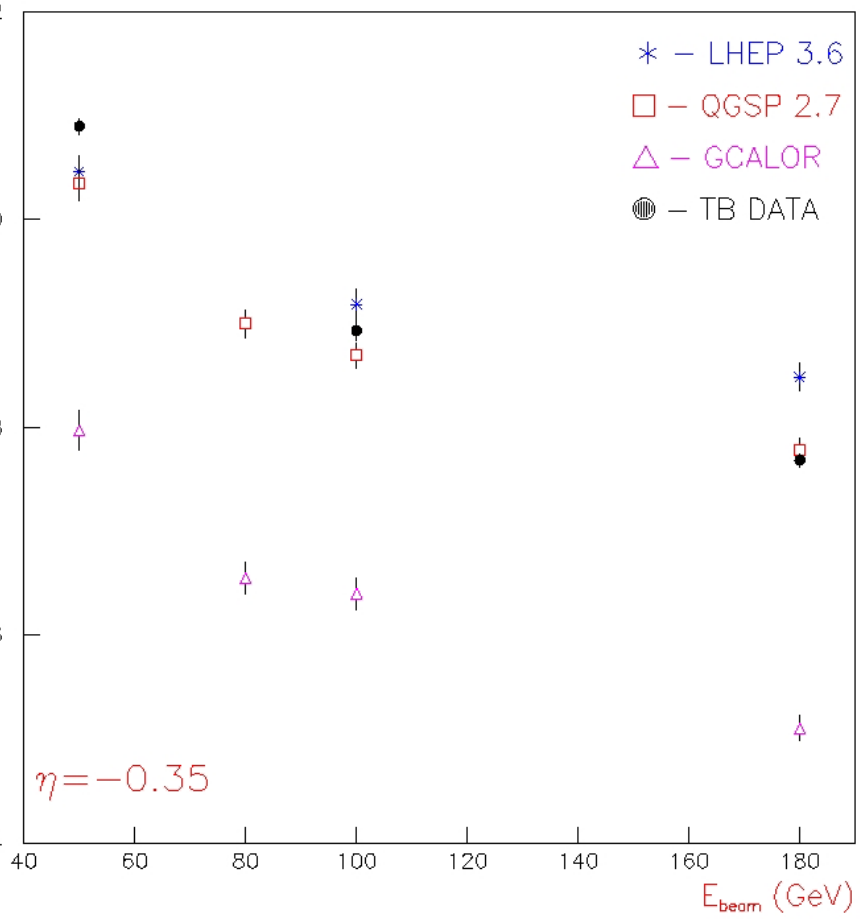
(π is normalized to e response for each energy and rapidity)

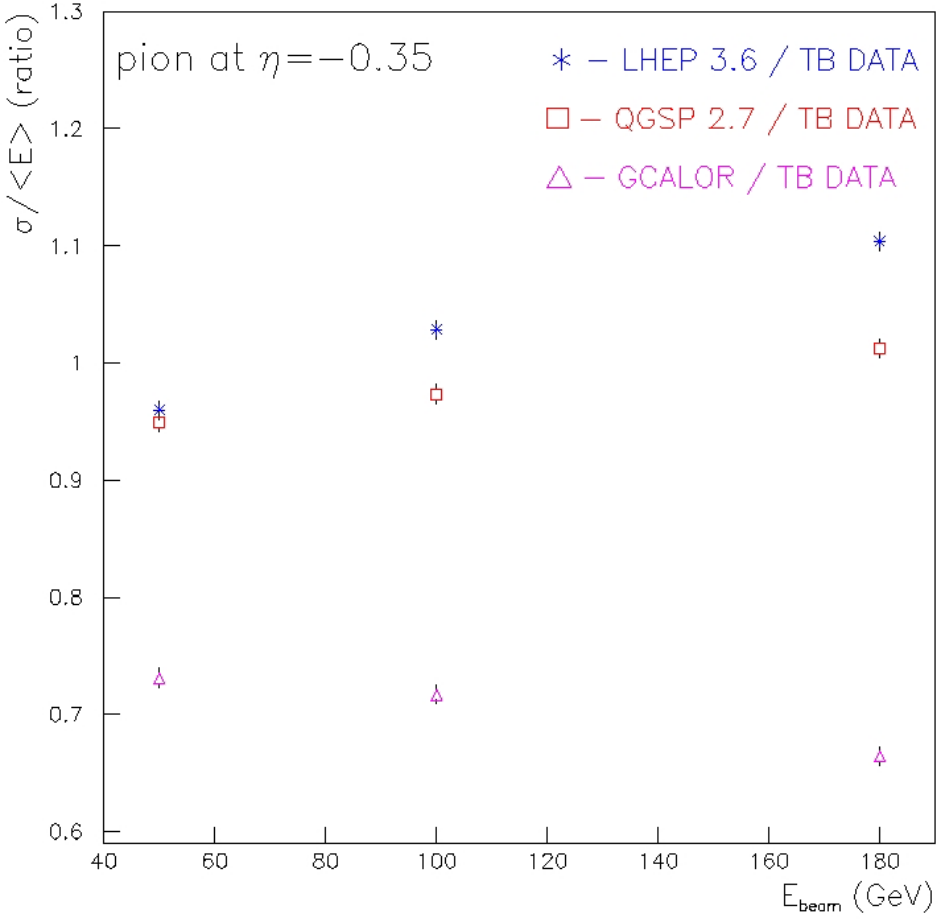
  - E_{beam}: 1, 2, 3, 5 and 9 GeV (π)
  - **η**: 0.25, 0.35, 0.45, 0.55, 0.65

- Geant4.5.2: QGSP 2.7 and LHEP 3.6

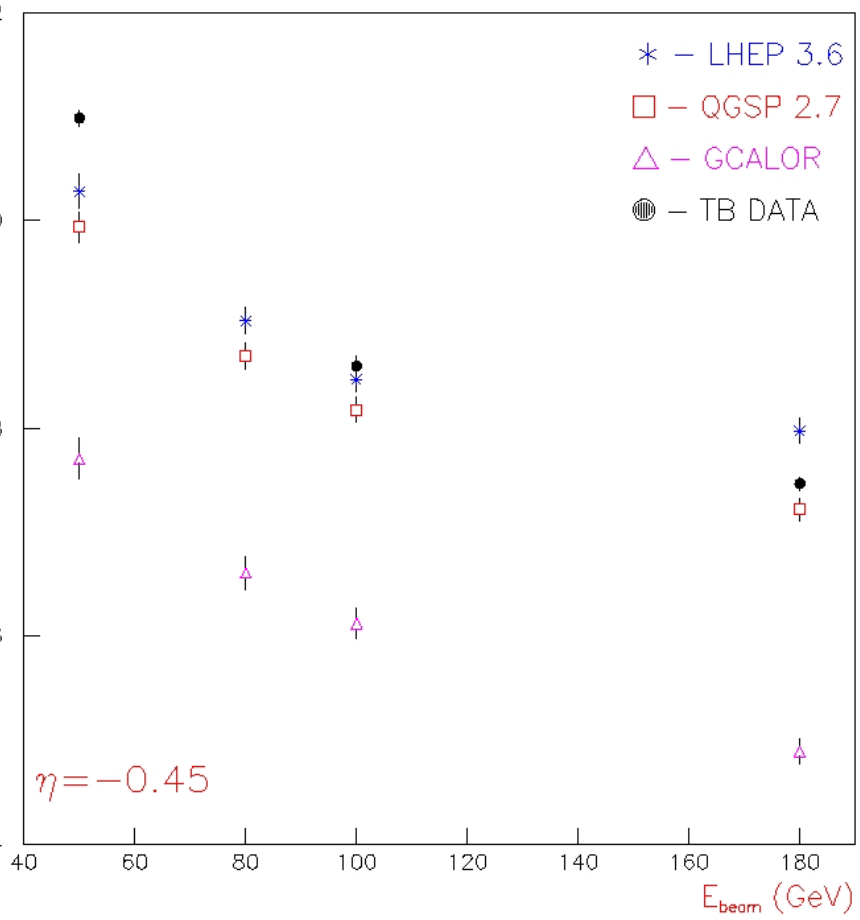
  - E_{beam}: 50, 80, 100, 180 GeV
  - **η**: 0.25, 0.35, 0.45, 0.55, 0.65

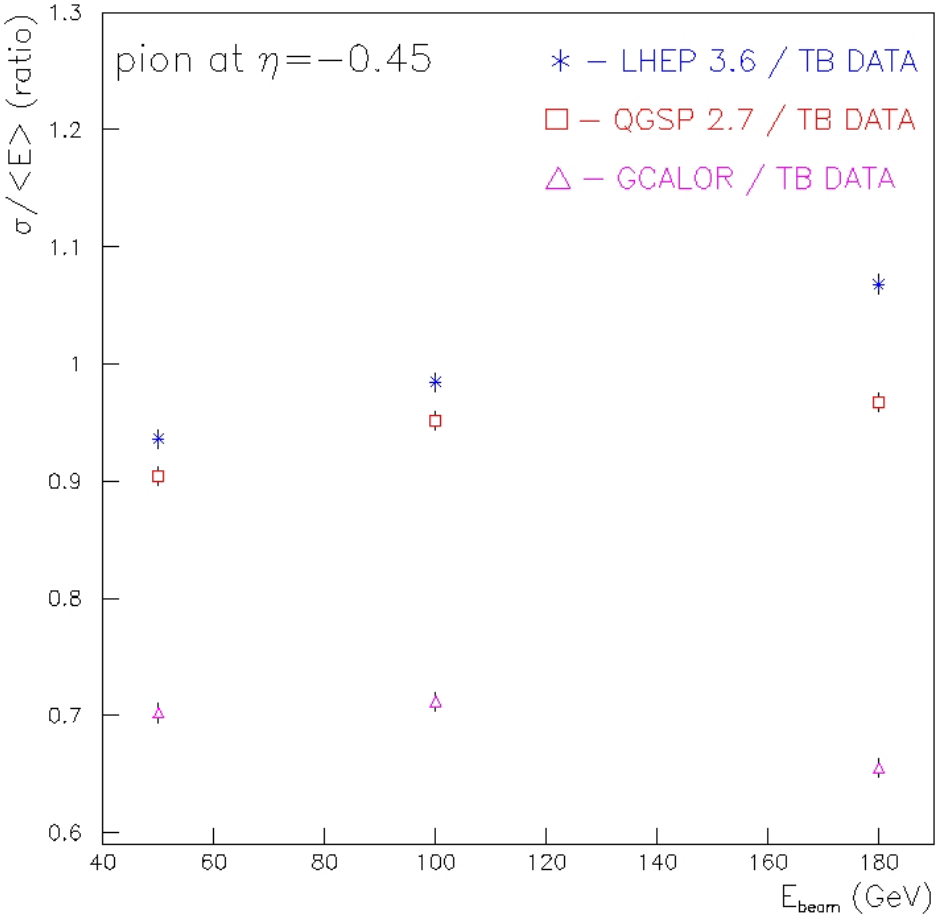
pion resolution



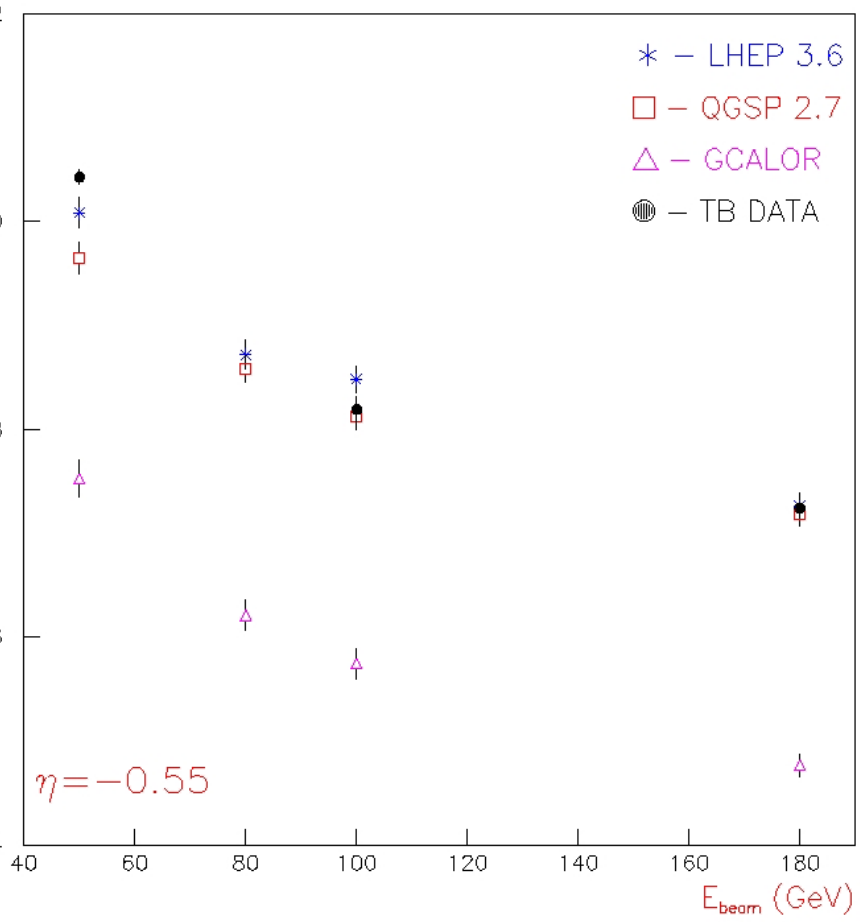


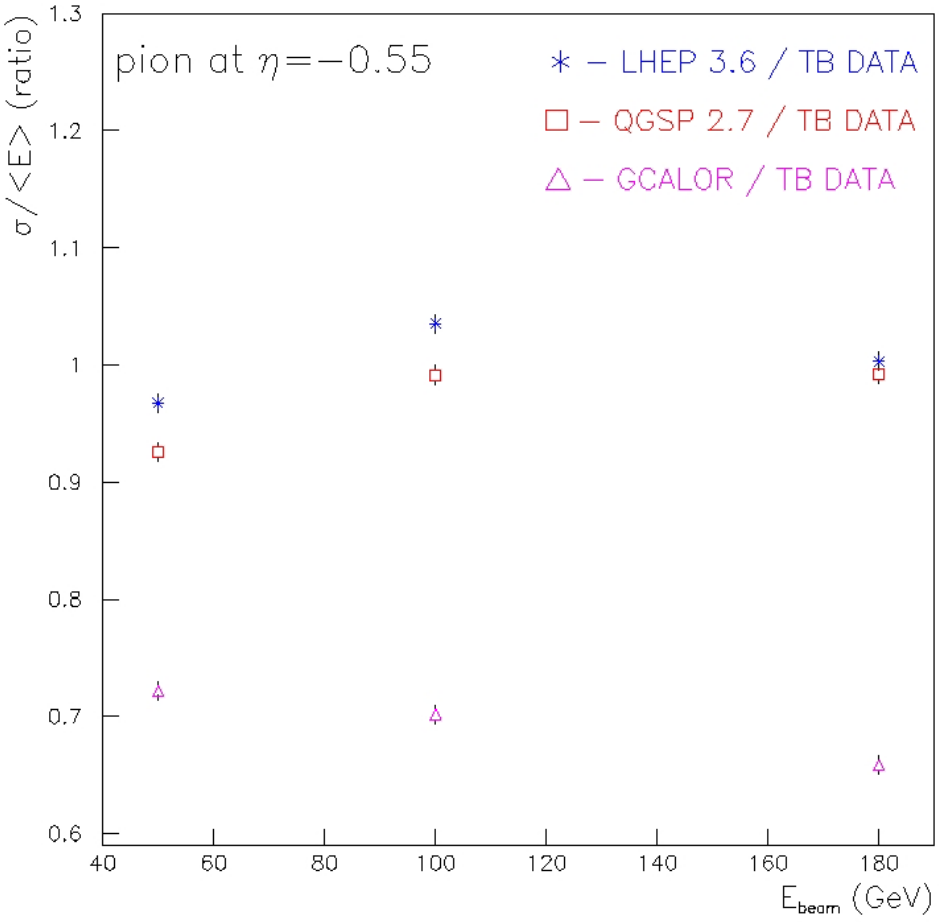
pion resolution



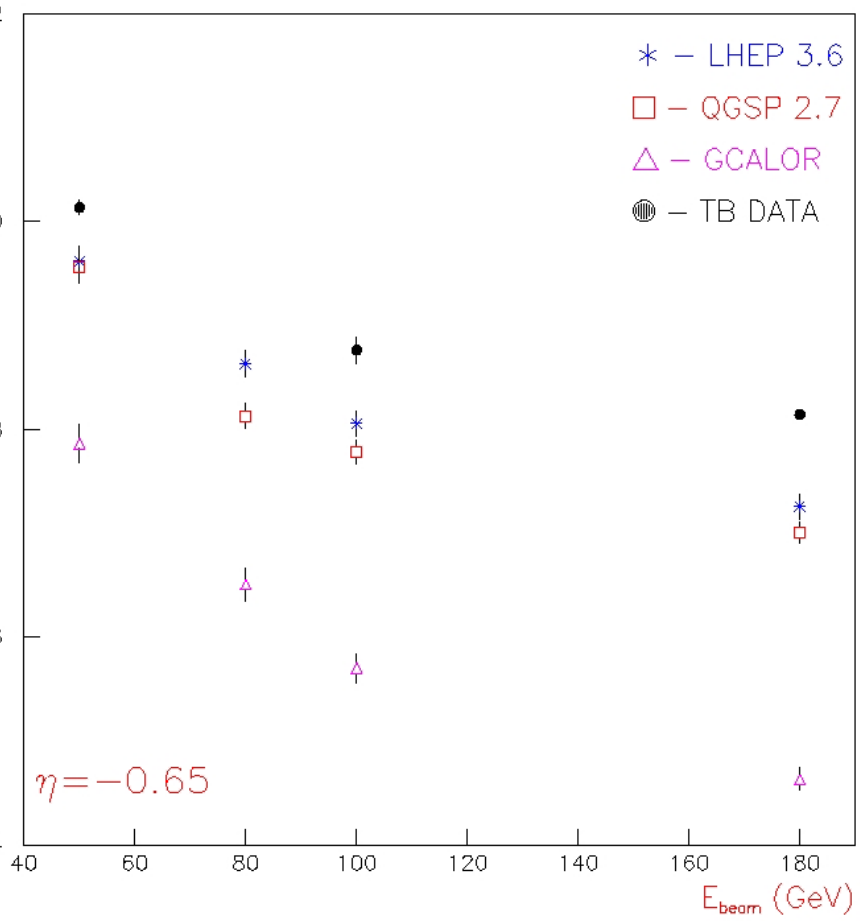


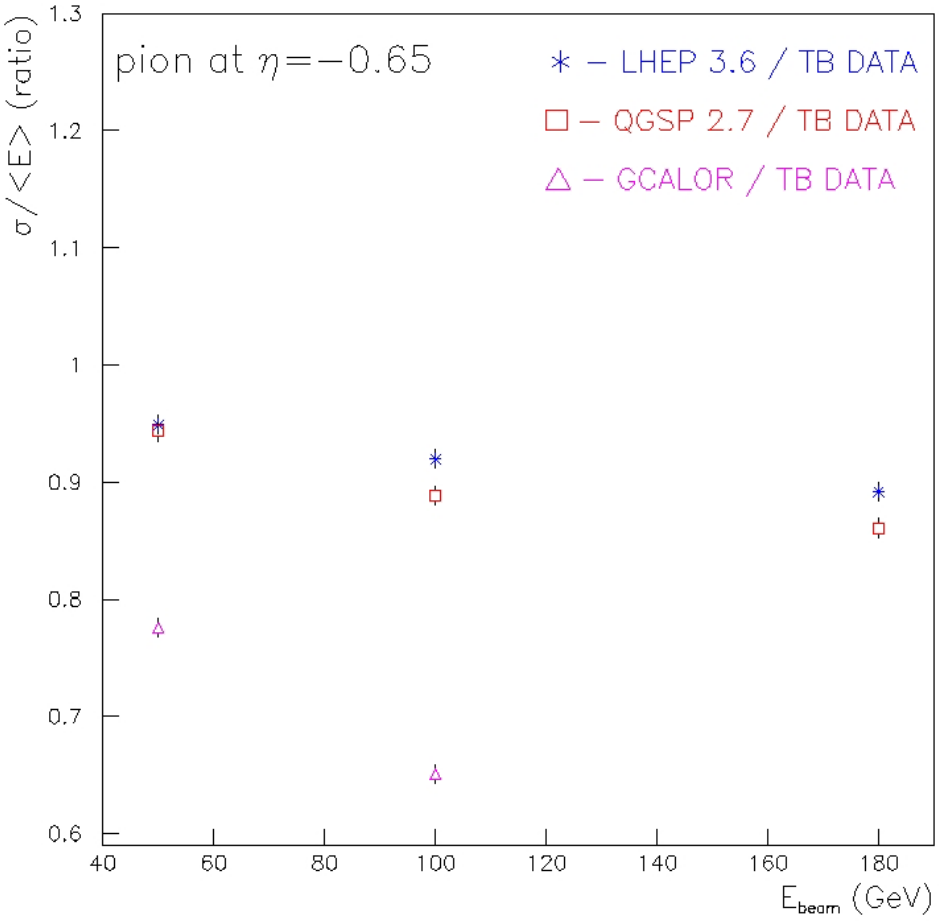
pion resolution



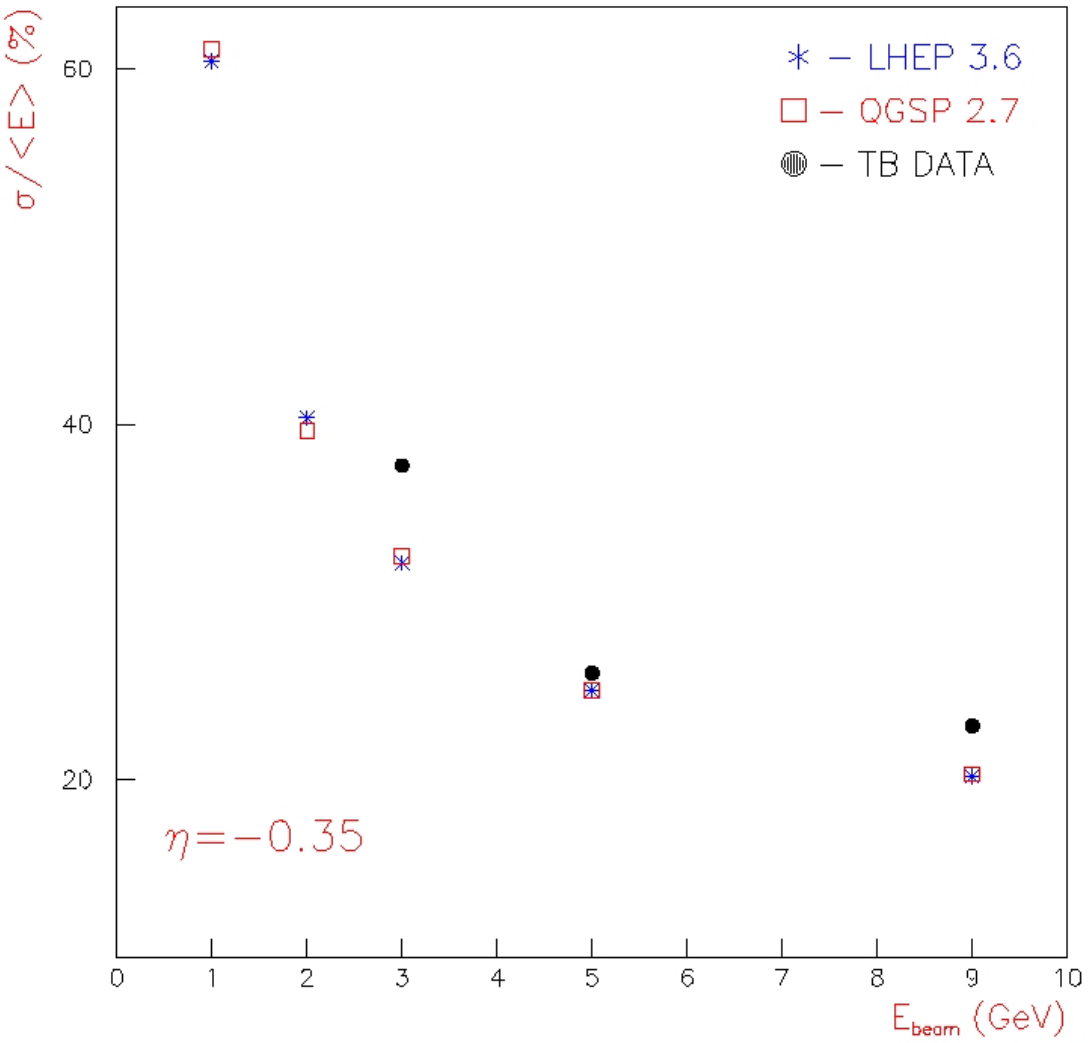


pion resolution

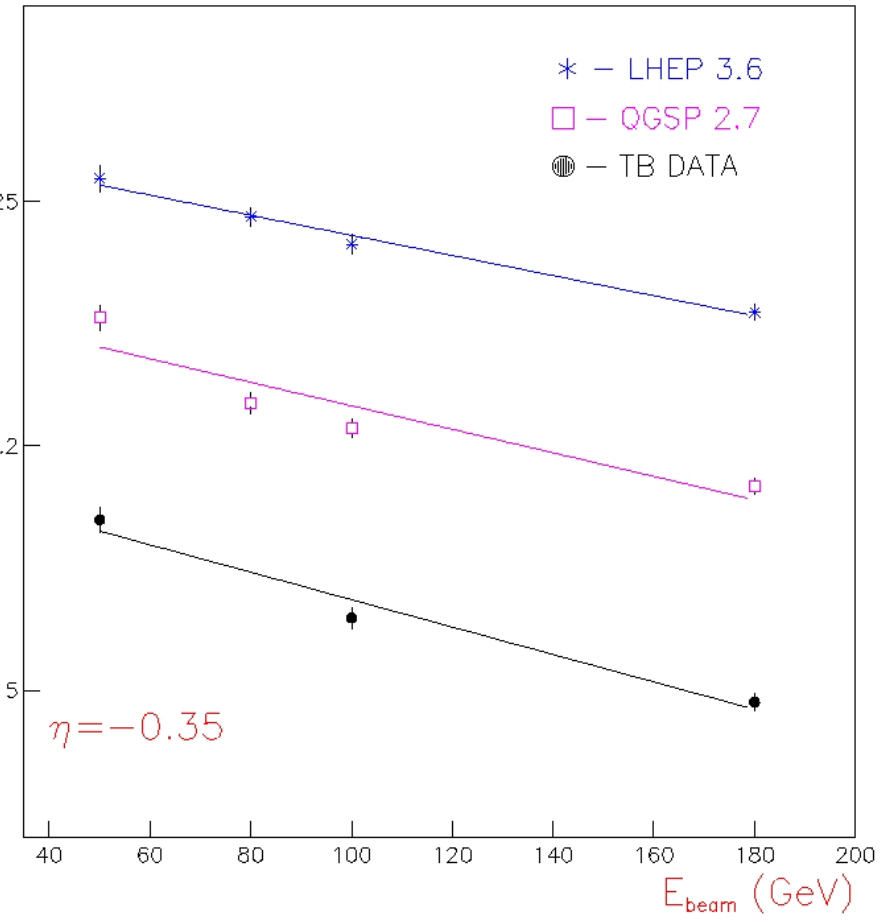


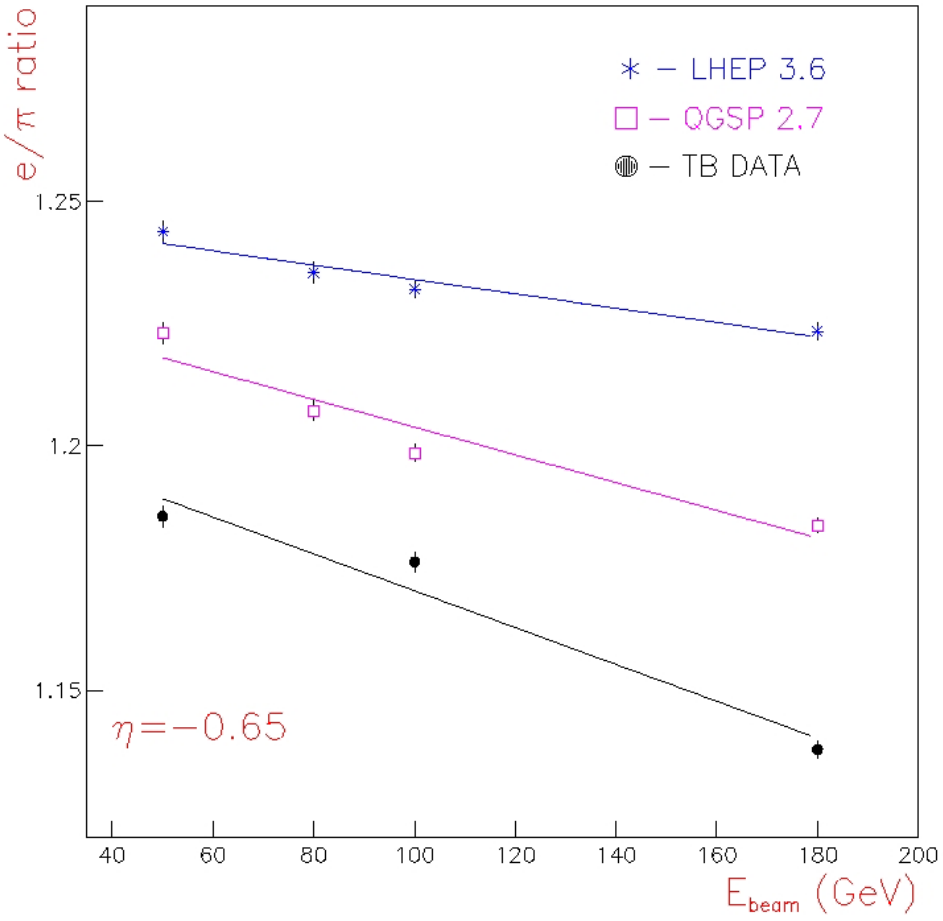


pion resolution

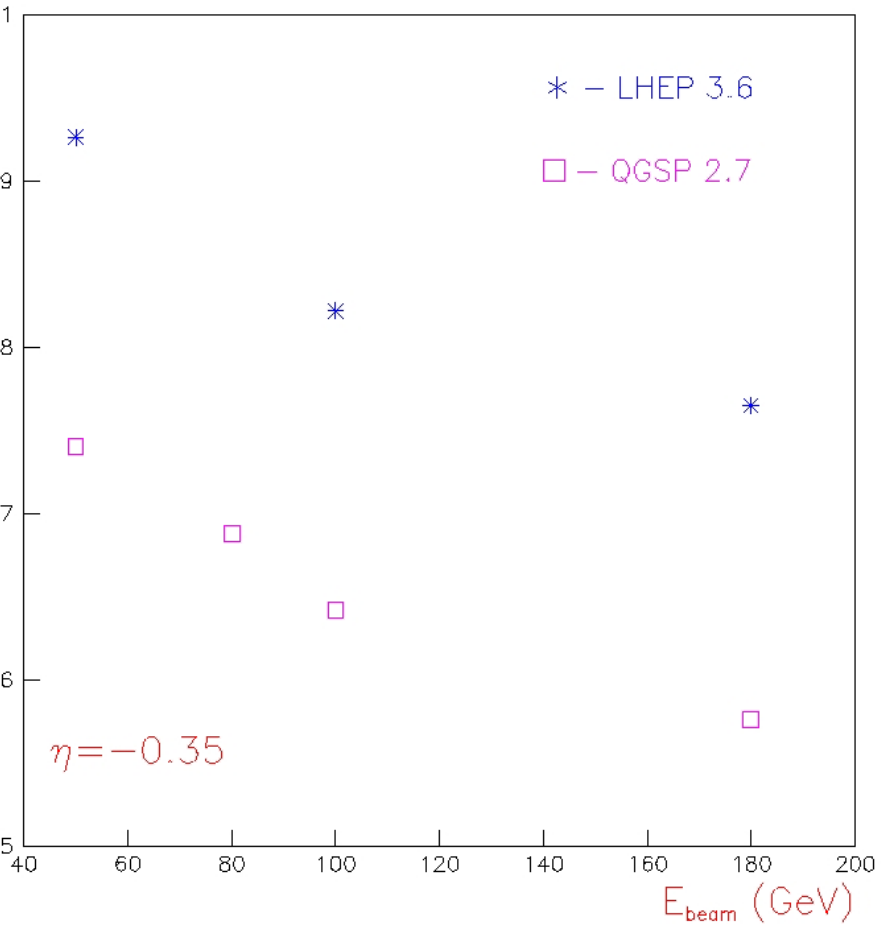


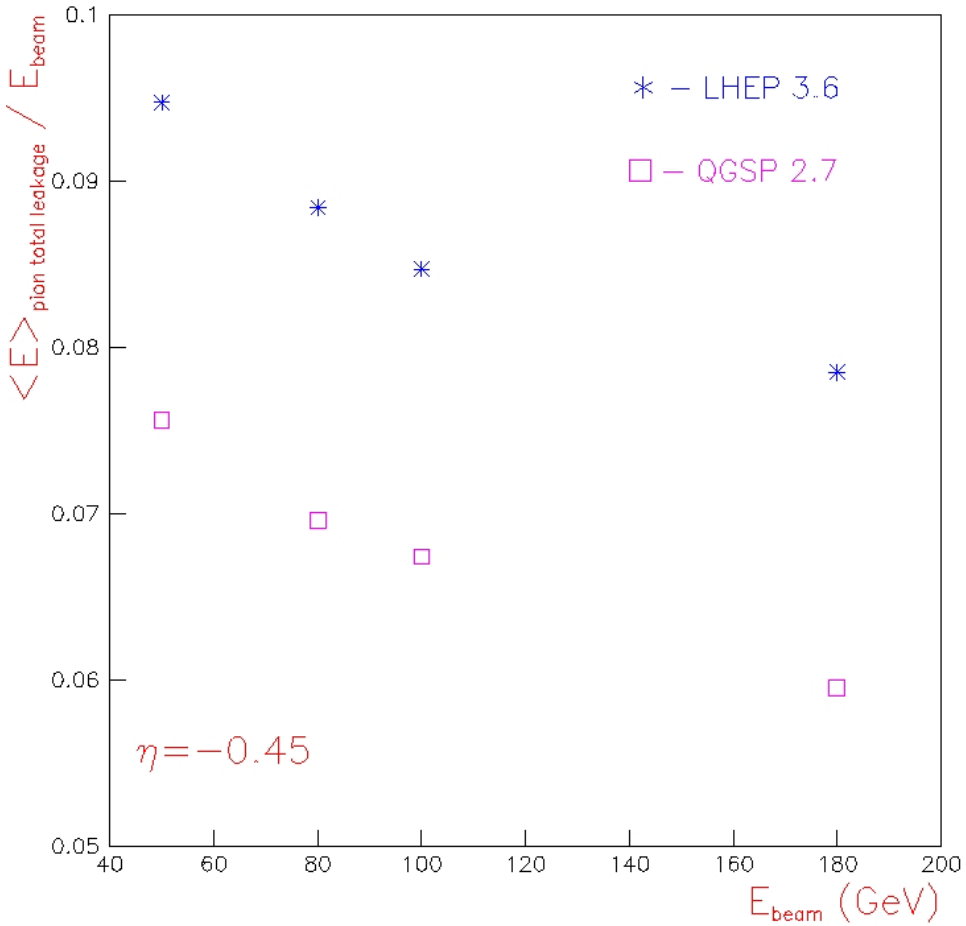
E_{beam} dependence of the e/π ratio



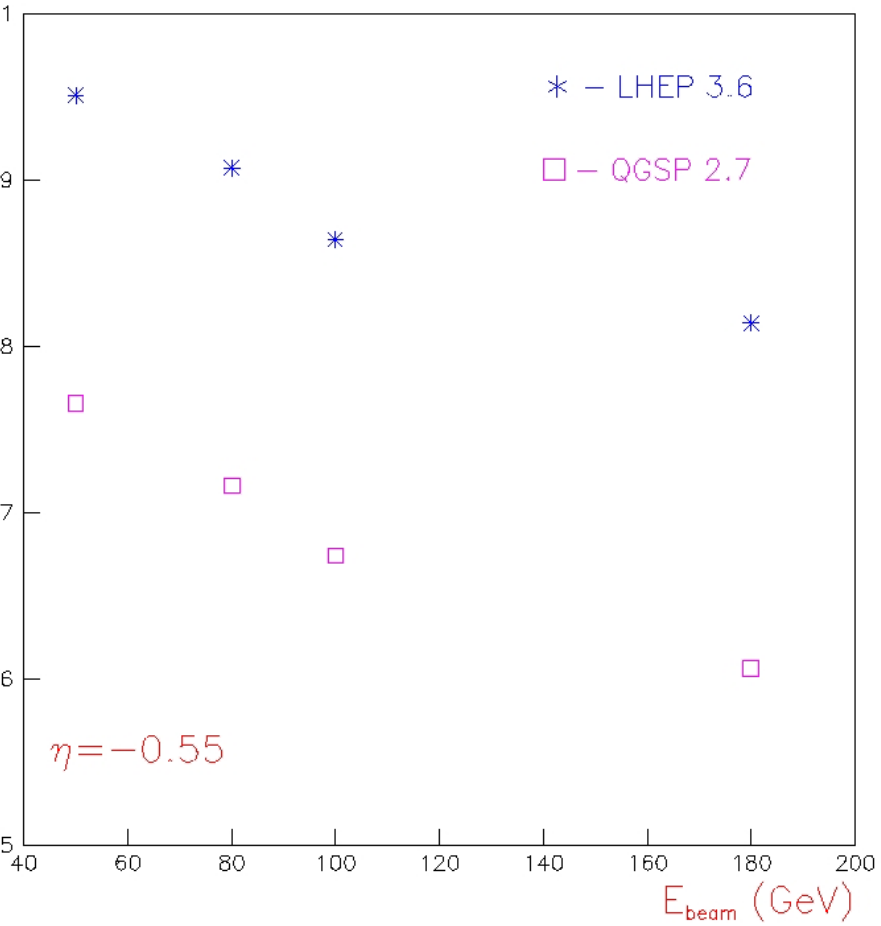


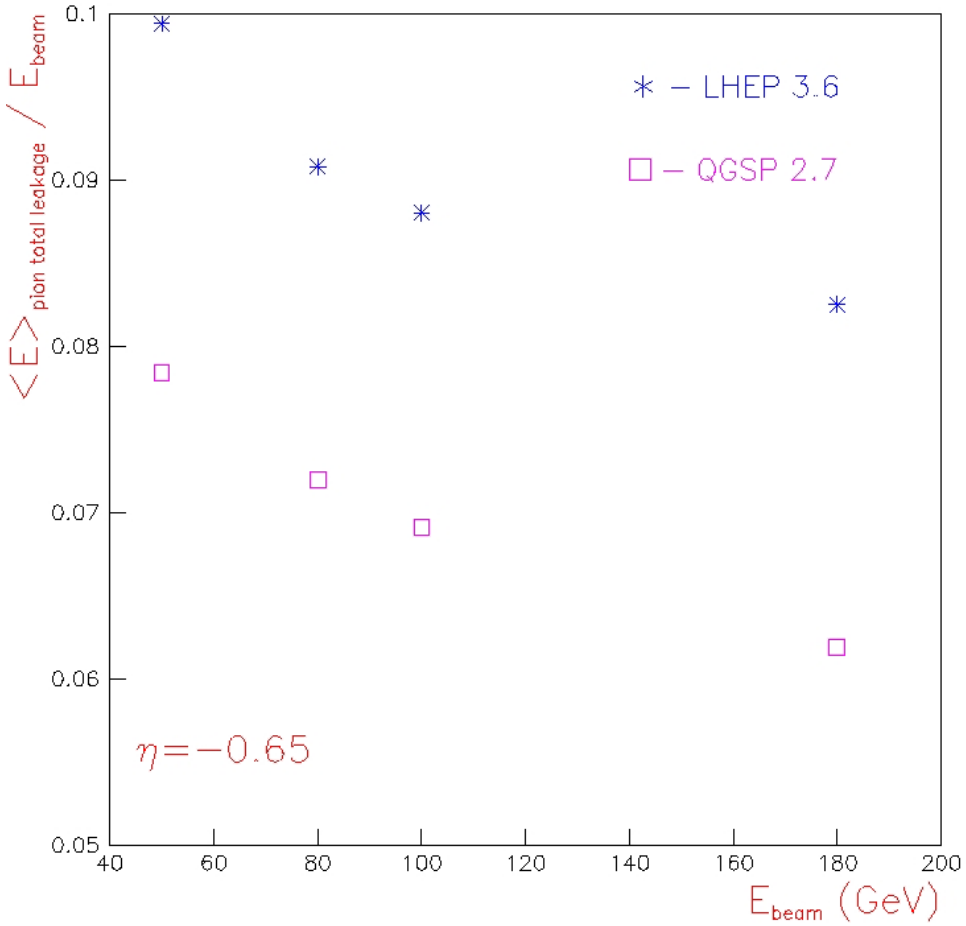
π lateral leakage



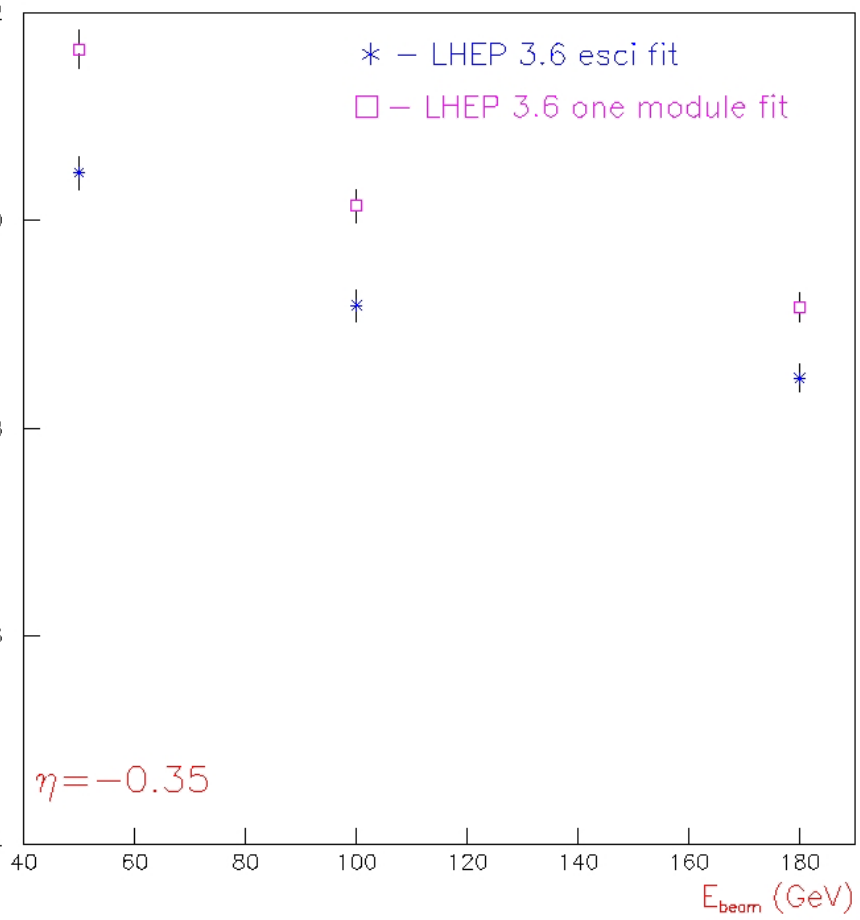


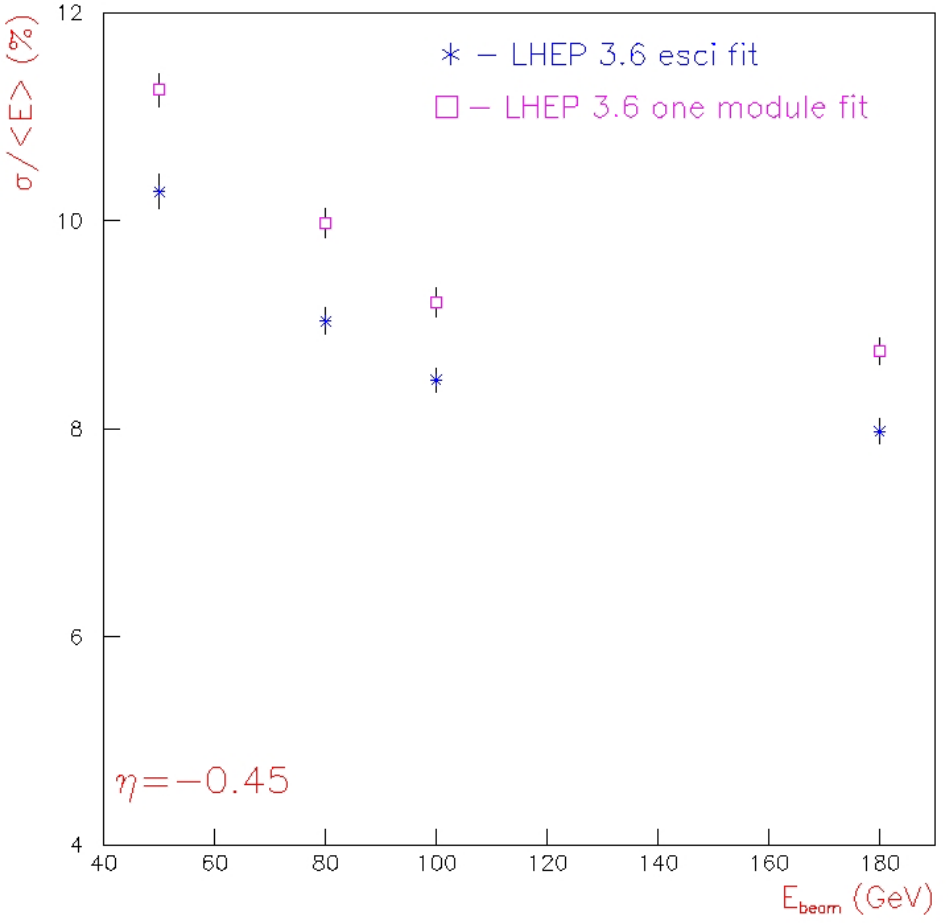
π lateral leakage



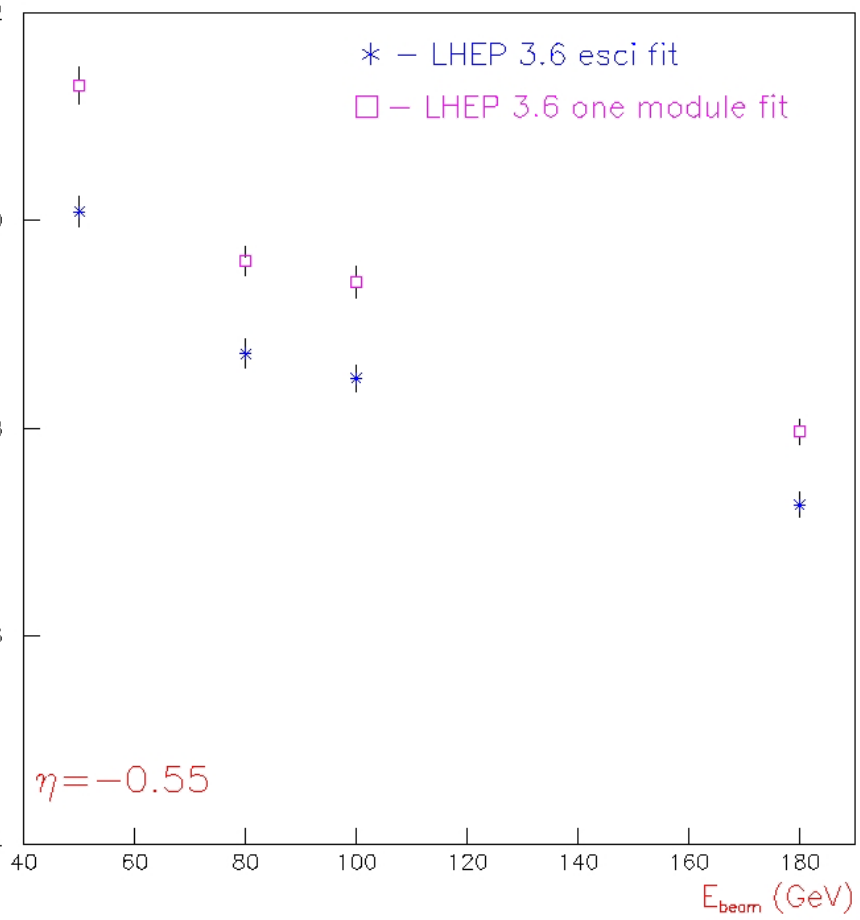


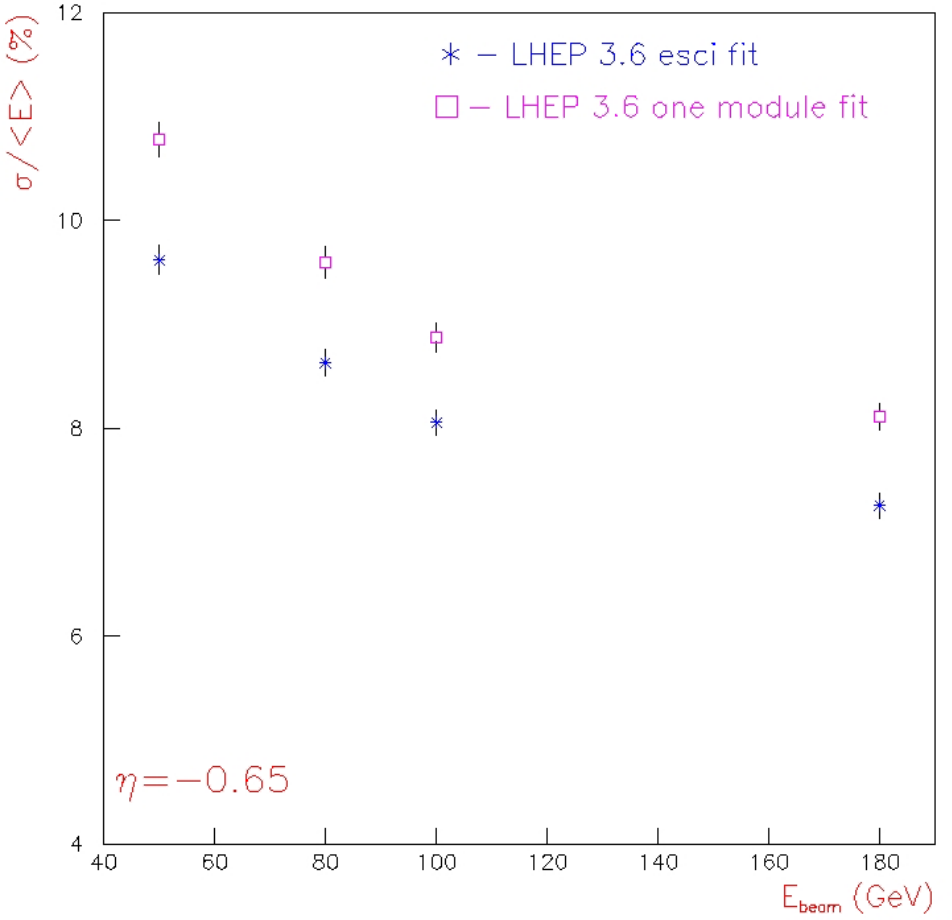
two different analysis





two different analysis





conclusions:

- e/π ratio better with QGSP
- pion resolution: no difference between QGSP and LHEP
- leakage: LHEP > QGSP

future plans:

- improve the analysis
- … ATHENA