

Grid testing of Geant4 : **10.4.cand{00,01}**

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CERN PH/SFT

Main Changes in Hadronics vs. Ref10

- **FTF**
 - Backported configuration interface (for now, only baryon projectile)
 - Improved anisotropy of secondary pions in annihilation
- *hadronic/models/util* : **G4SampleResonance**
 - Added protection for rare cases when a wide parent resonance, with a very small dynamic mass, decays into another wide (daughter) resonance
 - This fixes the few crashes seen in Ref10 with FTF
- **De-excitation & Precompound** : a few, minor technical changes
- **ParticleHP** : added NRESP7 model for accurate treatment of neutron-carbon interactions
- **RadioactiveDecay** : a few bug fixes
- **INCLXX** : a few bug fixes
- **LEND** : a few fixes

Crashes & Warnings

- No crash
- No infinite loop
- No warning

Reproducibility

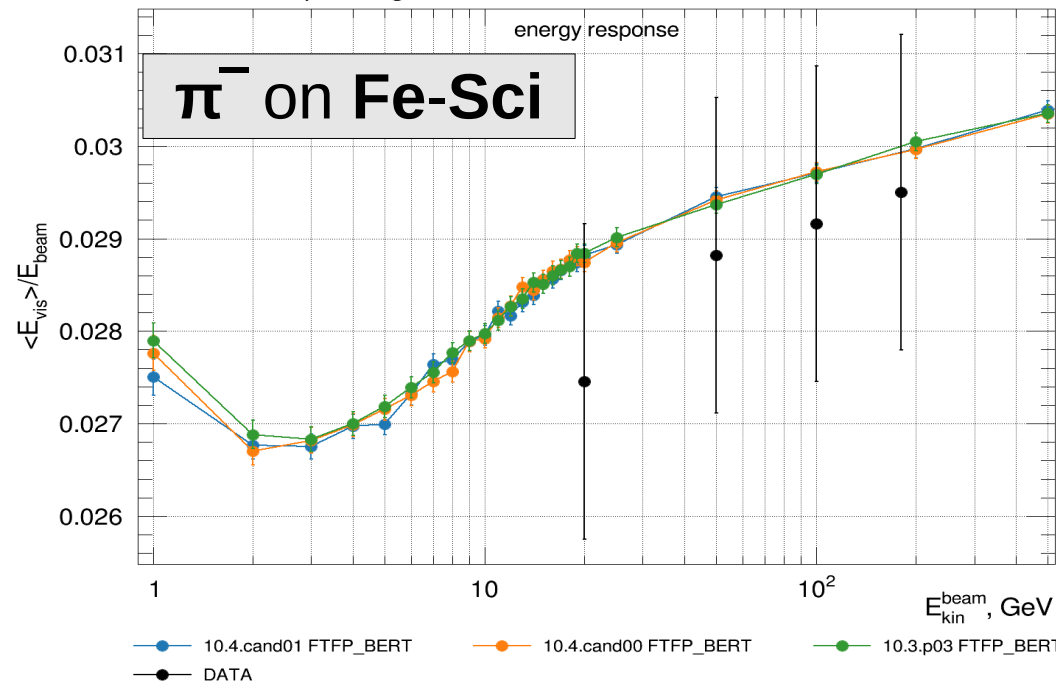
- Reproducibility OK
 - Also when Radioactive Decay is used
 - Note that correlated gamma emission is switched off (in all cases)
 - Several violations when INCLXX is used
 - Since G4 10.3.ref10
 - On-going debugging

Pion showers: FTFP_BERT

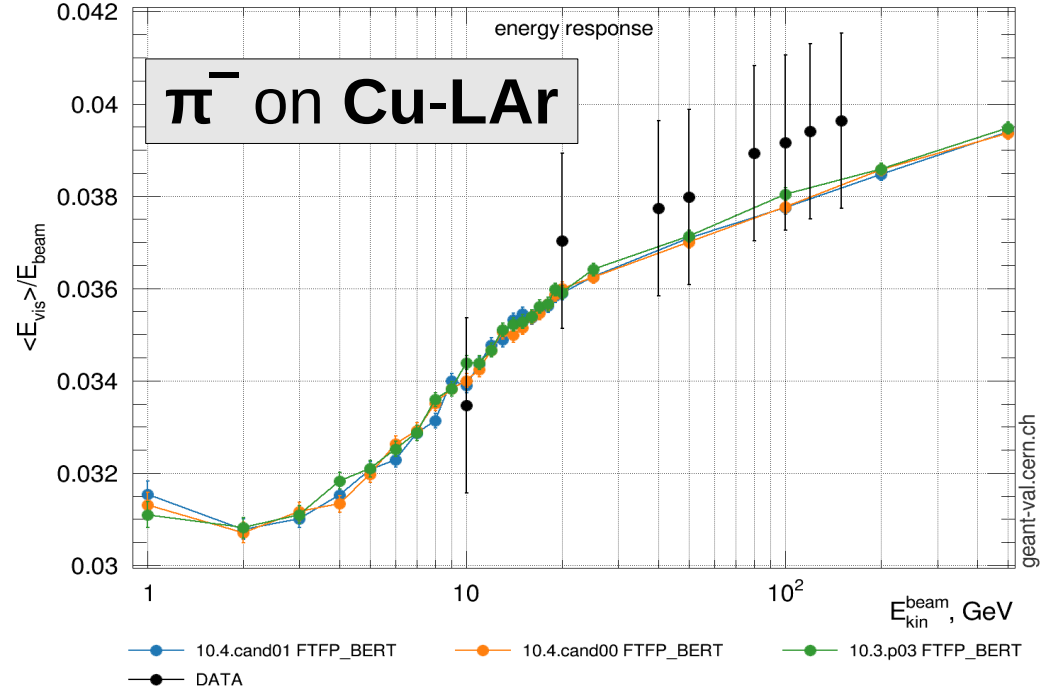
G4 10.4.cand01
10.4.cand00
10.3.p03

FTFP_BERT : Energy Response

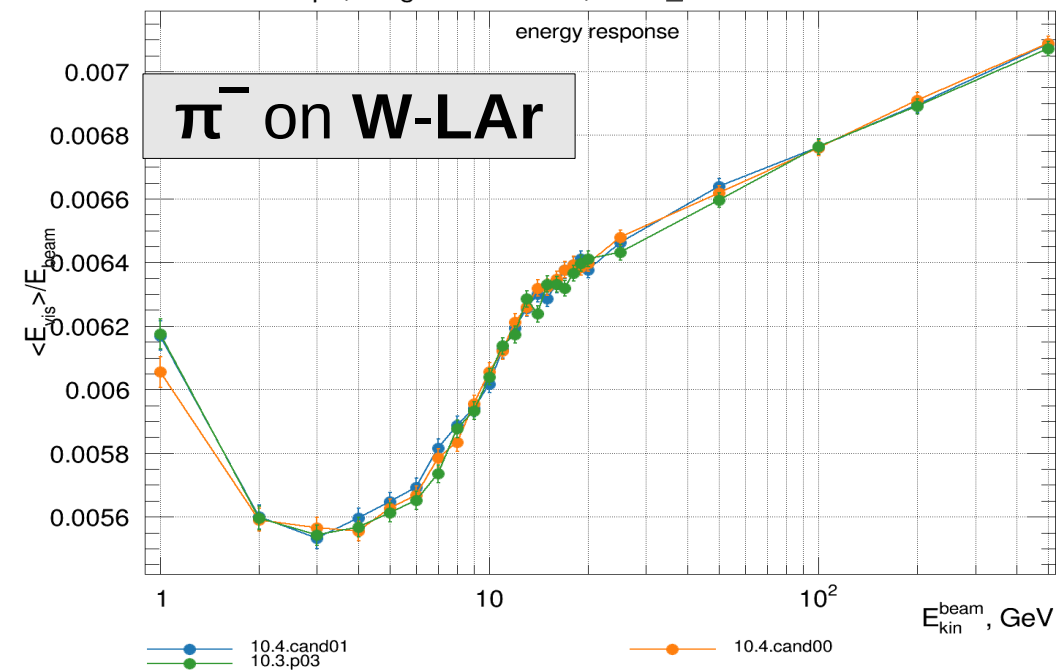
Beam: pi-, Target: TileCal



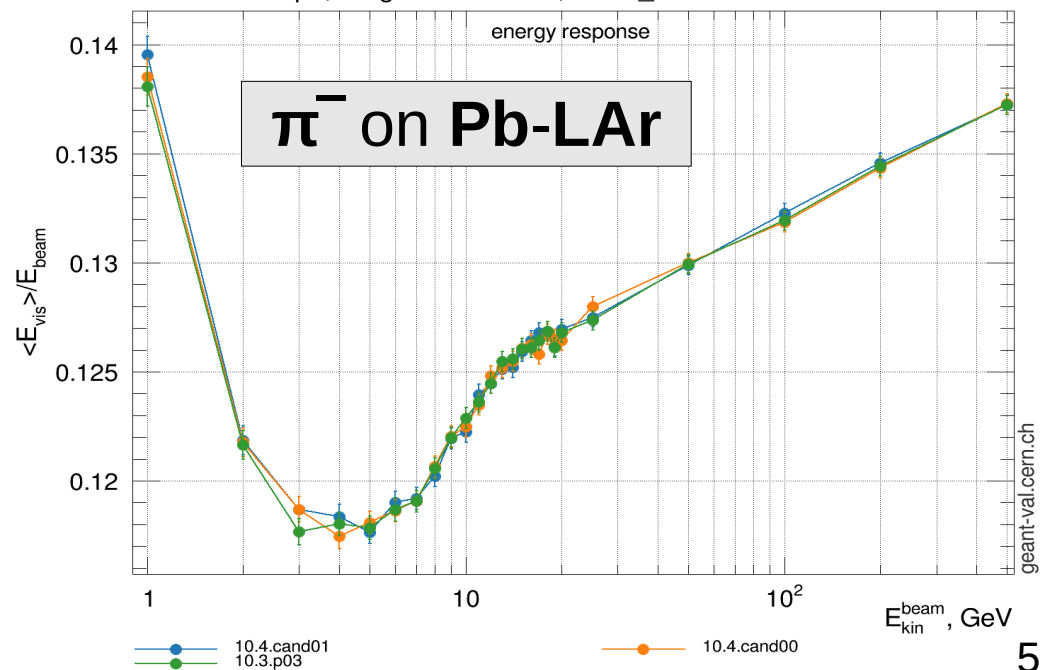
Beam: pi-, Target: AtlasHEC



Beam: pi-, Target: AtlasFCAL, FTFP_BERT

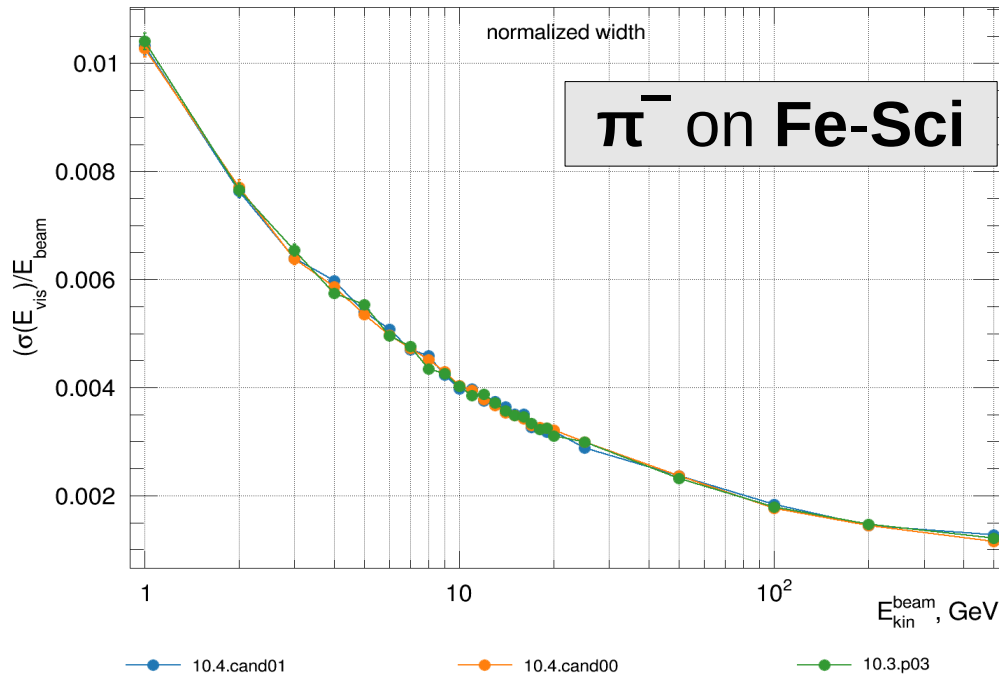


Beam: pi-, Target: AtlasECAL, FTFP_BERT

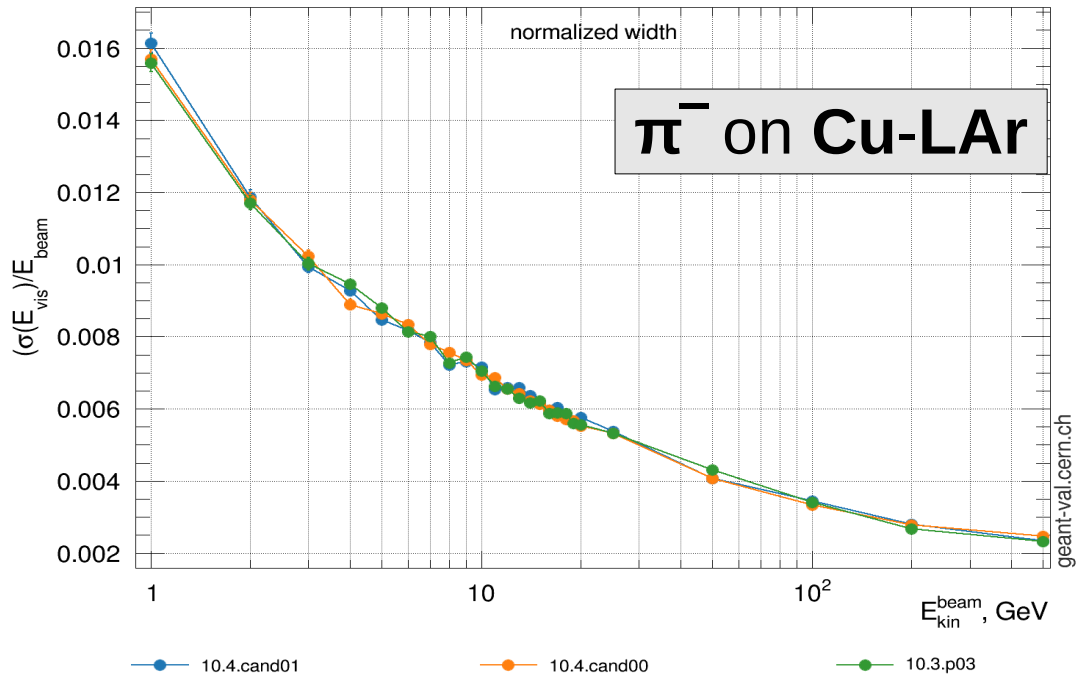


FTFP_BERT : Energy Width

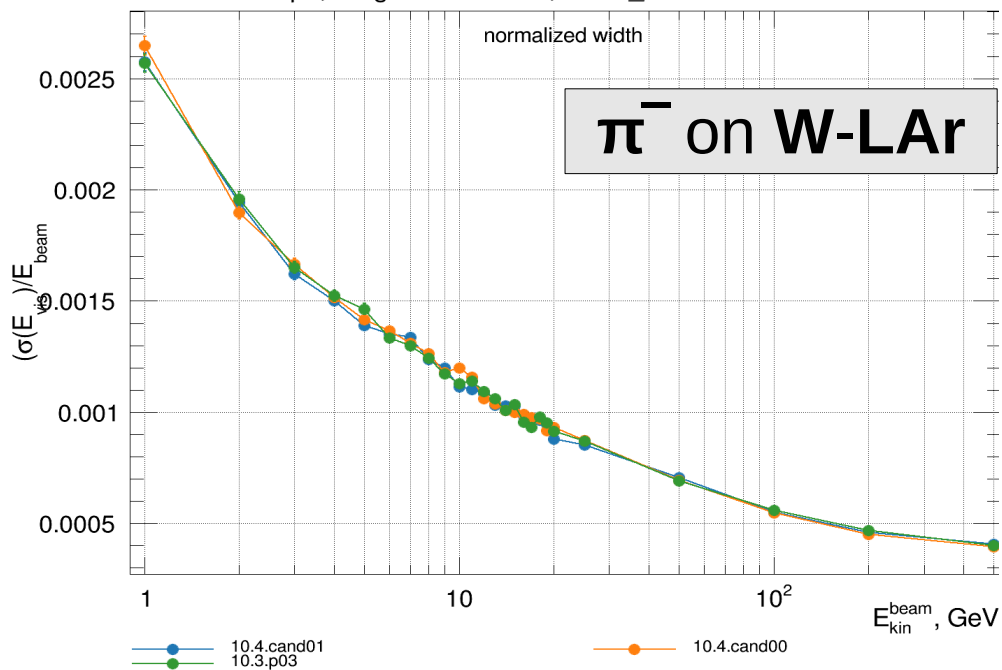
Beam: pi-, Target: TileCal, FTFP_BERT



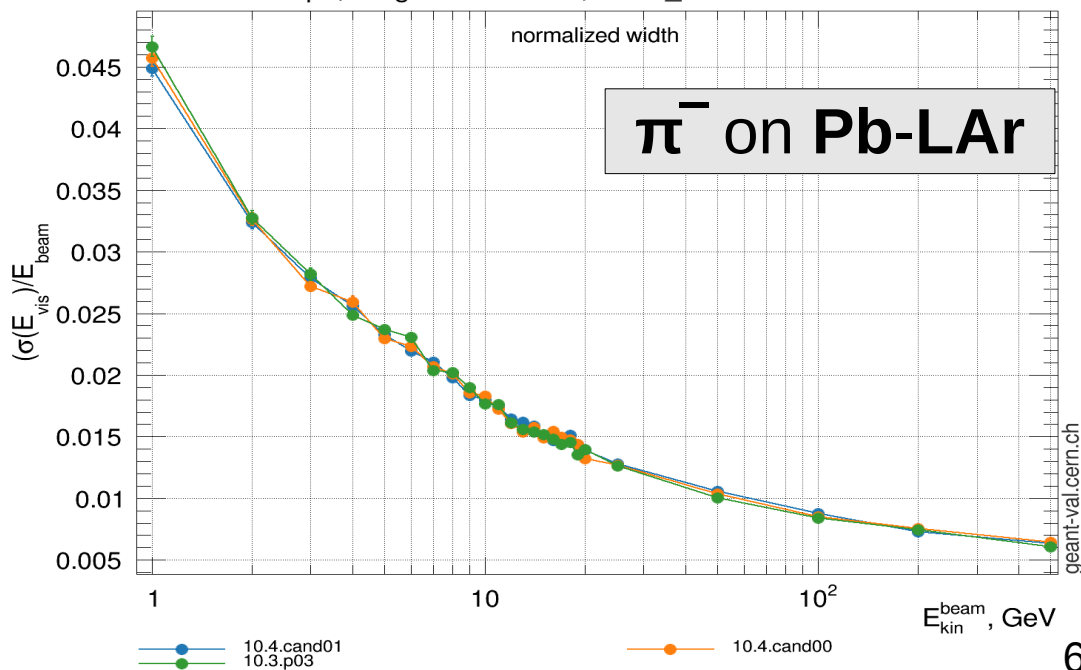
Beam: pi-, Target: AtlasHEC, FTFP_BERT



Beam: pi-, Target: AtlasFCAL, FTFP_BERT

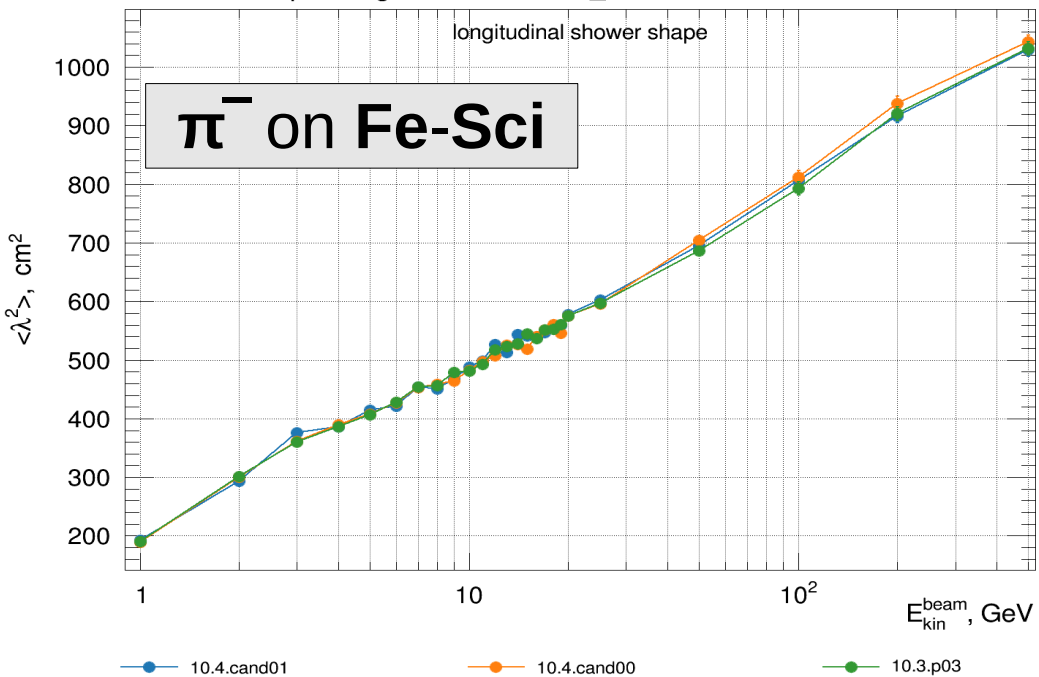


Beam: pi-, Target: AtlasECAL, FTFP_BERT

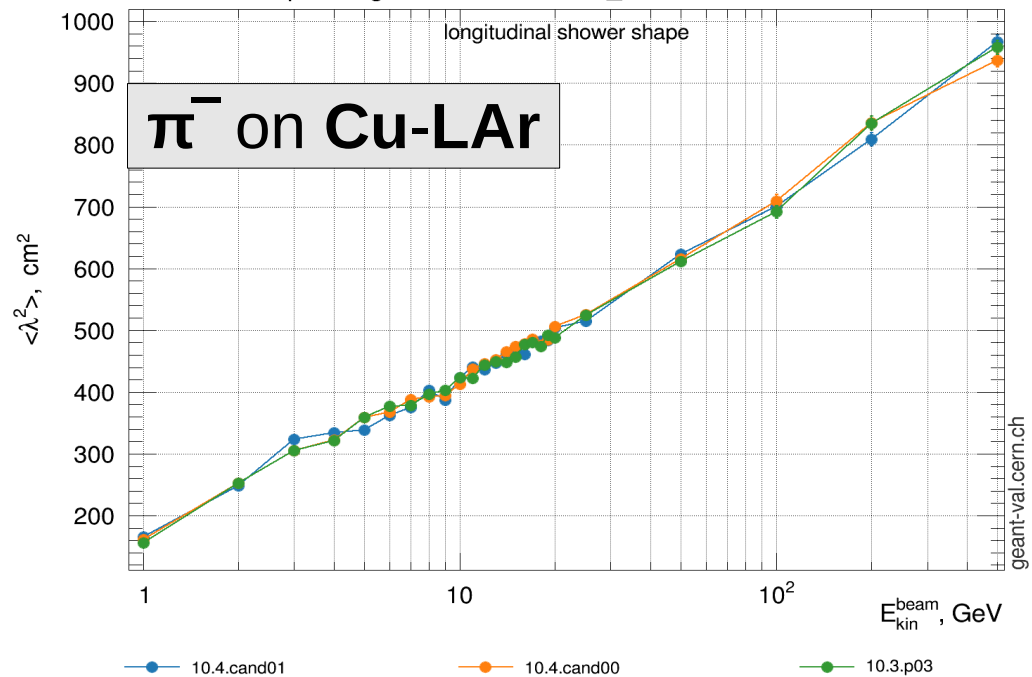


FTFP_BERT : Longitudinal Shape

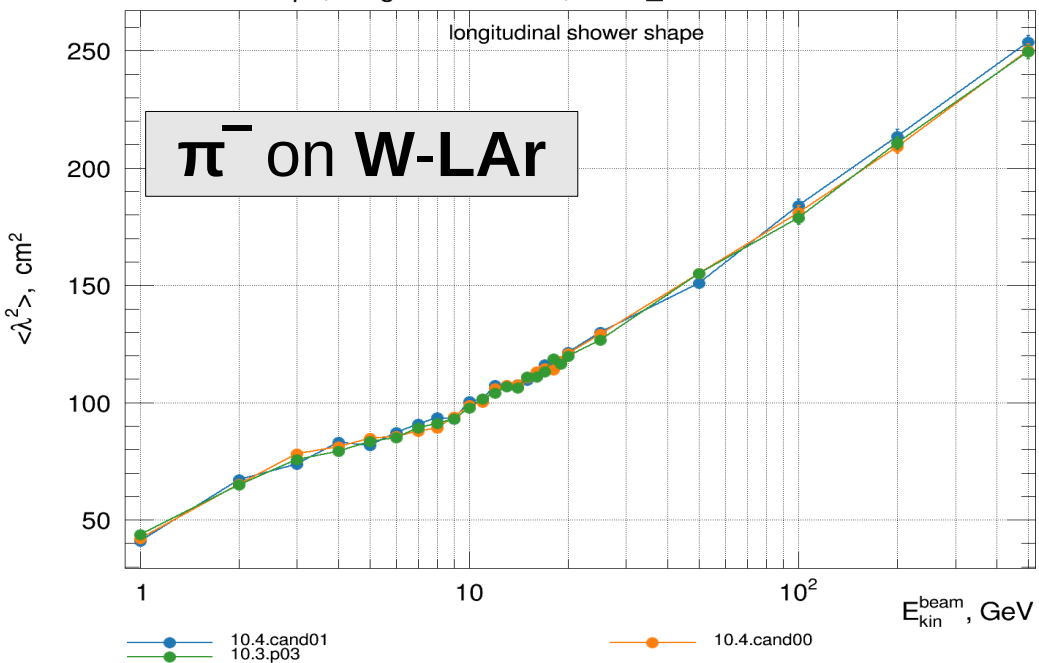
Beam: π^- , Target: TileCal, FTFP_BERT



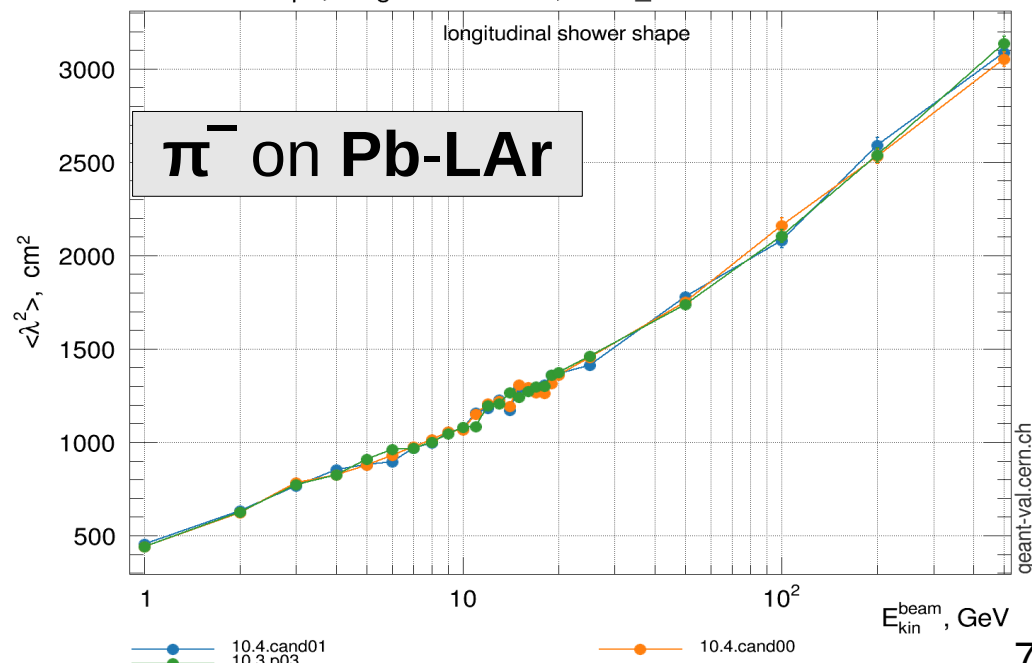
Beam: π^- , Target: AtlasHEC, FTFP_BERT



Beam: π^- , Target: AtlasFCAL, FTFP_BERT

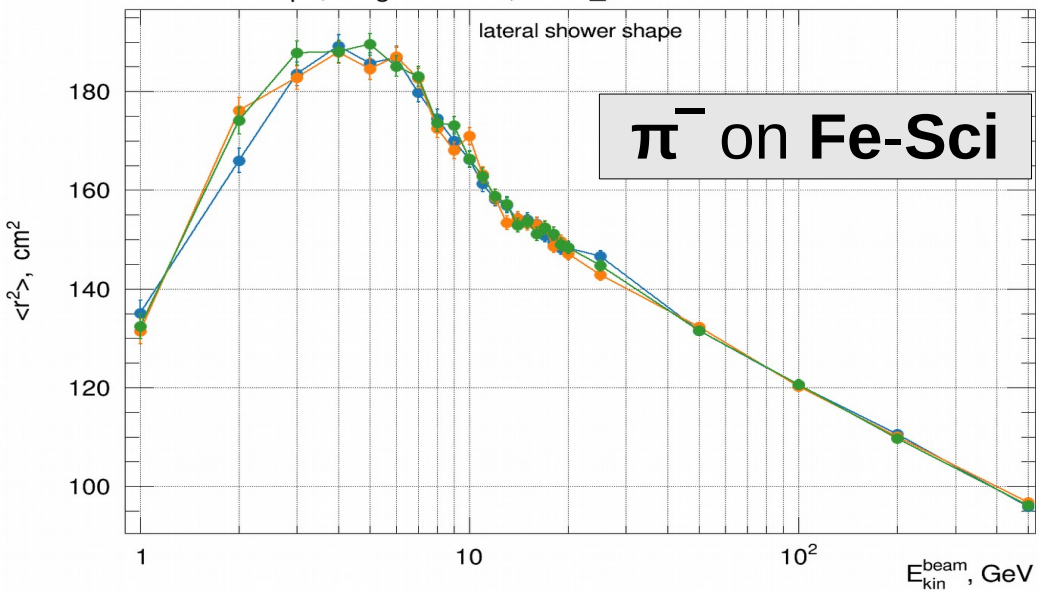


Beam: π^- , Target: AtlasECAL, FTFP_BERT

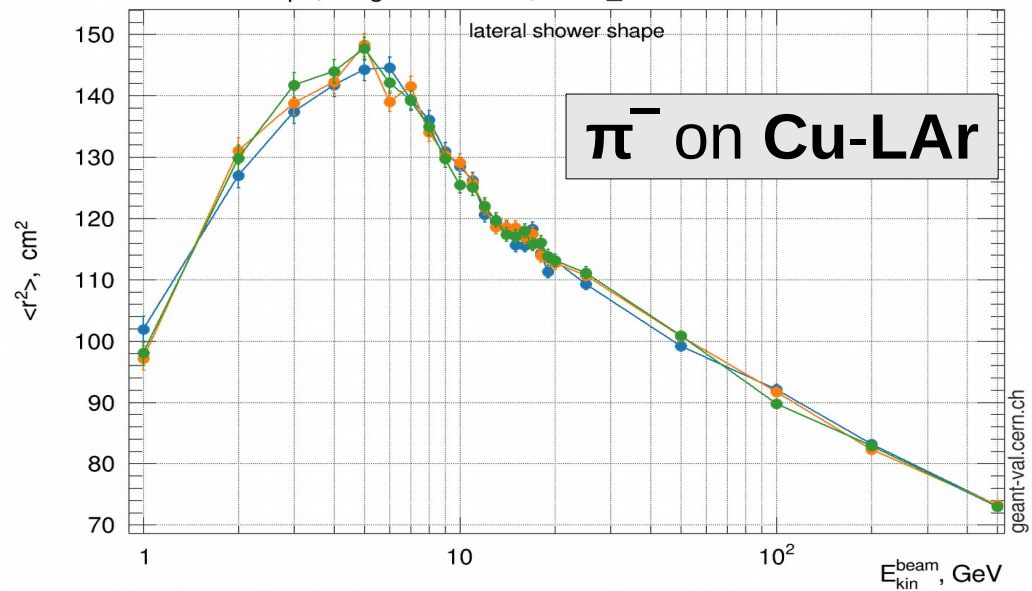


FTFP_BERT : Lateral Shape

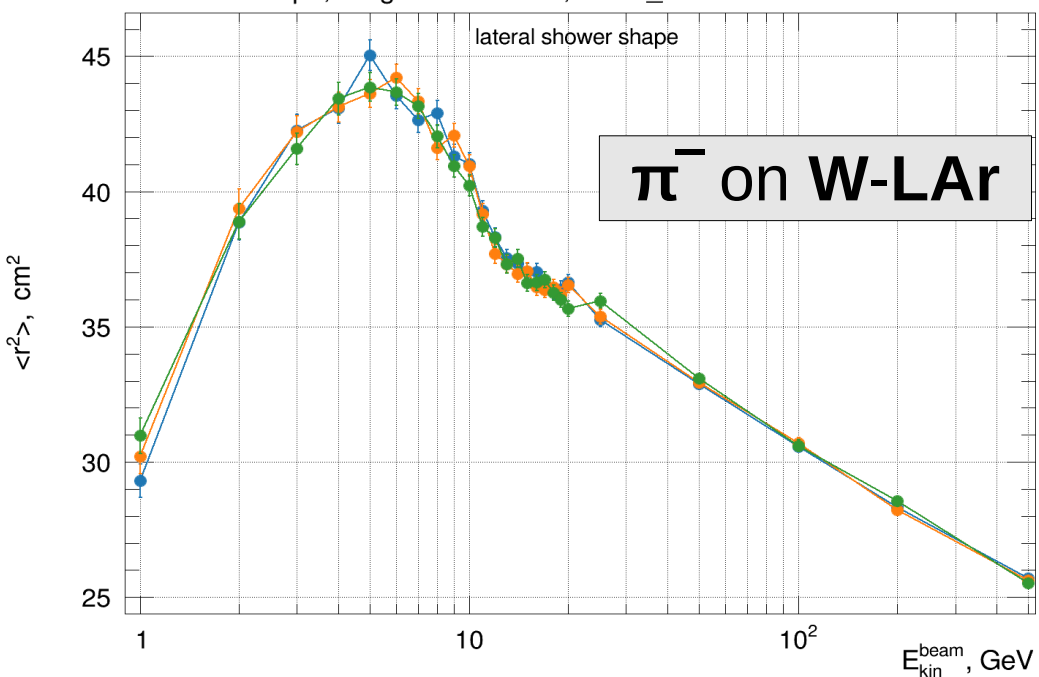
Beam: pi-, Target: TileCal, FTFP_BERT



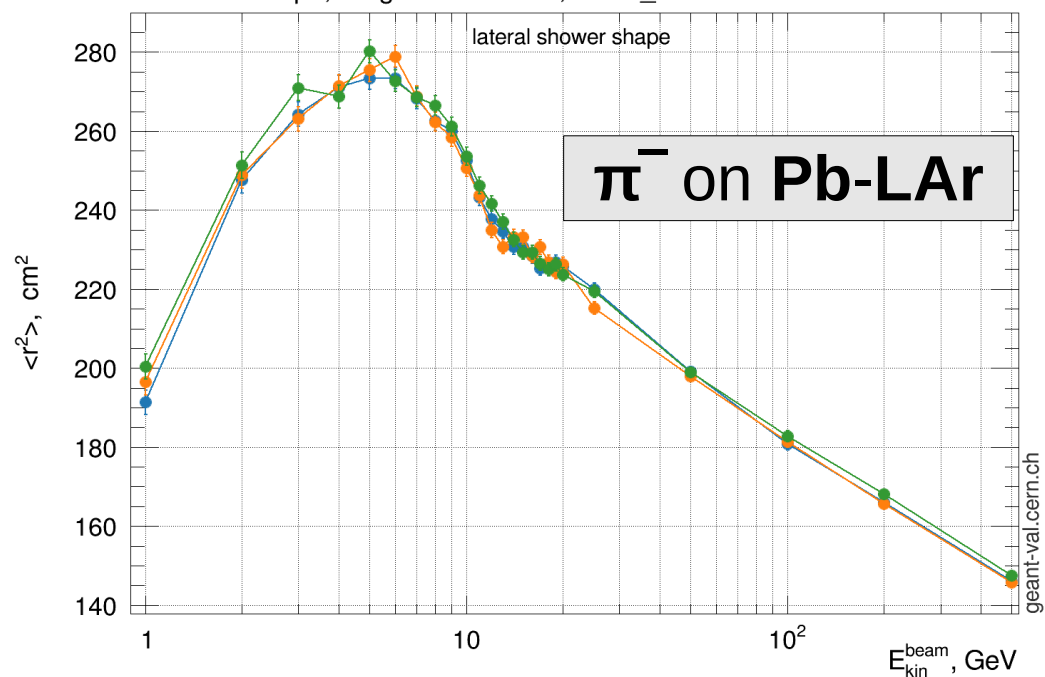
Beam: pi-, Target: AtlasHEC, FTFP_BERT



Beam: pi-, Target: AtlasFCAL, FTFP_BERT



Beam: pi-, Target: AtlasECAL, FTFP_BERT



Conclusions

- **G4 10.4.cand{00,01}**
 - No crash
 - No warning
 - Reproducibility OK
 - OK also with Radioactive Decay, but NOT with INCLXX
 - FTF hadronic showers
 - Similar to G4 10.3.p03