

Hadronic Showers in G4 10.6.ref01

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Main Changes in Hadronics vs. 10.6.ref00

No changes in BIC, INCLXX, Pre-equilibrium, De-excitation, Cross-sections, *etc.*

- **FTF** : fixed division by zero
- **QGS** : fixed warning on Windows
- **Bertini** : fixed outstanding problem of the interface with native pre-compound model, due to internal electron conversion in de-excitation
- **Radioactive Decay** : Coverity and memory fixes; changed default verbosity (from 0 to 1 and increased thresholds to reduce printouts)

Crashes & Warnings

- No crashes or infinite loops
- New warning from `RadioactiveDecayBase::DecayIt`
 - *“G4RadioactiveDecay::DecayIt : decay table not defined for Tm162. Set particle change accordingly.”*
 - Understood why it did not appear before: change in verbosity level, not clear if it is intentional or a mistake...

Reproducibility

- All OK

Pion- showers: FTFP_BERT

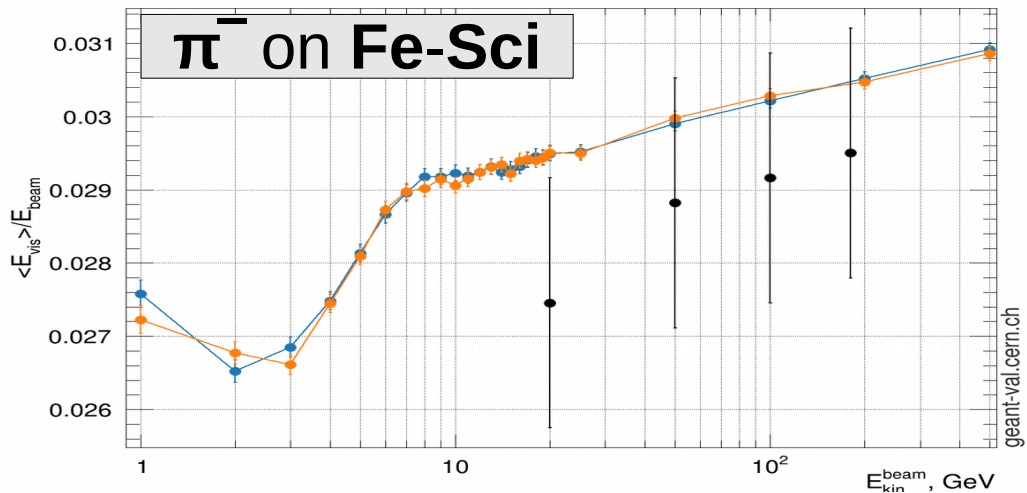
G4 10.6.ref01

G4 10.6.ref00

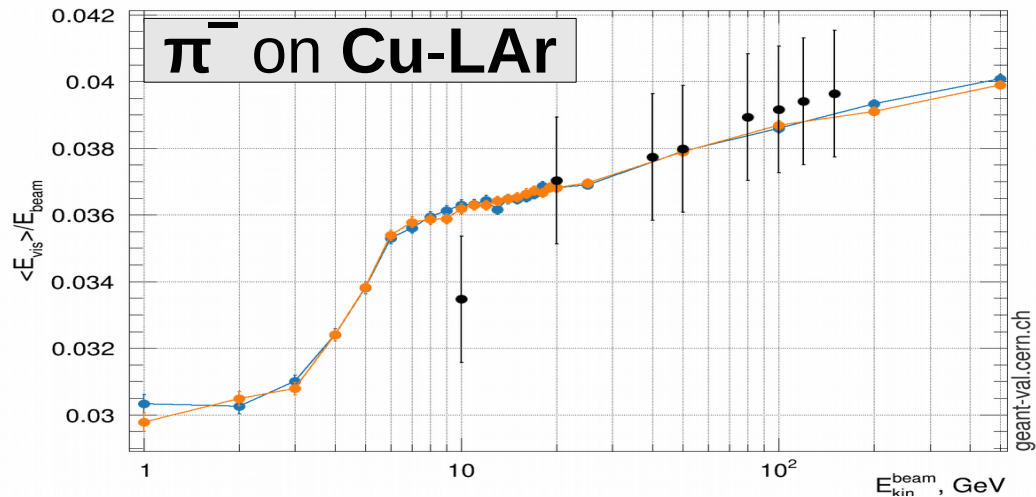
*Note : conventional Birks treatment
(easier and no experimental h/e to fit !)*

FTFP_BERT : Energy Response

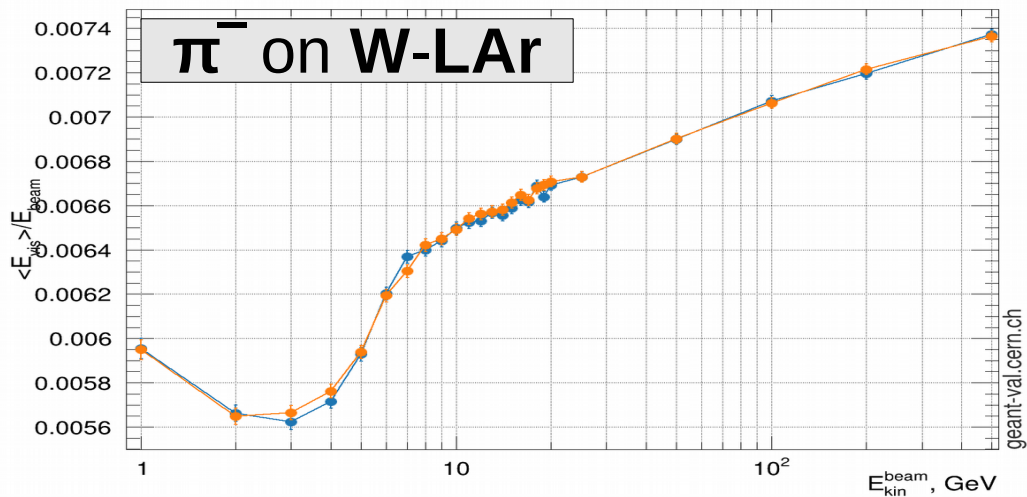
Energy response | Beam: pi- | Target: TileCal



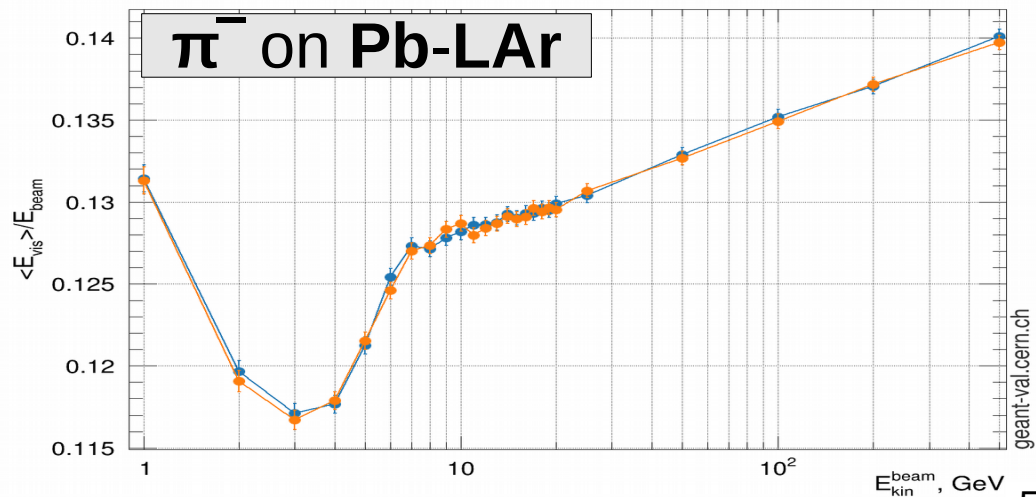
Energy response | Beam: pi- | Target: AtlasHEC



Energy response | Beam: pi- | Target: AtlasFCAL | FTFP_BERT



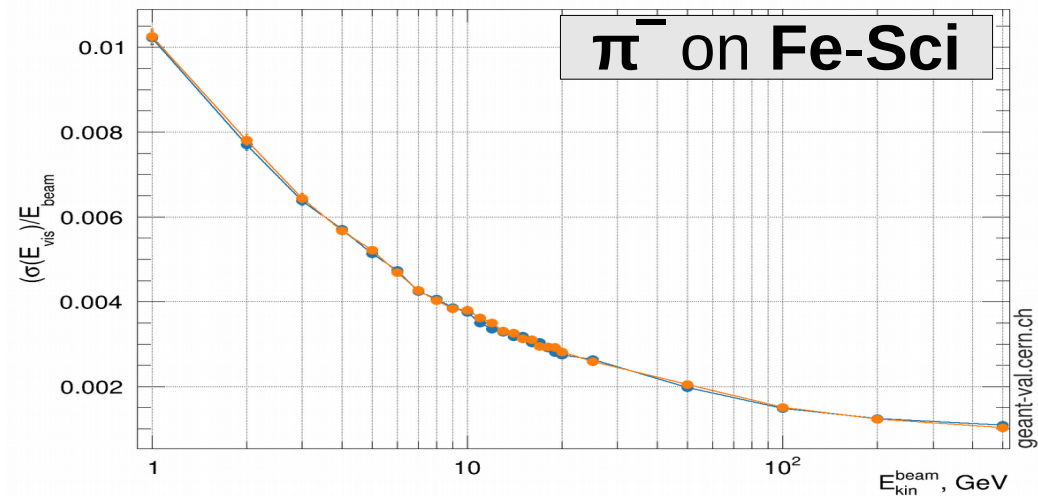
Energy response | Beam: pi- | Target: AtlasECAL | FTFP_BERT



FTFP_BERT : Energy Width

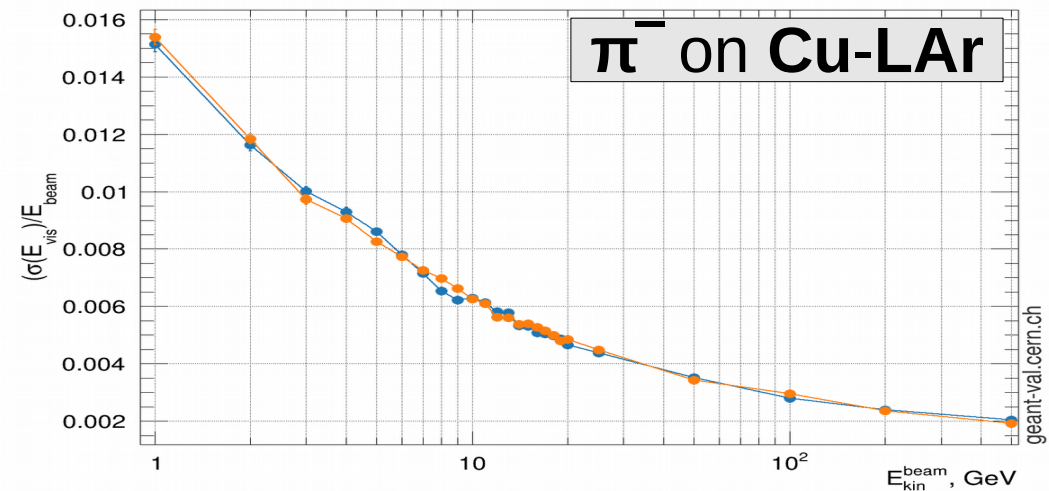
Normalized width | Beam: pi- | Target: TileCal | FTFP_BERT

π^- on Fe-Sci



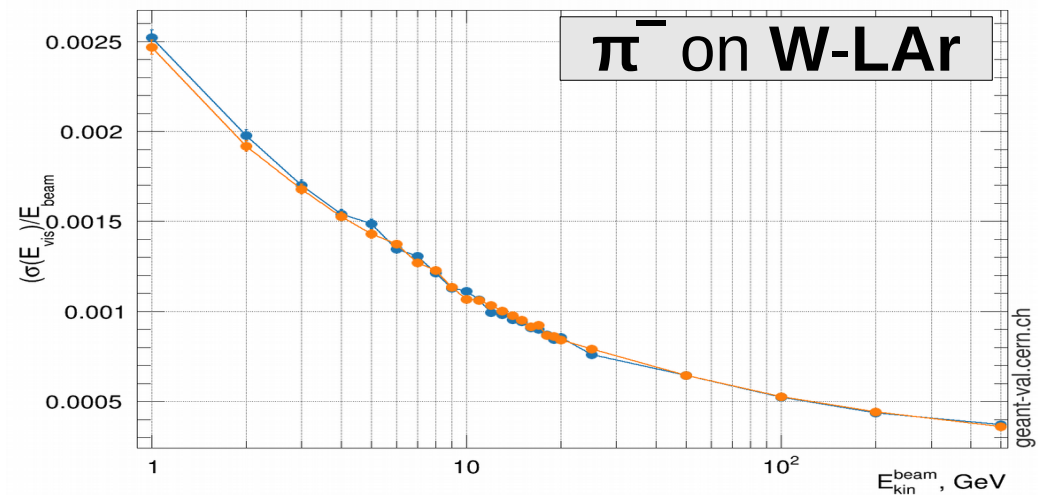
Normalized width | Beam: pi- | Target: AtlasHEC | FTFP_BERT

π^- on Cu-LAr



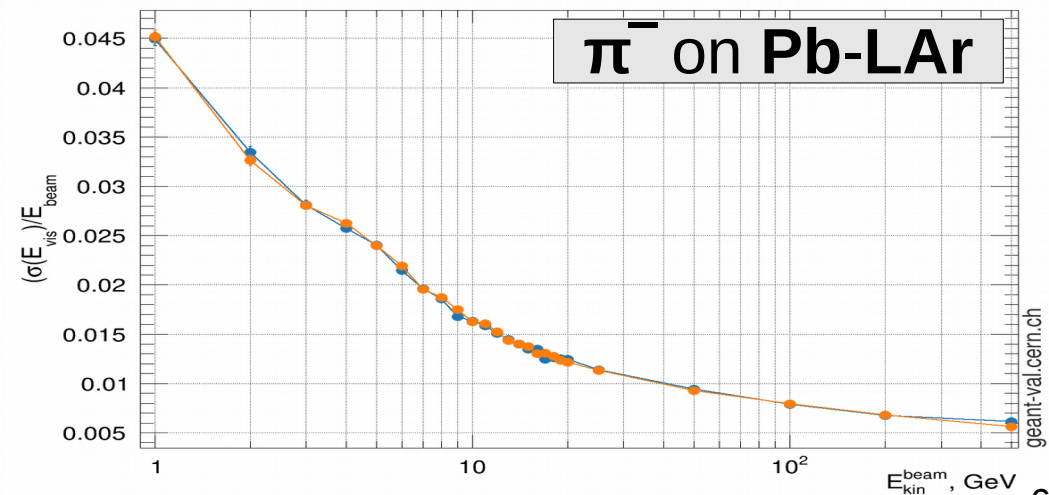
Normalized width | Beam: pi- | Target: AtlasFCAL | FTFP_BERT

π^- on W-LAr



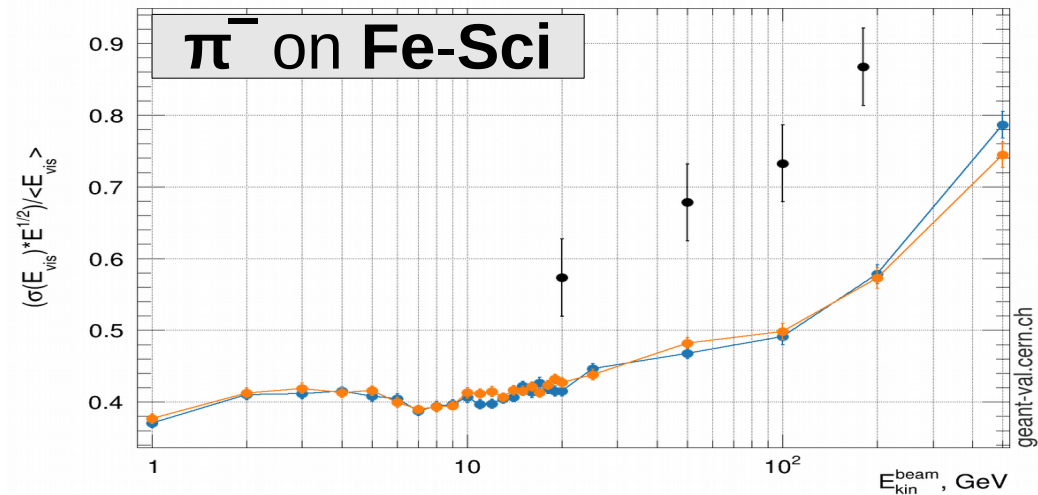
Normalized width | Beam: pi- | Target: AtlasECAL | FTFP_BERT

π^- on Pb-LAr

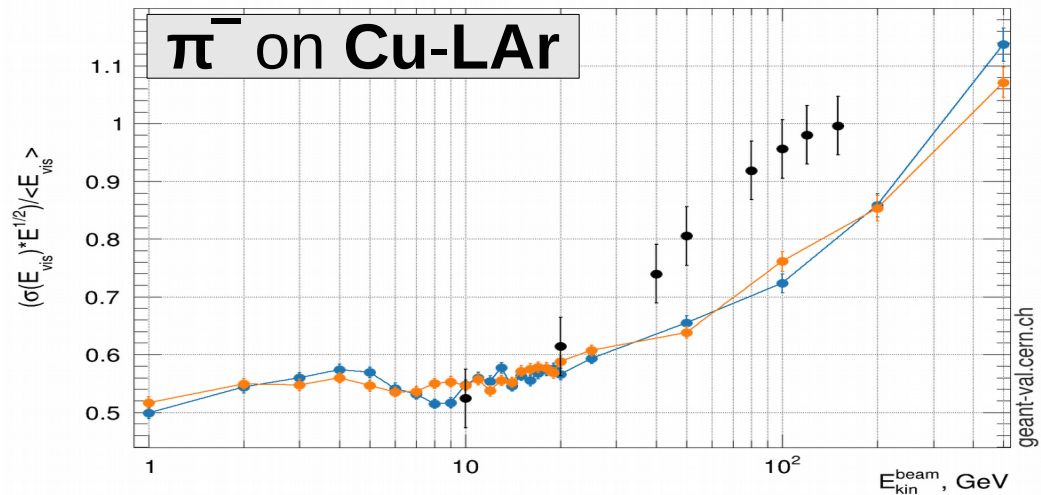


FTFP_BERT : Energy Resolution

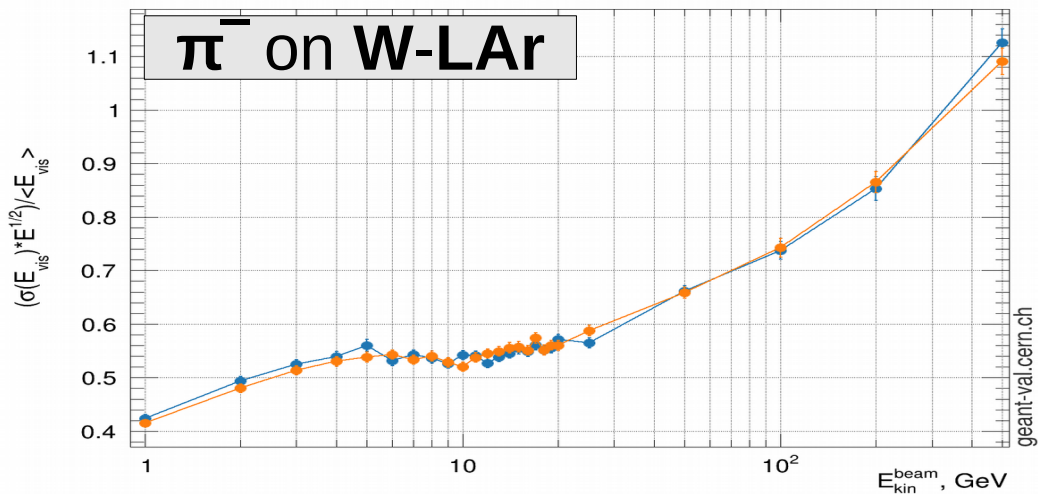
Energy resolution | Beam: pi- | Target: TileCal



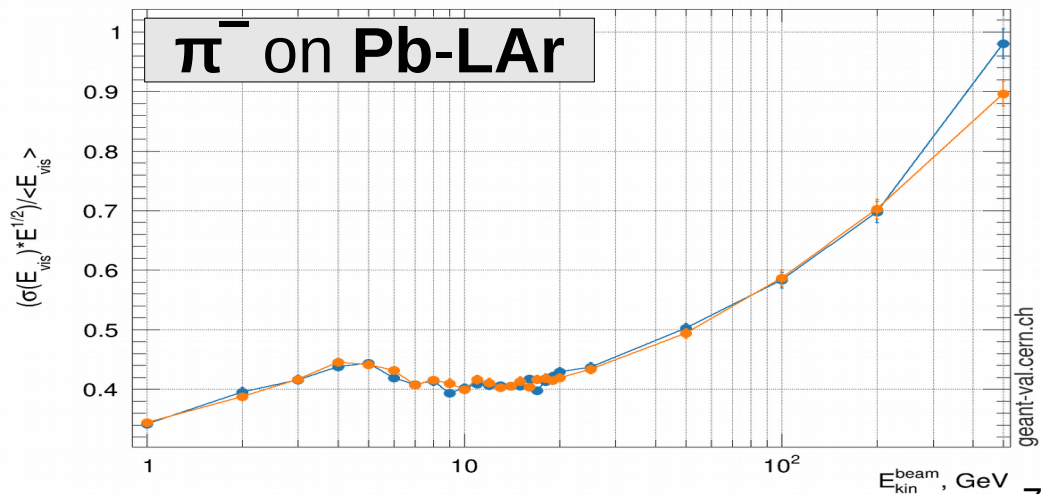
Energy resolution | Beam: pi- | Target: AtlasHEC



Energy resolution | Beam: pi- | Target: AtlasFCAL | FTFP_BERT

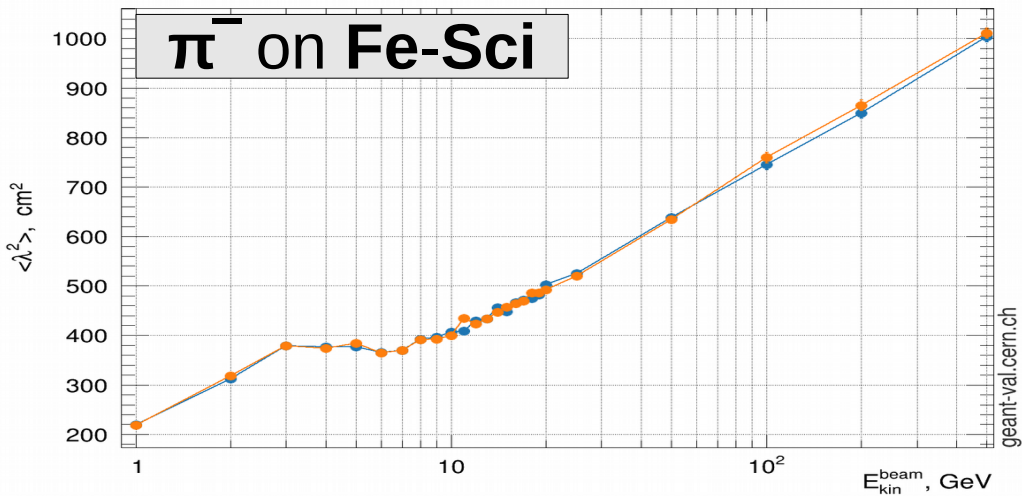


Energy resolution | Beam: pi- | Target: AtlasECAL | FTFP_BERT

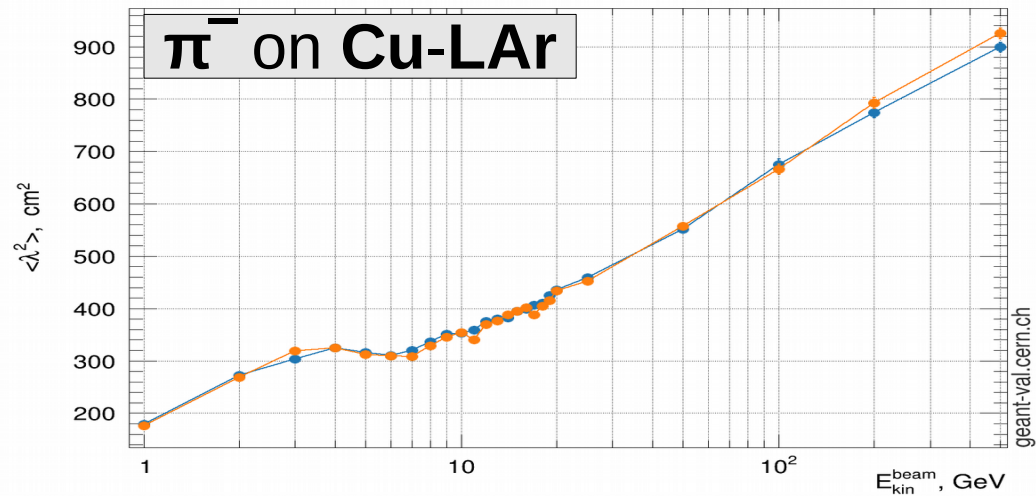


FTFP_BERT : Longitudinal Shape

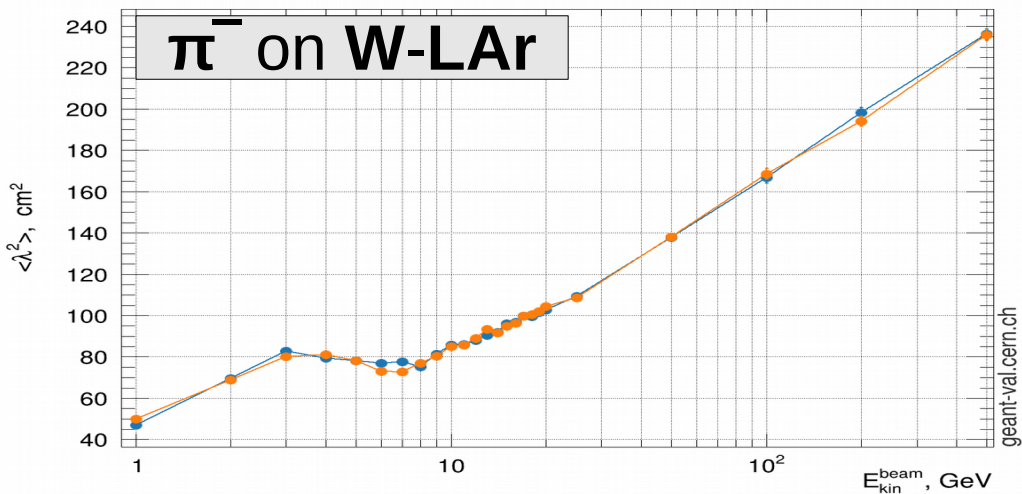
Longitudinal shower shape | Beam: pi- | Target: TileCal | FTFP_BERT



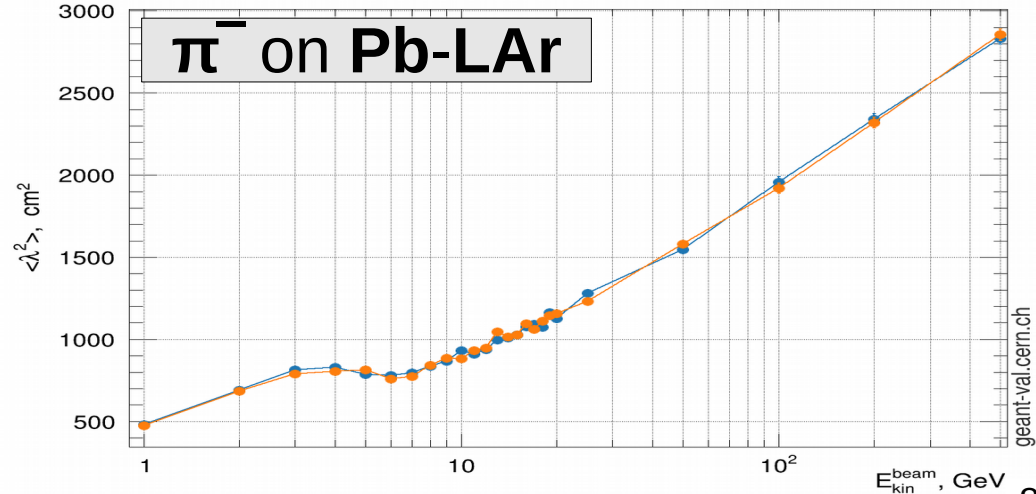
Longitudinal shower shape | Beam: pi- | Target: AtlasHEC | FTFP_BERT



Longitudinal shower shape | Beam: pi- | Target: AtlasFCAL | FTFP_BERT

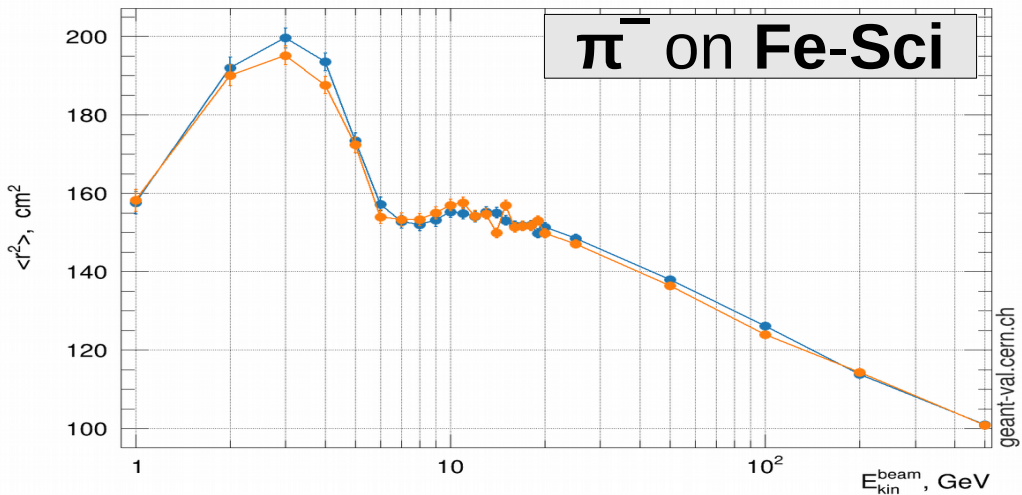


Longitudinal shower shape | Beam: pi- | Target: AtlasECAL | FTFP_BERT

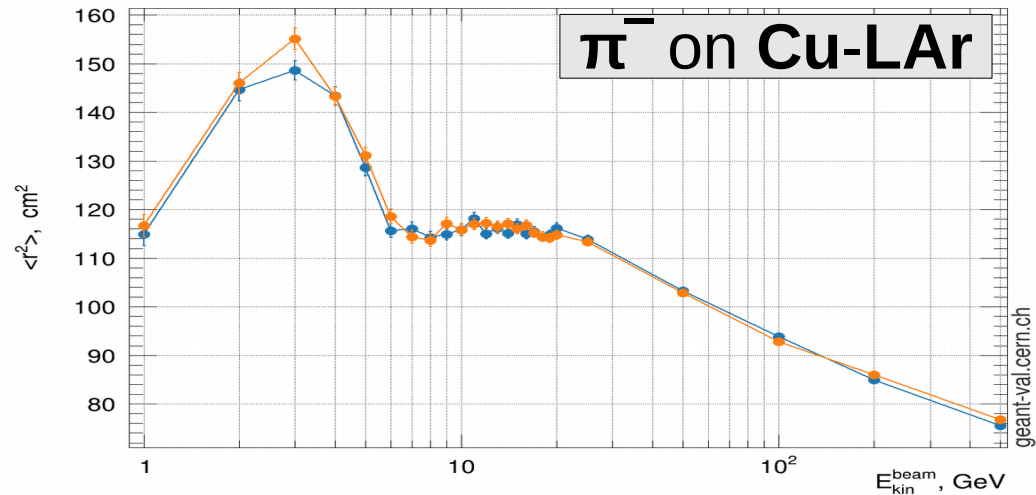


FTFP_BERT : Lateral Shape

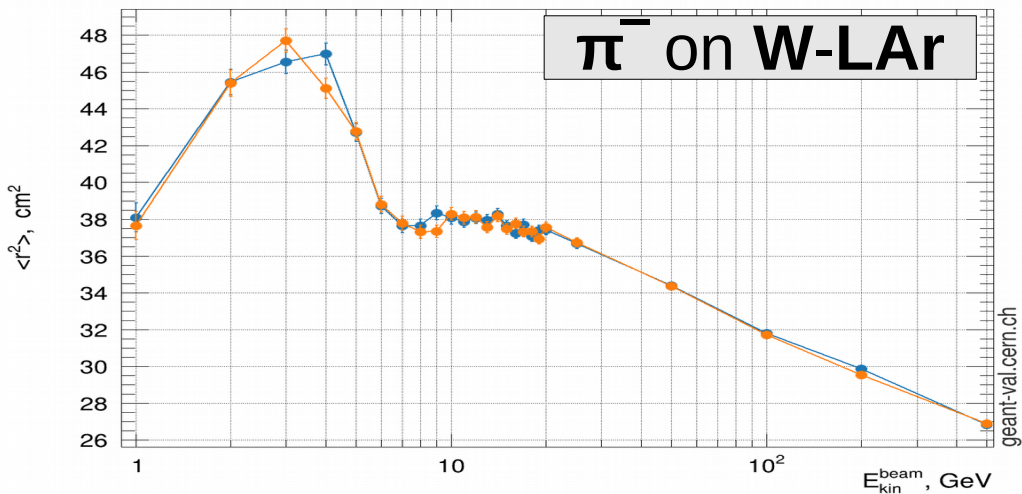
Lateral shower shape | Beam: pi- | Target: TileCal | FTFP_BERT



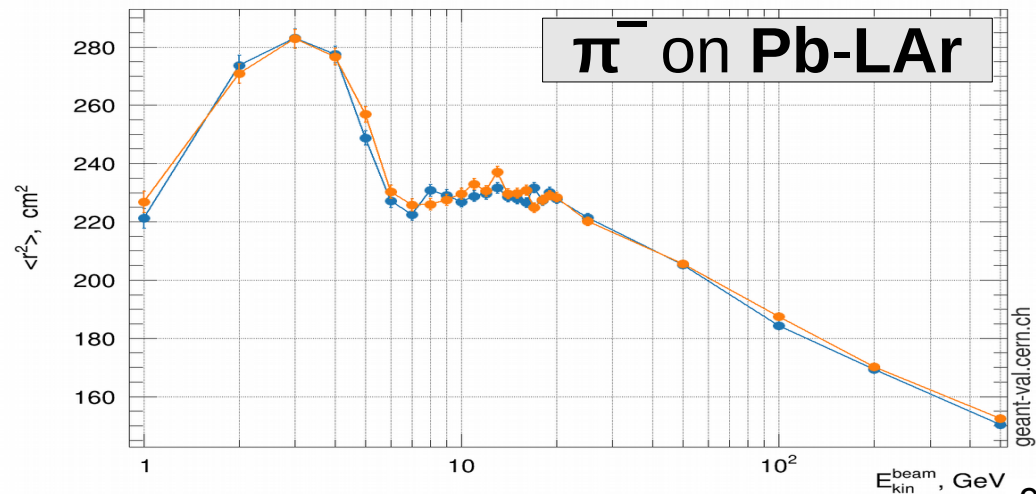
Lateral shower shape | Beam: pi- | Target: AtlasHEC | FTFP_BERT



Lateral shower shape | Beam: pi- | Target: AtlasFCAL | FTFP_BERT



Lateral shower shape | Beam: pi- | Target: AtlasECAL | FTFP_BERT



Conclusions

- **G4 10.6.ref01**
 - No crashes
 - New type of warning from RadioactiveDecay
 - Understood
 - Reproducibility OK
 - Hadron showers
 - Similar to those of G4 10.6.ref00