Showers in a highly granular scintillator-tungsten HCAL ($p \leq 10$ GeV)

Compact LInear Collider (CLIC)

- Future e^+e^- collider, planned to run up to $\sqrt{s} = 3$ TeV ▸ CLIC CDR
- To contain high energy showers: hadron calorimeter (HCAL) with **tungsten** absorber

Highly granular W-AHCAL

- Built by CALICE collaboration: $1 \times 1 \times 0.75$ m^3 prototype, **30 layers**
- Absorber: tungsten alloy (density: 17.8 g/cm^3)

Highly granular W-AHCAL

- Active material: scintillator tiles read out by Silicon Photomultipliers (SiPMs)
- Granularity: 3×3 cm^2 tiles in the center, 6×6 cm^2 and 12×12 cm^2 at the edges

- Total: 3.9 λ_I, 85 X_0

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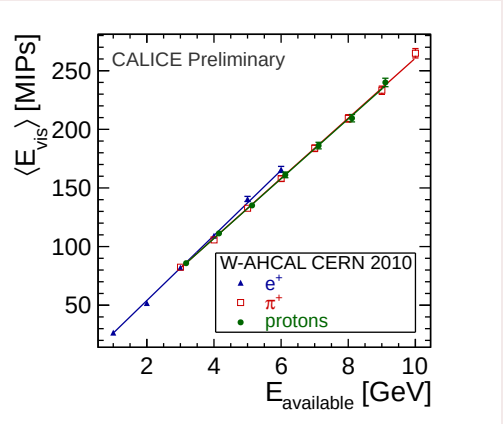
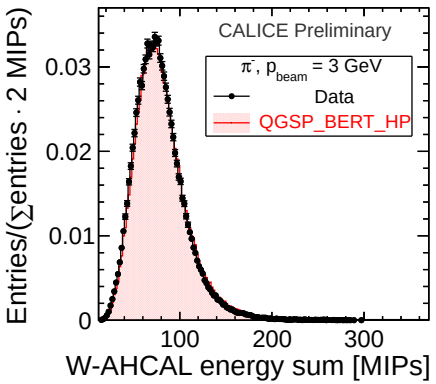
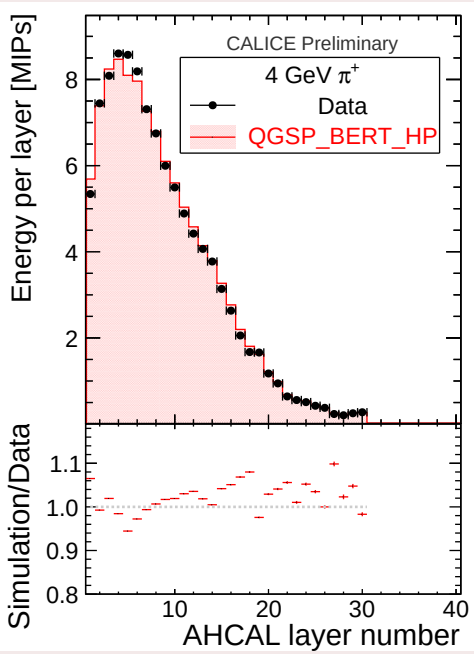
Low energy data set: e+π + μ+p (2010 at CERN PS T9)

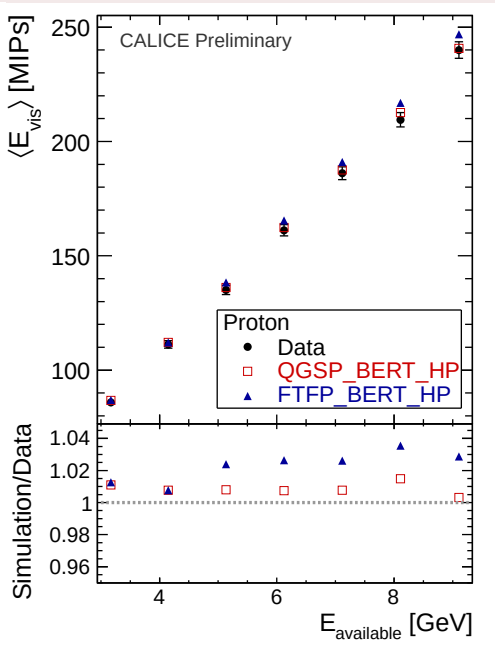
- Particle selection: Cherenkov triggers + information based on high calorimeter granularity
- Dense absorber (per layer: 2.8 X_0, 0.1 λ_I) $\Rightarrow$ high energy tails in energy spectra at low momenta
- Calorimeter response: similar for analyzed particle types



Comparison with GEANT4 simulations







- Remarkable good agreement for QGSP_BERT_HP (within 3% or better)
- Results with high energy data ($p \leq 300$ GeV) on the way