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Performance requirements of the hadronic calorimetry for a 100TeV proton-proton collider and the potential of an ATLAS-Tile concept readout by si-PMTS.

The particles produced at the future hadron Circular Collider (FCC-hh) with √ s = 100 TeV are of unprecedented energies. We present preliminary studies that motivate a 12 λ calorimeter in order to contain at 98% level TeV single hadron showers and multi-TeV jets and keep a needed pion energy resolution constant term of 3%, the dominant contribution to the total energy resolution at the TeV energies. The hadronic shower containment and resolution parametrizations shown are based on Geant 4 simulations and are compared with test-beam data from the ATLAS Tile hadronic calorimeter. Other requirements such as the transversal granularity and acceptance improvements with respect to LHC calorimetry are also addressed using FCC physics benchmarks. We also present the potential of the ATLAS-Tile hadron calorimeter mechanics/optics concept read out by silicon photomultipliers, allowing big flexibility to achieve the needed transversal and longitudinal granularity, while keeping the overall good performance, hermeticity, and complexity at reasonable levels.

Summary

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Primary author: HENRIQUES CORREIA, Ana Maria (CERN)

Presenter: HENRIQUES CORREIA, Ana Maria (CERN)

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