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Test Beam Studies for the ATLAS Tile Calorimeter Upgrade Readout Electronics

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The Large Hadron Collider (LHC) Phase II upgrade aims to increase the accelerator luminosity by a factor of 5-10. Due to the expected higher radiation levels and the aging of the current electronics, a new readout system for the Tile hadronic calorimeter (TileCal) of the ATLAS experiment is needed. A prototype of the upgrade TileCal electronics has been tested using the beam from the Super Proton Synchrotron (SPS) accelerator at CERN. Data were collected with beams of muons, electrons and hadrons at various incident energies and impact angles. The muon data allow to study the response dependence on the incident point and angle in a cell and inter-calibration of the response between cells. The electron data are used to determine the linearity of the electron energy measurement. The hadron data allow to determined the calorimeter response to pions, kaons and protons and tune the calorimeter simulation to that data. The results of the ongoing data analyses are discussed in the presentation.

Secondary topics

Scintillators

Applications

Experience with current calorimeter at the energy frontier

Primary topic

Front-end readout and trigger

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