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ATLAS Tile Calorimeter performance for single particles in beam tests

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Summary

The modules of the ATLAS Tile hadronic calorimeter (Tilecal) underwent extensive tests in the SPS beams at CERN. Studies were carried out with electrons, muons and hadrons ranging in energy from 10 GeV to 350 GeV.

The Tilecal calibration systems and energy reconstruction algorithms were also studied in great details, the associated systematics has been evaluated. The updated calibration scheme led to improved linearity and uniformity of the response.

Electrons and muons were used to set and understand the EM scale and the uniformity of the calorimeter. The pion response shows the expected behaviour with energy. The performance of the real Tile calorimeter modules to pions in terms of linearity and resolution corresponds well to that of earlier Tilecal prototype modules, after accounting for the different lengths and segmentations of the calorimeters.

The experimental results are also compared to several MC simulation samples.

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