

12th Beam Telescopes and Test Beams Workshop



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Study of the ATLAS Tile Calorimeter response to beams of particles using Phase II upgrade readout

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The Large Hadron Collider (LHC) Phase II upgrade aims to increase the instantaneous accelerator luminosity. A new readout system of the ATLAS Tile Calorimeter (TileCal) is needed to meet the trigger's requirements, to cope with the higher radiation levels and the aging of the current electronics. It has to handle longer latencies of up to 35 μ s at such high pileup levels. The upgrade TileCal electronics have been tested during test beam campaigns from the Super Proton Synchrotron (SPS) accelerator at CERN. Data were collected in 2015-2018 and 2021-2023, with beams of muons, electrons and hadrons at various incident energies and impact angles. This presentation summarizes the beam test campaigns, the upgrades of the calorimeter electronics, the trigger and particle identification systems. The results obtained analyzing muon, electron and hadron data are discussed.

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