

8th Beam Telescopes and Test Beams Workshop



Contribution ID: 25

Type: **not specified**

Studies of the response of the ATLAS Tile Calorimeter to beams of particles at the CERN test beams facility

Wednesday 29 January 2020 13:50 (20 minutes)

The Large Hadron Collider (LHC) Phase II upgrade aims to increase the accelerator instantaneous luminosity by a factor of 10. Due to the expected higher radiation levels, aging of the current electronics and to provide the capability of coping with longer latencies of up to 35 μ s needed by the trigger system at such high pileup levels, a new readout system of the ATLAS Tile Calorimeter (TileCal) 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 in 2016-2018 with beams of muons, electrons at various incident energies and impact angles.

This presentation summarizes the setup for particle identification and study of the ATLAS Tile Calorimeter data taking in preparation for the production of main boards and digitizer/shaper boards for the photomultiplier tubes and the results of the analysis of muons data, used to study the dependence of the response on the incident point and angle in the cell and of electron data, used to determine the linearity of the electromagnetic energy measurement.

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Session Classification: Analysis & Simulations