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The Level-1 Tile-Muon Trigger in the Tile Calorimeter Upgrade Program

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This report describes the Tile-Muon Trigger within the TileCal upgrade activities, focusing on the new on-detector electronics such as the Tile Muon Digitizer Board (TMDB) providing (receive and digitize) the signal from eight TileCal modules to three Level-1 muon endcap sector logic blocks.

Summary

The Tile Calorimeter (TileCal) is the central hadronic calorimeter of the ATLAS experiment at the Large Hadron Collider (LHC). The TileCal provides highly-segmented energy measurements for incident particles. Information from TileCal's last radial layer can assist in muon tagging in the Level-1 muon trigger by rejecting fake muon triggers arising from background radiation (slow charged particles - protons) without degrading the efficiency of the trigger. The TileCal main activity for the ATLAS Phase-0 upgrade program (2013-2014) was the activation of the TileCal third layer signal for assisting the muon trigger at $1.0 < |\eta| < 1.3$ (Tile-Muon Trigger).

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