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Upgrade of the ATLAS Tile Calorimeter for the High luminosity LHC

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The Tile Calorimeter (TileCal) is the hadronic calorimeter of ATLAS covering the central region of the ATLAS experiment. TileCal will undergo a major replacement of its on- and off-detector electronics for the high luminosity programme of the LHC in 2024.

The calorimeter signals will be digitized and sent directly to the off-detector electronics, where the signals are reconstructed and shipped to the first level of trigger at a rate of 40 MHz. This will provide a better precision of the calorimeter signals used by the trigger system and will allow the development of more complex trigger algorithms.

Three different options are presently being investigated for the front-end electronic upgrade. Extensive test beam studies will

determine which option will be selected. Field Programmable Gate Arrays (FPGAs) are extensively used for the logic

functions of the off- and on-detector electronics. One hybrid demonstrator prototype module with the new calorimeter

module electronics, but still compatible with the present system, is planned to be inserted in ATLAS by the end of 2015.

Collaboration

ATLAS Tile Calorimeter System

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