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Status and plans for the CMS High Granularity Calorimeter upgrade project

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The CMS Collaboration is preparing to build replacement endcap calorimeters for the HL-LHC era. The new high-granularity calorimeter (HGCAL) was first discussed publicly at CHEF 2013. As the name implies, it is a highly-granular sampling calorimeter with approximately six million silicon sensor channels (˜1.1cmˆ2 or 0.5cmˆ2 cells) and about four hundred thousand channels of scintillator tiles readout with on-tile silicon photomultipliers. The calorimeter is designed to operate in the harsh radiation environment at the HL-LHC, where the average number of interactions per bunch crossing is expected to exceed 140. Besides measuring energy and position of the energy deposits the electronics is also designed to measure the time of their arrival with a precision on the order of 50 ps. Many of the design ideas employed in HGCAL were first developed by the CALICE collaboration in the context of the ILC detectors. We will present the current status of the project, the many lessons learnt so far and our future plans.

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