

System Validation of the SiPM-on-Tile Section of the CMS High Granularity Calorimeter

Gabriele Milella^{1,2},

¹*DESY, Hamburg*

²*University of Hamburg, Hamburg*

In the High Luminosity Large Hadron Collider (HL-LHC), calorimetry, especially in the forward regions, encounters two significant challenges: coping with high levels of radiation and managing an unprecedented number of simultaneous events. To address these issues, the CMS Collaboration is planning to replace its existing endcap calorimeters for the HL-LHC period with the high-granularity calorimeter (HGCAL). This innovative sampling calorimeter will utilize as active materials silicon sensors and scintillator tiles, which are read by silicon photomultipliers (SiPMs).

The fundamental component of the SiPM-on-tile system is the tile module, which includes a Printed Circuit Board (PCB) equipped with one or two HGCROC ASICs, capable of reading a high number of SiPMs. These tile modules have undergone testing in beam experiments at DESY-II and various laboratory trials. The production of these tile modules for the upgrade is scheduled to commence next year. This presentation provides a detailed update on the current progress and future production plans for the SiPM-on-tile segment of HGCAL.