

Developments for the upgrade of the CMS HCAL front-end electronics

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We present an upgrade plan for the CMS HCAL front-end electronics. The HCAL upgrade is required for the increased luminosity of SLHC Phase I which is targeted for 2015. A key aspect of the HCAL upgrade is to add detector segmentation. The increased segmentation is achieved by replacing the hybrid photodiodes (HPDs) with silicon PMTs (SiPMs). We plan to instrument each fiber of the calorimeter with an SiPM (103,000 total). The upgrade plans include replacement of all electronic modules and a new custom ADC with matched sensitivity and timing information.

The increased data volume requires higher speed transmitters. The additional power dissipation for the read-out electronics requires better thermal design, since much of the on-detector infrastructure (front-end electronics crates, cooling pipes, optical fiber plant, etc.) will remain the same. We are considering to use circuits from the Cern MIC group (GBT and DC-DC converter).

We will report on performance requirements and on the preliminary designs.

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