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Progress on the Upgrade of the CMS Hadron Calorimeter Front-End Electronics

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We present a scheme to upgrade the CMS HCAL front-end electronics in the second long LHC shutdown (~2017). The HCAL upgrade is required to handle a major luminosity increase of the LHC that is expected for 2017. A key aspect of the HCAL upgrade is to readout longitudinal segmentation information to improve background rejection, energy resolution, and electron isolation at the L1 trigger. This paper focuses on the requirements for the new electronics and on the proposed solutions. The requirements include increased channel count, additional timing capabilities, and additional redundancy. The electronics are required to operate in a harsh environment and are constrained by the existing infrastructure. The proposed solutions span from chip level to system level. They include the development of a new ADC ASIC, the design and testing of higher speed transmitters to handle the increased data volume, the evaluation and use of circuits from other developments, evaluation of commercial FPGAs, better thermal design and improvements in the overall architecture.

for the collaboration

CMS Hcal Collaboration

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