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CMS-HF Calorimeter Upgrade for Run II

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CMS-HF Calorimeters have been undergoing a major upgrade for the last couple of years to alleviate the problems encountered during Run I, especially in the PMT and the readout systems. In this poster, the problems caused by the old PMTs installed in the detectors and their solutions will be explained. Initially, regular PMTs with windows thick enough to cause Cherenkov radiation were used. Instead of the light coming through the fibers from the detector, stray muons passing through the PMT itself produce Cherenkov radiation in the PMT window, resulting in erroneously large signals. Usually, large signals are the result of very high-energy particles in the calorimeter and are tagged as important. As a result, these so-called "window events"generate false triggers. Four-anode PMTs with thinner windows were selected to reduce these "window events."Additional channels also help eliminate such remaining events through some algorithms comparing the output of different PMT channels. During the EYETS 16/17 period in the LHC operations, the final components of the modifications to the readout system, namely the two-channel front-end electronics cards, are installed. Complete upgrade of the HF Calorimeter, including the preparations for the Run II will be discussed in this poster, with possible effects on the eventual data taking.

Summary

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