

The CMS Fast Beam Condition Monitor at the HL-LHC

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To face the heightened requirements of real-time and precision bunch-by-bunch luminosity determination and beam-induced background monitoring at the High-Luminosity LHC, the CMS BRIL project constructs a stand-alone luminometer, the Fast Beam Condition Monitor (FBCM). It will be fully independent from the CMS central timing, trigger and data acquisition services and able to operate at all times with a fast triggerless readout. The CO₂-cooled silicon-pad sensors will be connected to a dedicated front-end ASIC to amplify the signals and provide a few ns timing resolution. FBCM is based on a modular design, adapting several electronics components from the CMS Tracker for power, control and read-out functionalities. The 6-channel FBCM23 ASIC outputs a single binary high-speed asynchronous signal carrying the Time-of-Arrival and Time-over-Threshold information. The prototype chip is under extensive tests. The detector design and the results of the first validation tests are reported.

Alternate track

I read the instructions above

Yes

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