

Fast Beam Conditions Monitoring (BCM1F) for CMS.

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The CMS Beam Conditions and Radiation Monitoring System (BRM) is composed of different subsystems that perform monitoring of, as well as providing the CMS detector protection from, adverse beam conditions inside and around the CMS experiment. This paper presents the Fast Beam Conditions Monitoring subsystem (BCM1F), which is designed for fast flux monitoring based on bunch by bunch measurements of both beam halo and collision product contributions from the LHC beam. The BCM1F is located inside the CMS pixel detector volume close to the beam-pipe and provides real-time information. The detector uses sCVD (single-crystal Chemical Vapor Deposition) diamond sensors and radiation hard front-end electronics, along with an analog optical readout of the signals.

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