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A study of Quartz Cherenkov Detectors in the Forward Region of CMS at LHC

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Abstract
In forward regions of high energy colliders (e.g. LHC), near the direction of the beams, the detectors need to have excellent resolving times, high-rate readout and resistance to radiation. Among various detector schemes proposed for these applications, combinations of Cherenkov radiators (like quartz, sapphire, etc.) with fast photodetectors (PMT, MCP, SiPM, etc) have been considered. Quartz-based calorimeters are already employed at CMS in the forward direction. For single particle detection, quartz bar arrays (QUARTIC) have been proposed. We report here on results obtained with an operating prototype of these detectors, installed near the LHC beam pipe close to the CMS experiment at CERN LHC during a period of 13 TeV pp collisions in 2018.

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