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Data Quality Monitoring System for New GEM Muon Detectors for the CMS Experiment Upgrade ROBERT KING, Texas AM University, CMS MUON GROUP TEAM — The Gas Electron Multiplier (GEM) detectors are novel detectors designed to improve the muon trigger and tracking performance in CMS experiment for the high luminosity upgrade of the LHC. Partial installation of GEM detectors is planned during the 2016-2017 technical stop. Before the GEM system is installed underground, its data acquisition (DAQ) electronics must be thoroughly tested. The DAQ system includes several commercial and custom-built electronic boards running custom firmware. The front-end electronics are radiation-hard and communicate via optical fibers. The data quality monitoring (DQM) software framework has been designed to provide online verification of the integrity of the data produced by the detector electronics, and to promptly identify potential hardware or firmware malfunctions in the system. Local hits reconstruction and clustering algorithms allow quality control of the data produced by each GEM chamber. Once the new detectors are installed, the DQM will monitor the stability and performance of the system during normal data-taking operations. We discuss the design of the DQM system, the software being developed to read out and process the detector data, and the methods used to identify and report hardware and firmware malfunctions of the system.

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