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The upgrade and re-validation of the Compact Muon Solenoid Electromagnetic Calorimeter Control and Safety Systems during the second Long Shutdown of the Large Hadron Collider at CERN

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The Electromagnetic Calorimeter (ECAL) is one of the sub-detectors of the Compact Muon Solenoid (CMS), a general-purpose particle detector at the CERN Large Hadron Collider (LHC). The CMS ECAL Detector Control System (DCS) and the CMS ECAL Safety System (ESS) have supported the detector operations and ensured the detector's integrity since the CMS commissioning phase, more than 10 years ago. Over this long period, several changes to both systems were necessary to correct issues, extend functionality and keep them in-line with current hardware technologies and the evolution of software platforms. Due to the constraints imposed on significant changes to a running system, major hardware and software upgrades were therefore deferred to the second LHC Long Shutdown (LS2). This paper presents the architectures of the CMS ECAL control and safety systems, discusses the ongoing and planned upgrades, details implementation processes and validation methods and highlights the expectations for the post-LS2 systems.

Consider for promotion

Yes

Authors: Mr DI CALAFIORI, Diogo (ETH Zurich (CH)); Mr JIMENEZ ESTUPINAN, Raul (ETH Zurich (CH)); Mr ZELEPUKIN, Serguei (University of Wisconsin Madison (US) / ETH Zurich); Dr LUSTERMANN, Werner (ETH Zurich (CH)); Prof. DISSERTORI, Guenther (ETH Zurich (CH)); TSIROU, Andromachi (CERN); VERDINI, Piero Giorgio (INFN Sezione di Pisa, Universita' e Scuola Normale Superiore, P)

Presenter: Mr JIMENEZ ESTUPINAN, Raul (ETH Zurich (CH))

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