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Continuous and fast calibration of the CMS experiment: design of the automated workflows and operational experience

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The exploitation of the full physics potential of the LHC experiments requires fast and efficient processing of the largest possible dataset with the most refined understanding of the detector conditions. To face this challenge, the CMS collaboration has setup an infrastructure for the continuous unattended computation of the alignment and calibration constants, allowing for a refined knowledge of the most time-critical parameters already a few hours after the data have been saved to disk. This is the prompt calibration framework which, since the beginning of the LHC RunI, enables the analysis and the High Level Trigger of the experiment to consume the most up-to-date conditions optimizing the performance of the physics objects. In RunII this setup has been further expanded to include even more complex calibration algorithms requiring higher statistics to reach the needed precision. This imposed the introduction of a new paradigm in the creation of the calibration datasets for unattended workflows and opened the door to a further step in performance.

The presentation reviews the design of these automated calibration workflows, the operational experience in RunII and the monitoring infrastructure developed to ensure the reliability of the service.

Primary Keyword (Mandatory)

Data processing workflows and frameworks/pipelines

Secondary Keyword (Optional)

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Authors: CERMINARA, Gianluca (CERN); ORAMUS, Piotr Karol (AGH University of Science and Technology (PL))

Co-authors: PFEIFFER, Andreas (CERN); GOVI, Giacomo (Fermi National Accelerator Lab. (US)); FRANZONI, Giovanni (CERN); Dr MUSICH, Marco (Universite Catholique de Louvain (UCL) (BE)); DI GUIDA, Salvatore (Universita degli Studi Guglielmo Marconi (IT))

Presenter: ORAMUS, Piotr Karol (AGH University of Science and Technology (PL))

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