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Simulation of the CMS GEM System

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The new GE1/1 system of Gas Electron Multipliers (GEM) is going to be installed in the CMS detector in the forward region of $1.6 < |\eta| < 2.2$ after the second long LHC shutdown. 36 super-chambers are planned to be installed in order to ensure the redundancy and robustness of the muon system in high-luminosity conditions at the LHC. A further extension of the GEM system is also considered. Every super-chamber consists of two chambers segmented over certain number of readout sectors in a (η, φ) plane, where η is the pseudo-rapidity and φ is the azimuthal angle. The simulation of the entire GEM system integrated in the common CMS reconstruction chain is a necessary part of the performed Monte Carlo studies. A dedicated parametric model based on the exhaustive standalone MC studies and experimental test beam results has been developed in order to simulate the response of the GEM system. The simulated digital readout signals are used to build the reconstructed hits in the detector planes. They have been included in the common CMS muon reconstruction algorithms. This contribution will present the developed simulation model and the importance of the GEM system for the improvement of the muon reconstruction efficiency and muon identification.

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Classifica Sessioni: Poster session & coffee break

Classificazione della track: Simulation and Software