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Muon Reconstruction and Identification in CMS

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Muonic final states will provide clean signatures for many physics processes at the LHC. One of the main goals of the Compact Muon Solenoid (CMS) design is thus to ensure efficient and accurate identification and reconstruction of muons. A sophisticated muon system is used for muon identification and stand-alone reconstruction and the inner silicon tracker exploits the high magnetic field to ensure a very precise transverse momentum resolution. The global reconstruction algorithms combine muons reconstructed in the dedicated spectrometer with tracks reconstructed in the inner detector. The CMS reconstruction software is well suited for both offline reconstruction and online event selection (HLT) and its performance has been studied in detail using Monte Carlo simulations. The muon reconstruction has also been employed successfully to reconstruct cosmic muons traversing the CMS detector. The design of the CMS muon identification and reconstruction is presented, as well as its performance on simulated and cosmic data.

Primary author: Dr KONECKI, Marcin (Institute of Experimental Physics, University of Warsaw, Warsaw, Poland)

Presenter: Dr KONECKI, Marcin (Institute of Experimental Physics, University of Warsaw, Warsaw, Poland)

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