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Calibration, alignment and tracking performance of the CMS Silicon Strip Tracker

Monday 15 February 2010 17:00 (25 minutes)

We present results of the CMS Silicon Tracker commissioning and calibration procedures including full alignment in its final position based on several million reconstructed tracks, recorded during commissioning of the CMS experiment with cosmic rays in 2008 and 2009. Outlook for calibration and alignment with first collision data in 2009-2010 and expected tracking performance will be given.

The complex system of the CMS all-silicon Tracker with 15148 silicon strip and 1440 silicon pixel modules requires sophisticated calibration and alignment procedures. The recorded data allow a careful study of Tracker performance and reconstruction strategies under various operation conditions. In order to achieve optimal track-parameter resolution, the position and orientation of its modules need to be determined with a precision of several micrometers. The ultimate precision has been achieved in a multi-step multi-algorithm procedure by combining data from the charge deposition in the modules induced by traversing muons and from survey measurements.

The achieved resolution in all five track parameters is controlled with data-driven validation of the track parameter measurements near the interaction region, and tested against prediction with detailed detector simulation. Systematic effects are investigated.

Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):

http://mweber.web.cern.ch/mweber/vci/vci2010_long.pdf

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