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Alignment of the CMS Tracker: Latest Results from LHC Run-II

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The all-silicon design of the tracking system of the CMS experiment provides excellent resolution for charged tracks and an efficient tagging of jets. As the CMS tracker, and in particular its pixel detector, underwent repairs and experienced changed conditions with the start of the LHC Run-II in 2015, the position and orientation of each of the 15148 silicon strip and 1440 silicon pixel modules needed to be determined with a precision of several micrometers. The alignment also needs to be quickly recalculated each time the state of the CMS magnet is changed between 0T and 3.8T. Latest Run-II results of the CMS tracker alignment and resolution performance are presented that were obtained using several million reconstructed tracks from collisions and cosmic rays data of 2015 and 2016. The geometries and the resulting performance of physics observables are finally carefully validated with data-driven methods.

Tertiary Keyword (Optional)

Algorithms

Secondary Keyword (Optional)

Analysis tools and techniques

Primary Keyword (Mandatory)

Reconstruction

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