

First alignment of the Run 3 CMS tracker with cosmic rays

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After the long shutdown preparing the CMS detector for Run 3, the tracker alignment constants, namely position, orientation, and curvature of each of the 15148 tracker modules that compose the tracking system need to be derived again with a high precision in order to ensure a good performance of the detector for physics analysis. This process constitutes a major computational challenge due to the enormous number of degrees of freedom involved. The latest public results of the CMS tracker alignment performance corresponding to the very first alignment with cosmic rays, derived after the work in the underground experimental cavern was finished, will be presented. The workflows, turnarounds, the so-called automated alignment, and the use of CMS CERN Analysis Facilities (CAF) for the derivation of the alignment conditions will also be discussed.

Presenter: LEYVA PERNIA, Daina (CMS (CMS Fachgruppe HIGGS))

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