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Track-based alignment of the CMS Muon System AUSTIN SCHNEIDER, VADIM KHOTILOVICH, YURIY PAKHOTIN, ALEXEI SAFONOV, AYSEN TATARINOV, CMS, CMS COLLABORATION — The Muon system of the Compact Muon Solenoid (CMS) Detector at the Large Hadron Collider (LHC) is comprised of 250 Drift Tube (DT) and 468 Cathode Strip (CSC) Chambers. These detectors identify muons, provide a fast muon trigger, and are used to measure muon trajectories. The latter allows improvement of the momentum resolution for highly energetic muons compared to resolutions obtained with the central CMS silicon tracker alone. Performance of the Muon system depends on precise knowledge of the positions of each of the muon tracking elements within the CMS detector. We describe the techniques used to align the Muon system elements with high precision and quantify the accuracy of the alignment procedure. The current baseline algorithm provides an in-situ alignment of the system using tracks from the pp collision data. We particularly emphasize the software environment design and tools built to measure and validate positions of the muon detectors.

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None

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