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An automation framework for the calibration of the CMS Precision Proton Spectrometer

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The Precision Proton Spectrometer (PPS) is a near-beam spectrometer that utilizes timing and tracking detectors to measure scattered protons surviving collisions at the CMS interaction point (IP). It is installed on both sides of CMS, approximately 200 meters from the IP, within mechanical structures called Roman Pots. These special beam pockets enable the detectors to approach the LHC beam within a few millimeters of its center. Due to the challenging environment, PPS detectors require frequent calibrations and close monitoring.
This talk will introduce an automation software framework designed to streamline the calibration process, reducing the time users spend on these tasks, facilitating their implementation, and enhancing the monitoring of their execution and results. Developed alongside other CMS subsystems, the framework supports multi-stage calibrations that leverage CERN's distributed computing resources to run containerized tasks. Industry-grade tools such as Jenkins, InfluxDB, and Grafana are employed for monitoring the calibration execution and storing results, which can further be processed to identify anomalies in the data quality.

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