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Status and perspective of the CMS Precision Proton Spectrometer timing system

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The CMS Proton Precision Spectrometer (PPS), operating at the LHC, measures the kinematics of protons scattered in the very forward region with 3D silicon tracking stations. To reconstruct the longitudinal position of the proton interaction vertex and to suppress pile-up background, a timing detector based on planar single crystal CVD diamond has been developed, with a dedicated amplification and readout chain able to sustain a particle fluency of ˜1 MHz/channel. The detector operates in a secondary vacuum at few millimeters from the circulating beam, exposed to a highly non-uniform irradiation. In Run 2, detectors were exposed to local peaks above $10^{16} neq/cm^2$, a similar value is expected in the ongoing Run 3. In this talk a description of the timing system in the Run3 will be provided. Data reconstruction techniques will be briefly reported together with a discussion on the results obtained so far. The extension of the PPS detector to the HL-LHC is under discussion. The requirements on the new timing sensor will be presented.

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