Contribution ID: **222** Type: **Poster**

PPS2: a new precision proton spectrometer for CMS at HL-LHC

The CMS experiment has been successfully operating the Precision Proton Spectrometer (PPS) since 2016 to study central exclusive production (CEP) events, pp⟶pXp, at the LHC via the detection of the surviving protons. CEP allows unique sensitivity to physics beyond the standard model, e.g. in the search for anomalous quartic gauge couplings, axion-like particles, and in general new resonances. Currently PPS operates near beam tracking and timing detectors installed at ~200m from the interaction point inside dedicated stations. Since in the next years the accelerator will undergo a significant upgrade towards very high luminosity performances (HL-LHC), the CMS collaboration recently decided to build a new proton spectrometer (PPS2) to continue the physics program profiting of the new high luminosity regime. The talk will describe the physics motivation of PPS2, the detector design and the challenges of the integration of the apparatus inside the new accelerator facility.

Secondary track

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Session Classification: T11

Track Classification: T11 - Detectors