

CMS Phase-2 Inner Tracker Upgrade

Thursday, May 27, 2021 5:48 AM (18 minutes)

The HL-LHC conditions of instantaneous peak luminosity up to $7.5 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ and an integrated luminosity of the order of $300 \text{ fb}^{-1}/\text{year}$ would result in 1 MeV neutron equivalent fluence of $2.3 \times 10^{16} \text{ neq/cm}^2$ and a total ionizing dose (TID) of 12MGy (1.2 Grad) at the center of CMS, where its innermost component, the Phase-2 Pixel Detector will be installed. The detector should survive the above radiation dose, handle hit rates of 3 GHz/cm^2 at lowest radius, be able to separate and identify particles in extremely dense collision debris, deal with a pileup of 140-200 collisions per bunch crossing and have high impact parameter resolution. This translates into a highly granular detector design with thinner sensors and smaller pixels, and a faster and radiation hard electronics compared to the Phase-1 counterpart. This presentation focuses reviews the Phase-2 upgrade of the CMS silicon pixel detector focusing on the features of the detector layout and on developments of pixel devices.

TIPP2020 abstract resubmission?

Funding information

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Session Classification: Experiments: Trackers

Track Classification: Experiments: Experiments: Trackers