

Phase 1 CMS Pixel Detector Upgrade

Monday, 10 June 2013 13:36 (18 minutes)

The CMS pixel detector is a tracking device located closest to the interaction point. The present detector was designed for a maximum luminosity of $1 \times 10^{34} \text{ cm}^{-2} \text{s}^{-1}$. Following the Phase 1 upgrade of the LHC, the peak luminosity is foreseen to reach $2 \times 10^{34} \text{ cm}^{-2} \text{s}^{-1}$ or higher. Due to the radiation damage and significant data losses in the readout chip, the present pixel system must be replaced by a new one in order to maintain the excellent tracking and physics performance of the detector. The main new features of the upgraded pixel detector would be ultra-light mechanical design with four barrel layers and three end-cap disks, digital readout chip with higher rate capability and new cooling system. Motivations for the upgrade of the pixel detector as well as the features of the proposed detector will be presented.

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Session Classification: Session 1