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Overview and Present Status of the CMS Phase 1 Pixel Upgrade

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The silicon pixel detector is the innermost component of the CMS tracking system, providing high precision space point measurements of charged particle trajectories. Before 2018 the instantaneous luminosity of the LHC is expected to reach about $2 \times 10^{34} \text{cm}^{-2}\text{s}^{-1}$, which will significantly increase the number of interactions per bunch crossing. To maintain a high tracking efficiency, CMS has planned to replace the current pixel system during Phase 1 by a new lightweight detector, equipped with an additional 4th layer in the barrel, and one additional forward/backward disk. A new readout chip (ROC PSI_dig) has been designed, with increased data buffers and a digital readout protocol to increase the readout speed. The present status of the project will be presented, including preliminary results from tests on pre-production pixel modules and the organization and milestones for the construction of the new Pixel Tracker.

Collaboration

CMS

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