



Contribution ID : 216

Type : Oral presentation

## Status and plan for the upgrade of CMS Pixel Detector

*Saturday, 5 July 2014 16:15 (20)*

The silicon pixel detector is the innermost component of the CMS tracking system and plays a crucial role in the all-silicon CMS tracker.

While the current pixel tracker is designed for and performing well at an instantaneous luminosity of up to  $1 \cdot 10^{34} \text{cm}^{-2} \text{s}^{-1}$ , it can no longer be operated efficiently at significantly higher values. Based on the strong performance of the LHC accelerator, it is anticipated that peak luminosities of two times the design luminosity are likely to be reached before 2018 and perhaps significantly exceeded in the running period until 2022, referred to as Phase I.

Therefore an upgrade is planned for the year-end technical stop in 2016: With a new pixel readout chip (ROC), an additional fourth layer, two additional endcap disks, and a significantly reduced material budget the upgraded pixel detector will be able to sustain the efficiency of the pixel tracker at the increased requirements imposed by high luminosities and pile-up. The main new features of the upgraded pixel detector would be ultra-light mechanical design, digital readout chip with higher rate capability and new cooling system. These and other design improvements, along with results of Monte Carlo simulation studies for the expected performance of the new pixel detector will be discussed and compared to that of the current CMS detector.

### Summary

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**Session Classification** : Detector RD and Performance

**Track Classification** : Detector RD and Performance