

## **A New Pixel Detector for the CMS Experiment**

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Silicon pixel detectors are a key component of today's particle physics detectors: they are instrumental in the precision reconstruction of charged particle tracks and vertices. Installed at the heart of the LHC experiments, pixel detectors have been operated successfully since the beginning of the LHC data-taking in late 2009. Within the next decade the LHC machine and experiments will undergo several upgrades to maximize the physics output of the LHC. The LHC experiments aim at comparable detector performance in a significantly more difficult environment. The main challenge for the tracking detectors lies in the increased particle flux, which reduces the performance due to high data rates and limits the detector longevity because of radiation damage.

The CMS collaboration is preparing an upgrade of the CMS pixel detector to be installed after 2016. The new detector will be an evolution of the current pixel detector: an additional detector layer will be added, yet the material budget will be reduced, and the readout chain will be improved to cope with the higher data rate. In my presentation I will review design and performance of the current CMS pixel detector, discuss the lessons learned from operating the detector and outline the road to a new pixel detector for the CMS experiment.