

Pixel Sensors with slim edges and small pitches for the CMS upgrades for HL-LHC

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The CMS experiment will build a third generation Pixel detector for the HL-LHC. The foreseen integrated luminosity of 3000 1/fb together with the high particle rates demands sensors with higher granularity and a sensor design with limited dead area surrounding the active Pixel array. This contribution will cover the recent development of pixelated sensors with the regular 100 um pitch and with pitches reduced to 50 and 25 um. Moreover, results will also be shown from silicon sensors where the inactive area surrounding the pixel array has been reduced to 200 um. The devices were first characterized in terms of DC performance at the probe station, mounted on readout boards and exposed to 120Gev protons at the Fermilab Test Beam Facility. The contribution will include the bench characterization of the devices and the measurements of their tracking performances, in terms of efficiency and resolution, as measured in the beam. The prototypes were irradiated at the CERN PS irradiation facility and their performance post-irradiation will also be presented.

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