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Pixel sensors for the CMS phase-II upgrade

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The high luminosity phase of the Large Hadron Collider (HL-LHC) requires a major pixel detector R&D effort to develop both readout chip and sensor that are capable to withstand unprecedented extremely high radiation damage. The target integrated luminosity of 3000 fb⁻¹, that the HL-LHC is expected to deliver over about 10 years of operation, translates into a hadron fluence of 2×10^{16} 1MeV eq. n / cm² at about 3 cm from the interaction region where the first layer of the pixel detector could be located, and to a radiation dose of 10 MGy for the readout chip. The CMS collaboration has undertaken two baseline sensor R&D programs on thin n-in-p planar and 3D Silicon sensor technologies. Alternative technologies are also being investigated such as polycrystalline Diamond and HV-CMOS. Status, progresses, and prospects of this effort will be discussed.

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