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Investigation of hit efficiency of n-in-p pixels with different designs

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We present results of n-in-p pixel sensor prototypes of 100 to 270 μm thickness with different designs, focusing on alternative implementations of punch-through structures. A comparative study has been performed on pixel modules by means of radioactive sources and beam test measurements at the CERN-SPS and DESY. The results of these measurements will be discussed for devices irradiated up to a fluence of 3e15 neq cm-2. In addition, the charge collection properties at different depths inside the silicon bulk have been studied before and after irradiation with the grazing angle technique. The results will be compared to predictions of TCAD simulations. Charge collection and power dissipation properties have been investigated as a function of different operational temperatures.

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