

Thin n-in-p planar pixel sensor productions at MPP

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New productions of thin n-in-p pixel sensors designed at MPP will be presented.

Sensors in the thickness range between 50 and 150 μm have been produced at ADVACAM on SOI wafers with slim or active edges. Evaluation assemblies have been measured by means of radioactive source scans and beam tests.

The performance after irradiation in terms of hit efficiency of different pixel cell designs will be discussed.

The main focus is the optimization of the punch-through and bias rails to limit the loss of efficiency caused by these structures at high levels of irradiation.

The results have been used in the design of the sensors for the new RD53 read-out chips implemented in the coming productions at MPG-HLL and CIS.

Measurements of charge collection at different depths in the pixel sensor bulk have been obtained with the grazing angle technique for n-in-p pixel sensors.

This analysis also allows for the determination of hit efficiency with small pixel pitches in the high pseudo-rapidity range of the new pixel systems at HL-LHC.

Primary author: SAVIC, Natascha (Max-Planck-Institut fuer Physik (Werner-Heisenberg-Institut) (D))

Presenter: SAVIC, Natascha (Max-Planck-Institut fuer Physik (Werner-Heisenberg-Institut) (D))

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