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Recent Results of VTT's Edgeless Detector Prototypes

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During past five years VTT has actively developed edgeless detector fabrication process. Our straightforward and high yield process relies on ion-implantation to active the edges of the detector. The presentation covers latest edgeless pixel detector prototype results from CERN's SPS beam test and X-ray response characterization. In these evaluations 150 um thick n-on-n edgeless detectors have been flip-chip bonded to Medipix2 and Timepix readouts. The focus of the characterization has been in evaluation of the edge response. The results demonstrate that VTT's edgeless pixel detectors can reliable construct X-ray images and track minimum ionizing particles without information loss at the edge regions. These detectors are suitable for seamless tiling to construct a large area imaging detector. During 2010, latest fabrication process was performed for p-on-n edgeless detectors. The layout contained DC- and AC-coupled strip detectors and pixel detectors for Medipix/Timepix readouts. The fabricated detector thicknesses were 50, 100 and 150 um. The presentation covers electrical characterization results of the edgeless diodes, comprising leakage current, capacitance and breakdown voltage measurements. The results are compared with TCAD simulations of the diode structures to understand the found thickness dependences of the electrical properties.

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