



Contribution ID: 32

Type: **Live Presentation**

Performance Evaluation of Stitched Passive CMOS Strip Sensors

Thursday 24 February 2022 15:15 (20 minutes)

Silicon sensors will continue to be the central tracking elements for upcoming particle physics detectors. They will have to cover large areas and thus be a main cost driver. The currently used silicon sensors are available only from very few manufacturers, thus detector technologies and designs that can be realized through established commercial industrial production processes and are cost-effective are becoming increasingly relevant. The CMOS technology is one of the important candidates. Since typically CMOS foundries are equipped for producing much smaller sizes than the currently used wafer-scale strip sensors, several neighboring reticles have to be connected via a stitching process to obtain large sensors.

In this contribution strip sensors were designed and developed with the passive p-CMOS 150nm process including stitching of up to five reticles. The sensors are processed on a 150 μm thick wafer and are up to 4 cm long. There were two batches of sensors produced and investigated, of which the second batch had an improved backside processing to enhance the HV stability.

After initial electrical characterizations the sensors were tested in the laboratory with a ^{90}Sr source and infrared lasers. The key investigation was to evaluate the impact of stitching on the sensor performance. The presented results will demonstrate that the stitching does not show any negative effect on the sensor performance and the stitching process is successful.

Primary experiment

Primary authors: RODRIGUEZ RODRIGUEZ, Arturo (Albert Ludwigs Universitaet Freiburg (DE)); DIEHL, Leena (Albert Ludwigs Universitaet Freiburg (DE)); SPERLICH, Dennis (Albert Ludwigs Universitaet Freiburg (DE)); GREGOR, Ingrid-Maria (DESY & Bonn University); HONIG, Jan Cedric (Albert Ludwigs Universitaet Freiburg (DE)); JAKOBS, Karl (Albert Ludwigs Universitaet Freiburg (DE)); WIJK-FUCHS, Liv (Albert Ludwigs Universitaet Freiburg (DE)); SHARMA, Surabhi (Deutsches Elektronen-Synchrotron (DE)); MÄGDEFESSEL, Sven (University Freiburg); WANG, Tianyang (University of Bonn (DE)); HEMPEREK, Tomasz (University of Bonn (DE)); PARZEFALL, Ulrich (Albert Ludwigs Universitaet Freiburg (DE))

Presenter: DIEHL, Leena (Albert Ludwigs Universitaet Freiburg (DE))

Session Classification: Semiconductor Detectors

Track Classification: Semiconductor Detectors