Contribution ID: **15** Type: **not specified**

Simulation of CMOS Strip Sensors

Thursday 8 May 2025 10:15 (25 minutes)

In high-energy physics, there is a need to investigate silicon sensor concepts that offer large-area coverage and cost-efficiency for particle tracking detectors. Sensors based on CMOS imaging technology present a promising alternative silicon sensor concept.
As this technology follows a standardised industry process, it can provide lower sensor production costs and enable fast and large-scale production from various vendors.

The CMOS Strips project is investigating passive CMOS strip sensors fabricated by LFoundry in a 150nm technology.
The stitching technique was employed to develop two different strip sensor formats.
The strip implant layout varies in doping concentration and width, allowing the study of various electric field configurations.

The performance of irradiated and unirradiated samples was evaluated based on several test beam campaigns conducted at the DESY II test beam facility. The detector response was also simulated using Monte Carlo methods combined with TCAD Device simulations.

This contribution demonstrates how performance differences of the various strip sensor layouts can be investigated using Allpix^2 simulations.
In particular, the simulated detector response is presented and compared to test beam data.

Will the talk be given in person or remotely?

In person

Author: DAVIS, Naomi (Deutsches Elektronen-Synchrotron (DE))

Co-authors: VELYKA, Anastasiia; SPERLICH, Dennis (Albert Ludwigs Universitaet Freiburg (DE)); HUEGGING, Fabian (University of Bonn (DE)); LEX, Fabian Simon (University of Freiburg (DE)); GREGOR, Ingrid-Maria (DESY & Bonn University); ZATOCILOVA, Iveta (University of Freiburg (DE)); ARLING, Jan-Hendrik (Deutsches Elektronen-Synchrotron (DE)); WEINGARTEN, Jens (Technische Universitaet Dortmund (DE)); DINGFELDER, Jochen Christian (University of Bonn (DE)); JAKOBS, Karl (University of Freiburg (DE)); KROENINGER, Kevin Alexander (Technische Universitaet Dortmund (DE)); DIEHL, Leena (CERN); HAUSER, Marc (University of Freiburg (DE)); BASELGA, Marta (Technische Universitaet Dortmund (DE)); KARAGOUNIS, Michael (Fachhochschule Dortmund Univ. of Applied Sciences and Arts (DE)); SORGENFREI, Niels (CERN / University of Freiburg (DE)); KOPPENHÖFER, Roland (University of Freiburg (DE)); SPANNAGEL, Simon (Deutsches Elektronen-Synchrotron (DE)); PARZEFALL, Ulrich (University of Freiburg (DE)); WEI, Yingjie (University of Freiburg (DE))

Presenter: DAVIS, Naomi (Deutsches Elektronen-Synchrotron (DE))

Session Classification: Applications and studies

Track Classification: Applications & Studies