Contribution ID: **29** Type: **WG4 - Simulations**

Simulating monolithic active pixel sensors: A technology-independent approach using generic doping profiles

Thursday 20 June 2024 16:00 (20 minutes)

The optimisation of the charge collection behaviour in the sensitive region of CMOS sensors with nonlinear electric fields requires precise simulations, and this can be achieved by a combination of finite-element electrostatic field simulations and Monte Carlo methods.
This talk aims to demonstrate that by making basic assumptions and performing simulations based on the fundamental principles of silicon detectors and using generic doping profiles, performance parameters of MAPS can be inferred and compared for different sensor geometries. A procedure for this will be described in detail, along with example results. The described procedure utilises Sentaurus TCAD together with Allpix Squared, and serves as a toolbox for performing sensor response simulations without detailed knowledge of the sensor doping concentrations and manufacturing process.

Type of presentation (in-person/online)

online presentation (zoom)

Type of presentation (scientific results or project proposal)

Presentation on scientific results

Primary authors: SIMANCAS, Adriana (Deutsches Elektronen-Synchrotron (DE)); VELYKA, Anastasiia (Deutsches Elektronen-Synchrotron (DE)); RASTORGUEV, Daniil; DANNHEIM, Dominik (CERN); ECKSTEIN, Doris (Deutsches Elektronen-Synchrotron (DE)); FEINDT, Finn (Deutsches Elektronen-Synchrotron (DE)); VIGNOLA, Gianpiero (Deutsches Elektronen-Synchrotron (DE)); WENNLÖF, Håkan (Deutsches Elektronen-Synchrotron (DE)); GREGOR, Ingrid-Maria (DESY & Bonn University); DORT, Katharina (CERN, Justus-Liebig-Universitaet Giessen (DE)); MENDES, Larissa Helena (Deutsches Elektronen-Synchrotron (DE)); HUTH, Lennart (Deutsches Elektronen-Synchrotron (DE)); DEL RIO VIERA, Manuel Alejandro (Deutsches Elektronen-Synchrotron (DE)); STANITZKI, Marcel (Deutsches Elektronen-Synchrotron (DE)); SCHÜTZE, Paul (Deutsches Elektronen-Synchrotron (DE)); RUIZ DAZA, Sara (Deutsches Elektronen-Synchrotron (DE)); SPANNAGEL, Simon (Deutsches Elektronen-Synchrotron (DE)); LACHNIT, Stephan (Deutsches Elektronen-Synchrotron (DE)); SNOEYS, Walter (CERN)

Presenter: WENNLÖF, Håkan (Deutsches Elektronen-Synchrotron (DE))

Session Classification: WG4 - Simulations