

12th Beam Telescopes and Test Beams Workshop



Contribution ID: 48

Type: Talk

Timing studies of MAPS in 65 nm imaging process

Tuesday 16 April 2024 10:20 (20 minutes)

The goal of the TANGERINE project is to develop the next generation of monolithic silicon pixel detectors using a 65 nm CMOS imaging process, which offers a higher logic density and overall lower power consumption compared to currently utilized feature sizes.

The Analogue Pixel Test Structure (APTS) are sensors designed and developed by ALICE with readout boards developed by CERN EP R&D using a 65 nm imaging process to study the capabilities of this technology. In order to study the temporal development of charge collection, the sensor is tested at the DESY-II test beam facility. For each hit produced by an incident particle, the analogue signal output is recorded using an oscilloscope and analyzed offline, including information from the track reconstruction. The results of this analysis are compared with studies obtained through Technology Computer-Aided Design (TCAD) and Monte Carlo (MC) simulations. Through the use of generic doping profiles, the electric fields and electrostatic potentials are calculated with TCAD and imported into the Allpix Squared framework which allows high statistic and realistic simulations.

In this contribution, the sensor and setup, results obtained at the DESY-II Test Beam facility, laboratory characterization measurements using Fe-55 and a comparison with simulations will be presented

Primary authors: SIMANCAS, Adriana (Deutsches Elektronen-Synchrotron (DE)); VELYKA, Anastasiia (Deutsches Elektronen-Synchrotron (DE)); RECKLEBEN, Christian (Deutsches Elektronen-Synchrotron (DE)); RAS-TORGUEV, Daniil (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); SCHLAADT, Judith; MENDES, Larissa; HUTH, Lennart (Deutsches Elektronen-Synchrotron (DE)); DEL RIO VIERA, Manuel Alejandro (Deutsches Elektronen-Synchrotron (DE)); RUIZ DAZA, Sara (Deutsches Elektronen-Synchrotron (DE)); SPANNAGEL, Simon (Deutsches Elektronen-Synchrotron (DE)); SNOEYS, Walter (CERN); HE, Yajun (Deutsches Elektronen-Synchrotron DESY)

Presenter: DEL RIO VIERA, Manuel Alejandro (Deutsches Elektronen-Synchrotron (DE))

Session Classification: Simulation