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Simulation for an all silicon tracker for CLIC

CLIC is a possible future electron-positron linear collider with center-of-mass energies up to 3 TeV. The prospect of high precision measurements at CLIC imposes challenging specifications for the CLIC detector. The current CLIC detector concept is based on an all silicon tracker.

In this context a simulation chain has been setup to study the performance of different silicon sensor layouts. This simulation chain includes a charge deposit simulation with GEANT4 and a finite element simulation of the charge drift and signal formation with TCAD. In addition the effect of energy fluctuations and electronic noise on the readout signals are included. The readout signals are further used for position reconstruction, taking into account different readout schemes. Using this framework, the effect of various incident angles of the charged particles with respect to the sensor surface as well as the effect of the magnetic field on the sensor performance have been investigated. The simulation chain is validated with data.

Results from the simulation as well as the validation of the simulation with data are presented.

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