



Contribution ID: 12

Type: **not specified**

Fast calculation of capacitances in planar pixel and strip silicon sensors

Thursday, 13 June 2019 13:50 (20 minutes)

We present a program for fast calculation of capacitances in planar silicon pixel (strip) sensors, based on a 3D (2D) numerical solution of the Laplace equation. A comparison between calculated capacitances and measurements on silicon strip sensors, along with simulation results obtained with the TCAD Sentaurus suite are presented. The validity of 2D calculations is checked with measurements on a Multi-Geometry Silicon Strip Detector (MSSD) developed as a test structure during the CMS HPK campaign toward the specifications of silicon sensors for the CMS Phase-II Tracker. The agreement between calculations and measurements is $\sim 20\%$, while CPU time for a typical 2 GHz, 4 Core processor is below 5 min. In addition, our work includes calculations for various configurations of pixel geometry. The program is a useful tool for fast estimation of interstrip, interpixel and backplane capacitances before an embarkation to more sophisticated programs is launched.

Primary authors: ASSIOURAS, Panagiotis (Nat. Cent. for Sci. Res. Demokritos (GR)); ASENOV, Patrick (Nat. Cent. for Sci. Res. Demokritos (GR)); KAZAS, Ioannis (Nat. Cent. for Sci. Res. Demokritos (GR)); KYRIAKIS, Aristoteles (Nat. Cent. for Sci. Res. Demokritos (GR)); LOUKAS, Dimitrios (Nat. Cent. for Sci. Res. Demokritos (GR))

Presenter: LOUKAS, Dimitrios (Nat. Cent. for Sci. Res. Demokritos (GR))

Session Classification: Device Simulation