

SPICE model of irradiation detectors

Tuesday, 13 November 2007 09:30 (20 minutes)

Li Long and Ralf Röder
CiS Institut of Micro Senors GmbH
99099 Erfurt, Germany

Abstract

After three decades persistent investigation and development, semiconductor irradiation detector has continuously improved its performance and extended its application. A huge amount of researches regarding radiation hardness, detection efficiency, position and time resolution, and noise has been made. The semiconductor irradiation detector has reached a high level in both performance and diversity. Mean while, readout system for tracking and imaging has also been developed parallelly. Therefore we attempt to develop a SPICE model for irradiation detectors, which consists all effects of material properties, irradiation and annealing history and geometry. To acquire the parameter for the SPICE model we designed a lot of sensors with different geometry parameters and manufactured with different technology on different silicon materials. The parameters related with the radiation hardness are mainly from the outputs of RD50. A windows program PRODID is developed to generate the SPICE model library. This model can be used by system designer for the simulation of irradiation and maintenance scenario, for the plan of detection system, and the optimized integration of sensors and readout. For the sensor developer it can be used in the technology design and performance simulation.

Presenter: LONG, Li (CIS, Erfurt, Germany)

Session Classification: 3D detectors & Simulations & New structures