



Contribution ID: 193

Type: **Parallel Talk**

Sentaurus simulation of 3N163 Mosfet to study heavy ions effects

Tuesday 24 October 2017 15:50 (25 minutes)

Semiconductor devices are susceptible to ionization radiation and this kind of event can change their behaviour and electrical properties, causing since a simple current peak on output of the circuit to a logical inversion, each event have your own root cause that can variable from an absorbed radiation dose to a different source of radiation. To deal with these problems is necessary understand the mechanisms behind of each event and use this knowledge to build circuits and semiconductor devices more robust to the radiation. The spatial program and military applications use electronic systems composed of microcontrollers, memories and other parties that can be exposed to radioactive environments in their normally use, a way to handle an unexpected behaviour are needed to avoid accidents. Electronic devices simulation is one of the methods to study the effects of ionizing radiation effects in semiconductor systems. The capability of isolate regions of the device under tests and control the simulation environment bring the possibility of observing the component of an event and understand the mechanisms behind of the event. This research project aims were create a 3D struct to simulate a commercial P-MOSFET (3N163), the effects of a Total Ionization Dose of X-Ray was widely studied and the effects of heavy ions emission is the object of studies in this work to observe the SEE event. The main purpose of the simulations is understanding the results collected to extract the main data and study secondary results that don't was captured in the field experiment.

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Session Classification: Poster Session - NAT

Track Classification: Nuclear Analytical Techniques and Applications in Art, Archeology, Environment, Energy, Space and Security