

Session A: Basic Mechanisms

Chair: S. Metzger and R. A. Weller

A-1 NIEL scaling: comparison with measured defect introduction rate in silicon.

Pierre Arnolda, Christophe Inguibert, Thierry Nuns : ONERA
Cesar Boatella-Polo : CNES

Comparison of theoretical NIEL calculation with measured defect introduction rates leads to define a smoother displacement damage threshold as the one used traditionally.

A-2 P-channel Power MOSFET SEGR sensitivity to Heavy Ion Range.

Nathalie Charty, Nicolas Sukhaseum, Maryse Sauvagnac : TRAD
Francoise Bezerra, Robert Ecoffet : CNES
Remi Gaillard

Correlations of SEGR sensitivity with experimental parameters (Range, Deposited charge in EPI layer, VDS thresholds) allow determining a worst case range domain corresponding to the Bragg peak located near the interface of epitaxial and substrate layers.

A-3 Effect of ionizing radiation on defects and 1/f noise in Ge pMOSFETs.

Cher Xuan Zhang, S. Ashley Francis, Enxia Zhang, Daniel Fleetwood,
Ronald Schrimpf, Kenneth Galloway : Vanderbilt University
Eddy Simoen, Jerome Mitard, Cor Claeys : IMEC

The irradiation and annealing responses of Ge-pMOSFETs have been investigated under transmission gate bias. Both the threshold voltage shift and 1/f noise increase with dose and decrease with annealing time.

Posters for Session A

PA-1 Modeling of the tunneling current in MOS devices after proton irradiation using a nonlinear series resistance correction.

Enrique Miranda : Universitat Autònoma de Barcelona

The impact of 10 MeV protons on a MOS structure can lead to a significant reduction of the gate leakage current. To simulate this effect we consider a nonlinear series resistance correction in the Fowler-Nordheim tunneling expression.

PA-2 A theoretical analysis of the role of ambipolar diffusion on charge-carrier transport in a quasi-neutral region under high injection.

Larry Edmonds : NASA JPL

After explaining the reason that the ambipolar diffusion equation (ADE) found in popular textbooks is not useful for charge-collection investigations, a more useful version of the ADE, the regional ADE is derived.

PA-3 Development of TID-aware MOSFET model and its application.

Lili Ding : Tsinghua University

TID-aware MOSFET model which address total ionizing dose effect based on foundry model is built considering sub-circuit approximation. This method don't need complicated TCAD simulator and agree well with experimental data.