Technical Programme – Thursday, 23 September 2010

Posters and Late News

Chair: P. Adell and A. Touboul

LN-1 Assessment of Shielding Strategies, Dose Enhancement Effects and Shielding Tools for MEO and Jovian Missions.

Peter Truscott, Karen Ford, Fan Lei : QinetiQ
Sam Rason : Surrey Satellite Technology Ltd
Daniel Heynderickx : DH Consultancy

The performance of low- and high-Z shielding, as well as graded shields, is compared for Galileo-GPS and Jovian mission environments. As well as MULASSIS/Geant4, an updated version of SHIELDOSE-2 is used for 1D shielding analysis.

LN-2 Radiation effects in ytterbium-doped silica optical fibers: traps and color centers related to the radiation-induced optical losses.

Franck Mady, Mourad Benabdesselam, Yasmine Mebrouk, Bernard Dussardier : LPMC CNRS University of Nice-Sophia Antipolis

This work establishes connections between radiation-induced optical absorption and hole trap filling in ytterbium-doped optical fibers. It sets basic hardening routes to develop high output power Yb-doped fiber lasers for inter-satellite optical links eventually.

LN-3 TID-induced degradation in static and noise behavior of sub-100 nm multifinger bulk NMOSFETs.

Lodovico Ratti : Università di Pavia
Luigi Gaioni : INFN
Massimo Manghisoni, Valerio Re, Gianluca Traversi : Università di Bergamo

Results from the total ionizing dose characterization of sub-100 nm NMOSFETs are used to provide further evidence for a static and noise degradation model involving charge buildup in shallow trench isolations and lateral parasitic transistor.

LN-4 Irradiation Test Procedure for IAEA Safeguards Instrumentation.

Victor Kravtchenko : IAEA

An IAEA irradiation testing procedure for nuclear safeguards instrumentation is discussed. This shall define the methodology and criteria to allow for the prediction of an instrument's reliability based on the results of a few samples.

LN-5 Dose Induce Breakdown in Lateral DMOS Devices.

Pablo Fernandez-Martinez, Salvador Hidalgo, David Flores : IMB-CNM-CSIC
Francisco Rogelio Palomo : Dpt. Ingenieria Electronica : University of Sevilla

LDMOS transistor can undergo a premature Dose Induced Breakdown (DIB) under ionizing irradiation conditions. The main post-irradiation effects responsible for de DIB effect on LDMOS devices are studied with the aid of physics-based TCAD simulations.

LN-6 First In-flight Data Analysis of Displacement Damages on the OSL Sensor On-board CARMEN-2.

Christelle Deneau, Jean-Roch Vaillé, Laurent Dusseau, Julien Mekki : Université Montpellier 2
Pierre Garcia : TRAD
Daniel Boscher : ONERA
Françoise Bezerra, Eric Lorfèvre, Robert Ecoffet : CNES

The ability to monitor the displacement damage dose using the OSL sensor is demonstrated. A comparison between in-flight measurement on CARMEN-2 and ground based tests is led. The influence of the temperature is corrected.

LN-7 Experimental Characterization of Atmospheric Radiation Environment with Stratospheric Balloon.

Frédéric Wrobel, Jean-Roch Vaillé, Denis Pantel, Antoine Touboul, Frédéric Saigné : Université Montpellier 2 – IES
Luigi Dilillo, Paolo Rech, Jean-Marc Gallière, Université Montpellier 2 – LIRMM
Pierre Chadoutaud, Philippe Cocquerez, Michel Lacourty, Thien Lam-Trong : CNES
Jean-Luc Autran : Université Aix-Marseille – CNRS
Christian Charty : TRAD
Florent Laplanche, Bruno Azais : DGA

We report a stratospheric flight with a CNES balloon for which we developed a silicon detector in order to obtain data on the atmospheric radiation environment. Experiments and simulations are in good agreement.

LN-8 Layout Technique for Single-Event Transient Mitigation via Pulse Quenching.

Nicholas Atkinson, Atrhur Witulski, William Holman, Jonathan Ahlbin, Bharat Bhuva, Lloyd Massengill : Vanderbilt University

A recently developed layout technique that exploits single-event transient pulse quenching to mitigate transients in combinational logic is presented. TCAD simulations demonstrate how sensitive area and pulse width are reduced using this technique.

LN-9 The Technology Demonstration Module On-Board PROBA-II.

Reno Harboe-Sorensen : RHS Consult

As a semiconductor component radiation effects and technology demonstration experiment, the TDM on-board the PROBA-II satellite, will be described and some of its main features highlighted based on ground testing and calibrations.

LN-10 Laser validation of a non destructive test methodology for the radiation sensitivity assessment of power devices.

Florent Miller, Sébastien Morand, Nadine Buard: EADS
Rémi Gaillard
Thierry Carrière : Astrium Space Transportation

This paper presents a new test methodology based on the characterization of precursory events to perform non destructive radiation sensitivity assessment of power devices. Laser tests are used to demonstrate its efficiency.

LN-11 Neutron- and Proton-Induced SEU Error Rates for D- and DICE-Flip/Flop Designs at a 40 nm Technology Node.

Daniel Loveless, Lloyd Massengill : Institute for Space and Defense Electronics, Vanderbilt University
Srikanth Jagannathan, Trey Reece, Jugantor Chetia, Bharat Bhuva : Department of Electrical Engineering and Computer Science, Vanderbilt University
Shi-Jie Wen, Rick Wong, : Cisco Systems, Inc.
David Rennie : CertiChips, Inc.

Neutron and proton testing of 40 nm D- and DICE-Flip/Flop designs show small difference in error rates. Simulations are used to show that charge sharing is the primary cause for the increase in vulnerability.

LN-12 Total Dose Degradation of Voltage Regulators.

Allan Johnston, Bernard Rax : NASA/JPL

Total dose degradation is studied for low-dropout and conventional voltage regulators. Key parameters are identified, and circuit analyses are used to explain differences in degradation behavior. Internal bandgap reference performance is compared with conventional references.

LN-13 Evaluation Study of the Accelerated ELDRS Switching Test Method

Michael Wind, Peter Beck : AIT
Jerome Boch, Lauren Dusseau : University of Montpellier 2
Ali Mohammadzadeh, Marc Poizat : ESA

We describe the set-up of an evaluation study to review the applicability of the accelerated ELDRS switching test method, that makes use of sequenced high and low dose rate exposures, to many electric device parameters of a comprehensive set of bipolar parts.