

2017 17th European Conference on Radiation and Its Effects on Components and Systems (RADECS 2017)

**Geneva, Switzerland
2-6 October 2017**



**IEEE Catalog Number: CFP17449-POD
ISBN: 978-1-5386-1262-0**

**Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP17449-POD
ISBN (Print-On-Demand):	978-1-5386-1262-0
ISBN (Online):	978-1-5386-1261-3
ISSN:	0379-6566

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

Section I – Regular Papers

These papers were submitted to the Conference Review Committee and appear in the RADECS 2017 Conference Papers, in IEEE Xplore (Conference Section, RADECS 2017).

SESSION A: In-Orbit Low-Cost Radiation Studies

Low Level Radiation and Fault Protection Techniques Suitable for Nanosatellite Missions 1
David Selčan, Gregor Kirbiš, and Iztok Kramberger

CELESTA Demonstrator Radiation Characterization in a LEO Representative Environment at CHARM. 5
A. S. Merlenghi, M. Brugger, E. Chesta, S. Danzeca, R. Garcia Alia, A. Masi, P. Peronnard, R. Secondo, M. Bernard, L. Dusseau, X. Laurand, and J. R. Vaillé

Single Event Effect Analysis for Command and Data Handling Electronics of a Millimeter-Wave Radiometer 6U-Class Satellite Instrument 12
Mehmet Ogut, Yuriy Goncharenko, Steven C. Reising, Braxton Kilmer, Xavier Bosch-Lluis, Pekka Kangaslahti, and Erich Schlecht

RadFxSat: A Flight Campaign for Recording Single-Event Effects in Commercial Off-the-Shelf Microelectronics 19
Rebekah A. Austin, Brian D. Sierawski, James M. Trippe, Andrew L. Sternberg, Kevin M. Warren, Robert A. Reed, Robert A. Weller, Ronald D. Schrimpf, Michael L. Alles, Lloyd W. Massengill, Daniel M. Fleetwood, Gerald W. Buxton, III, Jonathan C. Brandenburg, W. Burns Fisher, and Robert Davis

SESSION B: Radiation effects in Optoelectronics and Photonics devices and ICs

Analysis of Image Lag Degradation in PPD CISs Induced by Total Ionizing Dose and Displacement Radiation Damage 24
Zujun Wang, Yuanyuan Xue, Jing Liu, Wei Chen, Wuying Ma, Baoping He, Zhibin Yao, and Jiangkun Sheng

Modelling Voltage Dependence of Photocurrent in Proton Irradiated GaAs Cells 29
Manuel Salzberger, Martin Rutzinger, Christel Nömayr, Paolo Lugli, and Claus G. Zimmermann

Impact of the Electric Field in the Modelling of the Dark Current Non Uniformity in Pixel Arrays 35
M. C. Ursule, T. Nuns, C. Inguibert, H. Bugnet, F. Mayer, and J. Pratlong

Radiation Hardness Studies on a Novel CMOS Process for Depleted Monolithic Active Pixel Sensors 42
Enrico Junior Schioppa, Richard Bates, Craig Buttar, Marco Dalla, Jacobus Willem Van Hoorne, Thanushan Kugathasan, Dzmitry Maneuski, Cesar Augusto Marin Tobon, Luciano Musa, Heinz Pernegger, Petra Riedler, Christian Riegel, Carla Sbarra, Douglas Michael Schaefer, Abhishek Sharma, Walter Snoeys, and Carlos Solans Sanchez

Multi-MGy Total Ionizing Dose Induced MOSFET Variability Effects on Radiation Hardened CMOS Image Sensor Performances 49
Serena Rizzolo, Vincent Goiffon, Marius Sergent, Franck Corbière, Sébastien Rolando, Aziouz Chabane, Philippe Paillet, Claude Marcandella, Sylvain Girard, Pierre Magnan, Marco Van Uffelen, Laura Mont Casellas, Robin Scott, and Wouter De Cock

Photobleaching Effects in Multi-Mode Radiation Resistant Optical Fibers.....	53
<i>Adrien Billat, Jeremy Blanc, Jochen Kuhnhen, and Daniel Ricci</i>	
Extrapolated Degradation of Optical Systems at MGy Levels due to Radiation-Induced Refractive Index Change.....	56
<i>Cyprien Muller, Thierry Lépine, Timothé Allanche, Philippe Paillet, Vincent Goiffon, Youcef Ouerdane, Aziz Boukenter, and Sylvain Girard</i>	
Analysis of X-Ray Photo-Charge Induced Speckles in a Radiation Hardened CMOS Image Sensor	63
<i>T. Allanche, V. Goiffon, S. Rizzolo, P. Paillet, O. Duhamel, A. Chabane, C. Muller, P. Magnan, F. Corbière, S. Rolando, R. Clerc, E. Marin, A. Boukenter, Y. Ouerdane, and S. Girard</i>	
SESSION C: Basic mechanisms of radiation effects	
Effects of SiH Groups on ELDRS Quantified by XPS with Combined Use of Gamma-ray and Electron-beam Irradiation.....	67
<i>Shintaro Toguchi, Daisuke Kobayashi, Takahiro Makino, Takeshi Ohshima, and Kazuyuki Hirose</i>	
Mechanism Behind Long Line-Type MCUs in Thin-BOX SOI SRAMs: Resistance-Based Modeling and Countermeasure.....	76
<i>Chin-Han Chung, Daisuke Kobayashi, and Kazuyuki Hirose</i>	
Temperature Dependence of the Radiation Degradation at High Total Dose Levels	84
<i>Viacheslav S. Pershenkov, Alexander S. Bakerenkov, Vitaly A. Telets, Vladimir V. Belyakov, Vladimir V. Shurenkov, Vladislav A. Felitsyn, and Alexander S. Rodin</i>	
SESSION D: Radiation Effects on Materials	
The Structural Changes of Surfaces of Solar Cell Protective Coatings Under Combined Electron-proton Irradiation	88
<i>R. H. Khasanshin and L. S. Novikov</i>	
Alpha Radiation Testing of Materials: A Technique with Excellent Dosimetry and No Radioactive Contamination	92
<i>Richard E. Sharp</i>	
Complex Environmental and Synergetic Effects on Space Materials: Lesson Learned from THERME In-flight Data.....	95
<i>E. Vanhove, S. Duzellier, D. Faye, and S. Remaury</i>	
Evaluation of Spacecraft Materials Behavior to JUICE Environment (Synergistic Effect of Radiations and Cryogenic Temperature).....	102
<i>Sabine Dagrass, Julien Eck, Claire Tonon, Sophie Duzellier, Thierry Paulmier, Nicolas Sukhaseum, Michal Maliki, and Christopher Semprimoschnig</i>	
SESSION E: Single Event Transients and Laser testing	
Radiation Effects on 1 Mb HfO ₂ -Based Resistive Memory	108
<i>Jinshun Bi, Feng Zhang, Yuan Duan, Kai Xi, Bo Li, Li Chen, and Ming Liu</i>	

Comparison of Single Event Transients in AlGaIn/GaN Schottky-Gate HEMTs Using Four Sources for Charge Injection.	113
<i>A. Khachatrian, N. J-H Roche, S. Buchner, A. D. Koehler, T. J. Anderson, K. D. Hobart, D. McMorro, S. D. LaLumondiere, N. P. Wells, M. A. Tockstein, E. C. Dillingham, J. P. Bonsall, P. Karuza, W. T. Lotshaw, S. C. Moss, D. L. Brew, V. Ferlet-Cavrois, and M. Mushitiello</i>	

Implications of Work-Function Fluctuation on Radiation Robustness of FinFET XOR Circuits.....	117
<i>Y. Q. Aguiar, F. L. Kastensmidt, C. Meinhardt, L. Artola, G. Hubert, and R. Reis</i>	

Effective Characterization of Radiation-induced SET on Flash-based FPGAs	122
<i>Luca Sterpone and Sarah Azimi</i>	

Move the Laser Spot, Not the DUT: Investigating the New Micro-mirror Capability and Challenges for Localizing SEE Sites on Large Modern ICs.....	126
<i>Matthew Cannon, Andrés Pérez-Celis, Gary Swift, Richard Wong, Shi-Jie Wen, and Michael Wirthlin</i>	

SESSION ET and ROUNDTABLE: Radiation Tests and Components Qualification

Incidents and Accidents: The Way of the Single Event Tester	130
<i>Kenneth A. LaBel</i>	

Testing the Tester: Lessons Learned During the Testing of a State-of-the-Art Commercial 14nm Processor Under Proton Irradiation	132
<i>C. M. Szabo, A. R. Duncan, and K. A. LaBel</i>	

The Difficulties and Solutions in SEE Radiation Experiments, Test Samples and Setup Preparation	142
<i>Aleksandr E. Koziukov, Vasily S. Anashin, Sergey A. Yakovlev, Anton S. Bychkov, and Vadim A. Mazharov</i>	

Advanced In-Situ Instrumentation of RF Circuits for Mixed-Field Irradiation Testing Purpose.....	146
<i>Steffen Mueller, Salvatore Danzeca, Rubén García Alía, Markus Brugger, Robert Weigel, and Alexander Koelpin</i>	

SESSION F: Radiation Effects in Devices and ICs

Architecture Choice for Radiation-Hard AlGaIn/GaN HEMT Power Devices	151
<i>D. Wellekens, S. Stoffels, A. Luu, M. Haussy, M. Mélotte, D. Agten, and S. Decoutere</i>	

TCAD Prediction of Dose Effects on MOSFETs with ECORCE	156
<i>A. Michez, J. Boch, J. Dardié, F. Wrobel, A. D. Touboul, T. Maraine, F. Saigné, E. Lorfèvre, and F. Bezerra</i>	

Temperature Effects on the Total Ionizing Dose Response of TaOx-based Memristive Bit Cells	160
<i>Michael L. McLain, J. Kyle McDonald, Harold P. Hjalmarson, Jason D. Serrano, Roy P. Cuoco, Don Hanson, David R. Hughart, Matthew J. Marinella, and E. Fredrick Hartman</i>	

Internal Electrostatic Discharge Testing of a RF Cable and Connectors	164
<i>Wousik Kim, James Z. Chinn, Harry S. Figueroa, and Dennis O. Thorbourn</i>	

Total Dose Radiation Hardening of MOS Transistors by Fluorine Implantation.....	168
<i>Chris Shaw, Kenneth Potter, Katrina Morgan, Peter Ashburn, Kees de Groot, and Bill Redman-White</i>	

SESSION G: Radiation Hardening by Design

The STG DICE Cell with the Decoder for Reading Data in Steady and Unsteady States for Hardened SRAM.....	171
<i>Yuri V. Katunin and Vladimir Ya. Stenin</i>	
Design and Test with Proton Beam of a 1.2 Gb/s Semi-custom Serialiser Implemented in 180 nm CMOS with SEU Mitigation by TMR.....	179
<i>Matteo Lupi, G. Aglieri Rinella, M. Bonora, H. Hillemanns, D. Kim, T. Kugathasan, A. Lattuca, G. Mazza, K. M. Sielewicz, and W. Snoeys</i>	
Muller C-element Self-corrected Triple Modular Redundant Logic with Multithreading and Low Power Modes	184
<i>C. Ramamurthy, A. Gujja, V. Vashishtha, Srivatsan Chellappa, and L. T. Clark</i>	
Hardened By Design All-Digital Pulsed Multiplying DLL for DDR2-3 Interfaces.....	188
<i>Chandarasekaran Ramamurthy and Lawrence T. Clark</i>	
Single-Event Transient Analysis and Hardening in a 180 nm CMOS Embedded Low-Dropout Regulator.....	192
<i>Liang Wang, Xupeng Han, Yuanfu Zhao, Qiang Bian, Suge Yue, Shijin Lu, Lei Shu, Jiaqi Liu, and Tongde Li</i>	
Investigation into SEU Effects and Hardening Strategies in SRAM Based FPGA.....	196
<i>Tianwen Li, Haigang Yang, He Zhao, Nan Wang, Yuanfeng Wei, and Yiping Jia</i>	
A Novel Combined Charge Balance Termination Structure Insensitive to Ionizing Radiation Effect	201
<i>Limei Song, Chao Xiao, Yanfei Zhang, Botao Sun, Lixin Wang, and Jiajun Luo</i>	
Superimposed In-Circuit Fault Mitigation for Dynamically Reconfigurable FPGAs	205
<i>Alexandra Kourfali, David Merodio Codinachs, and Dirk Stroobandt</i>	

SESSION H: Single Event Effects in Devices and ICs

A Mechanism for Destructive Single-Event Effect in Gallium Nitride Power HEMTs.....	211
<i>L. Scheick</i>	
SEL and Cell Failures in MRAM under Ion and Focused Laser Irradiation.....	218
<i>Alexander A. Pechenkin, Anna B. Boruzdina, Andrey V. Yanenko, Dmitry. E. Protasov, Ivan I. Shvetsov-Shilovskiy, and Anton A. Sangalov</i>	
Identification of Pulsed-Neutron-Induced Upset Bursts in Static Random Access Memories using Monte-Carlo Simulations	224
<i>Chao Qi, Wei Chen, Yan Liu, Xiaoming Jin, Shanchao Yang, and Xiaoqiang Guo</i>	

SESSION I: Single Event Effects Mechanisms and Modelling

Multiple Cell Event Partitioning for Simulation of Soft Error Rates in Space Systems with Embedded Error Correcting Codes.....	230
<i>Gennady I. Zebrev, Artur M. Galimov, Liza V. Mrozovskaya, Maxim S. Gorbunov, and Konstantin A. Petrov</i>	
Simulation and Experiment in Neutron Induced Single Event Effects in SRAM	234
<i>Xiaoming Jin, Chenhui Wang, Xiaoqiang Guo, Chao Qi, Shanchao Yang, Yan Liu, Wei Chen, Simone Gerardin, Marta Bagatin, Stefano Bonaldo, and Alessandro Paccagnella</i>	

SESSION J: Facilities and Dosimetry

MELAF - a 50 MeV Electron Accelerator Facility for Research in Radiation Effects	239
<i>Andreas Schüller, Christoph Makowski, Ralf-Peter Kapsch, Ralf Nolte, and Peter Beck</i>	
Assessment of a Setup for the Characterization of Electronic Devices under Protons at Cryogenic Temperature.	243
<i>F. Bezerra, M. Boutillier, B. Baradat, N. Chatry, C. Dossat, P. Garcia, and P. Pourrouquet</i>	
Proton Dosimetry at the Accelerator COSY for Radiation Effect Testing.....	249
<i>Max Baum, Olaf Felden, Udo Weinand, Stefan Höffgen, Jochen Kuhnhenh, and Stefan Metzger</i>	
AXEL Lab.: Representative Ground Simulation for Investigating Radiation Effects in Materials and Electronics	254
<i>S. Duzellier, L. Artola, G. Hubert, C. Inguibert, T. Nuns, S. Lewandowski, T. Paulmier, B. Dirassen, R. Rey, and C. Pons</i>	
UCL Irradiation Facilities Status	261
<i>L. Standaert, N. Postiau, and M. Loiselet</i>	
Review and Comparison of Irradiation Response and Annealing Models for High-sensitivity RADFETs	264
<i>M. Benito-Parejo, S. Ibarmia, and P. Portillo</i>	
Irradiation Facilities at CERN	272
<i>B. Gkotse, M. Brugger, P. Carbonez, S. Danzeca, A. Fabich, R. Garcia Alia, M. Glaser, G. Gorine, M. R. Jaekel, I. Mateu Suau, G. Pezzullo, F. Pozzi, F. Ravotti, M. Silari, and M. Tali</i>	
Towards a Unified Environmental Monitoring, Control and Data Management System for Irradiation Facilities: The CERN IRRAD Use Case	279
<i>B. Gkotse, M. Glaser, P. Jouvelot, E. Matli, G. Pezzullo, and F. Ravotti</i>	
Investigation on the Sensitivity Degradation of Dosimeters Based on Floating Gate Structure	287
<i>M. Brucoli, S. Danzeca, J. Cesari, M. Brugger, A. Masi, S. Gilardoni, A. Pineda, L. Dusseau, and F. Wrobel</i>	
Study of Floating Gate MOS Structures to Improve the Noise and Sensitivity as Radiation Dosimeter	291
<i>J. Cesari, M. Brucoli, S. Danzeca, A. Pineda, A. Masi, M. Brugger, S. Gilardoni, E. Isern, M. Roca, and E. Garcia-Moreno</i>	
New Setup for SEE Measurements in South America	295
<i>V. A. P Aguiar, N. H. Medina, N. Added, E. L. A. Macchione, S. G. Nascimento, A. R. Leite, and M. A. G. Silveira</i>	
Farmer Chamber Response to Different Filter Box and Surrounding Configurations	299
<i>Pedro Martín-Holgado, Y. Morilla, M. Domínguez, and G. Fernández</i>	
Design of an In-air Heavy Ion Irradiation Facility at KVI-CART	306
<i>Brian N. Jones, Marc-Jan van Goethem, Emiel van der Graaf, and Sytze Brandenburg</i>	

SESSION K: Radiation Hardness Assurance at devices and system level

SEE Test Guidelines and Characterisation of GaAs Power Devices	310
<i>J. Cueto, J. Chuan, L. de Pablo, C. Boatella, R. Marec, J. L. Muraro, A. Guillope, A. Rousset, and G. Vignon</i>	
Estimation of the Radiation Hardness of Bipolar Voltage Comparators in Wide Operation Temperature Range.....	314
<i>Alexander S. Bakerenkov, Alexander S. Rodin, Vladislav A. Felitsyn, Viacheslav S. Pershenkov, and Valentin I. Butin</i>	
TID Test on ITER Interlock Discharge Loop Interface Box (DLIB) System, an Example of Radiation Test at Equipment Level.....	318
<i>Gonzalo Fernández, Javier Bárcena, and Eugenio Muñoz</i>	
Approach to Estimation of Modern IC's Sustainability after Series of Single Events	326
<i>Georgii G. Davydov, Petr K. Skorobogatov, Dmitriy V. Boychenko, and Nikolay S. Dyatlov</i>	
Worst-Case Proton Contribution to the Direct Ionization SEU Rate	330
<i>J. Guillermin, N. Sukhaseum, P. Pourrouquet, N. Chatry, F. Bezerra, and R. Ecoffet</i>	
Hardening Application Programs by the Operating System on COTS Processors: What Protection to SEU can be Expected and at What Performance Cost?	338
<i>Emery K. Assogba and Marc Lobelle</i>	
Bayesian Modeling of COTS Power MOSFET Ionizing Dose Impact on Circuit Response.....	344
<i>A. F. Witulski, M. B. Smith, N. Mahadevan, A. L. Sternberg, C. Barnes, D. Sheldon, R. D. Schrimpf, G. Karsai, and M. W. McCurdy</i>	
Impact of the Detector Definition on the Reverse Monte Carlo Calculation Results.....	349
<i>Pierre Pourrouquet, Vincent Traisnel, Athina Varotsou, Guy Rolland, and Robert Ecoffet</i>	
Estimation of System Survival Reliability in a Radiation Environment Based on the Available Radiation Data at Component Level.....	355
<i>R. Ferraro, S. Danzeca, L. Dilillo, M. Brugger, A. Masi, and S. Gilardoni</i>	

SESSION L: Radiation Environments (space, atmospheric, terrestrial and accelerators)

Calculation Method of Maximum Radiation Conditions and Reliability using Quasi-Dynamic Radiation Belt Model.....	363
<i>H. Matsumoto</i>	
Validation of Flux Models to Characterize the Radiation Environment in Space Based on Current Rosetta-data	368
<i>Vanessa Wyrwoll, Sascha Lüdeke, Hugh Evans, and Björn Poppe</i>	
Validation of a Geant4 Full Model for the MIXS Instrument at BepiColombo.....	372
<i>P. Portillo-Caurcel, S. Ibarria, M. Benito-Parejo, J. M. Mas-Hesse, A. Balado, A. Martindale, J. Pearson, G. Butcher, C. Feldman, and E. Bunce</i>	

Impact of the Trapped Proton Anisotropy on the Ionizing Dose at Low Earth Orbits	377
<i>Athina Varotsou, Pierre Pourrouquet, Romain Fonta, Daniel Boscher, and Robert Ecoffet</i>	
Radiation Induced Background Characterization for a Next Generation of Space Telescope	380
<i>Luz Maria Martinez Sierra, Insoo Jun, and Patrick Morrissey</i>	
SESSION M - Analog And Mixed-Signal Integrated Circuits For Use in Space Applications and Radiation Environments (AMICSA)	
600 Mrad TID Effects on a New Generation High Rate Pixel Readout ASIC in 65nm CMOS with Low-power, Low Noise Synchronous Analog Front-end using Fast ToT Encoding and Auto-zeroing.....	384
<i>Ennio Monteil, Natale Demaria, Luca Pacher, Angelo Rivetti, Manuel Dionisio Da Rocha Rolo, Richard Wheadon, Andrea Paternò, and Serena Panati</i>	
REDW Radiation Effect Data Workshop Poster Session	
Radiation-Induced Attenuation Data of Polarization-Maintaining Fibres.....	389
<i>M. Caussanel, G. Beauvois, H. Duval, S. Grieu, G. Montay, and O. Gilard</i>	
The Effect of Preliminary Neutron Irradiation on IR-LED Characteristics During Operation	393
<i>Anastasiia V. Simonova, Alexandr V. Gradoboev, and Ksenia N. Orlova</i>	
Total Dose and Single-Event Effects Testing of the Intersil ISL70040SEH Gallium Nitride (GaN) FET Driver.....	399
<i>N. W. van Vonno, H. W. Satterfield, L. G. Pearce, F. C. Ballou, W. H. Newman, J. S. Gill, and E. J. Thomson</i>	
ELDRS Characterization to of Texas Instruments LMP2012 RRO Precision Amplifier	404
<i>Kirby Kruckmeyer</i>	
Radiation Evaluation of Digital Isolators for Space Applications.....	409
<i>Peter Beck, Michael Wind, Peter Clemens, Tobias Kündgen, Marcin Latocha, Wilhelm Lennartz, Stefan Metzger, Marc Poizat, Sven Ruge, Michael Steffens, and Christoph Tscherne</i>	
Total Ionizing Dose Tests of Power Bipolar Transistors and SiC Power Devices for JUICE	413
<i>Michael Steffens, Stefan K. Höffgen, and Marc Poizat</i>	
Evaluation of an Alternative Low Cost Approach for SEE Assessment of a SoC	418
<i>F. Bezerra, D. Dangla, F. Manni, J. Mekki, D. Standarovski, R. G. Alia, M. Brugger, and S. Danzeca</i>	
Single Event Effects and Total Dose Testing of Digital to Analog Converters	423
<i>A. B. Karakozov, P. V. Nekrasov, D. V. Bobrovsky, G. S. Sorokoumov, and V. A. Telets</i>	
MOSFETs SEB & SEGR Qualification Results with SOA Estimation	428
<i>Sergey A. Iakovlev, Vasily S. Anashin, Pavel A. Chubunov, Aleksandr E. Koziukov, Kais B. Bu-Khasan, Timofey A. Maksimenko, and Aleksandr M. Chlenov</i>	
The Radiation Performance of Intersil's Commercial Space Plastic Parts	432
<i>W. H. Newman, N. W. van Vonno, S. K. Bernard, L. G. Pearce, J. Broline, O. E. Mansilla, and E. J. Thomson</i>	

Radiation Hard Optical Link Developments at CERN.....	437
<i>Lauri Olanterä, Stéphane Détraz, Andrea Kraxner, Carmelo Scarcella, Christophe Sigaud, Csaba Soós, Jan Troska, and François Vasey</i>	
Study of Total Ionizing Dose Effects in 65nm Digital Circuits with the DRAD Digital RADiation Test Chip	443
<i>L. M. Jara Casas, D. Ceresa, S. Kulis, S. Miryala, J. Christiansen, R. Francisco, and D. Gnani</i>	
Destructive Failure Heavy Ion Testing of Different Amplifiers	449
<i>Anastasia A. Kalashnikova, Pavel A. Chubunov, Vasily S. Anashin, Sergey A. Iakovlev, Aleksandr E. Koziukov, Konstantin Z. Faradian, and Aleksandr M. Chlenov</i>	
Ionizing Radiation Response of the 4530 Parallel-to-Serial Driver and 4527 Registered Receiver	453
<i>Steven C. Witczak, Eric V. Williamson, Matthew J. Calderone, David L. Jarvis, Kristin E. Marino, and Glen E. Macejik</i>	
TID In-Situ Measurement of Temperature Coefficient of Various Commercial Voltage References	459
<i>Jiri Hofman, Richard Sharp, and Jiri Haze</i>	
Radiation Testing of an SAR ADC for Use in Quench Detection Systems for the HiLumi LHC	463
<i>Jelena Spasic, Reiner Denz, Josef Kopal, and Jens Steckert</i>	
Combined X-ray and Gamma Ray Testing to Investigate the TID Tolerance of Flip-chip FPGAs.....	467
<i>Nadia Rezzak, Jih-Jong Wang, Victor Nguyen, and Stephen Varela</i>	
Compendium of Recent SEE, and TID Test Results Conducted by CNES from 2011–2016.....	474
<i>Roberta Pilia, Florence Malou, David Dangla, Françoise Bezerra, Denis Standarovski, Robert Ecoffet, and Pierre Tastet</i>	
Microdose Effects in SRAM Cells under Heavy Ion Irradiation	482
<i>Anna B. Boruzdina, Andrey V. Yanenko, Anastasia V. Ulanova, Alexander I. Chumakov, Dmitriy V. Bobrovskiy, and Vyacheslav M. Uzhegov</i>	
Options for Radiation Tolerant High-Performance Memory	485
<i>Steven M. Guertin, Jean Yang-Scharlotta, Paris Blaisdell-Pijuan, and Raphael Some</i>	
Destructive Single-Events and Latchup in Radiation-Hardened Switching Regulators.....	492
<i>Sergeh Vartanian, Gregory R. Allen, Farokh Irom, Leif Z. Scheick, Shirley Hart, Nick W. van Vonno, and Larry Pearce</i>	
Single Event Latchup in ICs with Integrated Latchup Protection Technology	496
<i>D. S. Kostyuchenko, A. B Karakozov, P. V. Nekrasov, A. A. Pechenkin, D. V. Savchenkov, and A. Yu. Nikiforov</i>	
Proton Test Results for a Commercial Fanout Buffer, a Variable Gain Amplifier, and a $\pm 40\text{V}$ Operational Amplifier	499
<i>Randall Milanowski, Slaven Moro, Norm Hall, Raichelle Aniceto, Bert Vermeire, and Neal Nicholson</i>	
SEE Testing on PADI-X for JUICE 8-Channel Ultrafast Charge Pre-Amplifier ASIC	504
<i>I. Lopez-Calle, A. Sirin, H. Andersson, M. Kerenyi, JJ. Gonzalez, C. Poivey, L. Bonora, E. Muñoz, M. Domínguez, and G. Fernandez</i>	

Extended TID, ELDRS and SEE Hardening and Testing on Mixed Signal Telemetry LX7730 Controller.....	508
<i>Mathieu Sureau, Russell Stevens, Marco Leuenberger, Nadia Rezzak, Dorian Johnson, and Kathy Zhang</i>	
Radiation Evaluation of Analog Devices' RT6804-1 Radiation Tolerant Multicell Battery Monitor	517
<i>Shirley C. Hart, Philip G. Pandol, Nathan R. Wendel, and Ryan Peralta</i>	
Pulsed Laser Beam Identification of SEE-sensitive Regions and Observation of Additional Failure Modes Relevant for RHA in Digital Isolators.....	521
<i>Raphael Wolf, Michael Steffens, Stefan Metzger, Peter Beck, Michael Wind, and Marc Poizat</i>	
Proton Radiation Effects on Hamamatsu InGaAs PIN Photodiodes	526
<i>Raichelle Aniceto, Randall Milanowski, Slaven Moro, Kerri Cahoy, and Garrett Schlenvogt</i>	
Radiation Tolerant 6.25 Gbps 850nm Optical Transceiver	532
<i>A. Tanskanen, M. Karppinen, C. Boatella Polo, R. J. E. Jansen, and I. McKenzie</i>	
A Survey on Analog-to-Digital Converter Performance with Respect to Ionizing Radiation	536
<i>Steffen Mueller, Robert Weigel, and Alexander Koelpin</i>	
In-Beam Programming of Radiation-Hardened Flash-Based FPGA—RTG4.....	540
<i>Jih-Jong Wang, Nadia Rezzak, Stephen Varela, Victor Nguyen, Salim Samiee, Frank Hawley, and Esmat Hamdy</i>	
Dynamic SEE Testing of Selected Architectural Features of Xilinx 28 nm Virtex-7 FPGAs	544
<i>Gary M. Swift, Stephen E. Stone, Sebastián E. García, Kevin W. Wray, William J. Rowe, Krysten H. Pfau, Robert Liu, Jonathan Holden, Asa Angeles, Barry L. Willits, Kyle P. Robinson, Andrés Pérez-Celis, and Michael J. Wirthlin</i>	

Section II – Selected Papers - N/A

These papers were submitted by their Authors to IEEE Transactions on Nuclear Science and appear in IEEE Trans. On Nucl. Sci., vol 65, Number 8, August 2018. They also can be found in IEEEXplore (IEEE Trans. on Nucl. Sci, RADECS 2017 special issue).

SESSION A: In-Orbit Low-Cost Radiation Studies

- AT-1 **System Level Radiation Characterization of a 1U CubeSat Based on CERN Radiation Monitoring Technology**
R. Secondo, R. García Alía, P. Peronnard, M. Brugger, A. Masi, S. Danzeca, A. Merlenghi, E. Chesta, J. R. Vaillè, M. Bernard, and L. Dusseau
DOI: [10.1109/TNS.2018.2797319](https://doi.org/10.1109/TNS.2018.2797319)

SESSION B: Radiation effects in Optoelectronics and Photonics devices and ICs

- BT-1 **X-Ray, Proton and Electron Radiation Effects on Type I Fiber Bragg Gratings**
T. Blanchet, A. Morana, T. Allanche, C. Sabatier, I. Reghioua, E. Marin, A. Boukenter, Y. Ouerdane, P. Paillet, M. Gaillardin, O. Duhamel, C. Marcandella, M. C. Trinczek, G. Assailit, G. Auriel, D. Aubert, G. Laffont, and S. Girard
DOI: [10.1109/TNS.2018.2823771](https://doi.org/10.1109/TNS.2018.2823771)

- BT-2 **A Method to Separate Proton Damage in LED and Phototransistor of Optocouplers**
F. Irom, L. D. Edmonds, G. R. Allen, and B. G. Rax
DOI: [10.1109/TNS.2018.2819960](https://doi.org/10.1109/TNS.2018.2819960)
- BT-3 **Investigation of the Influence of Temperature and Annealing on the Radiation Hardness of Silicon Mach-Zehnder Modulators**
A. Kraxner, S. Detraz, L. Olantera, C. Scarcella, C. Sigaud, C. Soos, J. Troska, and F. Vasey
DOI: [10.1109/TNS.2018.2823863](https://doi.org/10.1109/TNS.2018.2823863)
- BT-4 **Radiation-Induced Defects in 8T-CMOS Global Shutter Image Sensor for Space Applications**
A. Le Roch, C. Virmontois, V. Goiffon, L. Tauziède, J.-M. Belloir, C. Durnez, and P. Magnan
DOI: [10.1109/TNS.2018.2820385](https://doi.org/10.1109/TNS.2018.2820385)
- BT-5 **6-MeV Electron Exposure Effects on OFDR-Based Distributed Fiber-Based Sensors**
C. Sabatier, S. Rizzolo, A. Morana, T. Allanche, T. Robin, B. Cadier, P. Paillet, M. Gaillardin, O. Duhamel, C. Marcandella, D. Aubert, G. Assailit, G. Auriel, A. Boukenter, Y. Ouerdane, L. Mescia, E. Marin, and S. Girard
DOI: [10.1109/TNS.2018.2804663](https://doi.org/10.1109/TNS.2018.2804663)
- BT-6 **Dependence of the Voids-Fiber Bragg Grating Radiation Response on Temperature, Dose, and Dose Rate**
A. Morana, S. Girard, E. Marin, M. Lancry, J. Grelin, C. Marcandella, P. Paillet, A. Boukenter, and Y. Ouerdane
DOI: [10.1109/TNS.2017.2778882](https://doi.org/10.1109/TNS.2017.2778882)
- BT-7 **Random Telegraph Signal in Proton Irradiated Single-Photon Avalanche Diodes**
F. Di Capua, M. Campajola, L. Campajola, C. Nappi, E. Sarnelli, L. Gasparini, and H. Xu
DOI: [10.1109/TNS.2018.2814823](https://doi.org/10.1109/TNS.2018.2814823)

SESSION C: Basic mechanisms of radiation effects

- CT-1 **Heavy Ion, Proton, and Neutron Charge Deposition Analyses in Several Semiconductor Materials**
Z. Wu and S. Chen
DOI: [10.1109/TNS.2018.2834962](https://doi.org/10.1109/TNS.2018.2834962)
- CT-2 **Dose-Rate Sensitivity of 65-nm MOSFETs Exposed to Ultrahigh Doses**
G. Borghello, F. Faccio, E. Lerario, S. Michelis, S. Kulis, D. M. Fleetwood, R. D. Schrimpf, S. Gerardin, A. Paccagnella, and S. Bonaldo
DOI: [10.1109/TNS.2018.2828142](https://doi.org/10.1109/TNS.2018.2828142)
- CT-3 **Improved Model for Excess Base Current in Irradiated Lateral p-n-p Bipolar Junction Transistors**
B. S. Tolleson, P. C. Adell, B. Rax, H. J. Barnaby, A. Privat, X. Han, A. Mahmud, and I. Livingston
DOI: [10.1109/TNS.2018.2829110](https://doi.org/10.1109/TNS.2018.2829110)

- CT-4 **Hydrogen Soaking, Displacement Damage Effects, and Charge Yield in Gated Lateral Bipolar Junction Transistors**
Xingji Li, Jianqun Yang, Daniel M. Fleetwood, Chaoming Liu, Yidan Wei, H. J. Barnaby, and K. F. Galloway
DOI: [10.1109/TNS.2018.2837032](https://doi.org/10.1109/TNS.2018.2837032)

SESSION D: Radiation Effects on Materials

- DT-1 **Qualification Strategy of New Technologies for Safety Instrumentation in Harsh Radiation Environments**
C. Zinoni, L. Janvier, and B. Symoens
DOI: [10.1109/TNS.2018.2810448](https://doi.org/10.1109/TNS.2018.2810448)
- DT-2 **Ni-Ion and γ -Ray Irradiated Silica-Based Glasses Characterized by Luminescence and Raman Spectroscopies**
A. Alessi, S. Girard, M. Raine, M. Fanetti, D. Di Francesca, L. Martin-Samos, I. Reghioua, M. Gaillardin, N. Richard, P. Paillet, M. Valant, A. Boukenter, and Y. Ouerdane
DOI: [10.1109/TNS.2017.2778884](https://doi.org/10.1109/TNS.2017.2778884)
- DT-3 **Growth and Decay Kinetics of Radiation-Induced Attenuation in Bulk Optical Materials**
S. Girard, T. Allanche, P. Paillet, V. Goiffon, M. Van Uffelen, L. Mont-Casellas, C. Muller, A. Boukenter, Y. Ouerdane, and W. De Cock
DOI: [10.1109/TNS.2017.2778318](https://doi.org/10.1109/TNS.2017.2778318)
- DT-3 **Degradation of KNN-Based Lead-Free Piezoelectric Material under Gamma Irradiation**
G. Dai, Y. Du, Q. Zhou, L. Zhong, X. Sun, K. Wang, and J. Zhang
DOI: [10.1109/TNS.2018.2817494](https://doi.org/10.1109/TNS.2018.2817494)

SESSION E: Single Event Transients and Laser testing

- ET-1 **Single Events Induced By Heavy Ions and Laser Pulses in Silicon Schottky Diodes**
M. Mauguet, D. Lagarde, F. Widmer, N. Chatry, X. Marie, E. Lorfevre, F. Bezerra, R. Marec, and P. Calvel
DOI: [10.1109/TNS.2018.2813096](https://doi.org/10.1109/TNS.2018.2813096)
- ET-2 **Effect of Transistor Variants on Single-Event Transients at the 14-/16-nm Bulk FinFET Technology Generation**
R. C. Harrington, J. A. Maharrey, J. S. Kauppila, P. Nsengiyumva, D. R. Ball, T. D. Haeffner, E. X. Zhang, B. L. Bhuva, and L. W. Massengill
DOI: [10.1109/TNS.2018.2843260](https://doi.org/10.1109/TNS.2018.2843260)
- ET-3 **Experimental Validation of an Equivalent LET Approach for Correlating Heavy-Ion and Laser-Induced Charge Deposition**
J. M. Hales, A. Khachatryan, S. Buchner, N. J.-H. Roche, J. Warner, Z. E. Fleetwood, A. Ildefonso, J. D. Cressler, V. Ferlet-Cavrois, and D. McMorro
DOI: [10.1109/TNS.2018.2828332](https://doi.org/10.1109/TNS.2018.2828332)
- ET-4 **Experimental Investigation of the Joint Influence of Reduced Supply Voltage and Charge Sharing on Single-Event Transient Waveforms in 65-nm Triple-Well CMOS**
M. Mitrovic, M. Hofbauer, K.-O. Voss, and H. Zimmermann
DOI: [10.1109/TNS.2018.2823273](https://doi.org/10.1109/TNS.2018.2823273)

SESSION F: Radiation Effects in Devices and ICs

- FT-1 **Total Ionizing Dose Response and Annealing Behavior of Bulk nFinFETs with ON-State Bias Irradiation**
L. Yang, Q. Zhang, Y. Huang, Z. Zheng, B. Li, B. Li, X. Zhang, H. Zhu, H. Yin, Q. Guo, J. Luo, and Z. Han
DOI: [10.1109/TNS.2018.2827675](https://doi.org/10.1109/TNS.2018.2827675)
- FT-2 **An Effective Method to Compensate Total Ionizing Dose-Induced Degradation on Double-SOI Structure**
Y. Huang, B. Li, X. Zhao, Z. Zheng, J. Gao, G. Zhang, B. Li, G. Zhang, K. Tang, Z. Han, and J. Luo
DOI: [10.1109/TNS.2018.2824402](https://doi.org/10.1109/TNS.2018.2824402)
- FT-3 **The Increased Single-Event Upset Sensitivity of 65-nm DICE SRAM Induced by Total Ionizing Dose**
Q. Zheng, J. Cui, W. Lu, H. Guo, J. Liu, X. Yu, Y. Wei, L. Wang, J. Liu, C. He, and Q. Guo
DOI: [10.1109/TNS.2018.2816583](https://doi.org/10.1109/TNS.2018.2816583)
- FT-4 **TID Response of pMOS Nanowire Field-Effect Transistors: Geometry and Bias Dependence**
J. Riffaud, M. Gaillardin, C. Marcandella, N. Richard, O. Duhamel, M. Martinez, M. Raine, P. Paillet, T. Lagutere, F. Andrieu, S. Barraud, M. Vinet, and O. Faynot
DOI: [10.1109/TNS.2018.2850531](https://doi.org/10.1109/TNS.2018.2850531)
- FT-5 **Radiation Tolerance of Proton-Irradiated LGADs**
S. Otero Ugobono, M. Carulla, M. Centis Vignali, M. Fernández García, C. Gallrapp, S. Hidalgo Villena, I. Mateu, M. Moll, G. Pellegrini, and I. Vila
DOI: [10.1109/TNS.2018.2826725](https://doi.org/10.1109/TNS.2018.2826725)
- FT-6 **X-Ray and Proton Radiation Effects on 40 nm CMOS Physically Unclonable Function Devices**
P. F. Wang, E. X. Zhang, K. H. Chuang, W. Liao, H. Gong, P. Wang, C. N. Arutt, K. Ni, M. W. McCurdy, I. Verbaudhede, E. Bury, D. Linten, D. M. Fleetwood, R. D. Schrimpf, and R. A. Reed
DOI: [10.1109/TNS.2017.2789160](https://doi.org/10.1109/TNS.2017.2789160)

SESSION G: Radiation Hardening by Design

- GT-1 **Radiation-Hardened Flip-Flops with Low-Delay Overhead Using pMOS Pass-Transistors to Suppress SET Pulses in a 65-nm FDSOI Process**
K. Yamada, H. Maruoka, J. Furuta, and K. Kobayashi
DOI: [10.1109/TNS.2018.2826726](https://doi.org/10.1109/TNS.2018.2826726)
- GT-2 **Lockstep Dual-Core ARM A9: Implementation and Resilience Analysis Under Heavy Ion-Induced Soft Errors**
Á. B. de Oliveira, G. S. Rodrigues, F. L. Kastensmidt, N. Added, E. L. A. Macchione, V. A. P. Aguiar, N. H. Medina, and M. A. G. Silveira
DOI: [10.1109/TNS.2018.2852606](https://doi.org/10.1109/TNS.2018.2852606)
- GT-3 **Power-Aware SE Analysis of Different FF Designs at the 14-/16-nm Bulk FinFET CMOS Technology Node**
H. Jiang, H. Zhang, I. Chatterjee, J. S. Kauppila, B. L. Bhuva, and L. W. Massengill
DOI: [10.1109/TNS.2018.2831002](https://doi.org/10.1109/TNS.2018.2831002)

- GT-4 **Dual-Interlocked Logic for Single-Event Transient Mitigation**
J. A. Maharrey, J. S. Kauppila, R. C. Harrington, P. Nsengiyumva, D. R. Ball, T. D. Haeffner,
E. X. Zhang, B. L. Bhuva, W. T. Holman, and L. W. Massengill
DOI: [10.1109/TNS.2017.2783239](https://doi.org/10.1109/TNS.2017.2783239)
- GT-5 **On the Efficacy of ECC and the Benefits of FinFET Transistor Layout for GPU Reliability**
C. Lunardi, F. Previlon, D. Kaeli, and P. Rech
DOI: [10.1109/TNS.2018.2823786](https://doi.org/10.1109/TNS.2018.2823786)

SESSION H: Single Event Effects in Devices and ICs

- HT-1 **Impact of D-Flip-Flop Architectures and Designs on Single-Event Upset Induced by Heavy Ions**
L. Artola, G. Hubert, S. Ducret, J. Mekki, A. Al Youssef, and N. Ricard
DOI: [10.1109/TNS.2018.2800742](https://doi.org/10.1109/TNS.2018.2800742)
- HT-2 **Radiation Effects on Deep Submicrometer SRAM-Based FPGAs under the CERN Mixed-Field Radiation Environment**
G. Tsiligiannis, S. Danzeca, R. García Alía, A. Infantino, A. Lesea, M. Brugger, A. Masi,
S. Gilardoni, and F. Saigné
DOI: [10.1109/TNS.2018.2806450](https://doi.org/10.1109/TNS.2018.2806450)
- HT-3 **Analysis of Temporal Masking Effects on Master- and Slave-Type Flip-Flop SEUs and Related Applications**
R. M. Chen, N. N. Mahatme, Z. J. Diggins, L. Wang, E. X. Zhang, Y. P. Chen, Y. N. Liu,
B. Narasimham, A. F. Witulski, B. L. Bhuva, and D. M. Fleetwood
DOI: [10.1109/TNS.2018.2823385](https://doi.org/10.1109/TNS.2018.2823385)
- HT-4 **Negative and Positive Muon-Induced Single Event Upsets in 65-nm UTBB SOI SRAMs**
S. Manabe, Y. Watanabe, W. Liao, M. Hashimoto, K. Nakano, H. Sato, T. Kin, S.-I. Abe, K. Hamada,
M. Tampo, and Y. Miyake
DOI: [10.1109/TNS.2018.2839704](https://doi.org/10.1109/TNS.2018.2839704)
- HT-5 **Mechanisms of Electron-Induced Single-Event Upsets in Medical and Experimental Linacs**
M. Tali, R. García Alía, M. Brugger, V. Ferlet-Cavrois, R. Corsini, W. Farabolini, A. Javanainen,
M. Kastriotou, H. Kettunen, G. Santin, C. Boatella Polo, G. Tsiligiannis, S. Danzeca, and A. Virtanen
DOI: [10.1109/TNS.2018.2843388](https://doi.org/10.1109/TNS.2018.2843388)
- HT-6 **Single-Event Effects in the Peripheral Circuitry of a Commercial Ferroelectric Random Access Memory**
L. Bossier, V. Gupta, A. Javanainen, G. Tsiligiannis, S. D. LaLumondiere, D. Brewé, V. Ferlet-Cavrois,
H. Puchner, H. Kettunen, T. Gil, F. Wrobel, F. Saigné, A. Virtanen, and L. Dilillo
DOI: [10.1109/TNS.2018.2797543](https://doi.org/10.1109/TNS.2018.2797543)
- HT-7 **Evaluation of the Suitability of NEON SIMD Microprocessor Extensions Under Proton Irradiation**
A. Lindoso, M. García-Valderas, L. Entrena, Y. Morilla, and P. Martín-Holgado
DOI: [10.1109/TNS.2018.2823540](https://doi.org/10.1109/TNS.2018.2823540)
- HT-8 **Effects of Total-Ionizing-Dose Irradiation on Single-Event Response for Flip-Flop Designs at a 14-/16-nm Bulk FinFET Technology Node**
H. Zhang, H. Jiang, X. Fan, J. S. Kauppila, I. Chatterjee, B. L. Bhuva, and L. W. Massengill
DOI: [10.1109/TNS.2017.2781622](https://doi.org/10.1109/TNS.2017.2781622)

- HT-9 **SEU Characterization of Three Successive Generations of COTS SRAMs at Ultralow Bias Voltage to 14.2-MeV Neutrons**
J. A. Clemente, G. Hubert, J. Fraire, F. J. Franco, F. Villa, S. Rey, M. Baylac, H. Puchner, H. Mecha, and R. Velazco
DOI: [10.1109/TNS.2018.2800905](https://doi.org/10.1109/TNS.2018.2800905)
- HT-10 **SEE Error-Rate Evaluation of an Application Implemented in COTS Multicore/ Many-Core Processors**
P. Ramos, V. Vargas, M. Baylac, N.-E. Zergainoh, and R. Velazco
DOI: [10.1109/TNS.2018.2838526](https://doi.org/10.1109/TNS.2018.2838526)

SESSION I: Single Event Effects Mechanisms and Modelling

- IT-1 **Physical Mechanisms Inducing Electron Single-Event Upset**
P. Caron, C. Inguibert, L. Artola, N. Chatry, N. Sukhaseum, R. Ecoffet and F. Bezerra
DOI: [10.1109/TNS.2018.2819421](https://doi.org/10.1109/TNS.2018.2819421)
- IT-2 **Impact of Heavy Ion Energy on Charge Yield in Silicon Dioxide**
V. V. Emeliyanov, A. S. Vatiev, and R. G. Useinov
DOI: [10.1109/TNS.2018.2813669](https://doi.org/10.1109/TNS.2018.2813669)
- IT-3 **The Impact of Multiple-Cell Charge Generation on Multiple-Cell Upset in a 20-nm Bulk SRAM**
T. Kato, T. Yamazaki, K. Maruyama, T. Soeda, H. Itsuji, D. Kobayashi, K. Hirose, and H. Matsuyama
DOI: [10.1109/TNS.2018.2830781](https://doi.org/10.1109/TNS.2018.2830781)
- IT-4 **Single-Event Burnout Mechanisms in SiC Power MOSFETs**
F. Witulski, D. R. Ball, K. F. Galloway, A. Javanainen, J.-M. Lauenstein, A. L. Sternberg, and R. D. Schrimpf
DOI: [10.1109/TNS.2018.2849405](https://doi.org/10.1109/TNS.2018.2849405)
- IT-5 **Single-Event Damage Observed in GaN-on-Si HEMTs for Power Control Applications**
E. Mizuta, S. Kuboyama, Y. Nakada, A. Takeyama, T. Ohshima, Y. Iwata, and K. Suzuki
DOI: [10.1109/TNS.2018.2819990](https://doi.org/10.1109/TNS.2018.2819990)
- IT-6 **Analysis and Modeling of the Charge Collection Mechanism in 28-nm FD-SOI**
V. Correias, I. Nofal, J. Cerba, F. Monsieur, G. Gasiot, D. Alexandrescu, P. Roche, and R. Gonella
DOI: [10.1109/TNS.2018.2828162](https://doi.org/10.1109/TNS.2018.2828162)
- IT-7 **Measurement and Mechanism Investigation of Negative and Positive Muon-Induced Upsets in 65-nm Bulk SRAMs**
W. Liao, M. Hashimoto, S. Manabe, Y. Watanabe, S.-I. Abe, K. Nakano, H. Sato, T. Kin, K. Hamada, M. Tampo, and Y. Miyake
DOI: [10.1109/TNS.2018.2825469](https://doi.org/10.1109/TNS.2018.2825469)
- IT-8 **Circuit-Level Layout-Aware Modeling of Single-Event Effects in 65-nm CMOS ICs**
A. O. Balbekov, M. S. Gorbunov, and G. I. Zebrev
DOI: [10.1109/TNS.2018.2802205](https://doi.org/10.1109/TNS.2018.2802205)
- IT-9 **Analysis of Temporal Masking Effects on Master- and Slave-Type Flip-Flop SEUs and Related Applications**
R. M. Chen, N. N. Mahatme, Z. J. Diggins, L. Wang, E. X. Zhang, Y. P. Chen, Y. N. Liu, B. Narasimham, A. F. Witulski, B. L. Bhuva, and D. M. Fleetwood
DOI: [10.1109/TNS.2018.2823385](https://doi.org/10.1109/TNS.2018.2823385)

SESSION J: Facilities and Dosimetry

- JT-1 **Radioluminescence and Optically Stimulated Luminescence Responses of a Cerium-Doped Sol-Gel Silica Glass under X-Ray Beam Irradiation**
N. Al Helou, H. El Hamzaoui, B. Capoen, G. Bouwmans, A. Cassez, Y. Ouerdane, A. Boukenter, S. Girard, G. Chadeyron, R. Mahiou, and M. Bouazaoui
DOI: [10.1109/TNS.2017.2787039](https://doi.org/10.1109/TNS.2017.2787039)
- JT-2 **Atmospheric-Like Neutron Attenuation during Accelerated Neutron Testing With Multiple Printed Circuit Boards**
C. Cazzaniga, B. Bhuva, M. Bagatin, S. Gerardin, N. Marchese, and C. D. Frost
DOI: [10.1109/TNS.2018.2825644](https://doi.org/10.1109/TNS.2018.2825644)
- JT-3 **Distributed Optical Fiber Radiation Sensing in the Proton Synchrotron Booster at CERN**
D. Di Francesca, I. Toccafondo, G. Li Vecchi, S. Calderini, S. Girard, A. Alessi, R. Ferraro, S. Danzeca, Y. Kadi, and M. Brugger
DOI: [10.1109/TNS.2018.2818760](https://doi.org/10.1109/TNS.2018.2818760)
- JT-4 **ReadMON: A Portable Readout System for the CERN PH-RADMON Sensors**
I. Mateu, M. Glaser, G. Gorine, M. Moll, G. Pezzullo, and F. Ravotti
DOI: [10.1109/TNS.2017.2784684](https://doi.org/10.1109/TNS.2017.2784684)
- JT-5 **Ultrahigh Fluence Radiation Monitoring Technology for the Future Circular Collider at CERN**
G. Gorine, G. Pezzullo, I. Mandic, A. Jazbec, L. Snoj, M. Capeans, M. Moll, D. Bouvet, F. Ravotti, and J.-M. Sallese
DOI: [10.1109/TNS.2018.2797540](https://doi.org/10.1109/TNS.2018.2797540)
- JT-6 **Thermal Neutron SRAM Detector Characterization at the CERN Mixed-Field Facility, CHARM**
C. Cangialosi, S. Danzeca, M. Brucoli, M. Brugger, and A. Masi
DOI: [10.1109/TNS.2018.2829631](https://doi.org/10.1109/TNS.2018.2829631)
- JT-7 **SEE Testing in the 24-GeV Proton Beam at the CHARM Facility**
R. García Alía, M. Brugger, M. Cecchetto, F. Cerutti, S. Danzeca, M. Delrieux, M. Kastriotou, M. Tali, and S. Uznanski
DOI: [10.1109/TNS.2018.2831786](https://doi.org/10.1109/TNS.2018.2831786)

SESSION K: Radiation Hardness Assurance at devices and system level

- KT-1 **Reliability–Performance Analysis of Hardware and Software Co-Designs in SRAM-Based APSocS**
L. Antunes Tambara, F. L. Kastensmidt, P. Rech, F. Lins, N. H. Medina, N. Added, V. A. P. Aguiar, and M. A. G. Silveira
DOI: [10.1109/TNS.2018.2844250](https://doi.org/10.1109/TNS.2018.2844250)

SESSION L: Radiation Environments (space, atmospheric, terrestrial and accelerators)

- LT-1 **In-Flight Dark Current Nonuniformity Used for Space Environment Model Benchmarking**
C. Inguibert, S. Bourdarie, M. Beaumel, M. C. Ursule, and R. Ecoffet
DOI: [10.1109/TNS.2018.2800903](https://doi.org/10.1109/TNS.2018.2800903)

- LT-2 **Electron Environment Characteristics and Internal Charging Evaluation for MEO Satellite**
J.-Z. Wang, Y.-Q. Hu, D.-Y. Yu, Z.-B. Cai, and Q.-X. Zhang
DOI: [10.1109/TNS.2018.2792049](https://doi.org/10.1109/TNS.2018.2792049)
- LT-3 **High-Energy Electrons in the Inner Zone**
D. Boscher, S. Bourdarie, V. Maget, A. Sicard, G. Rolland, and D. Standarovski
DOI: [10.1109/TNS.2018.2824543](https://doi.org/10.1109/TNS.2018.2824543)
- LT-4 **Contribution of Thermal Neutrons to Soft Error Rate**
C. Weulersse, S. Houssany, N. Guibbaud, J. Segura-Ruiz, J. Beaucour, F. Miller, and M. Mazurek
DOI: [10.1109/TNS.2018.2813367](https://doi.org/10.1109/TNS.2018.2813367)
- LT-5 **Electrons in GEO Measured With the ESA Multifunctional Spectrometer During the January 2014 SEP**
L. Arruda, P. Gonçalves, F. Carvalho, A. Marques, J. C. Pinto, A. Aguilar, P. Marinho, T. Sousa, H. Evans, and P. Nieminen
DOI: [10.1109/TNS.2018.2854161](https://doi.org/10.1109/TNS.2018.2854161)
- LT-6 **Impact of Thermal and Intermediate Energy Neutrons on SRAM SEE Rates in the LHC Accelerator**
M. Cecchetto, R. García Alía, S. Gerardin, M. Brugger, A. Infantino, and S. Danzeca
DOI: [10.1109/TNS.2018.2831786](https://doi.org/10.1109/TNS.2018.2831786)

SESSION M - Analog and Mixed-Signal Integrated Circuits for Use in Space Applications and Radiation Environments (AMICSA)

- MT-1 **Design of a Radiation Hardened Power-ON-Reset**
E. López-Morillo, F. R. Palomo, F. Márquez, and F. Muñoz
DOI: [10.1109/TNS.2018.2840326](https://doi.org/10.1109/TNS.2018.2840326)

SECTION SC: SHORT COURSE papers

- SC-1 **Evolution of Total Ionizing Dose Effects in MOS Devices with Moore's Law Scaling**
D. M. Fleetwood
DOI: [10.1109/TNS.2017.2786140](https://doi.org/10.1109/TNS.2017.2786140)
- SC-2 **Dosimetry Techniques and Radiation Test Facilities for Total Ionizing Dose Testing**
F. Ravotti
DOI: [10.1109/TNS.2018.2829864](https://doi.org/10.1109/TNS.2018.2829864)
- SC-3 **Displacement Damage in Silicon Detectors for High Energy Physics**
M. Moll
DOI: [10.1109/TNS.2018.2797540](https://doi.org/10.1109/TNS.2018.2797540)