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PART I OF TWO PARTS

**SELECTED PAPERS FROM THE 2007 RADIATION AND ITS EFFECTS ON COMPONENTS AND SYSTEMS
(RADECS) CONFERENCE, Deauville, France, September 10–14, 2007**

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SELECTED PAPERS FROM THE 2007 RADIATION AND ITS EFFECTS ON COMPONENTS AND SYSTEMS (RADECS) CONFERENCE, Deauville, France, September 10–14, 2007

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RADECS 2007 Conference Overview

THE 9th European Conference on Radiation and its Effects was held in Deauville in the French Normandy seashore on September 10–14, 2007, organized by the CEA, Commissariat à l’Energie Atomique, France, on behalf of the RADECS Association. This conference gathered 320 attendees from 21 countries all over the world. Participants were scientists, engineers and students working in industry, government and research institutions.

The Technical Program, arranged by Olivier Flament, and a team of 24 Session Chairs and 179 Official Reviewers, consisted of 38 oral and 62 poster contributed presentations. The Technical Chairman wished to thank the Chairpersons and Reviewers who dedicated time and competence to foster the quality and interest of the presentations. We are proud to acknowledge and list them in a special part of this volume.

The one-day Short Course, organized by Véronique Ferlet-Cavrois with 14 distinguished Lecturers, was dedicated this year to “Radiation Effects, from Material to System: A Multiscale Approach.” The Short-Course Lecturers, and a close team of Reviewers had been working very hard and we are very proud of their high quality preparation. This day enabled a synthetic and current restatement to be made before 150 Attendees. A special issue of IEEE TRANSACTIONS ON NUCLEAR SCIENCE is to be issued based on this material.

Eminent guests gave Invited Talks on exciting and hot topics, chaired by Jean-Claude Boudenot. We cheerfully thank all of them for having accepted our invitation to talk. Jean Bernard Memet, corrosion scientist and submarine explorer, talk about the research endeavours of the explorer Count of La Perouse who travelled by sea around the Americas, Siberia and explored the southern hemisphere near Australia in the 18th Century. Jacques Paul, Mission Scientist of CEA and Paris VII University, addressed scientific and technical advances on various tracks including Space exploration, the “Hunt for Black Holes with the Integral Space Gamma-Ray Observatory” and the detection technology implied. Frederick Bordry of CERN reported fresh news of the Large Hadron Collider to be fired soon in Geneva with “The LHC Power Converters and their Radiation Tolerance” to high energy particle halo in the accelerator tunnel. Robert Baumann, of Texas Instrument, and Robert Edwards, of Goodrich, gave the last news of test and design standards concerning single neutron effects, in Semiconductor Industry and in Avionics. Their talks successively addressed Semiconductor Industry and Avionics, respectively: “The new JEDEC JESD89A Test Standard—How is It Different than the Old One and Why Should We Use It?” and “Addressing the Effects of Atmospheric Radiation on Avionics, International

Electrotechnical Commission Technical Specification”. Xavier Ledoux of CEA described the new “Neutrons for Science” high intensity, 1–40 MeV collimated pulsed, neutron Beam with monoenergetic or continuous spectrum to be installed at GANIL in the frame of SPIRAL2 project.

A Technical Tour at GANIL, Grand Accélérateur National d’Ions Lourds, near the city of Caen, was kindly organized by Bruno Piquet and Philippe Chomaz, with 50 visitors.

The Roundtable on “Radiation Effects in Future Electronics from Device to Systems: Space, Avionics, High Energy Physics, Nuclear Energy, Physics Instruments, ITER—End of CMOS roadmap—New multidisciplinary needs?,” lead by Olivier Flament, gathered seven members on stage and a large audience of more than 100 in the auditorium.

Arrangements, always a large and careful task, has been inspired and superbly coordinated by Jacques Baggio. It involved a large team of enthusiastic and imaginative members comprising Marcia Arizaga and Theresa Farris for the industrial exhibits, Philippe Paillet for sponsors, Claude Fourbert and Ludovic Besson, Conference Secretaries from Aylesbeare, our partner in organizing RADECS 2007. The Industrial exhibition, with 24 booths occupied by component manufacturers, parts procurement agencies, test facilities and service providers as well as space agencies and professional organizations, was an important forum for the exchange of business and technical informations.

Our prime sponsors, the NASA Living with a Star Program, Tektronix Enabling Innovation and Codra Ingénierie, are sincerely and greatly acknowledged, and the CEA which took the whole responsibility of the event and gave operational and management support. Publicity support came from IEEE France Section though the IEEE Region 8 online journal. Joel Montaron, Jacques Baggio and Philippe Paillet were the cornerstone for finance and for the link with our CEA management and back-office. Thanks for their precious advices!

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The Scientific Advisory Committee, the three Liaisons with IEEE, the RADECS Association, and the previous and next Conference Chairs team an excellent backup and source of inspiration. We, the Organization Committee, including Awards Chair Alessandro Paccagnella and three editors Sylvain Girard, Nicolas Richard and Jim Schwank, count on their assistance and guidance during the five days of RADECS and after.

A team of doctoral graduate students, Jean Bisutti, Renaud Durand, Alexia Gallo, Blandine Tortech, Julien Mekki, Laurent Troussellier, Mathieu Boutillier, Antoine Gauffier and Patrice

Jaulent were recognizable in their RADECS t-shirts. They have volunteered and relentlessly did their best to help our attendees, inside and outside the conference facilities, with good spirit and enthusiasm from morning to evening.

The whole team (the CEA-DIF organizing team, the members of the committees, the session chairs and the reviewers) wish to think this RADECS issue, which has been profitable and rewarding to all, including reviewers, invited persons, lecturers, speakers, poster presenters and attendees.

Rendezvous with the next organizing teams in 2008 in Juvaskula, Finland, and in 2009 in Brüggeren, Belgium.

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Comments by the Editors

THIS Special Issue of the IEEE TRANSACTIONS ON NUCLEAR SCIENCE (TNS) contains selected papers from the 2007 Radiation and its Effects on Components and Systems Conference (RADECS 2007), which was held on 10–14 September, 2007, at the Centre International de Deauville, Deauville, France. Nearly 90 oral and poster papers were presented at the Conference and of these 70 of them were submitted for review for possible publication in this Special Issue of the TNS. (Two papers, "Efficient Protection Techniques Against SEUs for Adaptive Filters: An Echo Canceller Case Study" and "Effects of Guard Bands and Well Contacts in Mitigating Long SETs in Advanced CMOS Processes," were published in Part III of the June TNS issue under the Radiation Effects category.) These manuscripts were scrutinized by at least three reviewers to ensure that all manuscripts were original and represented significant contributions to the literature. Those manuscripts that have successfully finished going through the review process appear in this journal. Also included in this RADECS 2007 special issue of the TNS are selected review papers based on presentations at the highly successful RADECS 2007 Short Course. This is the first time that the RADECS special issue of the TNS has included review papers based on the Short Course.

To provide consistent reviews of papers throughout the year, the IEEE TRANSACTIONS ON NUCLEAR SCIENCE has made changes in its editorial process. The new editorial process relies on a year-round editorial board that now manages reviews for submissions throughout the year to the TRANSACTIONS in the area of radiation effects. The review process is managed by a Senior Editor and six or seven associate editors who are technically knowledgeable in one or more specializations

and are experienced in the publication process. This is the second time that the year-round editorial structure has been used for the RADECS special issue of the TNS. The process worked well. The editors thank Alison Larkin of the IEEE staff for her support in making this process run smoothly. Once more, coordination between RADECS and the IEEE, with Paul Dressendorfer as a knowledgeable Editor, has proven very effective and has made this review process a pleasant experience. We would like to take this opportunity to thank both the authors for their outstanding contributions and the reviewers for their relentless efforts in maintaining the high quality of these TRANSACTIONS.

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