2016 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2016)

Nuremberg, Germany
6-8 September 2016
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J. Lorenz (Fraunhofer IISB)

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M. Law (University of Florida)

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A. Juge, J. Franco, G. Gouget, P. Scheer, and T. Poiroux (STMicroelectronics; CEA-Leti)

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M. Noei and C. Jungemann (Chair of Electromagnetic Theory, RWTH Aachen)

11:30 Modeling the Thermal Conductivity of Si Nanowires with Surface Roughness
K. Vuttivorakulchai, M. Luisier, and A. Schenk (ETH Zurich)

11:50 One-Dimensional Multi-Subband Monte Carlo Simulation of Charge Transport in Si Nanowire Transistors

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11:50 Empirical Cluster Modeling Revisited
P. Pichler (Fraunhofer Institute for Integrated Systems and Device Technology IISB and Chair of Electron Devices, University of Erlangen-Nuremberg)

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Based on Ab Initio Calculation
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15:00 Examination of the InP/InGaAs Single-Photon Avalanche Diodes by Establishing a New TCAD-Based Simulation Environment
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15:20 Simulation of AlGaN/GaN Rake-Gate HFET: A Novel Normally-Off HFET Based on Stress and Layout Engineering
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Z. Stanoević, M. Karner, O. Baumgartner, HW. Karner, C. Kernstock, H. Demel, and F. Mitterbauer (Global TCAD Solutions GmbH)

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Z. Deng, J. Jiang, S. Dong, L. Zhang, J. Zhang, Y. Wang, and Z. Yu (Tsinghua University)

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**Plenary Session C (Richard-Wagner-Saal)**

**09:00 Invited: Performance Evaluation of FinFETs: From Multi-Subband BTE to DD Calibration**

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<td>Y. Huang and G. Wachutka (Technical University of Munich)</td>
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**10:00 A Simulation Model for SiC Power MOSFET Based on Surface Potential**

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<td>Y. Nakamura, M. Shintani, K. Oishi, T. Sato, T. Hikihara (Graduate School of Engineering, Kyoto University)</td>
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**10:20 3D TCAD Analysis of the Effect on di/dt of Cathode Shorts in Phase Controlled Thyristors**

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<td>M. Bellini and J. Vobeký (ABB Switzerland Ltd)</td>
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**Session 8: Equipment-Related Process Simulation (Albrecht-Dürer-Saal)**

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**10:00 Automated Source/Mask/Directed Self-Assembly Optimization Using a Self-Adaptive Hierarchical Modeling Approach**

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**10:20 Equipment Simulation for Studying the Growth Rate and Its Uniformity of Oxide Layers Deposited by Plasma-Enhanced Oxidation**

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<td>E. Baer and J. Niess (Fraunhofer Institute for Integrated Systems and Device Technology IISB; HQ-Dielectrics GmbH)</td>
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<td>A. Marchewka, R. Waser, and S. Menzel (Institut für Werkstoffe der Elektrotechnik II, RWTH Aachen University; Forschungszentrum Jülich)</td>
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**11:50 Advanced Physical Modeling of SiOₓ Resistive Random Access Memories**

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**12:10 Atomic Monte-Carlo Simulation for CBRAM with Various Filament Geometries**

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O11.1 C. Toechterle,1 F. Pfirsch,2 C. Sandow,2 and G. Wachutka1 (1 Institute for Physics of Electrotechnology, Technical University of Munich; 2 Infineon Technologies AG)

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O11.2 A. Tone, Y. Miyaoku, M. Miura-Mattausch, U. Feldmann, H. Kikuchihara, H. J. Mattausch, and D. Navarro1 (Hiroshima University; 1 Silvaco Japan)

15:20 Automated Vertical Design Co-Optimization of a 1200V IGBT and Diode
O11.3 M. Bina, A. Philippou, M. Hauf, Ch. Sandow, and F.-J. Niedernostheide (Infineon Technologies AG)

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O12.2 S. Di,1 Z. Lun,1 P. Chang,1 L. Shen,1 K. Zhao,1,3 T. Lu,2 G. Du,1 X. Liu1 (1 Institute of Microelectronics, Peking University; 2 CAPT, HEDPS, IFSA Collaborative Innovation Center of MoE, LMAM & School of Mathematical Sciences, Peking University; 3 School of Information and Communication, Beijing Information Science and Technology University)

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<td>M. A. Elmessary, D. Nagy, M. Aldegunde, A. J. García-Loureiro, and K. Kalna (Swansea University; Mansoura University; School of Engineering; Universidade de Santiago de Compostela)</td>
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F. Fuchs,1,2,3 A. Zienert,4 S. Mothes,2,5 M. Claus,2,5 S. Gemming,1,2 and J. Schuster2,3 (1Helmholtz-Zentrum Dresden-Rossendorf; 2Center for Advancing Electronics Dresden; 3Fraunhofer Institute for Electronic Nano Systems; 4Center for Microtechnologies, TU Chemnitz; 5Chair for Electron Device and Integrated Circuits, TU Dresden)

Using One-Dimensional Radiosity to Model Neutral Flux in Convex High Aspect Ratio Structures

P. Manstetten,1 L. Filipovic,2 A. Hössinger,3 J. Weinhub,1 and S. Selberherr2 (1Christian Doppler Laboratory for High Performance TCAD at the 2Institute for Microelectronics, TU Wien; 3Silvaco Europe Ltd.)

Deterministic Solutions of the Boltzmann Equation for Charge Transport in Graphene on Substrates

A. Majorana, G. Mascali, and V. Romano (University of Catania)

Performance Analysis of p-Type Silicon Nanowire FETs with Silicon-Germanium Cladding

M. Frey,1 J. Huang,2 F. Heinz,1 A. Erlebach,1 L. Smith,2 and V. Moroz2 (1Synopsys Switzerland LLC; 2Synopsys, Inc.)

Carbon Nanotube Field-Effect Transistor Performance in the Scope of the 2026 ITRS Recommendations

A. Pacheco-Sanchez,1 D. Loroch,1 S. Mothes,1,2 M. Schröter,1,3 and M. Claus1,2 (1Department of Electrical and Computer Engineering, Technische Universität Dresden; 2Center for Advancing Electronics Dresden, Technische Universität Dresden; 3Department of Electronics and Communication Engineering, University of California at San Diego)
Thursday, September 8

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10:20 A Comprehensive Solution for BEOL Variation Characterization and Modeling

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11:50 Noise Simulation of Bipolar Organic Semiconductor Devices Based on the Master Equation
W. Zhou, C. Zimmermann, and C. Jungemann (Chair of Electromagnetic Theory, RWTH Aachen University)

Plenary Session F (Richard-Wagner-Saal)

13:40 Invited: Future Perspectives of TCAD in the Industry
T. Ma, V. Moroz, R. Borges, K. El Sayed, P. Asenov, and A. Asenov (Synopsys)

Session 17: SiGe Device Simulation (Richard-Wagner-Saal)

14:20 Physics-Based Hot-Carrier Degradation Model for SiGe HBTs
H. Kamrani, D. Jabs, V. d’Alessandro, N. Rinaldi, and C. Jungemann (Chair of Electromagnetic Theory, RWTH Aachen University; Dept. of Electrical Eng. and Information Tech., University Federico II, Naples)

14:40 Impact of BTBT, Stress and Interface Charge On Optimum Ge in SiGe pMOS for Low Power Applications

Session 18: Monte-Carlo Simulation (Albrecht-Dürer-Saal)

14:20 Advanced Quasi Self-Consistent Monte Carlo Simulations of Electrical and Thermal Properties of Nanometer-Scale Gallium Nitride HEMTs Considering Local Phonon Number Distribution
N. Ito, T. Misawa, and Y. Awano (Keio University)

14:40 Theoretical Study of Electron Transport in Silicene and Germanene Using Full-Band Monte Carlo Simulations
G. Gaddemane, W. G. Vandenberghe, and M. V. Fischetti (University of Texas at Dallas)

Session 19: Graphene (Richard-Wagner-Saal)

15:40 Modeling Electrostatic Doping and Series Resistance in Graphene-FETs
S. Venica, M. Zanato, F. Driussi, P. Palestri, and L. Selmi (University of Udine)

16:00 Models for Plasmonic THz Detectors Based on Graphene Split-Gate FETs with Lateral p-n Junctions
M. Ryzhii, V. Ryshii, A. Satou, T. Otsuji, V. Mitin, and M. S. Shur (University of Aizu; Tohoku University; University at Buffalo; Rensselaer Polytechnic Institute)

16:20 Effect of Rotational Misalignment on Interlayer Coupling in a Graphene/hBN/Graphene van der Waal’s Heterostructure
A. Valsaraj, L. F. Register, and S. K. Banerjee (University of Texas at Austin)

Session 20: DFT and NEGF (Albrecht-Dürer-Saal)

15:40 Carrier Scattering by Workfunction Fluctuations and Interface Dipoles in High-κ/Metal Gate Stacks
Z. Zeng, F. Triozon, and Y.-M. Niquet (CEA, INAC-MEM, L Sim; University Grenoble Alpes; CEA,INAC-MEM)
16:00  Metal-InGaAs Contact Resistance Calculations from First Principles
O20.2  T. Markussen and K. Stokbro (QuantumWise A/S)

16:20  Semiconductor Band Alignment from First Principles: A New Nonequilibrium Green’s Function Method Applied to the CZTSe/CdS Interface for Photovoltaics
O20.3  M. L. N. Palsgaard,¹,²  A. Crovetto,¹  T. Gunst,¹  T. Markussen,²  O. Hansen,¹  K. Stokbro,² and M. Brandbyge¹ (¹DTU Technical University of Denmark; ²QuantumWise A/S)

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