

International Semiconductor Device Research Symposium
December 7-9, 2011
Stamp Student Union
University of Maryland
College Park, Maryland, USA

Technical Program

Wednesday, December 7, 2011

12:00 PM - 7:00 PM Registration – Grand Ballroom Lounge

WP1: Nanoelectronics I: Novel Devices - 1:30 PM - 3:30 PM

Chairperson: Terrance O'Regan, U.S. Army Research Laboratory

Meeting Room: Colony Ballroom

- 1:30 PM - 1:50 PM **WP1-01 Invited**
Principles of Operation for a Fast, Low-Voltage Digital Switch
Thomas Theis¹
¹IBM Research
- 1:50 PM - 2:10 PM **WP1-02 Invited**
Modified RCA Clean Transfer of Graphene and All-carbon Electronic Devices Fabrication
*Xuelei Liang¹, B. Sperling², I. Calizo², G. Cheng², C. Hacker², Q. Zhang², Y. Obeng², K. Yan¹, H. Peng¹,
A. Hight Walker², C. Richter²*
¹Peking University, China, ²National Institute of Standards and Technology
- 2:10 PM - 2:30 PM **WP1-03 Student**
A Tunneling Field-Effect Transistor Using Side Metal Gate/High-k Material for LowPower Application
Hyun Woo Kim¹, J. Lee¹, W. Kim¹, M. Sun¹, J. Kim¹, G. Kim¹, K. Kim¹, H. Kim¹, J. Seo¹, B. Park¹
¹Seoul National University, Korea, Republic of
- 2:30 PM - 2:50 PM **WP1-04**
Four -state FETs Incorporating Quantum Dot Gate (QDG), Quantum Dot Channel (QDC) and Spatial
Wavefunction-switched (SWS) Structures: Basis for 2-bit Processing Circuit Architectures
Faquir Jain¹, K. Baskar¹, S. Karmakar¹, P. Chan¹, E. E. Suarez¹, B. Miller¹, J. Chandty¹, E. Heller²
¹University of Connecticut, ²RSoft Design Group
- 2:50 PM - 3:10 PM **WP1-05**
Silicon-Compatible Bulk-Type Compound Junctionless Field-Effect Transistor
Seongjae Cho¹, S. Park², B. Park², J. Harris, Jr.¹
¹Stanford University, ²Seoul National University, Korea, Republic of
- 3:10 PM - 3:30 PM **WP1-06**
Giant Injection of Two-Dimensional Electron Gas
Alexander Dmitriev¹, M. Shur¹
¹Rensselaer Polytechnic Institute

WP2: Wide Bandgap I: UV Emitters - 1:30 PM - 3:30 PM

Chairperson: Michael Wraback, U.S. Army Research Laboratory

Meeting Room: Charles Carroll Room

- 1:30 PM - 2:00 PM **WP2-01 Invited**
Towards Sub-300 nm Laser Diodes on Bulk AlN Substrates
Thomas Wunderer¹, C. Chua¹, J. Northrup¹, Z. Yang¹, N. Johnson¹, M. Kneissl^{1,2}, G. Garrett³, H. Shen³, M. Wraback³, R. Schlessler⁴, R. Dalmau⁴, Z. Sitar⁴
¹Palo Alto Research Center, ²Technische Universität Berlin, Germany, ³U.S. Army Research Laboratory, ⁴HexaTech
- 2:00 PM - 2:30 PM **WP2-02 Invited**
Single-chip 260 nm Pseudomorphic Ultraviolet Light Emitting Diode Emitting over 200 mW Output Power
Leo Schowalter¹, J. Grandusky¹, J. Chen¹, M. Mendrick¹, S. Gibb¹
¹Crystal IS, Inc.
- 2:30 PM - 3:00 PM **WP2-03 Invited**
Deep UV LEDs
Remis Gaska¹
¹Sensor Electronic Technology, Inc.
- 3:00 PM - 3:20 PM **WP2-04**
Enhanced Photon Extraction Efficiency in 260 nm Pseudomorphic AlN-based Ultraviolet Light Emitting Diodes
Jianfeng (Jeff) Chen¹, J. Grandusky¹, M. Mendrick¹, S. Gibb¹, Y. Kim², S. Lin², L. Schowalter¹
¹Crystal IS, Inc., ²Rensselaer Polytechnic Institute

WP3: Oxides and Dielectrics - 1:30 PM - 3:30 PM

Chairperson: Ali Gokirmak, University of Connecticut

Meeting Room: Benjamin Banneker Room

- 1:30 PM - 1:50 PM **WP3-01 Invited**
First Principles Computational Studies of High-k Dielectric Stacks for Next Generation Transistors
Ramamurthy Ramprasad¹
¹University of Connecticut
- 1:50 PM - 2:10 PM **WP3-02 Student**
Improvement of Polycrystalline Silicon Thin-Film Transistors with Nickel-Titanium Oxide by Sol-Gel Spin-Coating and Nitrogen Implantation
Shih-Chieh Wu¹, T. Hou¹, S. Chuang², T. Chao¹, T. Lei¹
¹National Chiao-Tung University, Taiwan, ²National University of Kaohsiung, Taiwan
- 2:10 PM - 2:30 PM **WP3-03 Student**
Electrical Characteristics of SiGe MOSFETs Integrated with Tantalum or Titanium Oxynitride Higher-k Gate Dielectrics
Chen-Chien Li¹, K. Chang-Liao¹, C. Fu¹, T. Tzeng¹, T. Wang¹, W. Tsai², C. Ai²
¹National Tsing Hua University, Taiwan, ²Institute of Nuclear Energy Research, Taiwan
- 2:30 PM - 2:50 PM **WP3-04 Student**
A 0.7 nm EOT and Low Gate Leakage Current for MOS Device with Ti/HfO₂/Hf Higher-k Gate Dielectric
Hao-Zhi Hong¹, K. Chang-Liao¹, C. Fu¹, C. Li¹, Y. Hsu¹, T. Wang¹
¹National Tsing Hua University, Taiwan

2:50 PM - 3:10 PM **WP3-05 Student**
Effects of Oxygen Content and Capping Metal Layer on Bipolar Switching Properties of HfO₂-Based Resistive Random Access Memory Devices
Chen-Chien Li¹, K. Chang-Liao¹, Y. Chen¹, C. Fu¹, L. Liu¹, T. Wang¹
¹National Tsing Hua University, Taiwan

3:10 PM - 3:30 PM **WP3-06 Student**
Improved Characteristics of Charge-trapping Flash Device with Tunneling Layer Formed by Low Temperature Nitrogen-Rich SiN/SiO₂ Stack
Chun-Yuan Chen¹, K. Chang-Liao¹, J. Ho¹, T. Wang¹
¹National Tsing Hua University, Taiwan

WP4: Photovoltaics/Electronics for Energy - 1:30 PM - 3:30 PM

Chairperson: Patrick Shea, Northrop Grumman

Co-Chairperson: Mason Reed, Motech Americas

Meeting Room: Juan Ramon Jimenez Room

1:30 PM - 1:50 PM **WP4-01**
Modeling of Thermal Conductivity and Thermoelectric Power Factor in Ultrathin SOI Nanomembranes and Silicon Nanowires
Zlatan Aksamija¹, I. Knezevic¹, E. Ramayya¹
¹University of Wisconsin-Madison

1:50 PM - 2:10 PM **WP4-02 Student**
3-D Simulation of Electronic and Ionic Transport in PEFC Cathodes
Soumak Mookherjee¹, P. Andrei¹, W. Zhu¹, J. Zheng¹
¹Florida State University

2:10 PM - 2:30 PM **WP4-03**
A Large-area, LED-based Spectral Response Measurement System for Solar PV Device Characterization
Behrang Hamadani¹, J. Roller¹, H. Yoon¹, B. Dougherty¹
¹National Institute of Standards and Technology

2:30 PM - 2:50 PM **WP4-04**
Short-circuit Current Enhancement in p-i-n GaAs/Ge Solar Cells with Tuned Superlattices, Embedded in the Mid-region
Argyrios Varonides¹
¹University of Scranton

2:50 PM - 3:10 PM **WP4-05 Student***
Benchmarking Admittance Spectroscopy Methodologies for Solar Cell Electrical Characterization
Dionisis Berdebes¹, J. Moore¹, X. Wang¹, M. Lundstrom¹
¹Purdue University

3:10 PM - 3:30 PM **WP4-06 Invited**
Detecting Free Carriers in Organic Photovoltaic Systems: Time-Resolved Microwave Conductivity
Garry Rumbles^{1,2}, O. Reid¹
¹NREL, ²University of Colorado

WP5: Optics and Optoelectronics: - 1:30 PM - 3:30 PM

Chairperson: Martin Peckerar, University of Maryland

Meeting Room: Margaret Brent Room B

- 1:30 PM - 1:50 PM **WP5-01 Invited**
Negative Electromagnetic Radiation Pressure on Left-Handed Dissipative Media
Henri Lezec¹, A. Agrawal², M. Abashin¹, K. Chau³
¹NIST, ²Syracuse University, ³University of British Columbia, Okanagan, Canada
- 1:50 PM - 2:10 PM **WP5-02**
Low Photon Nonlinear Effects in Integrated Photonic Crystal Cavities Coupled to Quantum Dots
Ranojoy Bose¹, D. Sridharan¹, H. Kim¹, G. Solomon², E. Waks¹
¹University of Maryland, College Park, ²National Institute of Standards and Technologies
- 2:10 PM - 2:30 PM **WP5-03 Student**
Overcoming Auger Recombination in Nanocrystal Quantum Dots Using Purcell Enhancement
Shilpi Gupta¹, E. Waks¹
¹Institute for Research in Electronics and Applied Physics
- 2:30 PM - 2:50 PM **WP5-04**
Selective Coupling of Quantum Dot Exciton Spin States to a Photonic Crystal Cavity Using Magnetic Field Tuning
Hyochul Kim¹, T. Shen¹, D. Sridharan¹, G. Solomon², E. Waks¹
¹University of Maryland, ²NIST
- 2:50 PM - 3:10 PM **WP5-05**
Ultrafast Control of Electron Spin in a Quantum Dot Using Geometric Phase
Vladimir Malinovsky¹, S. Rudin¹
¹U.S. Army Research Laboratory
- 3:10 PM - 3:30 PM **WP5-06**
Novel Theory on the Operation of Bipolar Junction Transistor Using Internal Photovoltaic Effect Model
Kensho Okamoto¹
¹Kagawa University, Japan

3:30 PM – 3:45 PM Coffee Break – Grand Ballroom Lounge

WP6: Nanoelectronics II: 2D Materials and Memory - 3:45 PM - 5:55 PM

Chairperson: Glen Birdwell, U.S. Army Research Laboratory

Meeting Room: Colony Ballroom

- 3:45 PM - 4:15 PM **WP6-01 Invited**
Wafer-scale Graphene Technology and GHz Nanoelectronics
Deji Akinwande¹, K. Parrish¹, M. Ramon¹, L. Tao¹, S. Banerjee¹
¹University of Texas, Austin
- 4:15 PM - 4:35 PM **WP6-02 Student**
Low-IRESET Unipolar HfO₂ RRAM and Tunable Resistive-Switching Mode via Interface Engineering
Kuan-Liang Lin¹, T. Hou¹, Y. Lee², J. Lin³, J. Chang³, J. Shieh⁴, C. Chou³, W. Chang⁵, W. Jang⁵, C. Lin⁵
¹National Chiao Tung University, Taiwan, ²National Nano Device Laboratories, Taiwan, ³National Central University, Taiwan, ⁴National United University, Taiwan, ⁵Winbond Electronics Corporation, Taiwan
- 4:35 PM - 4:55 PM **WP6-03 Student**
Uniformity Improvement by Optimization of Switching Interface in Bi-layer Unipolar RRAM Structure for Low Power New Memory Application
Kyung-Chang Ryoo¹, J. Oh¹, S. Jung¹, S. Kim¹, B. Park¹
¹Seoul National University, Korea, Republic of

- 4:55 PM - 5:15 PM **WP6-04 Student**
Vertical-Channel STacked ARray (VCSTAR) for 3D NAND Flash Memory
Yoon Kim¹, S. H. Park¹, W. Kim¹, J. Y. Seo¹, and B. G. Park¹
¹Seoul National University, Korea, Republic of
- 5:15 PM - 5:35 PM **WP6-05 Student**
A High-Density SRAM Design Technique Using Silicon Nanowire FETs
Yi-Bo Liao¹, M. Chiang², K. Kim³, W. Hsu¹
¹National Cheng Kung University, Taiwan, ²National Ilan University, Taiwan, ³IBM
- 5:35 PM - 5:55 PM **WP6-06 Student**
Single Layer MoS₂ Band Structure and Transport
Mehdi Salmani-Jelodar¹, Yaohua Tan¹, Mathieu Luisier², Timothy Boykin³, Gerhard Klimeck¹
¹Purdue University, ²Integrated Systems Laboratory, ETH, ³University of Alabama in Huntsville

WP7: Wide Bandgap II: Nitride Optoelectronics - 3:55 PM - 5:45 PM

Chairperson: Chad Gallinat, U.S. Army Research Laboratory

Meeting Room: Charles Carroll Room

- 3:45 PM - 4:15 PM **WP7-01 Invited**
Challenges and Approaches of Fabricating GaN-based Green Lasers
Dmitry Sizov¹, R. Bhat¹, C. Zah¹
¹Corning Incorporated
- 4:15 PM - 4:35 PM **WP7-02**
Failure Mode and Effects Criticality Analysis of AlGaInP and GaN Based LEDs for Medical Applications
Milind Sawant¹, A. Christou¹
¹University of Maryland
- 4:35 PM - 4:55 PM **WP7-03 Student**
Optical Studies of Strained InGaN/GaN Quantum Structures Implanted with Europium for Red Light Emitting Diodes
Jingzhou Wang¹, W. Jadwisienczak¹, M. Ebdah¹, M. Kordesch¹, A. Anders²
¹Ohio University, ²Lawrence Berkeley National Laboratory
- 4:55 PM - 5:15 PM **WP7-04**
Improved THz Emission in c-plane InGaN due to Polarization Charges at the InGaN/GaN Interface
Nathaniel Woodward¹, C. Gallinat¹, G. Metcalfe¹, H. Shen¹, M. Wraback¹
¹U.S. Army Research Laboratory
- 5:15 PM - 5:35 PM **WP7-05 Student***
Nitride THz GaN Quantum Cascade Lasers
Hung Chi Chou¹, M. Anwar¹, T. Manzur², A. Sood³, J. Zeller³
¹University of Connecticut, ²Naval Undersea Warfare Center (NUWC), ³Magnolia Optical Technologies
- 5:35 PM - 5:55 PM **WP7-06 Student**
Properties of InAs- and Silicon-Based Ballistic Spin Field-Effect Transistors Operated at Elevated Temperature
Dmitri Osintsev¹, V. Sverdlov¹, A. Makarov¹, S. Selberherr¹
¹Institute for Microelectronics, Austria

WP8: Oxides and Dielectrics II - 3:45 PM - 5:55 PM

Chairperson: Agis Iliadis, University of Maryland

Meeting Room: Benjamin Banneker Room

- 3:45 PM - 4:15 PM **WP8-01 Invited**
Higher-k Dielectrics and Conductive Oxide Electrodes for Next Generation DRAMs with a Design Rule of < 20 nm[#]
Cheol Seong Hwang¹, J. Han¹, W. Lee¹, S. Lee¹
¹Seoul National University, Korea, Republic of
- 4:15 PM - 4:35 PM **WP8-02**
Characterization and Resistive Switching Properties of Solution-Processed HfO₂, HfSiO₄, and ZrSiO₄ Thin Films on Rigid and Flexible Substrates
Joseph L. Tedesco¹, W. Zheng¹, O. Kirillov¹, S. Pookpanratana¹, H. Jang¹, P. Kavuri¹, N. Nguyen¹, C. Richter¹
¹National Institute of Standards and Technology
- 4:35 PM - 4:55 PM **WP8-03**
Properties and Challenges of Scaled Resistive Memory
Seann Bishop¹, B. Briggs¹, K. Leedy², H. Bakhru¹, N. Cady¹
¹University at Albany - SUNY, ²Wright-Patterson Air Force Base
- 4:55 PM - 5:15 PM **WP8-04 Student**
Analysis of Nonpolar Resistive Switching Exhibited by Al/Cu_xO/Cu Memristive Devices Created via Room Temperature Plasma Oxidation
Nathan McDonald¹, S. Bishop², B. Briggs², J. Van Nostrand¹, N. Cady²
¹AFRL Rome Research Site, ²College of Nanoscale Science and Engineering, University at Albany,
- 5:15 PM - 5:35 PM **WP8-05 Student**
Comparison of HfO_x-Based Resistive Memory Devices with Crystalline and Amorphous Active Layers
Benjamin Briggs¹, S. Bishop¹, J. Capulong¹, M. Hovish¹, R. Matyi¹, N. Cady¹
¹State University of New York at Albany
- 5:35 PM - 5:55 PM **WP8-06 Student**
Effects of Triple Blocking Layers on Operation Performance in Charge-trapping Flash Devices
Zong-Hao Ye¹, K. Chang-Liao¹, J. Tsai¹, T. Wang¹
¹National Tsing Hua University, Taiwan

WP9: Organic Materials and Devices - 3:45 PM - 5:45 PM

Chairperson: Oana Jurchescu, Wake Forest University

Meeting Room: Juan Ramon Jimenez Room

- 3:45 PM - 4:15 PM **WP9-01 Invited**
Untangling the Essence of Bulk Heterostructure Organic Solar Cells: Why Complex Need Not be Complicated
Muhammad Alam¹
¹Purdue University
- 4:15 PM - 4:45 PM **WP9-02 Invited**
An Active Matrix Microphone
Ioannis Kymissis¹, Y. Hsu¹
¹Columbia University

- 4:45 PM - 5:05 PM **WP9-03**
Influence of Interfacial Chemistry and Molecular Length on the Electronic Properties of Metal-Molecule-Silicon Junctions Produced by Flip Chip Lamination
Michael Walsh¹, M. Coll², B. Jones¹, C. Richter¹, C. Hacker¹
¹NIST, ²Institut de Cincia de Materials de Barcelona, Spain
- 5:05 PM - 5:25 PM **WP9-04**
Electrical and Optical Properties of MEH-PPV/ Modified PCBM Blend
S. S. Sharma¹
¹Govt. Women Engineering College, Ajmer, India
- 5:25 PM - 5:45 PM **WP9-05 Student***
Tuning the Microstructure and Electronic Performance in Organic Thin-Film Transistors Using Chemical Modifications at Interfaces
Jeremy Ward¹, E. Chapman¹, M. Loth², J. Kline³, M. Coll⁴, J. Anthony², T. Thonhauser¹, O. Jurchescu¹
¹Wake Forest University, ²University of Kentucky, ³NIST, ⁴Institut de Cincia de Materials de Barcelona, Spain

WP10: Novel Devices I - 3:45 PM - 5:45 PM

Chairperson: Curt Richter, NIST

Meeting Room: Margaret Brent Room B

- 3:45 PM - 4:05 PM **WP10-01**
CMOS-integrated Memristors for Neuromorphic Architectures
Dana Wheeler¹, K. Kim², S. Gaba², E. Wang¹, S. Kim¹, I. Valles¹, J. Li¹, Y. Royter¹, J. Cruz-Albrecht¹, T. Hussain¹, W. Lu², N. Srinivasa¹
¹HRL Laboratories, ²University of Michigan
- 4:05 PM - 4:25 PM **WP10-02 Student***
Fabrication of Segmented-Channel MOSFETs for Reduced Short-Channel Effects
Byron Ho¹, X. Sun¹, N. Xu¹, T. Sako², K. Maekawa², M. Tomoyasu², Y. Akasaka³, T. King Liu¹
¹University of California, Berkeley, ²TEL Technology Center, America LLC, ³Tokyo Electron, Taiwan, Taiwan
- 4:25 PM - 4:45 PM **WP10-03 Student**
Novel MOSFET Structure Using p-n Junction Gate for Ultra-low Subthreshold-Swing
Garam Kim¹, M. Sun², S. Kim¹, H. Kim¹, J. Kim¹, E. Park¹, H. Kim¹, B. Park¹
¹Seoul National University, Korea, Republic of, ²Samsung Electronics Co., Ltd., Korea, Republic of
- 4:45 PM - 5:05 PM **WP10-04 Student**
Phase-Change Memory on Thin-Film-Transistor Technology
Lin Li¹, L. Zhang¹, J. He², and M. Chan¹
¹Hong Kong University of Science and Technology, China, ²Institute of PKU-HKUST IER, China
- 5:05 PM - 5:25 PM **WP10-05 Student**
Impact of Electrolyte Deposition Technique on Resistive Pt/Ta₂O₅/Cu Switch Performance
Pragya Shrestha^{1,2}, M. Verma³, Y. Kang³, K. Cheung¹, H. Baumgart², M. Orlovski³
¹National Institute of Standards and Technology, ²Old Dominion University, ³Virginia Tech

6:00 PM – 8:30 PM Welcome Reception and Poster Session – Grand Ballroom

WP11: Poster Session - 6:00 PM - 8:30 PM

Chairperson: Meredith Reed, U.S. Army Research Laboratory

Meeting Room: Grand Ballroom

WP11-01-Nanoelectronics

WP11-01-01

A Combinational Logic Optimization for Majority Gate-Based Nanoelectronic Circuits Based on GA
Keivan Navi¹, A. Roohi², M. Kamrani³, S. Sayedsalehi²

¹Shahid Beheshti University, Iran, Islamic Republic of, ²Science and Research Branch, Islamic Azad University, Iran, Islamic Republic of, ³Sharif University of Technology, Iran, Islamic Republic of

WP11-01-02 Student*

Gate-Induced Drain Leakage Current of MOSFET with Junction Doping Dependence

Hyunho Park¹, B. Choi²

¹Samsung Electronics / Sungkyunkwan University, Korea, Republic of, ²Sungkyunkwan University, Korea, Republic of

WP11-01-03 Student

Analysis of Output Transconductance of FinFETs Incorporating Quantum Mechanical and Temperature Effects with 3D Temperature Distribution

Md. Rakibul Akanda¹, Q. Khosru¹

¹BUET, Bangladesh

WP11-01-04 Student **WITHDRAWN**

Effect of Quantum Confinement on the Performance of the Junctionless Transistor

Suresh Gundapaneni¹, S. Ganguly¹, A. Kottantharayil¹

¹Indian Institute of Technology Bombay, India

WP11-01-05 Student

Investigation of Vertical Type Single-Electron Transistor with Sidewall Spacer Quantum Dot

Kyung-Wan Kim¹, J. Lee¹, K. Kang¹, H. Kim¹, J. Seo¹, W. Kim¹, B. Park¹

¹Seoul National University, Korea, Republic of

WP11-01-06 Student

Impact of Strain on the Drive Current of Double Gate InGaAs Tunneling Field Effect Transistor

Ahmad Zubair¹, O. Shoron¹, S. Siddiqui¹, Q. Khosru¹

¹Bangladesh University of Engineering and Technology., Bangladesh

WP11-01-07 Student

Investigation of Self Boosting Disturbance Induced by Channel Coupling in 3D Stacked NAND Flash Memory

Wandong Kim¹, Y. Kim¹, S. Park¹, J. Seo¹, D. Kim¹, S. Kim¹, B. Park¹

¹Seoul National University, Korea, Republic of

WP11-01-08 Student

Heterojunction-A Comparative Study

Vijay Lamba¹, D. Engles², M. Verma¹

¹HCTM Kaithal, India, ²GNDU Amritsar, India

WP11-01-09 Student

Enhancement of Field Emission of Carbon Nanotubes Arrays Formed by Self-Assembled Microspheres

P. Zhao¹, Hongping Zhao¹

¹Case Western Reserve University

WP11-01-13 Student*

Effects of Interface Roughness Scattering on RF Performance of Nanowire Transistors

SungGeun Kim¹, S. Mehrotra¹, M. Luisier², T. Boykin³, G. Klimeck¹

¹Purdue University, ²ETH Zurich, Switzerland, ³The University of Alabama in Huntsville

WP11-01-14 Student

Immobilization of Proteins on Semiconductor Nanowires for Biosensor Development

Elissa Williams^{1,2}, A. Davydov², S. Krylyuk^{2,3}, N. Lin², K. Steffens², K. Bertness², Y. Koshka⁴, V. Oleshko², J. Schreifels¹, M. Rao¹

¹George Mason University, ²NIST, ³University of Maryland, ⁴Mississippi State University

WP11-02-Wide Bandgap Devices**WP11-02-02**

Characteristics of AlGa_N/Ga_N Heterostructure Field Effect Transistor Grown on 4 inch Si (111)

Substrate Using Formation of Dot-like AlSi_xC_{1-x} Interlayer

Jae-Hoon Lee¹, J. Lee²

¹Samsung LED Company. Ltd., Korea, Republic of, ²Kyungpook National University, Korea, Republic of

WP11-02-03 Student **WITHDRAWN**

Moisture Assisted Electron Transport in Si-C Nanotubes: an Ab-initio Study

Sudhanshu Choudhary¹, S. Qureshi¹

¹IIT Kanpur, India

WP11-02-04 Student

Dependence of Self-Heating Effect on Passivation Layer in AlGa_N/Ga_N HEMT Devices

Ali Haghshenas¹, M. Fathipour¹, A. Mojab¹

¹University of Tehran, Iran, Islamic Republic of

WP11-02-05

Nano-dimensional Structures of 3C-SiC Formed from Rice Husk

Edward Gorzkowski, III¹, S. Qadri¹, B. Rath¹

¹Naval Research Lab

WP11-02-06 Student*

The Effect of Different Passivations on Near Interface Trap Density of 4H-SiC/SiO₂ Structures

Shahrazad Salemi¹, A. Akturk¹, S. Potbhare¹, A. Lelis², N. Goldsman¹

¹University of Maryland, ²U.S. Army Research Laboratory

WP11-02-07

Realization of Vertically-aligned GaN p-n Core-shell Nanoscale Structures Using

Top-down Fabrication

Dipak Paramanik¹

¹National Institute of Standards and Technology

WP11-02-08

Trap Analysis in AlGa_N/Ga_N HEMTs and Their Component Layers

Pankaj Shah¹, R. Dedhia¹, R. Tompkins¹, E. Viveiros¹, K. Jones¹

¹U.S. Army Research Laboratory

WP11-02-09

Realization of n-ZnO:Ga / p-ZnO:GaP Homojunction by RF Magnetron Sputtering

G. Subramaniam¹, B. Lakshmi Narayanan¹, B. Thailampillai¹, Gopalakrishnan Nammalvar¹
¹National Institute of Technology, India**WP11-02-10 Student**

Photonic Devices Properties of Zinc Nitride Film Produced by Reactive Magnetron Sputtering

Ahalapitiya Jayatissa¹, T. Wen¹
¹University of Toledo**WP11-02-11**

Manufacturability of High Power Ultraviolet-C Light Emitting Diodes on Bulk Aluminum Nitride Substrates

James Grandusky¹, Z. Zhong², J. Chen², C. Leung², L. Schowalter¹
¹Crystal IS, Inc., ²Sanan, China**WP11-02-12 Student***Absorption in Biased Al_xGa_{1-x}N/GaN Quantum Wells*Hung Chi Chou¹, M. Anwar¹, T. Manzur², A. Sood³, J. Zeller³*
¹University of Connecticut, ²Naval Undersea Warfare Center (NUWC), ³Magnolia Optical Technologies**WP11-02-13 Student**

Photosensitivity Analysis of n-ZnO/p-SiC Heterojunction Structures

Ji-Chul Jung¹, M. Kang¹, J. Kim², J. Lee², B. Moon², S. Koo¹
¹Kwangwoon University, Korea, Republic of, ²Korea University, Korea, Republic of**WP11-02-14**

Investigation of a High Temperature Oxide-Trap Activation Model for SiC Power MOSFETs

Ronald Green¹, A. Lelis¹, D. Habersat¹, M. El¹
¹U.S. Army Research Laboratory**WP11-03-Low Power Electronics****WP11-03-01 Student**

An N-Channel Graded-Junction Lateral Diffused MOS Transistor in 0.18μm Low-Power Logic CMOS Process

Yang Liu¹, Bin Wan², and Huaqiang Wu¹
¹Tsinghua University, China, ²Hangzhou Dianzi University**WP11-03-02 Student**

Ballistic and High Field Transport in a Nano-MOSFET

Munawar A. Riyadi^{1,2}, V. Arora^{1,3}
¹Universiti Teknologi Malaysia, Malaysia, ²Diponegoro University, Indonesia, ³Wilkes University.**WP11-03-03 Student**

Ultra-Compact Low-Power ICO/VCO Circuits with Double Gate MOSFETs

Soumyasanta Laha¹, K. Wijesundara¹, A. Kulkarni¹, S. Kaya¹
¹Ohio University**WP11-04-Electronics for Energy/Photovoltaics****WP11-04-01 Student**

Antenna-Coupled Dual Band RF Energy Harvester Design

Bo Li¹, S. Xi¹, N. Shahshahan¹, N. Goldsman¹
¹University of Maryland College Park

WP11-04-02

A Planar Dual-Band Antenna Design for RF Energy Harvesting Applications

Xi Shao¹, B. Li¹, N. Shahshahan¹, N. Goldsman¹

¹*University of Maryland*

WP11-04-03 Student*

Design of Radio Frequency Energy Harvesting System for an Unmanned Airplane

Wei Zhao¹, K. Choi², Z. Dilli¹, S. Bauman¹, T. Salter³, M. Peckerar¹

¹*University of Maryland College Park, ²Intel Corporation, ³Laboratory for Physical Sciences*

WP11-04-04 Student

An Analytical Model to Characterize the Input Stage of a MOSFET Based RF Energy Harvester for Improved Impedance Matching

Negin Shahshahan¹, X. Shao¹, B. Li¹, N. Goldsman¹

¹*University of Maryland*

WP11-04-05 Student

Fabrication Methodology for Nanostructured Hybrid Organic/Inorganic Photovoltaic Devices Formed with Alternating Sacrificial Spacers in a Nested Nanotube Configuration

Patrick Boland, Jr.¹, D. Gu¹, G. Namkoong¹, H. Baumgart¹

¹*Old Dominion University*

WP11-04-06 Student*

Fabrication and Characteristics of Vertical Type Organic Transistor Using Indenofluorenedione Derivatives as a n-Type Active Layer

Tae Yeon Lee¹, D. Jung¹, S. Oh¹

¹*Sogang University, Korea, Republic of*

WP11-04-07 Student

Improvement in the Performance of P3HT:PCBM Based Organic Photovoltaic Cell Using DMDCNQI as n-Type Dopant and Buffer Layer

Joo Hyung Lee¹, E. Yang¹, S. Oh¹

¹*Sogang University, Korea, Republic of*

WP11-04-08 Student

Process Engineering to Avoid Epitaxy at a-Si:H/c-Si Interface for Heterojunction Silicon Solar Cells

Pradip Chaudhari¹, S. More¹, R. Dusane¹

¹*Indian Institute of Technology Bombay, India*

WP11-04-09 Student

Polarization Enhanced Tunnel Junctions in Tandem Solar Cells

Shuai Zhou¹, R. Tompkins¹, K. Jones¹, C. Gallinat¹, P. Rotella¹, C. Moe¹, M. Wraback¹

¹*U.S. Army Research Lab*

WP11-04-10 Student

Metal-Oxide Coaxial Nanowire Photovoltaic Cells

Dante DeMeo¹, S. MacNaughton¹, S. Sonkusale¹, T. Vandervelde¹

¹*Tufts University*

WP11-04-11 Student

Effects of Texturing on the CV Analysis of Silicon Solar Cells

Xufeng Wang¹, J. Moore¹, D. Berdebes¹, M. Lundstrom¹

¹*Purdue University*

WP11-05-Modeling

WP11-05-01 Student

New Latch-up Model for Deep Sub-micron Integrated Circuit

Pan Dong¹, L. Fan¹, S. Yue¹, H. Zheng¹, S. Du¹

¹*Beijing Microelectronics Technology Institute, China*

WP11-05-02 Student

A Parameter Extraction Method Based on Particle Swarm Optimization

Xue Zheng¹, G. Zhang¹, K. Chen¹

¹*Xi'an Jiaotong University, China*

WP11-05-03

A Physical Model for Scaling and Optimizing Layers Structure of InGaAs/InP Double Heterojunction Bipolar Transistors Based on Hydrodynamic Simulation

Ji Ge¹

¹*Institute of Microelectronics, Chinese Academy of Sciences, China*

WP11-05-04 Student

A Quantum Mechanical Treatment of Low Frequency Noise in Scaled NMOS Transistors

Xiaochen Zhang¹, M. White¹

¹*The Ohio State University*

WP11-05-05

A Hybrid Neural Network-Based Behavioral Model of Microwave Active Components

Michel Reece¹, B. Davis¹, C. Waiyaki¹, E. Viveiros²

¹*Morgan State University, ²U.S. Army Research Laboratory*

WP11-05-06

Waveguide Detection of Radiation from a Random Sheet of Nanowires

Frank Crowne¹, G. Birdwell¹, T. O'Regan¹

¹*U.S. Army Research Laboratory*

WP11-06-Oxides and Dielectrics

WP11-06-01

Energy Band Diagram of Metal-Oxide-Semiconductor Capacitor with HfLaTaO/HfSiO Stacked High-k Dielectric

Chin-Lung Cheng¹, K. Chang-Liao²

¹*National Formosa University, Taiwan, ²National Tsing Hua University, Taiwan*

WP11-06-02 Student

GIDL and FN Tunneling Current Correction on Charge Pumping Techniques for Profiling Traps in High-k Gated MOSFETs

Chun-Chang Lu¹, K. Chang-Liao¹, F. Tsai¹, C. Tsao¹, T. Wang¹, F. Hou², Y. Hsu²

¹*National Tsing Hua University, Taiwan, ²Institute of Nuclear Energy Research, Taiwan*

WP11-06-03 Student **WITHDRAWN**

a-IGZO Thin Film Transistor Using Polymer Gate Dielectric

W.-K. Lin¹, S. Chang¹, C. Chiu¹, Z. Pei¹

¹*National Chung Hsing University, Taiwan*

WP11-06-04 Student

Optimization and Scaling of Interfacial GeO₂ Layers for High- κ Gate Stacks on Germanium and Extraction of Dielectric Constant of GeO₂

Shahjahan Murad¹, D. W. McNeill¹, S. Mitchell¹, B. Armstrong¹, M. Modreanu², G. Hughes³, R. Chellappan³

¹*Queens University Belfast, United Kingdom, ²Tyndall National Institute, Ireland, ³Dublin City University, Ireland*

WP11-06-05

Low Loss and High Tuning Barium Strontium Titanate (BST) Thin Films

*Richard Fu*¹

¹*U.S. Army Research Laboratory*

WP11-07-*Novel Devices***WP11-07-01**

Temperature Impact on Double Gate nTFET Ambipolar Behavior

*Joao Martino*¹, *M. Martino*¹, *P. Agopian*¹, *S. Santos Filho*¹

¹*University of Sao Paulo, Brazil*

WP11-07-02 Student*

Switching Time and Current Reduction Using a Composite Free Layer in Magnetic Tunnel Junctions

*Alexander Makarov*¹, *V. Sverdlov*¹, *D. Osintsev*¹, *S. Selberherr*¹

¹*TU Wien, Austria*

WP11-07-03 Student

A Novel Dual-Control-Gate Floating Gate Transistor Used in VCO Application

Abderrezak Marzaki^{1,2}, *V. Bidal*¹, *R. Laffont*², *W. Rahajandraibe*², *J. Portal*², *E. Bergeret*², *R. Bouchakour*²

¹*ST-Microelectronics, France*, ²*IM2NP, France*

WP11-07-04 Student

Modeling of Thermoelectric Effects in Phase Change Memory Cells

*Faruk Dirisaglik*¹, *G. Bakan*¹, *A. Gokirmak*¹, *H. Silva*¹

¹*University of Connecticut*

WP11-07-05 Student

A Novel Doping-less Bipolar Transistor with Schottky Collector

*Kanika Nadda*¹, *M. Kumar*¹

¹*IIT Delhi, India*

WP11-08-*Optics and Optoelectronics***WP11-08-01 Student**

High Performance Dual-band Long-wave Infrared Focal Plane Array Based on Type-II InAs/GaSb Superlattices

*Edward K. Huang*¹, *A. Haddadi*¹, *G. Chen*¹, *B. Nguyen*¹, *M. Hoang*¹, *R. McClintock*¹, *M. Razeghi*¹

¹*Northwestern University*

WP11-08-02

An Investigation on the Light-Emission Mechanism of Metal-Insulator-Semiconductor Light-Emitting Diodes with Different SiGe Quantum Well Structures

*M. H Liao*¹, *L. Chang*¹

¹*National Taiwan University, Taiwan*

WP11-08-03 Student

Progress toward 3-5 μm Strained Quantum Cascade Laser Design Using Quasi-Phased Matched Non-linear Conversion on GaAs (111)B

*David Mueller*¹, *G. Triplett*¹

¹*University of Missouri*

WP11-08-04

Failure Analysis of THz GaAs Photoconductive Antenna by Means of High Resolution

X-ray Topography

*Syed Qadri*¹, *D. Wu*¹, *H*¹, *B. Graber*¹, *N. Mahadik*¹, *A. Garzarella*¹

¹*US Naval Research Laboratory*

WP11-09-Processing Technology

WP11-09-01 Student

Characterization of Size-controlled ZnO Nanorods Produced by Electrochemical Deposition Technique
Nilgun Orhan¹, M.C. Baykul¹
¹*Eskisehir Osmangazi University, Turkey*

WP11-09-02

Fabrication and Characterization of Size-controlled CdS Nanostructures by a Modified Chemical Bath Deposition Method
Mevlana Baykul¹, N. Orhan¹
¹*Eskisehir Osmangazi University, Turkey*

WP11-09-03

Local Stress Determination in Shallow Trench Insulator Structures with One-side and Two-sides Pad-SiN Layer by Polarized Micro-Raman Spectroscopy Extraction and Mechanical Modelization
M. H Liao¹, L. Chang¹
¹*National Taiwan University, Taiwan*

WP11-09-04 Student

Study of 22/20 nm Tri-Gate Transistors Compatible in a Low-Cost Hybrid FinFET/Planar CMOS Process
Tim Baldauf¹, A. Wei², R. Illgen², S. Flachowsky², T. Herrmann²
J. Höntschel², M. Horstmann², W. Klix¹, and R. Stenzel¹
¹*University of Applied Sciences Dresden, Germany, ²GLOBALFOUNDRIES Dresden Module One LLC & Co.KG, Germany*

WP11-09-05

A New EOT Shrinking Mechanism in TiN/HfLaON HKMG MOSFET: Experimental and Ab-initio Study
Qingqing Liang¹
¹*Institute of Microelectronics of Chinese Academy of Sciences, China*

WP11-09-06 Student*

Silicidation Using Nickel and Dysprosium Stack on Si(100): NiSi₂ Formation and Impact on Schottky Barrier Height
Phyllis Lim¹, Z. Qian¹, C. Dongzhi², Y. Yee-Chia¹
¹*National University of Singapore (NUS), Singapore, ²Institute of Materials Science and Engineering, A*STAR, Singapore*

WP11-09-07 Student

Quantum Modeling of Electron Confinement in Double Triangular Quantum Well Formed in Nanoscale Symmetric Double-Gate InAlAs/InGaAs/InP HEMT
Jyotika Jogi¹, N. Verma¹, M. Gupta², R. Gupta³
¹*Microelectronics Research Laboratory, A.R.S.D College, University of Delhi, south campus, India, ²Semiconductor Device Research Laboratory, India, ³Maharaja Agrasen Institute of Technology, India*

WP11-09-08 Student

The Impact of Process Parameter Variations on the Electrical Characteristics of a RESURF LDMOS and its Compact Modeling
Vala Fathipour¹, A. Mojab¹, M. Malakoutian¹, S. Fathipour¹, M. Fathipour¹
¹*University of Tehran, Iran, Islamic Republic of*

WP11-09-09 Student

Characteristics Optimizing of LDMOS Devices with Advanced-RESURF
Shokouh Shahbazi¹, M. Fathipour²
¹*Islamic Azad University of Arak, Iran, Islamic Republic of, ²University of Tehran, Iran, Islamic Republic of*

WP11-10-Reliability

WP11-10-01

Non Volatile Memory Reliability Prediction Based on Oxide Defect Generation Rate during Stress and Retention Tests

Hassen Aziza¹

¹*IM2NP laboratory, France*

WP11-10-02 Student

Dependence of 1/f Noise Characteristics of NMOSFETs on Body Bias and Temperature in Sub-threshold Region

SungKyu Kwon¹, Ho-Young Kwak¹, Hyuk-Min Kwon¹, Jae-Hyung Jang¹, Yi-Jung Jung¹,

Sang-Su Kim², Da-Soon Lee², Jong-Kon Lee², Song-Jae Lee¹, and Hi-Deok Lee¹,

¹*ChungNam National University, Korea, Republic of, ²MagnaChip Semiconductor*

WP11-10-03

An Introduction to the Evaluation of the Effects of High Power Microwave Signals on Signaling Systems

Zeynep Dilli¹, N. Seekhao¹, J. Rodgers¹

¹*University of Maryland, College Park*

WP11-10-04 Student

An Analytical Model for MOSFET Local Oxide Capacitance

Ivan Starkov¹, A. Starkov², S. Tyaginov³, H. Enichlmair⁴, H. Ceric¹, and T. Grasser³

¹*Institute for Microelectronics, Vienna University of Technology, Austria, ²St. Petersburg State*

University of Low Temperature and Food Technologies, Russia, ³Vienna University of Technology,

Austria, and ⁴Austriamicrosystems AG, Austria

WP11-10-05

Statistical Vulnerability Analysis to Study Intra-chip Coupling of High Power Microwave Signals

Zeynep Dilli¹, R. Curley¹, N. Goldsman¹

¹*University of Maryland, College Park*

WP11-10-06 Student

Stress Relaxation Behavior and Low Cycle Fatigue Behavior of Bulk SAC 305

Gary Paradee¹, A. Christou¹

¹*University of Maryland*

WP11-11-Organic Materials

WP11-11-01 Student

Low-Temperature Fabrication of Fully Transparent InGaZnO Thin Film Transistors with Ga-doped ZnO Source/Drain

Ji-Hong Kim¹, J. Kim¹, J. Roh¹, K. Lee¹, K. Do¹, J. Shin¹, B. Moon¹, S. Koo¹

¹*Korea University, Korea, Republic of*

WP11-11-02 Student **WITHDRAWN******

Novel Device Structure of Fully Encapsulated Low Voltage Vertical OFET Using 13,6-N-sulfinylacetamidopentacene

Munish Puri¹, S. Bhanja¹

¹*University of South Florida*

WP11-12-Testing and Characterization

WP11-12-01 Student

Effect of Infrared Filter on the Electrical Characteristics of Silicon-based PIN Photo-detectors

H.J. Kim^{1,2}, B. Choi¹

¹*Sungkyunkwan university, Korea, Republic of, ²Samsung Electronics Co., Korea, Republic of*

WP11-12-02WITHDRAWN****

Surface Functionalization of Pure and V Doped ZnO Films by THIOL
G. Jayalakshmi¹, N. Gopalakrishnan¹, Thailampillai Balasubramanian¹
¹National Institute of Technology, India

WP11-12-03

Analysis of Subthreshold Characteristics of p-MOSFETs with (0/90°) and 45° Channel Orientation
Toshihiro Matsuda¹, H. Hanai¹, F. Asano¹, H. Iwata¹, T. Ohzone²
¹Toyama Prefectural University, Japan, ²Dawn Enterprise, Japan

WP11-13- SiGe, Germanium, and SOI

WP11-13-01 Student

Modeling the Floating-Body-Effect-Related Transient Behavior of 40 nm PD SOI NMOS Device via the SPICE Bipolar/MOS Model
James Kuo¹, S. Fang¹, D. Chen², C. Yeh²
¹National Taiwan University, Taiwan, ²UMC, Taiwan

WP11-13-02 Student **WITHDRAWN**

Suppression of Variability in Metal Source/Drain SOI MOSFET with Partial Buried Oxide and δ -Doping
Ganesh C. Patil¹, S. Qureshi¹
¹Indian Institute of Technology Kanpur, India

WP11-13-03 Student

A Subthreshold Swing Model for FD SOI MOSFET with Vertical Gaussian Profile
Kebin Chen¹, G. Zhang¹, X. Zheng¹
¹Xi'an Jiaotong University, China

WP11-13-04

Analysis and Simulation of a 45 nm High-K/Metal PD-SOI DTMOS under Forward Bias
Abimael Jimenez¹, R. Ambrosio¹, K. Monfil¹, C. Martinez¹, J. Munoz², Z. Blanco¹
¹Universidad Autonoma de Ciudad Juarez, Mexico, ²Universidad de Guadalajara, Mexico

WP11-13-05 Student **WITHDRAWN**

Analog/RF Performance of NPN SiGe HBT on Thin Film SOI Over -55 to +125 °C Temperature Range
Prasanna Kumar Misra¹, S. Qureshi¹
¹Indian Institute of Technology Kanpur, India

WP11-13-06 Student

Ballistic Hole injection Velocity Analysis in Ge UTB p-MOSFETs:
Dependence on body thickness, orientation and strain
Saumitra Mehrotra¹, A. Paul¹, G. Klimeck¹
¹Purdue University

WP11-14-Sensors, MEMS, and NEMS

WP11-14-01 Student

High Power CMOS Circuit with LDMOSFET
Chan-Soo Lee, Sr.¹, M. Gendensuren¹, Z. Cui¹, K. Lee, Sr.¹, N. Kim, Sr.¹
¹Chungbuk National University, Korea, Republic of

WP11-14-02

Fabrication of a MZI Device Based on Waveguides of SiN for Biological Detection
Abimael Jimenez¹, A. Heredia², R. Ambrosio¹, M. Moreno³
¹UACJ, Mexico, ²UPAEP, Mexico, ³INAOE, Mexico

WP11-14-03 Student

High Performance Tunnel Field Effect Transistor with a Tri-Material-Gate Structure

Renrong Liang¹, N. Cui¹, M. Zhao¹, J. Wang¹, J. Xu¹¹Tsinghua University, China**WP11-14-04 Student***

Single Photon Avalanche Diode in Standard CMOS 0.5um Technology

Bowe Zhang¹, Q. Yuan¹, Z. Li¹, M. Zaghoul¹¹The George Washington University**WP11-14-05 Student**

Hot wire chemical vapor deposited boron carbide thin film/c-silicon diode for neutron detection application

Pradip Chaudhari¹, A. Singh², A. Topka², and R. Dusane¹¹Indian Institute of Technology Bombay, Mumbai, India, ²Bhabha Atomic Research Centre, India**WP11-14-06 Student**

Sol-gel Derived Aluminum Doped Nanocrystalline Zinc Oxide for Hydrogen Gas Sensing

Ahalapitiya Jayatissa¹, Y. Hou¹¹University of Toledo**WP11-14-07 Student**

Characterization of Porous Nickel Oxide Base Hydrogen Gas Sensor

Ahalapitiya Jayatissa¹, A. Soleimanpour¹¹University of Toledo**WP11-14-08 Student**

Ammonia Sensor Device Using Graphene Modified with Platinum

Ahalapitiya Jayatissa¹, M. Gautam¹¹University of Toledo**Thursday, December 8, 2011****7:30 AM Registration and Continental Breakfast – Grand Ballroom Lounge****Plenary Session - 8:30 AM - 10:15 AM***Chairperson: Curt Richter, NIST**Meeting Room: Colony Ballroom*

8:40 AM - 9:25 AM

PL1 Invited

Progress in Nonpolar and Semipolar GaN Materials and Devices

James Speck¹¹University of California

9:25 AM - 10:10 AM

PL2 Invited

Emerging Memory Devices

H.-S. Philip Wong¹¹Stanford University**10:30 AM – 10:45 AM Coffee Break – Grand Ballroom Lounge**

TA1: Nanoelectronics III - 10:45 AM - 12:15 PM

Chairperson: Stephen Kilpatrick, U.S. Army Research Laboratory

Meeting Room: Colony Ballroom

- 10:45 AM - 11:15 AM **TA1-01 Invited**
Advanced Contact and Junction Technologies for Improved Parasitic Resistance and Short Channel Immunity in FinFETs Beyond 22nm Node
Kah-Wee Ang¹, B. Min¹, M. Gunji¹, P. Hung¹, I. Ok¹, C. Hobbs¹, P. Kirsch¹, R. Jammy¹, M. Rodgers², D. Franca², S. Gausepohl²
¹SEMATECH Inc., ²CNSE
- 11:15 AM - 11:35 AM **TA1-02**
Physics-Based, Closed-Form I/V Model for Lightly-Doped Short Channel Triple-Gate MOSFETs Including Three-Dimensional Effects
Alexander Kloes¹, M. Schwarz¹, T. Holtij¹
¹Technische Hochschule Mittelhessen, Germany
- 11:35 AM - 11:55 AM **TA1-03**
Denser and More Stable FinFET SRAM Using Multiple Fin Heights
Angada Sachid¹, C. Hu¹
¹University of California Berkeley
- 11:55 AM - 12:15 PM **TA1-04 Student**
Low-frequency Noise in High-k LaLuO₃/TiN MOSFETs
Maryam Olyaei¹, B. G. Malm¹, E. D. Litta¹, P. Hellström¹, and M Östling¹
¹Royal Institute of Technology, Sweden

TA2: Wide Bandgap III: Device Physics and Characterization - 10:45 AM - 12:15 AM

Chairperson: Lee Rodak, U.S. Army Research Laboratory

Meeting Room: Charles Carroll Room

- 10:45 AM - 11:15 AM **TA2-01 Invited**
Impact of Hetero-interface on the Photoresponse of GaN/SiC Separate Absorption and Multiplication Avalanche Photodiodes
Anand Sampath¹, Q. Zhou², R. Enck¹, C. Gallinat¹, P. Rottella, Jr.¹, D. McIntosh³, P. Shen¹, J. Campbell³, M. Wraback¹
¹U.S. Army Research Laboratory, ²University of Virginia, ³University of Virginia
- 11:15 AM - 11:35 AM **TA2-02**
Temperature Dependent Electroluminescence Measurement of AlGaIn-Based Ultraviolet Light-Emitting Diodes
Craig Moe¹, G. Garrett¹, H. Shen¹, M. Wraback¹, M. Shatalov², X. Hu², Y. Bilenko², J. Yang², W. Sun², R. Gaska²
¹U.S. Army Research Laboratory, ²Sensor Electronic Technology, Inc.
- 11:35 AM - 11:55 AM **TA2-03 Student***
Optoelectronic Characterization of 4H-SiC Avalanche Photodiodes Operated in DC and in Geiger Mode
Marc Dandin¹, A. Akturk², A. Vert³, S. Soloviev³, P. Sandvik³, S. Potbhare², N. Goldsman², P. Abshire¹, K. Cheung⁴
¹University of Maryland, ²CoolCAD Electronics, LLC, ³GE Global Research, ⁴National Institute of Standards & Technology
- 11:55 AM - 12:15 AM **TA2-04**
Analytical Model for Ion-implanted 4H-Silicon Carbide Metal-Semiconductor Field-Effect Transistors
Shouguo Wang¹
¹Northwest University, China

TA3: Sensors, NEMS, and MEMS - 10:45 AM - 12:15 PM

Chairperson: Agis Iliadis, University of Maryland

Meeting Room: Benjamin Banneker Room

- 10:45 AM - 11:15 AM **TA3-01 Invited**
Integrating Biological Molecules with Electrode Surfaces for Bioanalytical Sensing Applications
Joseph Robertson¹, V. Silin¹, J. Reiner², J. Kasianowicz¹
¹National Institute of Standards and Technology, ²Virginia Commonwealth University
- 11:15 AM - 11:35 AM **TA3-02**
An Electronic Microfluidic Switch Using Dielectrophoresis for Control of Microparticles
Mehdi Javanmard¹, S. Emaminejad¹, R. Dutton¹, R. Davis¹
¹Stanford University
- 11:35 AM - 11:55 AM **TA3-03 Student**
Double Cavity Vacuum Sealed Piezoresistive Absolute Pressure Sensor
Pradeep Rathore¹, P. Varshney¹, B. Panwar¹
¹Indian Institute of Technology Delhi, India

TA4: Flexible Electronics - 10:45 AM - 12:45 PM

Chairperson: Eric Forsythe, U.S. Army Research Laboratory

Meeting Room: Juan Ramon Jimenez Room

- 10:45 AM - 11:15 AM **TA4-01 Invited**
Materials, Processing, and Characterization for Flexible Electronics
William Wong¹
¹University of Waterloo, Canada
- 11:15 AM - 11:35 AM **TA4-02**
A Physics of Failure Based Qualification Process for Flexible Display Interconnect Materials
Thomas Martin¹
¹University of Maryland
- 11:35 AM - 11:55 AM **TA4-03**
Thin Film Transistors with Buckled Gate
Sanjiv Sambandan¹
¹Indian Institute of Science, India
- 11:55 AM - 12:15 PM **TA4-04**
Room Temperature Plasma Assisted Atomic Layer Deposition Al₂O₃ Film's Encapsulation Application in Organic Light Emitting Diodes
Richard Fu¹, A. Chen¹, M. Srour¹, S. Blomquist¹, E. Forsythe¹, J. Shi¹, D. Morton¹
¹U.S. Army Research Laboratory

TA5: Processing Technology - 10:45 AM - 12:15 PM

Chairperson: Helena Silva, University of Connecticut

Meeting Room: Margaret Brent Room B

- 10:45 AM - 11:05 AM **TA5-01 Student***
Pd-InGaAs as a New Self-Aligned Contact Material on InGaAs
Eugene Kong¹, X. Zhang¹, I. Lie¹, Q. Zhou¹, Y. Yeo¹
¹National University of Singapore (NUS), Singapore

• = Nominated for a Best Student Paper Award

- 11:05 AM - 11:25 AM **TA5-02 Student**
Improvement of the GaSb/Al₂O₃ Interface Using a Thin InAs Surface Layer
Serge Oktyabrsky¹, A. Greene¹, M. Yakimov¹, P. Nagaiah¹, S. Madisetti¹, V. Tokranov¹, and R. Moore¹
¹University at Albany
- 11:25 AM - 11:45 AM **TA5-03 Student**
Co-InGaAs as a Novel Self-Aligned Metallic Source/Drain Material for Implant-less In_{0.53}Ga_{0.47}As n-MOSFETs
Ivana¹, S. Subramanian¹, E. Kong¹, Z. Qian¹
¹National University of Singapore, Singapore
- 11:45 AM - 12:05 PM **TA5-04 Student**
The Fabrication of Poly-Si MOSFETs Using Ultra-Thin High-K/Metal-Gate Stack for Monolithic 3D Integrated Circuits Technology Applications
T. -H. Wu¹, M. Lee¹
¹National Taiwan Normal University, Taiwan

12:15 PM – 1:15 PM Lunch Break – Grand Ballroom

TP1: Nanoelectronics IV: - 1:15 PM - 3:15 PM

Chairperson: Qiliang Li, George Mason University

Meeting Room: Colony Ballroom

- 1:15 PM - 1:35 PM **TP1-01**
Study the Effect of Applied Voltage on Propagation Delay of Bilayer Graphene Nanoribbon Transistor
Asrulnizam Abd Manaf¹, M. Hosseinghadiry¹, S. Mehdi Mousavi², H. Sadeghi²
¹Universiti Sains Malaysia, Malaysia, ²Universiti Teknologi Malaysia, Malaysia
- 1:35 PM - 1:55 PM **TP1-02 Student***
Submicron Ambipolar Nanocrystalline-silicon TFTs with High-k Gate Dielectrics
Anand Subramaniam¹, K. Cantley¹, R. Chapman¹, H. Stiegler¹, E. Vogel²
¹The University of Texas at Dallas, ²Georgia Institute of Technology
- 1:55 PM - 2:15 PM **TP1-03 Student **WITHDRAWN****
Comparative Analysis of Next Generation III-V Nanowire Field Effect Transistors
Ifat Jahangir¹, S. Jahangir², Q. D. M. Khosru¹
¹Bangladesh University of Engineering and Technology, Bangladesh, ²University of Michigan
- 2:15 PM - 2:35 PM **TP1-04 Student**
Ft of 100GHz for 100nm Multi-gate In_{0.53}Ga_{0.45}As MOSFET
Jiongjiong Mo¹, N. Wichmann¹, Y. Roelens¹, M. Zaknounge¹, L. Desplanque¹, X. Wallart¹, S. Bollaert¹
¹University of Lille1, France
- 2:35 PM - 2:55 PM **TP1-05 Student**
Comparison of Silicon-on-Insulator and Body-on-Insulator FinFET Based Digital Circuits with Consideration on Self-Heating Effects
Peijie Feng¹ and P. Ghosh¹
¹Syracuse University
- 2:55 PM - 3:15 PM **TP1-06 Student***
Effect of Annealing Temperature on the Barrier Height of Nano-particle Embedded Ni-contacts to 4H-SiC
Min-Seok Kang¹, H. Anderson², Z. Carl-Mikael², S. Koo¹
¹Kwangwoon University, Korea, Republic of, ²KTH, Sweden

TP2: Wide Bandgap IV: Wide Bandgap Materials for Optoelectronics - 1:15 PM - 3:15 PM

Chairperson: Craig Moe, U.S. Army Research Laboratory

Meeting Room: Charles Carroll Room

- 1:15 PM - 1:35 PM **TP2-01**
WBG Substrates for Devices, Progress and Trends (SiC to III-Nitrides Comparison)
Alexander Syrkin¹
¹*TDI Inc.*
- 1:35 PM - 1:55 PM **TP2-02 Student**
Study of Conductivity Type of Undoped ZnO Films Grown on n- and p-type (100) Si Substrates by Pulsed Laser Deposition
Saeed Esmaili Sardari¹, A. Berkovich¹, A. Iliadis¹
¹*University of Maryland*
- 1:55 PM - 2:15 PM **TP2-03**
Fabrication of ZnO Homojunction by Al-As-N Tridoping
B. Lakshmi Narayanan¹, G. Subramaniam¹, Gopalakrishnan Nammalvar¹
¹*National Institute of Technology, India*
- 2:15 PM - 2:35 PM **TP2-04 Student**
InP/ZnS Core-Shell Quantum Dots Sensitized ZnO Nanowires for Photovoltaic Devices
Gang Shen¹, N. Harris¹, N. Dawahre¹, D. Wilbert¹, W. Baughman¹, E. Rivera¹, D. Nikles¹, T. Bryant², S. Kim¹, P. Kung¹
¹*The University of Alabama, ²Virginia State University*
- 2:35 PM - 2:55 PM **TP2-05 Student**
Characteristics of THz Carrier Dynamics in GaN and ZnO Nanowires by Temperature Dependent Terahertz Time Domain Spectroscopy Measurement
Soner Balci¹, W. Baughman¹, D. Wilbert¹, G. Shen¹, P. Kung¹, S. Kim¹
¹*University of Alabama*
- 2:55 PM - 3:15 PM **TP2-06 Student**
Epitaxially Grown GaZnO Thin Films as Transparent Electrodes for 4H-SiC
Jung-Ho Lee¹, J. Kim², M. Kang¹, B. Moon², S. Koo¹
¹*Kwangwoon University, Korea, Republic of, ²Korea University, Korea, Republic of*

TP3: Sensors - 1:15 PM - 3:15 PM

Chairperson: Mehdi Javanmard, Stanford University

Meeting Room: Benjamin Banneker Room

- 1:15 PM - 1:35 PM **TP3-01**
High Resolution Bio-sensing Using Cantilever Embedded MOS Structure
P. BS¹, P. Varshney¹, Pradeep Rathore¹, S. Rabbani¹, S. Panwar²
¹*Indian Institute of Technology Delhi, India, ²Mosys Inc.*
- 1:35 PM - 1:55 PM **TP3-02 Student***
Domain-Wall Spintronic Memristor for Capacitance and Inductance Sensing
Hiwa Mahmoudi¹, V. Sverdlov¹, S. Selberherr¹
¹*Vienna University of Technology, Austria*
- 1:55 PM - 2:15 PM **TP3-03 Student***
A III-V Field Effect Transistor (FET) with Hafnium Oxide Gate Dielectric for the Detection of DNA Hybridization
Nicholas Fahrenkopf¹, P. Nagaiah¹, N. Tokranova¹, S. Oktyabrsky¹, V. Tokranov¹, M. Bergkvist¹, N. Cady¹
¹*University at Albany*

- 2:15 PM - 2:35 PM **TP3-04 Student **WITHDRAWN****
Analytical Model of a Tunnel FET Based Biosensor for Label Free Detection
Rakhi Narang¹, K. Reddy², M. Saxena³, R. Gupta⁴, M. Gupta¹
¹University of Delhi, South Campus, India, ²National Institute of Technology, India, ³DDU College, University of Delhi, India, ⁴Maharaja Agrasen Institute of Technology, India
- 2:35 PM - 2:55 PM **TP3-05 Student**
Combined Si Schottky Barriers and SiGe/Si Multi Quantum Wells for Infrared Detection
Mahdi Moeen¹, M. Kolahdouz¹, M. Ostling¹, H. Radamson¹
¹KTH Royal Institute of Technology, Sweden
- 2:55 PM - 3:15 PM **TP3-06 Student***
Label Free Detection of Human MIG Using AlGaIn/GaN High Electron Mobility Transistor
Fahmida Tulip¹, E. Eteshola², S. Islam¹, S. Mostafa¹, H. Huq³
¹The University of Tennessee - Knoxville, ²Ohio State University, ³The University of Texas Pan American

TP4: SOI and SiGe - 1:15 PM - 3:15 PM

Chairperson: Jerrold Floro, University of Virginia

Meeting Room: Juan Ramon Jimenez Room

- 1:15 PM - 1:35 PM **TP4-01 Student**
2D Analytical DC Model for Nanoscale Schottky Barrier DG-MOSFETs
Mike Schwarz¹, T. Holtij¹, A. Kloes¹, B. Iniguez²
¹Technische Hochschule Mittelhessen, Germany, ²Universitat Rovira i Virgili, Spain
- 1:35 PM - 1:55 PM **TP4-02 Student**
Static and Low-Frequency Noise Characterization of Ultrathin SOI with Very Thin BOX in Pseudo-MOSFET Configuration
Amer EL HAJJ DIAB¹, I. Ionica¹, S. Cristoloveanu¹, F. Allibert², Y. Bae³, J. Chroboczek¹, G. Ghibaudo¹
¹IMEP-LAHC, France, ²Soitec S.A., France, ³Uiduk University, Korea, Republic of
- 1:55 PM - 2:15 PM **TP4-03**
Charge Pumping and DCIV Currents in SOI FinFETs
En Xia Zhang¹, D. Fleetwood¹, S. Francis¹, C. Zhang¹, F. Mamouni¹, R. Schrimpf¹
¹Vanderbilt University
- 2:15 PM - 2:35 PM **TP4-04 Student**
Design and Analysis of Multi-Gate Field-Effect-Diodes for Embedded Memory
Zakariae Chbili¹, Y. Yang¹, Q. Li¹, D. Ioannou¹
¹George Mason University
- 2:35 PM - 2:55 PM **TP4-05 Student**
Enhanced Programming and Erasing Speeds in p-Channel, Charge-trapping Flash Transistor Devices with SiGe Channel
Li-Jung Liu¹, K. Chang-Liao¹, Y. Jian¹, T. Wang¹, M. Tsai²
¹National Tsing Hua University, Taiwan, ²Industrial Technology Research Institute, Taiwan
- 2:55 PM - 3:15 PM **TP4-06 Student**
Improvement of Thermal Stability of Ni-Germanide with Co-sputtering of Nickel and Palladium for High Performance Ge CMOSFET
Hong-Sik Shin¹, S. Oh¹, M. Kang^{1,2}, J. Jang¹, J. Oh³, P. Majhi³, R. Jammy³, Y. Chung⁴, S. Kim⁴, D. Lee⁴, S. Lee¹, H. Lee¹
¹Chungnam National University, Korea, Republic of, ²National NanoFab Center, Korea, Republic of, ³SEMATECH, ⁴MagnaChip Semiconductor, Korea, Republic of

TP5: Testing and Characterization - 1:15 PM - 3:15 PM

Chairperson: Patrick Shea, Northrop Grumman

Meeting Room: Margaret Brent Room B

- 1:15 PM - 1:35 PM **TP5-01 Invited**
Performance and Reliability Investigation of (110) and (100) Sidewall Oriented MugFETs
Chadwin Young¹, K. Akarvardar^{1,2}, G. Bersuker¹, I. Ok¹, T. Ngai¹, K. Ang¹, C. Hobbs¹,
P. Kirsch¹, R. Jammy¹
¹SEMATECH, ²GLOBALFOUNDRIES
- 1:35 PM - 1:55 PM **TP5-02 Student***
Spin Dependent Charge Pumping: A New Tool for MOS Interface Characterization
Brad C. Bittel¹, P. Lenahan¹, J. Ryan², J. Fronhieser³, A. Lelis⁴
¹Penn State University, ²NIST, ³GE Global Research, ⁴U.S. Army Research Lab
- 1:55 PM - 2:15 PM **TP5-03**
Extended Defects that Affect Carrier Lifetime in High Blocking Voltage SiC Epilayers
Nadeemullah Mahadik¹, R. Stahlbush¹, J. Caldwell¹, M. O'Loughlin², A. Burk²
¹Naval Research Laboratory, ²Cree, Inc.
- 2:15 PM - 2:35 PM **TP5-04 Student**
Characterization of NVSM Gate Stacks with 'Gridded' Capacitors
Christopher Barthol¹, M. White¹
¹The Ohio State University
- 2:35 PM - 2:55 PM **TP5-05**
Band Alignment of TFET Heterojunctions and Post Deposition Annealing Effects by Internal
Photoemission Spectroscopy
Qin Zhang^{1,2}, G. Zhou², H. Xing², A. Seabaugh², K. Xu^{1,3}, O. Kirillov¹, C. Richter¹, N. Nguyen¹
¹National Institute of Standards and Technology, ²University of Notre Dame, ³Purdue University
- 2:55 PM - 3:15 PM **TP5-06 Student***
Determination of Oxide Properties with a New Fast Tunneling Current Measurement Protocol
Philippe Chiquet¹, G. Micolau¹, R. Laffont¹, F. Lalande¹, A. Regnier², B. Bouteille³
¹IM2NP, Universite Aix-Marseille, France, ²ST Microelectronics, France, ³CNRS, France

TP10: Reliability - 1:15 PM - 3:15 PM

(Note: TP10 is intentionally out of order due to reasons beyond our control)

Chairperson: Martin Peckerar, University of Maryland

Meeting Room: Prince George's Room

- 1:15 PM - 1:45 PM **TP10-01 Invited**
Modeling the Charge Transport and Degradation in HfO₂ Dielectric for Reliability Improvement and
Life-Time Predictions in Logic and Memory Devices
Andrea Padovani¹, L. Larcher¹, L. Vandelli¹, O. Pirrotta¹, P. Pavan¹
¹Universita di Modena e Reggio Emilia, Italy
- 1:45 PM - 2:05 PM **TP10-02**
Electrical Reliability Characteristics and Dielectrics Degradation in Gate Stacks (REO-HfO₂) Grown on
the High Mobility Ge Substrates
Md. Shahinur Rahman¹, E. Evangelou², N. Konofaos³, A. Dimoulas⁴
¹Technical University-Dresden, Germany, ²University of Ioannina, Greece, ³University of
Aegean, Greece, ⁴NCSR, DEMOKRITOS, Greece

- 2:05 PM - 2:25 PM **TP10-03 Student**
Fast Extraction of Extrinsic Cells in a NVM Array after Retention under Gate Stress
Reda Djenadi^{1,2}, G. Micolau^{1,2}, J. Postel-Pellerin^{1,2}, R. Laffont^{1,2}, J. Ogier³, F. Lalande^{1,2}, J. Melkonian^{1,2}
¹IM2NP, France, ²CNRS, France, ³STMicroelectronics, France
- 2:25 PM - 2:45 PM **TP10-04 Student**
Characterization of Al₂O₃-HfO₂-Al₂O₃ Sandwiched MIM Capacitor under DC and AC Stresses
Ho Young Kwak¹, H. Kwon¹, S. Kwon¹, J. Jang¹, W. Choi¹, Y. Chung², J. Lee², M. Lim², S. Lee¹, H. Lee¹
¹Chungnam National University, Korea, Republic of, ²Magnachip Semiconductor, Korea, Republic of
- 2:45 PM - 3:05 PM **TP10-05 Student* **WITHDRAWN****
Reliability Studies in 45 nm Technology Node: Threshold Voltage Fluctuations Due to Random Dopants and Random Telegraph Noise
Dragica Vasileska¹, N. Ashraf¹, J. Sarthak¹
¹Arizona State University
- 3:05 PM - 3:25 PM **TP10-06 Student* **WITHDRAWN****
Investigation of RF/Microwave Performance Degradation for Cylindrical Nanowire MOSFET Due to Interface (Localised) Charges
Rajni Gautam¹, M. Saxena¹, R. Gupta², M. Gupta¹
¹University of Delhi, India, ²Maharaja Agrasen Institute of Technology, India

3:15 PM – 3:45 PM Coffee Break – Grand Ballroom Lounge

TP6: Nanoelectronics V: Nanotubes and Graphene - 3:45 PM - 5:45 PM

Chairperson: Madan Dubey, U.S. Army Research Laboratory

Co-Chairperson: YuHuang Wang, University of Maryland

Meeting Room: Colony Ballroom

- 3:45 PM - 4:05 PM **TP6-01 Student**
Tunable Transmission Gap in Graphene p-n Junction
Redwan Sajjad¹, A. Ghosh¹
¹University of Virginia
- 4:05 PM - 4:25 PM **TP6-02 Student***
Charge Transfer Region at the Edge of Metal Contacts on Graphene and its Impact on Contact Resistance Measurement
Kangmu Lee¹, A. Ohoka¹, P. Asbeck¹
¹University of California, San Diego
- 4:25 PM - 4:45 PM **TP6-03 Student**
Low-Field Acoustic Phonon Limited Mobility in GNRs
Sahar Jalili¹, M. Fathipour¹
¹University of Tehran, Iran, Islamic Republic of
- 4:45 PM - 5:05 PM **TP6-04**
Incidence Angle-dependent Transport across a Single Graphene p-n Junction
Surajit Sutar¹, E. Comfort¹, J. Lee¹
¹SUNY at Albany
- 5:05 PM - 5:25 PM **TP6-05 Student**
Physics-Based GNFET Compact Model for Digital Circuit Design
Dincer Unluer¹, F. Tseng¹, A. Ghosh¹
¹University of Virginia

TP7: Wide Bandgap V: GaN/ZnO Materials and Devices - 3:45 PM - 6:05 PM

Chairperson: Dan Ewing, Northrop Grumman

Meeting Room: Charles Carroll Room

- 3:45 PM - 4:05 PM **TP7-01 Invited**
III-Nitride Devices on Si: Challenges and Opportunities
F. (Shadi) Shahedipour-Sandvik¹, M. Tungare¹, J. Leathersich¹, P. Suvarna¹, R. Tompkins², K. Jones²
¹State University of New York-Albany, ²U.S. Army Research Laboratory
- 4:05 PM - 4:25 PM **TP7-02 Student**
InGaN/GaN Microwave Varactors with High Q , High-Breakdown Voltage and High Linearity
Wei Lu¹, L. Wang¹, S. Gu¹, D. Aplin¹, P. Yu¹, P. Asbeck¹
¹UCSD
- 4:25 PM - 4:45 PM **TP7-03**
GaN Power Schottky Diodes Fabricated on Low Doped MOCVD Layers Grown on Multiple Substrates
Randy Tompkins¹, S. Zhou¹, J. Smith¹, M. Derenge¹, K. Kirchner¹, K. Jones¹, G. Mulholland², R. Metzger², J. Leach², P. Suvarna³, M. Tungare³, F. Shahedipour-Sandvik³
¹U.S. Army Research Laboratory, ²Kyma Technologies Inc., ³State University of New York at Albany
- 4:45 PM - 5:05 PM **TP7-04 Student***
Investigation of Blistering Process in H-implanted GaN at Different Implantation Temperatures
U. Dadwal¹, M. Reiche², S. Chandra¹, R. Singh¹
¹Indian Institute of Technology Delhi, New Delhi, India, ²Max Planck Institute of Microstructure Physics, Weinberg, Germany
- 5:05 PM - 5:25 PM **TP7-05**
Temperature Profiling in AlGaIn/GaN HEMTs with Nanocrystalline Diamond Heat Spreading Layers by Raman Spectroscopy
Travis Anderson¹, M. Tadjer², K. Hobart¹, T. Feygelson³, J. Caldwell¹, M. Mastro¹, J. Hite¹, C. Eddy, Jr¹, F. Kub¹, J. Butler³, B. Pate¹
¹US Naval Research Laboratory, ²Universidad Politecnica de Madrid, Spain, ³SAIC
- 5:25 PM - 5:45 PM **TP7-06 Student**
ZnO Thin Film Transistors by Low Temperature Deposition Plasma-Enhanced Atomic Layer Deposition in a Showerhead Reactor
Israel Ramirez¹, Y. Li¹, D. Zhao¹, T. Jackson¹
¹Penn State University

TP8: Low Power Electronics - 3:45 PM - 6:05 PM

Chairperson: Edo Waks, University of Maryland

Meeting Room: Benjamin Banneker Room

- 3:45 PM - 4:05 PM **TP8-01**
A Novel Approach of Cap-sharing to Reduce the Big Loop Filter Capacitance in Semi-digital PLL
Ketan Dewan¹, P. Sareen¹, M. Dietl¹
¹Texas Instrument, Germany
- 4:05 PM - 4:25 PM **TP8-02**
Improving SRAM Read/Write Margin with Asymmetric Halo MOSFET
Koji Nii¹, M. Yabuuchi¹, H. Fujiwara¹, Y. Tsukamoto¹, K. Maekawa¹, M. Igarashi¹
¹Renesas Electronics Corporation, Japan
- 4:25 PM - 4:45 PM **TP8-03**
Fabrication of Silicon Tunnel-FETs Using Epitaxial NiSi₂ Schottky Junctions and Dopant Segregation Technique
Shinji Migita¹, H. Ota¹
¹AIST, Japan

- 4:45 PM - 5:05 PM **TP8-04 Student**
 Modulation of Transfer Characteristics of Si Nanowire Tunnel FET on Ultra-Thin-Body and BOX (UTBB) SOI Substrate Using Back-Gate Bias
Min-Chul Sun^{1,2}, S. Kim¹, G. Kim¹, H. Kim¹, H. Kim¹, J. Lee¹, H. Shin¹, B. Park¹
¹Seoul National University, Korea, Republic of, ²Samsung Electronics Co., Ltd., Korea, Republic of
- 5:05 PM - 5:25 PM **TP8-05 Student**
 Modeling and Simulation of Dielectric Pocket Double Gate (DP-DG) MOSFET for Low Voltage Low Power Analog Applications
Vandana Kumari¹, M. Saxena², R. Gupta³, M. Gupta¹
¹University of Delhi, South Campus, India, ²Deen Dayal Upadhyaya College, University of Delhi, India, ³Maharaja Agrasen Institute of Technology, India
- 5:25 PM - 5:45 PM **TP8-06 Student***
 Experimental Study to Push the Flash Floating Gate Memories Toward Low Energy Applications
Vincenzo Della Marca^{1,2}, A. Regnier¹, J. Ogier¹, R. Simola¹, S. Niel¹, J. Postel-Pellerin², F. Lalonde², G. Molas³
¹STMicroelectronics, France, ²Aix-Marseille University, France, ³CEA-Leti, France
- 5:45 PM - 6:05 PM **TP8-07 Student***
 Heterostructure Design and Demonstration of InGaSb Channel III-V CMOS Transistors
Ze Yuan¹, A. Nainani¹, B. Bennett², J. Boos², M. Ancona², K. Saraswat¹
¹Stanford University, ²Naval Research Laboratory

TP9: SiGe and Germanium - 3:45 PM - 5:55 PM

Chairperson: Phillip Thompson, Naval Research Laboratory

Meeting Room: Juan Ramon Jimenez Room

- 3:45 PM - 4:15 PM **TP9-01 Invited**
 The Properties of Germanium-Tin Alloys for Infrared Device Applications
James Kolodzey¹, M. Coppinger¹, S. Kim¹, N. Bhargava¹, J. Gupta¹, C. Ni¹, Y. Yeo²
¹University of Delaware, ²Air Force Institute of Technology
- 4:15 PM - 4:35 PM **TP9-02**
 Class-A Stacked SiGe HBT Power Amplifier at Millimeter-Wave
Thomas Farmer¹, A. Darwish², B. Huebschman¹, E. Viveiros¹, H. Hung¹, M. Zaghloul³
¹U.S. Army Research Laboratory, ²The American University in Cairo, Egypt, ³The George Washington University
- 4:35 PM - 4:55 PM **TP9-03 Student***
 Ultra-Shallow Emitter Formation for Germanium Bipolar Transistor by Diffusion from Polycrystalline Germanium
Kezheng Li¹, K. Kong¹, H. Gamble¹, M. Armstrong¹
¹Queen's University Belfast, United Kingdom
- 4:55 PM - 5:15 PM **TP9-04 Student**
 Ge_{1-x}Mn_x Heteroepitaxial Quantum Dots: Growth, Structure and Magnetism
Joseph Kassim¹, J. Floro¹, P. Reinke¹, C. Nolph¹, C. Dennis²
¹University of Virginia, ²National Institute of Standards and Technology
- 5:15 PM - 5:35 PM **TP9-05 Student**
 Surface Characterization of Nickel Germanides for Schottky Source/Drain Contacts to Germanium p-MOSFETs
Durga Rao Gajula¹, D. McNeill¹, B. Coss², H. Dong², S. Jandhyala², J. Kim², R. Wallace², M. Armstrong¹
¹Queen's University Belfast, United Kingdom, ²University of Texas at Dallas

5:35 PM - 5:55 PM **TP9-06 Student***
Ge p-i-n Detectors on Si for High Power Density Applications
Anthony Davidson, III¹, P. Thompson¹, M. Twigg¹, B. Boos¹, D. Park¹, D. Tulchinsky¹
¹Naval Research Laboratory

6:15 PM – 8:30 PM Symposium Awards Banquet – Grand Ballroom
Opening Remarks: Dr. Rajinder Khosla, NSF

Friday, December 9, 2011

7:30 AM Continental Breakfast – Grand Ballroom Lounge

FA1: Nanoelectronics VI: Nanotubes and Graphene - 8:00 AM - 9:50 AM

Chairperson: Osama Nayfeh, U.S. Army Research Laboratory

Meeting Room: Colony Ballroom

8:00 AM - 8:30 AM **FA1-01 Invited**
Chemical Defect Propagation on Carbon Nanotubes
YuHuang Wang¹
¹University of Maryland

8:30 AM - 8:50 AM **FA1-02**
Controlling Chariltiy and Pinhole Defects in Ni Catalyst for Synthesis of Graphene
Eugene Zakar¹, K. Hauri¹, R. Fu¹
¹U.S. Army Research Laboratory

8:50 AM - 9:10 AM **FA1-03**
Dynamic Crosstalk Analysis in CNT Bus Architecture
M. Majumder¹, N. Pandya¹, Brajesh K. Kaushik², S. K. Manhas¹
¹Indian Institute of Technology, Roorkee, India, ²Indian Institute of Techonology, Roorkee, India

9:10 AM - 9:30 AM **FA1-04 Student**
An Investigation of ZG NR-Based Transistors
Hossein Karamitaheri^{1,2}, M. Pourfath^{1,3}, R. Faez², H. Kosina¹
¹TU Wien, Austria, ²Sharif University of Technology, Iran, Islamic Republic of,
³University of Tehran, Iran, Islamic Republic of

9:30 AM - 9:50 AM **FA1-05 Student***
Wafer-scale Synthesis and Transfer of High Quality Monolayer Graphene for Nanoelectronics
Li Tao¹, J. Lee¹, M. Holt¹, D. Akinwande¹
¹The University of Texas at Austin

FA2: Wide Bandgap VI: SiC Materials and Devices - 8:00 AM - 10:10 AM

Chairperson: Dan Ewing, Northrop Grumman

Co-Chairperson: Aivars Lelis, U.S. Army Research Laboratory

Meeting Room: Charles Carroll Room

8:00 AM - 8:30 AM **FA2-01 Invited**
Expansion of Shockley Stacking Faults in High Doped 4H-SiC Epilayers
*Robert Stahlbush¹, N. Mahadik¹, E. Imhoff¹, K. Hobart¹, R. Myers-Ward¹, C. Eddy, Jr¹,
D. Gaskill¹, F. Kub¹*
¹Naval Research Laboratory

8:30 AM - 8:50 AM **FA2-02**
SiC MOSFET Oxide-Trap Two-way Tunneling Model
Aivars Lelis¹, D. Habersat¹, R. Green¹, N. Goldsman²
¹U.S. Army Research Lab, ²University of Maryland

- 8:50 AM - 9:10 AM **FA2-03**
Using Triangular Voltage Sweep to Detect Mobile Ions in Silicon Carbide MOS
Daniel Habersat¹, A. Lelis¹, R. Green¹
¹*U.S. Army Research Laboratory*
- 9:10 AM - 9:30 AM **FA2-04 **WITHDRAWN****
Device Modeling Analysis and Simulation of SiC P-i-N Diode under Pulsed Power Conditions
Aderinto Ogunniyi¹, H. O'Brien¹, C. Scozzie¹, W. Shaheen², J. Zhang³, L. Cheng³, A. Agarwal³, V. Temple⁴
¹*U.S. Army Research Laboratory*, ²*Berkeley Research Associates*, ³*Cree, Inc.*, ⁴*Silicon Power Corporation*
- 9:30 AM - 9:50 AM **FA2-05 Student***
Electrically Detected Magnetic Resonance Study of a Near Interface Trap in 4H-SiC MOSFETs
Corey Cochrane¹, P. Lenahan¹, A. Lelis²
¹*The Pennsylvania State University*, ²*U.S. Army Research Lab*
- 9:50 AM - 10:10 AM **FA2-06 Student***
The Effects of Different Silicon Carbide-Silicon Dioxide Interface Passivations on Transition Region Mobility and Transport
Shahrzad Salemi¹, A. Akturk¹, S. Potbhare¹, A. Lelis², N. Goldsman¹
¹*University of Maryland*, ²*U.S. Army Research Laboratory*

FA3: Nanowires, Assembly Methods and Devices I - 8:00 AM - 9:50 AM

Chairperson: Babak Nikoobakht, NIST

Meeting Room: Benjamin Banneker Room

- 8:00 AM - 8:30 AM **FA3-01 Invited**
Vapor-Liquid-Solid Growth and Characterization of Al-Catalyzed Si Nanowires
Joan Redwing¹, Y. Ke¹, X. Wang¹, C. Eichfeld¹, X. Weng¹, C. Kendrick¹, S. Mohny¹, T. Mayer¹
¹*Penn State University*
- 8:30 AM - 8:50 AM **FA3-02**
High-Field Carrier Velocity in Silicon Tri-Gate Nanowire pMOSFETs with <100>- and <110>-Oriented Channel
Masumi Saitoh¹, K. Ota¹, C. Tanaka¹, Y. Nakabayashi¹, K. Uchida², T. Numata¹
¹*Toshiba Corporation, Japan*, ²*Tokyo Institute of Technology, Japan*
- 8:50 AM - 9:10 AM **FA3-03**
Improving the Selectivity of a Metal Oxide Nanowire Gas Sensor Using a Microhotplate/FET Platform
Eric N. Dattoli¹, K. Benkstein¹
¹*National Institute of Standards and Technology*
- 9:10 AM - 9:30 AM **FA3-04 Student**
Growth and Characterization of Nanowires and Nanorods on Al₂O₃(110), Si(111) and SiO₂/p-Si(100) by MOCVD
Abdiel Rivera¹, M. Anwar¹, M. Monville², S. Chang², J. Zeller³, A. Sood³, T. Manzur⁴
¹*University of Connecticut*, ²*CVD Equipment Corporation*, ³*Magnolia Optical Technologies*, ⁴*Naval Underwater Warfare Center*
- 9:30 AM - 9:50 AM **FA3-05 Student**
Local Stressors to Accommodate 1.2 to 5.6 GPa Uniaxial Tensile Stress in Suspended Gate-All-Around Si Nanowire nMOSFETs by Elastic Local Buckling
Mohammad Najmzadeh¹, D. Bouvet¹, W. Grabinski¹, A. Ionescu¹
¹*Swiss Federal Institute of Technology (EPFL), Switzerland*

FA4: Modeling & Simulation I - 8:00 AM - 10:00 AM

Chairperson: Neil Goldman, University of Maryland

Meeting Room: Juan Ramon Jimenez Room

- 8:00 AM - 8:20 AM **FA4-01**
On-Current Limitation of High-K Gate Insulator MOSFETs
Chun-Hsing Shih¹, J. Wang², N. CHIEN¹, R. Shia¹, Y. Luo³, S. Chen⁴, C. Lien³
¹National Chi Nan University, Taiwan, ²UMC, Taiwan, ³National Tsing Hua University, Taiwan, ⁴National United University, Taiwan
- 8:20 AM - 8:40 AM **FA4-02**
A Quasi-Analytical Model of the Junctionless Nanowire Field-Effect Transistor
Elena Gnani¹, S. Reggiani¹, A. Gnudi¹, G. Baccarani¹
¹University of Bologna, Italy
- 8:40 AM - 9:00 AM **FA4-03 Student**
Estimating and Enhancing the Yield of Tunneling SRAM Cells by Simulation
Dingli Zuo¹, M. Kelly¹
¹University of Cambridge, United Kingdom
- 9:00 AM - 9:20 AM **FA4-04**
Analytical Modeling and Simulation for Dual metal Symmetrical Gate Stack (DMGAS) Cylindrical/Surrounded Gate MOSFET
P. Ghosh¹, Subhasis Haldar², R. Gupta³, M. Gupta¹
¹Semiconductor Device Research Laboratory, India, ²University of Delhi, India, ³Maharaja Agrasen Institute of Technology, India
- 9:20 AM - 9:40 AM **FA4-05 Student***
A New Compact Modeling for the Current and Drift Region Resistance in High-Performance LDMOS Transistors
Alireza Mojab¹, M. Fathipour¹, V. Fathipour¹, A. Haghshenas¹, M. Malakoutian¹
¹University of Tehran, Iran, Islamic Republic of
- 9:40 AM - 10:00 AM **FA4-06 Student**
Analytical Modeling of the Impact of Drain Voltage on P, R and C Noise Coefficients for a Symmetric Tied-gate InAlAs/InGaAs DG-HEMT
Monika Bhattacharya¹, J. Jogi², R. Gupta³, M. Gupta¹
¹Semiconductor Device Research Laboratory, Department of Electronic Science, University of Delhi, South Campus, India, ²A.R.S.D. College, Department of Electronic Science, University of Delhi, South Campus, India, ³Department of Electronics and Communication Engineering, Maharaja Agrasen Institute of Technology, Sector-22, Rohini, India

10:00 AM – 10:15 AM Coffee Break – Grand Ballroom Lounge

FA5: Nanoelectronics VII: Nanotubes and Graphene - 10:15 AM - 12:15 PM

Chairperson: Qiliang Li, George Mason University

Meeting Room: Colony Ballroom

- 10:15 AM - 10:45 AM **FA5-01 Invited**
Graphene Transistors for RF Applications: Opportunities and Challenges
Jeong Moon¹
¹HRL Laboratories
- 10:45 AM - 11:05 AM **FA5-02**
CVD Graphene Ubiquitous High Speed Electronics on Flexible/Rigid Substrates
Osama Nayfeh¹, B. Nichols¹, T. Ivanov¹, R. Proie¹, G. Meissner¹
¹United States Army Research Laboratory

- 11:05 AM - 11:35 AM **FA5-03 Invited**
Graphene-based Electronics for Ubiquitous RF Communications and Sensing
Tomas Palacios¹
¹*Massachusetts Institute of Technology*
- 11:35 AM - 11:55 AM **FA5-04 Student**
Optical Bio Sensor Using Graphene Nano Ribbons
Bhaven Mehta¹, Z. Li¹, M. Zaghoul¹
¹*The George Washington University*
- 11:55 AM - 12:15 PM **FA5-05**
Device and Circuit-Level Performance Benchmarking of Carbon Nanotubes
Vijay Arora^{1,2}, M. Tan¹
¹*Universiti Teknologi Malaysia, Malaysia, ²Wilkes University*

FA6: Wide Bandgap VII: III-Nitride HEMTs - 10:15 AM - 12:25 PM

Chairperson: Ken Jones, U.S. Army Research Laboratory

Meeting Room: Charles Carroll Room

- 10:15 AM - 10:45 AM **FA6-01 Invited**
Frequency-Configurable Electronics
Grigory Simin¹, R. Gaska²
¹*University of South Carolina, ²Sensor Electronic Technology Inc.*
- 10:45 AM - 11:05 AM **FA6-02**
Normally-Off InAlN/GaN HEMTs with n⁺⁺ GaN Cap Layer: A Simulation Study
Stanislav Vitanov¹, J. Kuzmik^{2,1}, V. Palankovski¹
¹*TU Wien, Austria, ²Slovak Academy of Sciences, Slovakia*
- 11:05 AM - 11:25 AM **FA6-03**
Performance Enhancement of AlGaIn/GaN Metal-Oxide-Semiconductor Heterojunction Field-Effect Transistor (MOSHFET) with Atomic Layer Deposition (ALD) of High-k HfAlO Gate Dielectric Layer
Bongmook Lee¹, Y. Choi¹, C. Kirkpatrick¹, A. Huang¹, V. Misra¹
¹*North Carolina State University*
- 11:25 AM - 11:45 AM **FA6-04 Student***
Design and Simulation of Enhancement-mode N-polar GaN Single-channel and Dual-channel MIS-HEMTs
Peijie Feng¹, K. H. Teo², T. Oishi³, M. Nakayama³, C. Duan², J. Zhang²
¹*Syracuse University, ²Mitsubishi Electric Research Laboratories (MERL), ³Mitsubishi Electric Cooperation*
- 11:45 AM - 12:05 PM **FA6-05 Student**
Comparative Study of E- and D-mode InAlN/AlN/GaN HEMTs with f_T Near 200 GHz
Berardi Sensale Rodriguez¹, J. Guo¹, R. Wang¹, G. Li¹, T. Fang¹, P. Saunier², A. Ketterson², M. Schuette², G. Snider¹, P. Fay¹, D. Jena¹, H. Xing¹
¹*University of Notre Dame, ²Triquint Semiconductor*
- 12:05 PM - 12:25 PM **FA6-06 Student***
Modeling Reliability of GaN/AlGaIn/AlN/GaN HEMT
Dragica Vasileska¹, B. Padmanabhan¹, S. Goodnick¹
¹*Arizona State University*

FA7: Nanowires, Assembly Methods and Devices II - 10:15 AM - 12:25 PM

Chairperson: Albert Davydov, NIST

Meeting Room: Benjamin Banneker Room

- 10:15 AM - 10:45 AM **FA7-01 Invited**
Nanowires in Energy Devices
P. Daniel Dapkus¹, C. Chi¹, M. Yao¹, A. Madaria¹, T. Yeh¹, Y. Lin¹, C. Zhou¹
¹University of Southern California
- 10:45 AM - 11:05 AM **FA7-02**
Scaling-up Charge Injection to Nanowire p-n Heterojunctions: From Individual Nanowires to Their Large Size Arrays
Babak Nikoobakht¹
¹NIST
- 11:05 AM - 11:25 AM **FA7-03 Student**
Self-aligned Multi-channel Silicon Nanowire Field-effect Transistors
Hao Zhu^{1,2}, Q. Li^{1,2}, H. Yuan^{1,2}, H. Baumgart³, D. Ioannou¹, C. Richter²
¹George Mason University, ²National Institute of Standards and Technology, ³Old Dominion University
- 11:25 AM - 11:45 AM **FA7-04 Student**
Planar VLS Grown GaAs Nanowire Array Based HEMTs
Xin Miao¹, X. Li¹
¹University of Illinois at Urbana Champaign
- 11:45 AM - 12:05 PM **FA7-05 Student**
Silicon Nanowire-Based Oscillator Achieved Through Solid-Liquid Phase Switching
Adam Cywar¹, G. Bakan¹, A. Gokirmak¹, and H. Silva¹
¹University of Connecticut
- 12:05 PM - 12:25 PM **FA7-06 Student**
Location and Cause of Surface Potential Fluctuations in an SOI Nanowire
Ted Thorbeck^{1,2}, N. Zimmerman²
¹University of Maryland, ²NIST

FA8: Modeling and Simulation II - 10:15 AM - 12:15 PM

Chairperson: Zeynep Dilli, University of Maryland

Meeting Room: Juan Ramon Jimenez Room

- 10:15 AM - 10:35 AM **FA8-01 Student* **WITHDRAWN****
A New Dynamic Threshold Voltage Modeling for Flexible Threshold Voltage Field Effect Transistors
Nadim Chowdhury¹, Z. Azim¹, I. Ahmed¹, I. Niaz¹, H. Alam¹, Q. Khosru¹
¹Bangladesh University of Engineering and Technology, Bangladesh
- 10:35 AM - 10:55 AM **FA8-02 Student**
Modeling the Capacitance-Voltage Characteristics of the Trench Insulated Gate Bipolar Transistor (TIGBT) by Minimizing its Helmholtz Free Energy
Md Sattar^{1,1}, N. Gunther¹, M. Barycza¹, M. Rahman¹
¹Santa Clara University
- 10:55 AM - 11:15 AM **FA8-03 Student**
Modeling of a New Liner Stressor Comprising Ge₂Sb₂Te₅ (GST): Amorphous-Crystalline Phase Change and Stress Induced in FinFET Channel
Ran Cheng¹, Y. Ding¹, B. Liu¹, Y. Yeo¹
¹National University of Singapore, Singapore

- 11:15 AM - 11:35 AM **FA8-04 Student**
 Source of Chaos in Radio Frequency MOSFETs
Myunghwan Park¹, J. Rodgers¹, D. Lathrop¹
¹University of Maryland
- 11:35 AM - 11:55 AM **FA8-05 Student**
 DC Circuit Model of a Memristor
Anas Mazady¹, M. Anwar¹
¹University of Connecticut
- 11:55 AM - 12:15 PM **FA8-06 Student**
 Hydrodynamic Simulations of a Nanoscale RingFET
Nicholas Williams¹, A. Gokirmak¹
¹University of Connecticut

12:25 PM – 1:15 PM Lunch Break (on your own)

FP1: Optics, Optoelectronics and Plasmonics - 1:15 PM - 2:55 PM

Chairperson: Babak Nikoobakht, NIST

Meeting Room: Colony Ballroom

- 1:15 PM - 1:45 PM **FP1-01 Invited**
 Collective Plasmon Modes in Nanoparticle Assemblies
Stephan Link¹
¹Rice University
- 1:45 PM - 2:05 PM **FP1-02 Student**
 Deterministic Nano-manipulation and Immobilization of Single Quantum Dots
*Chad Ropp¹, Z. Cummins¹, R. Probst¹, S. Nah¹, S. Qin¹, R. Kumar¹, S. R. Raghavan¹,
 J. T. Fourkas¹, B. Shapiro¹, E. Waks¹*
¹University of Maryland
- 2:05 PM - 2:35 PM **FP1-03 Invited**
 Stable Single Mode Terahertz Semiconductor Sources at Room Temperature
Manijeh Razeghi¹
¹Northwestern University
- 2:35 PM - 2:55 PM **FP1-04**
 Interface Engineering for Efficient Organic Optoelectronic Devices Using Nanostructured
 Transition Metal Oxides
*Maria Vasilopoulou¹, I. Kostis^{1,2}, G. Papadimitropoulos¹, N. Konofaos^{2,3}, A.A. Iliadis⁴,
 P. Argitis¹, and D. Davazoglou¹*
¹National Center for Scientific Research, Greece, ²University of the Aegean, Greece, ³Aristotle
 University of Thessaloniki, Greece, ⁴University of Maryland

FP2: Space and Extreme Environment Electronics - 1:15 PM - 2:55 PM

Chairperson: Albert Davydov, NIST

Meeting Room: Charles Carroll Room

1:15 PM - 1:35 PM FP2-01 ****WITHDRAWN****

Combined Electro-thermal Coupling, Electromagnetic, and Physical Modeling of Multi-finger InP DHBTs

Ji Ge¹

¹Institute of Microelectronics, Chinese Academy of Sciences, China

1:35 PM - 1:55 PM

FP2-02 **Student**

Multilayer, Colloidal Nanoparticle Based Devices for Biological and Nuclear Radiation Detection

Liqiao Qin¹, C. Shing¹, S. Sawyer¹

¹Rensselaer Polytechnic Institute

1:55 PM - 2:15 PM

FP2-03

Compact Modeling of Silicon Carbide Lateral MOSFETs for Extreme Environment Integrated Circuits

Avinash Kashyap¹, C. Chen¹, V. Tilak²

¹GE Global Research Center, ²GE Global Research Center, India

2:15 PM - 2:35 PM

FP2-04 ****WITHDRAWN****

Degradation Factors Affecting Carbon Nanotube Field Emission Cathodes

Adrian Southard¹, S. Getty¹, D. Glavin¹, C. Kotecki¹, L. Hess¹, N. Costen¹

¹NASA Goddard Space Flight Center

2:35 PM - 2:55 PM

FP2-05 **Student**

Selective Nano-devices for the Detection of Nitroaromatic Explosive Compounds

Geetha Aluri¹, A. Motayed², A. Davydov³, V. Oleshko³, K. Bertness³, N. Sanford³, M. Rao¹

¹George Mason University, ²University of Maryland, ³National Institute of Standards and Technology

FP3: Novel Devices II - 1:15 PM - 3:15 PM

Chairperson: Michael Shur, Rensselaer Polytechnic Institute

Co-Chairperson: YuHuang Wang, University of Maryland

Meeting Room: Benjamin Banneker Room

1:15 PM - 1:35 PM

FP3-01

TaO_x Memresistive Devices with Ferromagnetic Electrodes

Hyuk-Jae Jang¹, P. Shrestha², O. Kirillov³, H. Baumgart⁴, K. Cheung³, O. Jurchescu⁵, C. Richter³

¹NIST & Wake Forest University, ²NIST & Old Dominion University, ³NIST, ⁴Old Dominion University,

⁵Wake Forest University

1:35 PM - 1:55 PM

FP3-02

Effects of Oblique Wave Propagation on the Nonlinear Plasma Resonance in the Two-Dimensional Channel of the Dyakonov-Shur Detector

Sergey Rudin¹, G. Rupper¹, F. Crowne¹

¹U.S. Army Research Laboratory

1:55 PM - 2:15 PM

FP3-03

Simulation Comparison of Reset Operation for Mushroom Phase Change Memory Cells with Different Access Device

Azer Faraclas¹, N. Williams¹, A. Gokirmak¹, H. Silva¹

¹University of Connecticut

2:15 PM - 2:35 PM

FP3-04

Low-Temperature PEALD ZnO Double-Gate TFTs

Yuanyuan Li¹, I. Ramirez¹, H. Li¹, T. Jackson¹

¹Penn State University

2:35 PM - 2:55 PM

FP3-05

Design, Simulation, and Characterization of THz Metamaterial Absorber

Lee Butler¹, D. Wilbert¹, W. Baughman¹, S. Balci¹, P. Kung¹, S. Kim¹

¹University of Alabama

2:55 PM - 3:15 PM

FP3-06

Ultrahigh Sensitive Plasmonic Terahertz Detector Based on an Asymmetric Dual-Grating Gate HEMT Structure

Takayuki Watanabe¹, S. Boubanba Tombet¹, Y. Tanimoto¹, T. Suemitsu¹, Y. Wang², H. Minamide², H. Ito², D. Fateev³, V. Popov³, D. Coquillat⁴, W. Knap⁴, T. Otsuji¹

¹Tohoku University, Japan, ²RIKEN, Japan, ³RAS, Russian Federation, ⁴University of Montpellier - CNRS, France

FP4: Modeling & Simulation III - 1:15 PM - 2:55 PM

Chairperson: Meredith Reed, U.S. Army Research Laboratory

Meeting Room: Juan Ramon Jimenez Room

1:15 PM - 1:35 PM

FP4-01

Finite Element Modeling of Current-Induced Filaments in Nanocrystalline Silicon

Sean Fischer¹, C. Osorio¹, N. Williams¹, H. Silva¹, A. Gokirmak¹

¹University of Connecticut

1:35 PM - 1:55 PM

FP4-02

Threshold Voltage and Sub-Threshold Slope Variation with Gate-length in Al₂O₃/InAlAs/InGaAs QW FETs

John Xanthakis¹, I. Tsopelas¹, A. Gili¹

¹National Technical University of Athens, Greece

1:55 PM - 2:15 PM

FP4-03

Graded Silicon-Germanium Channel Tunnel Field Effect Transistor (G-TFET): An Approach to increase I_{ON} Without Compromising I_{OFF}

Poornendu Chaturvedi¹, N. Goyal^{1,2}

¹Solid State Physics Laboratory, India, ²Norwegian University of Science and Technology, Norway

2:15 PM - 2:35 PM

FP4-04

One-Flux Theory of Saturated Drain Current in Nanoscale Transistors

Ting-wei Tang¹, M. Fischetti², S. Jin³, N. Sano⁴

¹University of Massachusetts, ²University of Texas at Dallas, ³Synopsys, Inc.,

⁴University of Tsukuba, Japan

2:35 PM - 2:55 PM

FP4-05 Student

Compact Analytical Modeling of the Gate Leakage, Current Partitioning for Double Gate MOSFET Device

Ghader Darbandy¹, F. Lime¹, A. Cerdeira², M. Estrada², S. Garduo², B. Iniguez¹

¹URV, Spain, ²CINVESTAV-D.F, Mexico