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<sup>1</sup>*CEA-Leti, Universit   Grenoble Alpes, France*; <sup>2</sup>*CEA-List, Paris-Saclay University, France*; <sup>3</sup>*CEA-List, Universit   Grenoble Alpes, France*

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Université Grenoble Alpes, France;* <sup>3</sup>*CEA, Aix-Marseille University, Université de Toulon,  
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<sup>1</sup>*CEA-Leti, France*; <sup>2</sup>*INSA Lyon, France*; <sup>3</sup>*STMicroelectronics, United Kingdom*;  
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<sup>1</sup>*CEA-Leti, Université Grenoble Alpes, France;* <sup>2</sup>*Université Grenoble Alpes, CNRS, Grenoble-INP, LMGP, France*

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<sup>1</sup>*SHI-ATEX Co., Ltd., Japan*; <sup>2</sup>*Tokyo City University, Japan*; <sup>3</sup>*Tokyo Institute of Technology, Japan*

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## Simulation & Modeling for RF & CMOS

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Chair(s): Gianluca Fiori; *University of Pisa*  
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<sup>1</sup>*CEA-Leti, France*; <sup>2</sup>*CEA-Leti, Université Grenoble Alpes, France*; <sup>3</sup>*Centro Universitário da FEI, Brazil*

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<sup>1</sup>*Politecnico di Milano, Italy*; <sup>2</sup>*STMicroelectronics, France*; <sup>3</sup>*STMicroelectronics, Italy*

## Simulation & Modeling of Defects & Traps

Date: Thursday, September 16, 2021  
Time: 16:00 - 17:00  
Room: CHROME 1  
Chair(s): Zlatan Stanojevic; *Global TCAD Solutions*  
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<sup>1</sup>*Technische Universität Wien, Institute for Microelectronics, Austria;* <sup>2</sup>*Technische Universität Wien, Institute for Microelectronics / Nanolayers Research Computing, Ltd, Austria;* <sup>3</sup>*Technische Universität Wien, Institute for Microelectronics, Christian Doppler Lab., Austria*

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<sup>1</sup>*Technische Universität Wien, Institute for Microelectronics, Austria;* <sup>2</sup>*Technische Universität Wien, Institute for Microelectronics / Nanolayers Research Computing, Ltd, Austria;* <sup>3</sup>*Technische Universität Wien, Institute for Microelectronics, Christian Doppler Lab., Austria*

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<sup>1</sup>*Technische Universität Wien, Institute for Microelectronics, Austria;* <sup>2</sup>*Technische Universität Wien, Institute for Microelectronics / Nanolayers Research Computing, Ltd, Austria;* <sup>3</sup>*Technische Universität Wien, Institute for Microelectronics, Christian Doppler Lab., Austria*

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<sup>1</sup>*IMS Laboratory, CNRS UMR 5218, University of Bordeaux, France;*  
<sup>2</sup>*STMicroelectronics, France;* <sup>3</sup>*Université de Bordeaux, Laboratoire IMS, CNRS UMR 5218, France*

## Simulation & Modeling for Memory & Imaging Applications

Date: Thursday, September 16, 2021  
Time: 17:00 - 18:00  
Room: CHROME 1  
Chair(s): Wladek Grabinski; *MOS-AK Association*  
Viktor Sverdlov; *Technische Universität Wien*

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<sup>1</sup>*CEA-Leti, France*; <sup>2</sup>*NaMLab gGmbH, Germany*; <sup>3</sup>*Technische Universität Dresden, Institute for Semiconductor & Microsystems Technology, NaMLab gGmbH, Germany*; <sup>4</sup>*Università degli Studi di Udine, Italy*

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<sup>1</sup>*INRIA Sophia-Antipolis, France*; <sup>2</sup>*STMicroelectronics, France*; <sup>2</sup>*STMicroelectronics, United Kingdom*; <sup>3</sup>*STMicroelectronics, INRIA Sophia-Antipolis, France*; <sup>4</sup>*Université de Nice, France*

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<sup>1</sup>*CEA-Leti, France*; <sup>2</sup>*STMicroelectronics, France*; <sup>2</sup>*STMicroelectronics, United Kingdom*; <sup>3</sup>*STMicroelectronics, INRIA Sophia-Antipolis, France*

## Advanced Memory Devices

Date: Friday, September 17, 2021  
Time: 15:00 - 16:00  
Room: CHROME 1  
Chair(s): Qing-Tai Zhao; *Forschungszentrum Jülich*  
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<sup>1</sup>*National Center for Scientific Research Demokritos, Greece*; <sup>2</sup>*National Center for Scientific Research Demokritos / IBM Research, Greece*

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## GaN Technology & Characterization

Date: Friday, September 17, 2021  
Time: 16:00 - 17:00  
Room: CHROME 1  
Chair(s): Nadine Collaert; *IMEC*  
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<sup>1</sup>CEA-Leti, France; <sup>2</sup>CEA-Leti, Université Grenoble Alpes, IMEP-LAHC MINATEC, France; <sup>3</sup>CEA-Leti, Université Grenoble Alpes, IMEP-LAHC MINATEC, University of Padova, France; <sup>4</sup>IMEP-LaHC, University Grenoble Alpes, University Savoie Mont Blanc, CNRS, Grenoble INP, France; <sup>5</sup>STMicroelectronics, Italy

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<sup>1</sup>CEA-Leti, France; <sup>2</sup>IMEP-LaHC, University Grenoble Alpes, Grenoble-INP, France; <sup>3</sup>IMEP-LaHC, University Grenoble Alpes, University Savoie Mont Blanc, CNRS, Grenoble INP, France

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<sup>1</sup>imec, Belgium; <sup>2</sup>Université Catholique de Louvain, Belgium

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## Memories and 3D Integration (JOINT 2020 TEDbrief special edition & SSC-L special edition)

Date: Tuesday, September 14, 2021

Time: 15:00 - 16:00

Room: CHROME 2

Chair(s): Guilhem Larrieu; *Laboratory of Analysis and Architecture of Systems*  
Alyssa Apsel; *Cornell University*

**A 1 Mbit Fully Logic-Compatible 3T Gain-Cell Embedded DRAM in 16nm FinFET..... Available on Xplore**

Robert Giterman<sup>2</sup>, Amir Shalom<sup>1</sup>, Andreas Burg<sup>2</sup>, Alexander Fish<sup>1</sup>, Adam Teman<sup>1</sup>

<sup>1</sup>*Bar-Ilan University, Israel*; <sup>2</sup>*École Polytechnique Fédérale de Lausanne, Switzerland*

**Area-Efficient Multi-Hop Inductive Coupling Interface for 3D-Stacked Memory with 0.23-V Transmitter and Sub-10- $\mu$ m Coil Design..... Available on Xplore**

Kota Shiba, Tatsuo Omori, Mototsugu Hamada, Tadahiro Kuroda

*University of Tokyo, Japan*

**Vertically Replaceable Memory Block Architecture for Stacked DRAM Systems by Wafer-on-Wafer (WOW) Technology ..... Available on Xplore**

Shinji Sugatani, Norio Chujo, Koji Sakui, Hiroyuki Ryoson, Tomoji Nakamura, Takayuki

Ohba

*Tokyo Institute of Technology, Institute of Innovative Research, Japan*

## Advanced Characterization & TCAD (2020 TEDbrief special edition)

Date: Tuesday, September 14, 2021  
Time: 16:00 - 17:00  
Room: CHROME 1  
Chair(s): Denis Rideau; *STMicroelectronics*  
Viktor Sverdlov; *Technische Universität Wien*

### **Out-of-Equilibrium Body Potential Measurement on silicon-on-Insulator with Deposited Metal Contacts..... Available on Xplore**

Miltiadis Alepidis<sup>1</sup>, Aude Bouchard<sup>1</sup>, Cecile Delacour<sup>2</sup>, Irina Ionica<sup>1</sup>

<sup>1</sup>*IMEP-LaHC, University Grenoble Alpes, Grenoble-INP and University Saint Mont Blanc, France;* <sup>2</sup>*Neel Institut CNRS, University Grenoble Alpes, France*

### **Analysis of MIS-HEMT Device Edge Behavior for GaN Technology Using New Differential Method..... Available on Xplore**

Roméo Kom Kammeugne<sup>1</sup>, Charles Leroux<sup>1</sup>, Jacques Cluzel<sup>1</sup>, Laura Vauche<sup>1</sup>, Cyrille Le Royer<sup>1</sup>, Romain Gwoziecki<sup>1</sup>, Jérôme Biscarrat<sup>1</sup>, Frédéric Xavier Gaillard<sup>1</sup>, Matthew Charles<sup>1</sup>, Edwige Bano<sup>2</sup>, Gérard Ghibaudo<sup>3</sup>

<sup>1</sup>*CEA-Leti, France;* <sup>2</sup>*IMEP-LaHC, University Grenoble Alpes, Grenoble-INP, France;*

<sup>3</sup>*IMEP-LaHC, University Grenoble Alpes, University Savoie Mont Blanc, CNRS, Grenoble INP, France*

### **Characterization and TCAD Modeling of Mixed-Mode Stress Induced by Impact Ionization in Scaled SiGe HBTs ..... Available on Xplore**

Nicolò Zagni, Francesco Maria Puglisi, Giovanni Verzellesi, Paolo Pavan  
*Università degli studi di Modena e Reggio Emilia, Italy*

### **Monte Carlo Comparison of n-Type and p-Type Nanosheets with FinFETs: Effect of the Number of Sheets ..... Available on Xplore**

Fabian Bufler, Doyoung Jang, Geert Hellings, Geert Eneman, Philippe Matagne, Alessio Spessot, Myung-Hee Na  
*imec, Belgium*

## Imaging, MEMS, Sensors (JOINT 2020 TEDbrief special edition & SSC-L special edition)

Date: Tuesday, September 14, 2021  
Time: 17:00 - 18:00  
Room: PLATINE Auditorium  
Chair(s): Minhao Yang; *École Polytechnique Fédérale de Lausanne*  
Mirjana Banjevic; *Sensirion AG*

**A Bio-Inspired Reservoir-Computer for Real-Time Stress Detection from ECG Signal**..... Available on Xplore  
Sanjeev T Chandrasekaran<sup>2</sup>, Sumukh P Bhanushali<sup>2</sup>, Imon Banerjee<sup>1</sup>, Arindam Sanyal<sup>2</sup>  
<sup>1</sup>*Emory University, United States*; <sup>2</sup>*University at Buffalo, United States*

**Luximos: a 768x64 900-fps Tileable Pipelined X-Ray CMOS Image Sensor for Dental Imaging with 2.6 LSB/nGy Sensitivity** ..... Available on Xplore  
Nicola Massari<sup>3</sup>, Xu Hesong<sup>2</sup>, Alessandro Tarolli<sup>1</sup>, Luca Parmesan<sup>3</sup>, Daniele Perenzoni<sup>2</sup>, Sabrina Colpo<sup>1</sup>, Nicola Fronza<sup>1</sup>, David Stoppa<sup>2</sup>, Matteo Perenzoni<sup>3</sup>, Alfredo Maglione<sup>1</sup>  
<sup>1</sup>*AdvanSid, Italy*; <sup>2</sup>*AMS, Switzerland*; <sup>3</sup>*Fondazione Bruno Kessler, Italy*

**A 2.67  $\mu$ J Per Measurement FMCW Ultrasound Rangefinder System for the Exploration of Enclosed Environments**..... Available on Xplore  
Gönenç Berkol, Peter Baltus, Pieter Harpe, Eugenio Cantatore  
*Eindhoven University of Technology, Netherlands*

**Polarization Independent Band Gaps in CMOS Back-End-of-Line for Monolithic High-Q MEMS Resonator Confinement**..... Available on Xplore  
Richard Hudeczek<sup>2</sup>, Peter Baumgartner<sup>1</sup>  
<sup>1</sup>*Intel Deutschland, Germany*; <sup>2</sup>*Technical University of Munich, Germany*

**Compact Modeling and Behavioral Simulation of an Optomechanical Sensor in Verilog a**..... Available on Xplore  
Houssein Elmi Dawale, Loïc Sibeud, Sébastien Regord, Guillaume Jourdan, Sébastien Hentz, Franck Badets  
*CEA, France*

## In/Near-Memory Computing (JOINT 2020 TEDbrief special edition & SSC-L special edition)

Date: Thursday, September 16, 2021  
Time: 17:00 - 18:00  
Room: PLATINE Auditorium  
Chair(s): Nitin Chawla; *STMicroelectronics*  
Elisa Vianello; *CEA-Leti*

### **Ultrahigh-Density 3-D Vertical RRAM with Stacked Junctionless Nanowires for In-Memory-Computing Applications ..... Available on Xplore**

Mona Ezzadeen<sup>5</sup>, Daphnée Bosch<sup>2</sup>, Bastien Giraud<sup>4</sup>, Sylvain Barraud<sup>3</sup>, Jean-Philippe Noël<sup>4</sup>, Didier Lattard<sup>2</sup>, Joris Lacord<sup>2</sup>, Jean-Michel Portal<sup>1</sup>, François Andrieu<sup>4</sup>  
<sup>1</sup>*Aix-Marseille University, Université de Toulon, CNRS, IM2NP, France;* <sup>2</sup>*CEA, France;*  
<sup>3</sup>*CEA-Leti, Université Grenoble Alpes, France;* <sup>4</sup>*CEA-List/Leti, Université Grenoble Alpes, France;* <sup>5</sup>*CEA, Aix-Marseille University, Université de Toulon, CNRS, IM2NP, Aix-Marseille University, France*

### **IGZO-Based Compute Cell for Analog In- Memory Computing—DTCO Analysis to Enable Ultralow-Power Ai at Edge ..... Available on Xplore**

Daisuke Saito<sup>2</sup>, Jonas Doevenspeck<sup>1</sup>, Stefan Cosemans<sup>1</sup>, Hyungrock Oh<sup>1</sup>, Manu Perumkunnil<sup>1</sup>, Papistas Ioannis<sup>1</sup>, Belmonte Attilio<sup>1</sup>, Rassoul Nouredine<sup>1</sup>, Delhougne Romain<sup>1</sup>, Kar Gouri<sup>1</sup>, Debacker Peter<sup>1</sup>, Mallik Arindam<sup>1</sup>, Verkest Diederik<sup>1</sup>, Na Nyung-Hee<sup>1</sup>  
<sup>1</sup>*imec, Belgium;* <sup>2</sup>*Sony Semiconductor Solutions Corporation, Japan*

### **A 35.6 TOPS/W/mm<sup>2</sup> 3-Stage Pipelined Computational SRAM with Adjustable Form Factor for Highly Data-Centric Applications..... Available on Xplore**

Jean-Philippe Noël<sup>3</sup>, Manuel Pezzin<sup>1</sup>, Roman Gauchi<sup>1</sup>, Jean-Frédéric Christmann<sup>1</sup>, Maha Kooli<sup>1</sup>, Henri-Pierre Charles<sup>1</sup>, Lorenzo Ciampolini<sup>1</sup>, Mariam Diallo<sup>1</sup>, Florent Lepin<sup>1</sup>, Benjamin Blampey<sup>2</sup>, Pascal Vivet<sup>1</sup>, Subhasish Mitra<sup>1</sup>, Bastien Giraud<sup>3</sup>  
<sup>1</sup>*CEA, France;* <sup>2</sup>*CEA-Leti, Université Grenoble Alpes, France;* <sup>3</sup>*CEA-List/Leti, Université Grenoble Alpes, France*

**Substrates & Design Techniques for RF/mmW Applications (JOINT 2020 TEDbrief special edition & SSC-L special edition)**

Date: Thursday, September 16, 2021  
Time: 17:00 - 18:00  
Room: TITANE 2  
Chair(s): David Ruffieux; CSEM SA  
Jean-Pierre Raskin; *Université catholique de Louvain*

**Influence of Substrate Resistivity on Porous Silicon Small Signal**

**RF Properties..... Available on Xplore**

Geoffroy Godet<sup>1</sup>, Emmanuel Augendre<sup>1</sup>, Jose Lugo-Alvarez<sup>1</sup>, H  l  ne Jacquinot<sup>1</sup>,  
Fr  d  ric Xavier Gaillard<sup>1</sup>, Thomas Lorne<sup>1</sup>, Emmanuel Rolland<sup>1</sup>, Thierry Taris<sup>2</sup>, Florence  
Servant<sup>1</sup>

<sup>1</sup>*CEA-Leti, France*; <sup>2</sup>*IMS Laboratory, IMS Bordeaux, CNRS, France*

**Analysis of Gate Metal Resistance in CMOS Compatible RF GaN HEMTs.. Available on Xplore**

Rana Elkashlan<sup>1</sup>, Raul Rodriguez<sup>1</sup>, Sachin Yadav<sup>1</sup>, Ahmad Khaled<sup>1</sup>, Uthayasankaran  
Peralagu<sup>1</sup>, Alireza Alian<sup>1</sup>, Niamh Waldron<sup>1</sup>, Ming Zhao<sup>1</sup>, Piet Wambacq<sup>2</sup>, Bertrand  
Parvais<sup>1</sup>, Nadine Collaert<sup>1</sup>

<sup>1</sup>*imec, Belgium*; <sup>2</sup>*imec, Vrije Universiteit Brussels, Belgium*

**A 108 Gb/S 64-QAM CMOS D-Band Rx with Integrated Lo Generation ..... Available on Xplore**

Abdelaziz Hamani, Alexandre Siligaris, Cedric Dehos, Nicolas Cassiau, Benjamin  
Blampey, Fabrice Chaix, Marjorie Gary, Jos   Luis Gonzalez-Jimenez  
*CEA-Leti, Universit   Grenoble Alpes, France*

**A 84.48Gb/S 64-QAM CMOS D-Band channel-Bonding Tx front-End with  
Integrated multi-Lo Frequency Generation ..... Available on Xplore**

Abdelaziz Hamani, Alexandre Siligaris, Fernando Barrera, Cedric Dehos, Nicolas  
Cassiau, Benjamin Blampey, Fabrice Chaix, Marjorie Gary, Jos   Luis Gonzalez-Jimenez  
*CEA-Leti, Universit   Grenoble Alpes, France; CEA-Leti, Universit   Grenoble Alpes,  
Finland*

## Cryogenic Electronics (JOINT 2020 TEDbrief special edition & SSC-L special edition)

Date: Friday, September 17, 2021  
Time: 16:00 - 17:00  
Room: PLATINE Auditorium  
Chair(s): Sorin Voinigescu; *University of Toronto*  
David Esseni; *University of Udine*

### **Cryogenic Operation of Thin-Film FDSOI nMOS Transistors: the Effect of Back Bias on Drain Current and Transconductance** ..... Available on Xplore

Mikaël Cassé<sup>2</sup>, Bruna Cardoso Paz<sup>3</sup>, Gérard Ghibaudo<sup>5</sup>, Thierry Poiroux<sup>2</sup>, Sylvain Barraud<sup>3</sup>, Maud Vinet<sup>2</sup>, de Franceschi Silvano<sup>1</sup>, Tristan Meunier<sup>4</sup>, Frédéric Xavier Gaillard<sup>2</sup>

<sup>1</sup>CEA-IRIG, France; <sup>2</sup>CEA-Leti, France; <sup>3</sup>CEA-Leti, Université Grenoble Alpes, France;

<sup>4</sup>CNRS Institut Néel, France; <sup>5</sup>IMEP-LaHC, University Grenoble Alpes, University Savoie Mont Blanc, CNRS, Grenoble INP, France

### **Performance and Low-Frequency Noise of 22-nm FDSOI Down to 4.2 K for Cryogenic Applications** ..... Available on Xplore

Bruna Cardoso Paz<sup>3</sup>, Mikaël Cassé<sup>2</sup>, Christoforos Theodorou<sup>6</sup>, Gérard Ghibaudo<sup>6</sup>, Thorsten Kammler<sup>5</sup>, Luca Pirro<sup>5</sup>, Maud Vinet<sup>2</sup>, Silvano de Franceschi<sup>1</sup>, Tristan Meunier<sup>4</sup>, Frédéric Xavier Gaillard<sup>2</sup>

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### **A Cryo-CMOS Digital Cell Library for Quantum Computing Applications .. Available on Xplore**

Edwin Schriek<sup>3</sup>, Fabio Sebastiano<sup>1</sup>, Edoardo Charbon<sup>2</sup>

<sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>École Polytechnique Fédérale de Lausanne, Switzerland; <sup>3</sup>Independent, Netherlands

### **Bias Voltage DAC Operating at Cryogenic Temperatures for Solid-State Qubit Applications**..... Available on Xplore

Patrick Vliex<sup>1</sup>, Carsten Degenhardt<sup>1</sup>, Christian Grewing<sup>1</sup>, Dennis Nielinger<sup>1</sup>, Stefan van Waasen<sup>1</sup>, Stefan Heinen<sup>2</sup>

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## Device Modelling (2020 TEDbrief special edition)

Date: Friday, September 17, 2021  
Time: 17:00 - 18:00  
Room: CHROME 1  
Chair(s): Cristell Maneux; *University of Bordeaux*  
Thierry Poiroux; *CEA-Leti*

### **Conductance in a Nanoribbon of Topologically Insulating MoS<sub>2</sub> in the 1T' Phase** ..... Available on Xplore

Viktor Sverdlov<sup>1</sup>, Al-Moatasem Bellah El-Sayed<sup>3</sup>, Hans Kosina<sup>2</sup>, Siegfried Selberherr<sup>2</sup>  
<sup>1</sup>*Technische Universität Wien, CDL for NovoMemLog, IuE, Austria;* <sup>2</sup>*Technische Universität Wien, Institute for Microelectronics, Austria;* <sup>3</sup>*Technische Universität Wien, Institute for Microelectronics / Nanolayers Research Computing, Ltd, Austria*

### **Analytical Model for Interface Traps Dependent Back Bias Capability and Variability in Ultrathin Body and Box FDSOI MOSFETs** ..... Available on Xplore

Wangyong Chen, Linlin Cai, Xiaoyan Liu, Gang Du  
*Peking University, China*

### **Charge-Based Model for the Drain-Current Variability in Organic Thin-Film Transistors Due to Carrier-Number and Correlated-Mobility Fluctuation ...** Available on Xplore

Aristeidis Nikolaou<sup>3</sup>, Ghader Darbandy<sup>3</sup>, Jakob Leise<sup>3</sup>, Jakob Pruefer<sup>3</sup>, James W. Borchert<sup>1</sup>, Michael Geiger<sup>1</sup>, Hagen Klauk<sup>1</sup>, Benjamin Iñiguez<sup>2</sup>, Alexander Kloes<sup>3</sup>  
<sup>1</sup>*Max Planck Institute for Solid State Research, Germany;* <sup>2</sup>*Universitat Rovira i Virgili, Spain;* <sup>3</sup>*University of Applied Sciences Mittelhessen, Germany*

### **Macromodel for AC and Transient Simulations of Organic Thin-Film Transistor Circuits Including Nonquasistatic Effects** ..... Available on Xplore

Jakob Leise<sup>3</sup>, Jakob Pruefer<sup>3</sup>, Aristeidis Nikolaou<sup>3</sup>, Ghader Darbandy<sup>3</sup>, Hagen Klauk<sup>1</sup>, Benjamin Iñiguez<sup>2</sup>, Alexander Kloes<sup>3</sup>  
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