2014 10th Conference on Ph.D. Research in Microelectronics and Electronics

(PRIME 2014)

Grenoble, France
30 June – 3 July 2014
Welcome - Workshop on Green Electronics I
Chair: Emmanuel Pistono, Univ. de Grenoble, IMEP-LAHC
Monday, June 30th, 10:20 – 10:40
Room: Petit Salon

Session 1: Workshop on Green Electronics I
Monday, June 30th, 10:40 – 12:20
Room: Petit Salon

1A1 – Invited - IP rights, and particularly patents - How and what for?
10:40 Sigrid Thomas¹, Jeremy Harrison²
11:40 Cabinet Beaumont

1A2 – Invited – Mixed-signal verification challenges
11:40 Nicolas Delorme
12:20 Asyn

12:20-13:20 - Lunch Break
Session 2: Workshop on Green Electronics II
Monday, June 30th, 13:20 – 15:00
Room: Petit Salon

Bernard Courtois
CMP

2A2 - Invited - Reduction of IPs Energy Consumption with Ultra-Low Voltage Supply
Fady Abouzeid
STMicroelectronics

15:00-15:20 - Coffee Break

Session 3: Workshop on Green Electronics III
Monday, June 30th, 15:20 – 17:00
Room: Petit Salon

Frédéric Hasbani
STMicroelectronics

3A2 - Invited - RF Power Gating Techniques for Ultra Low Power Communication
Sylvain Bourdel¹, I. Ben Amor², J.F. Pons², N Dehaese², R. Vauché², J. Gaubert²
¹Univ. Grenoble Alpes, IMEP-LAHC
²IM2NP

Tuesday July 1st

Session 4: Opening and Plenary
Chairs: Dominique Morche (CEA-Leti), Gilles Sicard (Univ. Grenoble, TIMA), Yannis Le Guennec (Univ. Grenoble, IMEP-LAHC)
Tuesday, July 1st, 09:00 – 09:30
Room: Petit Salon

Session 5A: Simulation Approaches of Analog and Digital Systems
Tuesday, July 1st, 09:30 – 10:10
Room: B221
Chair: Marie-Minerve Louërat, Université Pierre et Marie Curie, LIP6, Paris
Session 5B: ADC/DAC/Mixed I
Tuesday, July 1st, 09:30 – 10:10
Room: Petit Salon
Chair: Marcello De Matteis, University of Milano Bicocca, University of Salento

5B1 - A 1.2V low-power high-resolution noise-shaping ADC using multistage time encoding converters for Biomedical Applications
09:30
Francisco Javier Pérez Sanjurjo, Enrique Prefasi Sen and Luis Hernandez Corporales
Universidad Carlos III Madrid

5B2 - A Low Power Second Order Current Mode Continuous Time Sigma Delta ADC with 98 dB SNDR
09:50
Sina Parsnejad, Feyyaz Melih Akcakaya and Gunhan Dundar
Bogazici University

Session 5C: Signal Processing
Tuesday, July 1st, 09:30 – 10:10
Room: B225
Chairs: Emil Novakov, Univ. Grenoble Alpes IMEP-LAHC

5C1 - Continuous Time Analog to Digital Conversion in Interferer Resistant Wake Up Radios
09:30
Alin Ratiu, Dominique Morche, Bruno Allard, Xuefand Lin-Shi, Jacques Verdier
1Univ. Grenoble Alpes, 2CEA-Leti, 3Univ. de Lyon

5C2 - Green improvements of IEEE 802.11 directional multi-gigabit physical layer specifications
09:50
Marc-Antoine Bouzigues, Isabelle Siaud, Maryline Hélard and Anne-Marie Ulmer-Moll
1Orange, 2IETR - UMR CNRS 6164

10:10-10:40 - Coffee Break
Session 6A: Simulation Approaches of Analog and Digital Systems
Tuesday, July 1st, 10:40 – 12:20
Room: B221
Chair: Marie-Minerve Louërat, Université Pierre et Marie Curie, LIP6, Paris

6A1 - An Efficient Simulation Methodology for Electrical Energy Systems
Alessandro Sassone, Sara Vinco, Massimo Poncino and Enrico Macii
Politecnico di Torino

6A2 - Macromodel-based Signal and Power Integrity simulations of an LP-DDR2 interface in mSiP
Gianni Signorini1,2, Stefano Grivet-Talocia3, Igor Simone Stievano3 and Luca Fanucci2
1Intel Mobile Communications GmbH, 2University of Pisa, 3Politecnico di Torino

6A3 - A SystemC Bluetooth Network Simulator
Cristiano Scavongelli and Massimo Conti
Università Politecnica delle Marche

6A4 - A new algorithm for convergence verification in circuit level simulations
Francesco Lannutti1, Francesco Menichelli1, Paolo Nenzi2 and Mauro Olivieri1
1Sapienza University of Rome, 2ENEA

6A5 -Simulation methodology for Large-Bandwidth Track-and-Hold microwave circuit
Arnaud Meyer1,2, Patricia Desgreys1, Hervé Petit1, Bruno Louis2, Vincent Petit2
1Telecom ParisTech, 2Thales Systèmes aéropostés

Session 6B: ADC/DAC/Mixed I
Tuesday, July 1st, 10:40 – 12:20
Room: Petit Salon
Chair: Marcello De Matteis, University of Milano Bicocca, University of Salento

6B1 - Invited - Design of Class-D Amplifier for Audio Portable Solutions
Angelo Nagari
STMicroelectronics, Grenoble

6B2 - Time Interleaved Current Steering DAC for Ultra-High Conversion Rate
Da Feng1, Sai-Weng Sin1, Edoardo Bonizzoni2 and Franco Maloberti2
1University of Macau, 2University of Pavia

6B3 - Calibrated Switched Capacitor Integrators based on Current Conveyors and its application to Delta Sigma ADC
Harish Balasubramaniam and Klaus Hofmann
Technical University of Darmstadt
6B4 - Statistical Analysis of Harmonic Distortion in a Differential Bootstrapped Sample and Hold Circuit
Gaël Kamdem De Teyou\textsuperscript{1,2}, Hervé Petit\textsuperscript{1}, Patrick Loumeau\textsuperscript{1} and Hussein Fakhoury\textsuperscript{1}
\textsuperscript{1}Télécom ParisTech, \textsuperscript{2}Renesas Mobile

Session 6C: Signal Processing
Tuesday, July 1\textsuperscript{st}, 10:40 – 12:20
Room: B225
Chairs: Luca Fanucci, University of Pisa \slash Emil Novakov, Univ. Grenoble Alpes IMEP-LAHC

6C1 - Multiple-Event Direct to Histogram TDC in 65nm FPGA Technology
Neale Dutton\textsuperscript{1,2}, Johannes Vergote\textsuperscript{1,2} and Salvatore Gnecci\textsuperscript{1,2}, Lindsay Grant\textsuperscript{2}, David Lee\textsuperscript{2}, Sara Pellegrin\textsuperscript{i}, Bruce Rae\textsuperscript{2}, Robert Henderson\textsuperscript{1}
\textsuperscript{1}University of Edinburgh, \textsuperscript{2}STMicroelectronics United Kingdom

6C2 - High-Speed Serial Interface with a Full Digital Delay-Loop
Christian Harder, Bastian Mohr and Stefan Heinen
RWTH Aachen University

6C4 - A vector implementation of a fast Fourier transform on DSP and NVIDIA CUDA platforms
Bartosz Pikacz and Jacek Gambrych
Warsaw University of Technology

6C5 - Experimental validation of a new power line communication system for battery management
Jérémie Jousse\textsuperscript{1,2}, Nicolas Ginot\textsuperscript{2}, Christophe Batard\textsuperscript{2} and Elisabeth Lemaire\textsuperscript{1}
\textsuperscript{1}CEA LITEN, \textsuperscript{2}PRES LUNAM - UMR CNRS 6164

12:20-13:20 - Lunch Break

Session 7A: NEMS, MEMS, Sensors
Tuesday, July 1\textsuperscript{st}, 13:20 – 15:00
Room: B221
Chair: Catherine Dehollain, Swiss Federal Institute of Technology (EPFL)

7A1 - Carbon Nanotube Based Temperature Sensors Fabricated by Large-Scale Spray Deposition
Engin Cagatay, Aniello Falco, Alaa Abdellah and Paolo Lugli
Technische Universität München

7A2 - Methodology Modeling of MaE-fabricated Porous Silicon Nanowires
Aleandro Antidormi\textsuperscript{1,2}, Diego Chiabrando\textsuperscript{1,2}, Maria Grazia Graziano\textsuperscript{1}, Luca Boarino\textsuperscript{2} and Gianluca Piccinini\textsuperscript{1}
7A3 - Analysis and Modeling of Four-Folded Vertical Hall Devices in Current Domain
14:00 Hadi Heidari, Edoardo Bonizzoni, Umberto Gatti and Franco Maloberti
14:20 *University of Pavia*

7A4 - 3-Terminal Tungsten CMOS-NEM Relay
14:20 Martín Riverola, Gabriel Vidal-Álvarez, Francesc Torres and Núria Barniol
14:40 *Universitat Autònoma de Barcelona*

7A5 - Tunable Transimpedance Sustaining-Amplifier for High Impedance CMOS-MEMS Resonators
14:40 Guillermo Sobreviela, Arantxa Uranga and Nuria Barniol
15:00 *Universitat Autònoma de Barcelona*

Session 7B: Reliability Analysis of Analog and Digital Systems
Tuesday, July 1st, 13:20 – 15:00
Room: Petit Salon
Chair: Ian O'Connor, *Lyon Institute of Nanotechnology (INL) University of Lyon*

7B1 - Invited - AUTOMICS: A Novel CAD Framework for Substrate Modeling
13:20 Ramy Iskander
14:00 *Université Pierre et Marie Curie, LIP6, Paris*

7B2 - Sensitivity based Methodologies for Process Variation Aware Analog IC Optimization
14:00 Engin Afacan, Gönenç Berkol, Faik Başkaya and Günhan Dündar
Bogazici University
14:20
14:40 *École polytechnique fédérale de Lausanne*

7B3 - Impact of enhanced contact doping on minority carriers diffusion currents
14:40 Camillo Stefanucci, Pietro Buccella, Maher Kayal and Jean Michel Sallese
15:00

7B4 - Reliability Analysis of Logic Circuits Using Probabilistic Techniques
14:40 Satish Grandhi, Christian Spagnol and Emanuel Popovici
15:00 *University College Cork, Ireland*

Session 7C: Energy Harvesting
Tuesday, July 1st, 13:20 – 15:00
Room: B225
Chair: Jean-Marc Duchamp, *Univ. de Grenoble IMEP-LAHC.*
7C1 - A 40mV Start up Voltage DC–DC Converter for Thermoelectric Energy Harvesting Applications
13:20 Carlo Veri¹, Mirko Pasca¹, Stefano D'Amico¹, L. Francioso²
¹University of Salento, ²CNR-IMM

7C2 - Wire-bonds Used as Matching Inductor in RF Energy Harvesting Applications
13:40 Dino Michelon¹,², Emmanuel Bergeret¹, Mathieu Egels¹ and Antonio Di Giacomo²
¹IM2NP, ²STMicroelectronics

7C3 - FEM modeling of vertically integrated nanogenerators in compression and flexion modes
14:00 Ran Tao, Ronan Hinchet, Gustavo Ardila Rodriguez, Laurent Montes and Mireille Mouis
Univ. Grenoble Alpes IMEP-LAHC

7C4 - Design of a low power wireless sensor network node for distributed active vibration control system
14:20 Mateusz Zielinski¹, Fabien Mieyeville¹, David Navarro¹ and Olivier Bareille²
²INP Lyon, ¹Lyon Institute of Nanotechnology (INL) University of Lyon,²LTDS

7C5 - Co-design of Dual-band GSM Filtenna based on Printed-IFA for Energy Harvesting
14:40 Manh Ha Hoang¹,², Van Hieu Nguyen², Thi Quynh Van Hoang² and Tan Phu Vuong¹
¹Univ. Grenoble Alpes IMEP-LAHC, ²Ho Chi Minh City of Technology

15:00-15:20 - Coffee Break

Session 8A: Power Amplifier and Detector
Tuesday, July 1st, 15:20 – 17:00
Room: B221
Chair: Estelle Lauga-Larroze, Univ. Grenoble Alpes IMEP-LAHC

8A1 - Sub-Threshold Based Power Detector for Low-Cost Millimeter-Wave Applications
15:20 Ayssar Serhan, Estelle Lauga-Larroze and Jean-Michel Fournier
Univ. Grenoble Alpes IMEP-LAHC

8A2 - Structured Design to Optimize the Output Power of Stacked Power Amplifiers
15:40 Elena Sobotta, Robert Wolf, David Fritsche and Frank Ellinger
TU Dresden

8A3 - 66-87 GHz Power Amplifier with 20dBm 1-dB compression point and 35% peak PAE in a 55nm SiGe technology
16:00 David Del Rio¹,², Roc Berenguer¹,², Ainhoa Rezola¹,² and Juan Francisco Sevillano¹,²
¹CEIT, ²Technological Campus of University of Navarra (TECNUN)
Session 8B: CMOS Sensor Design
Tuesday, July 1st, 15:20 – 17:00
Room: Petit Salon
Chair: Gianluca Piccinini, Politecnico di Torino

8B1 - Invited - Sensor Interfaces: Keys to Success of Integrated Sensor Systems
15:20 Franco Maloberti
16:00 University of Pavia

8B2 - Base-Station Design for Passive UHF RFID Tags with Pulse-Width Modulated Backscattering
16:00 Kerem Kapucu and Catherine Dehollain
École polytechnique fédérale de Lausanne

8B3 - Backside Illuminated Wafer-to-Wafer Bonding Single Photon Avalanche Diode Array
16:20 Yu Zou1, Danilo Bronzi1, Federica Villa1 and Sascha Weyers2
1Politecnico di Milan, 2Fraunhofer IMS

8B4 - 5x5 SPAD Matrices for the Study of the Trade-offs between Fill Factor, Dark Count Rate and Crosstalk in the Design of CMOS Image Sensors
16:40 Manuel Moreno Garcia, Rocio Del Rio Fernandez, Oscar Guerra Vinuesa and Angel Rodriguez Vazquez
Instituto de Microelectronica de Sevilla

Session 8C: Material and Process Challenges
Tuesday, July 1st, 15:20 – 17:00
Room: B225
Chair: Irina Ionica, Univ. Grenoble Alpes IMEP-LAHC

8C1 - Structural, magnetic and dielectric properties of nanocomposites for RF applications
15:20 Hélène Takacs1,2, Bernard Viala1, Jean-Hervé Tortai2, Juvenal Alarcon Ramos1, Marie Bousquet1, Florence Duclairoir3, Cécile Gourgon2
1CEA Leti, 2LTM – CNRS– UJF, CEA INAC
**Wednesday July 2nd**

**Session 9A: Power Electronics: Integration, Modeling and Applications**
Wednesday, July 2nd, 08:50 – 10:10
Room: B221
Chair: Nicolas Rouger, Univ. Grenoble Alpes G2Elab, CNRS G2Elab

**9A1 - A Suitable Inductor Modeling for DC-DC Converters**
08:50 Andrea Mocci, Alessandro Serpi, Ignazio Marongiu and Gianluca Gatto
DIEE, University of Cagliari

**9A2 - Monolithically Integrated Voltage Level Shifter for Wide Bandgap Devices Based Converters**
09:10 Romain Grezaud\(^1\), François Ayel\(^1\), Nicolas Rouger\(^2\) and Jean-Christophe Crebier\(^2\)
\(^1\)CEA Leti, \(^2\)Univ. Grenoble Alpes G2Elab, CNRS G2Elab
**Session 9A3: Extensive Electro-Thermal Simulation Methodology for Automotive High Power Circuits**

Adrian-Gabriel Bajenaru¹, Cristian Mihai Boianceanu¹, Fabio Ballarin² and Gheorghe Brezeanu³
09:30 ¹Infineon Technologies Romania, ²Infineon Technologies Italia, ³Politehnica University of Bucharest
09:50

**Session 9A4: Two-Dimensional Optical Beam Induced Current measurements in 4H-SiC bipolar diodes**

Hassan Hamad, Pascal Bevilacqua, Christophe Raynaud and Dominique Planson
INSA de Lyon - Ampère Laboratory

10:10

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**Session 9B: Emerging Technologies for Digital Circuits**

**Wednesday, July 2nd, 08:50 – 10:10**

Room: Petit Salon
Chair: Edith Beigné, CEA-Leti

**9B1 - Invited - Towards the Use of Functionality-Enhanced Devices: A Transversal Design Approach**

Pierre-Emmanuel Gaillardon
Swiss Federal Institute of Technology (EPFL)
08:50
09:30

**9B2 - Safe Operation Region Characterization for Quantifying the Reliability of CMOS Logic Affected by Process Variations**

Usman Khalid, Antonio Mastrandrea and Mauro Olivieri
Sapienza University of Rome
09:30
09:50

**9B3 - High Performance Electronics on Flexible Silicon for Brain Computing**

Galo Torres Sevilla, Jhonathan Rojas and Muhammad Mustafa Hussain
King Abdullah University of Science and Technology
09:50
10:10

10:10-10:40 - Coffee Break

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**Session 10A: Digital Techniques I**

**Wednesday, July 2nd, 10:40 – 12:20**

Room: B221
Chair: Edith Beigné, CEA-Leti

**10A1 - Towards Formal Verification of Reset Sequence in Fully Asynchronous Digital Circuits**

Oleksandr Melnychenko¹ and Hans-Peter Kreuter²
¹Vienna University of Technology, ²Infineon Technologies Austria AG
10:40
11:00
10A2 - A New Circuit Topology for Floating High Voltage Level Shifters
11:00  Dawei Liu, Simon Hollis and Bernard Stark
       University of Bristol

10A3 - Probabilistic Saboteur-based Simulated Fault Injection Techniques for Low Supply Voltage Interconnects
11:20  Sergiu Nimara, Alexandru Amariei, Oana Boncalo and Mircea Popa
       Politehnica University Timisoara

10A4 - Design of a secure architecture for scalar multiplication on elliptic curves
11:40  Simon Pontié and Paolo Maistri
       Univ. Grenoble Alpes TIMA

10A5 - ASIC design of a Phoneme Recogniser based on Discrete Wavelet Transforms and Support Vector Machines
12:00  Michelle Cutajar, Edward Gatt, Ivan Grech and Owen Casha
       University of Malta

Session 10B: Millimeter Wave Circuits
Wednesday, July 2nd, 10:40 – 12:20
Room: Petit Salon
Chair: José Luis Gonzalez-Jimenez, CEA-Leti

10B1 - Invited - ESD Co-Design Methodologies for RF and mmW Circuits
10:40  Roc Berenguer
       CEIT

10B2 - Filterless millimetre-wave optical generation using optical phase modulators without DC bias
11:20  Rabiaa Guemri¹, Frédéric Lucarz¹, Daniel Bourreau¹, Camilla Kärnfelt¹, Jean-Louis de Bougrenet de la Tocnaye¹, Trevor Hall²
       ¹Télécom Bretagne, ²University of Ottawa

10B3 - A Digitally Controlled Threshold Adjustment Circuit in a 0.13um SiGe BiCMOS Technology for Receiving Multilevel Signals up to 80Gbps
11:40  Timothy De Keulenaer, Guy Torfs, Ramses Pierco and Johan Bauwelinck
       INTEC/IMEC - Ghent University

10B4 - A 60 GHz down-conversion mixer using a novel topology in 65 nm CMOS
12:00  Chong Wang, Zhiqun Li, Qin Li, Yang Liu, Jia Cao and Zhigong Wang
       Southeast University, China

12:20-13:20 - Lunch Break
Session 11A: Signal Generation Circuits
Wednesday, July 2nd, 13:20 – 15:00
Room: Petit Salon
Chair: Roc Berenguer, CEIT

13:20
11A1 - A High Conversion Gain Millimeter-Wave Frequency Doubler in 65nm CMOS
Yang Liu, Zhiqun Li, Qin Li, Chong Wang and Zhigong Wang
Southeast University, China

13:40
11A2 - Integrated Multi-band Fractional-N PLL for FMCW Radar Systems at 2.4 and 5.8 GHz
Niko Joram, Bastian Lindner, Jens Wagner and Frank Ellinger
TU Dresden

14:00
11A3 - A Low Power, Small Area, Fully Integrated 5.5GHz CMOS LC-VCO
Shaahin Haddadinejad¹, Achim Noculak², Michael Hinz¹ and Bernd Meinerzhagen¹
¹BST TU Braunschweig, ²Institut fuer Theoretische Elektrotechnik der RWTH Aachen

14:20
11A4 - Comparative Analyses of Phase Noise in Differential Oscillator Topologies in 28 nm CMOS Technology
Ilias Chlis¹,², Domenico Pepe¹ and Domenico Zito¹,²
¹Tyndall National Institute, ²University College Cork

14:40
11A5 - Switched oscillators
Clement Jany¹, Alexandre Siligaris¹, Philippe Ferrari² and Pierre Vincent¹
¹CEA-Leti, ²Univ. Grenoble Alpes IMEP-LAHC

15:00-15:20 - Coffee Break

Session 12A: Amplifiers
Wednesday, July 2nd, 15:20 – 17:00
Room: Petit Salon
Chair: Piero Malcovati, University of Pavia

15:20
12A1 - High Precision Bidirectional Chopper Instrumentation Amplifier With Negative and Positive Input Common Mode Range
Matei Nicolae Stan¹,², Laurentiu Creosteau¹ and Gheorghe Brezeanu²
¹On Semiconductor, ²University Politehnica of Bucharest

15:40
12A2 - Comparative Study of a Fully Differential Op Amp in FinFET and Planar Technologies
Sébastien Morrison¹,², Bertrand Parvais², Gerd Vandersteen¹, Kenichi Miyaguchi¹, Abdelkarim Mercha² and Piet Wambacq¹
¹VUB, ²imec
12A3 - An novel architecture for current-feedback instrumentation amplifiers with rail-to-rail input range
16:00 Francesco Del Cesta¹, Aurelio Nunzio Longhitano¹, Paolo Bruschi¹ and Massimo Piotto²
¹University of Pisa, ²IEIIT Pisa

12A4 - A Bootstrap Transimpedance Amplifier for High Speed Optical Transcutaneous Wireless Links
16:20 Tianyi Liu, Zhicheng Cai, Jens Anders and Maurits Ortmanns
University of Ulm

12A5 - High Accuracy Current Sense Amplifier With Extended Input Common Mode Range
16:40 Razvan Puscasu¹², Pavel Brinzoi¹, Laurentiu Creosteanu¹ and Gheorghe Brezeanu²
¹ON Semiconductor, ²University Politehnica of Bucharest

Session 11B - 12B: Company Fair
Wednesday, July 2nd, 13:20 – 17:00
Room: Grand Salon

Thursday July 3rd

Session 13A: Digital Techniques II
Thursday, July 3rd, 08:50 – 10:10
Room: B221
Chair: Jean-Frederic Christmann, CEA-Leti

13A1 - Test and Diagnosis of FPGA Cluster Using Partial Reconfiguration
08:50 Rehman Saif-Ur, Mounir Benabdenbi and Lorena Anghel
Univ. Grenoble Alpes, TIMA

13A2 - A New Hardware Implementation of The Advanced Encryption Standard Algorithm for Automotive Application
09:10 Riccardo Cassettari, Luca Fanucci and Giorgio Boccini
University of Pisa

13A3 - FPGA Design for the Decoding Functions of the Physical Layer Adaptation Subsystem of XG-PON Optical Network Unit/Terminal
09:30 Georgios Georgis¹, Charalambos Tzeranis¹, George Synnefakis² and Dionysios Reisis¹
¹National and Kapodistrian University of Athens, ²inAccess S.A.

13A4 - Fast Register Criticality Evaluation in a SPARC Microprocessor
09:50 Kais Chibani, Michele Portolan and Régis Leveugle
Univ. Grenoble Alpes, TIMA
Session 13B: Power Converter and Integrated Control
Thursday, July 3rd, 08:50 – 10:10
Room: Petit Salon
Chair: Pierre-Olivier Jeannin, Univ. Grenoble Alpes G2Elab

13B1 – Invited - Challenges and Benefits of Microelectronics for Power Electronics: from Integrated Optical Driving to Optimized Power Semiconductor Switches
08:50
Nicolas Rouger
Univ. Grenoble Alpes / CNRS / G2Elab

13B2 - An Improved DC-Link Voltage Equalization for Three-Level Neutral-Point Clamped Converters
09:30
Mario Porru, Alessandro Serpi, Ignazio Marongiu and Alfonso Damiano
University of Cagliari

13B3 - Simplified Review of DCDC Switching Noise and Spectrum Contents
09:50
Adnan Fares¹, Sami Ajram¹ and Guy Cathébras²
¹SL3J SYSTEMS, ²LIRMM

Session 13C: Modeling and Characterization for Emerging Devices
Thursday, July 3rd, 08:50 – 10:10
Room: B225
Chair: Marie-Minerve Louërat, Université Pierre et Marie Curie, LIP6, Paris

13C1 - Quantifying the Figures of Merit of Graphene-Based Adiabatic Pass-XNOR Logic (PXL) Circuits
08:50
Valerio Tenace and Andrea Calimera
Politecnico di Torino

13C2 - 3D Modeling of CNT Networks for sensing applications
09:30
Simone Colasanti, Vijay Deep Bhatt and Paolo Lugli
Technical University Munich (TUM)

13C3 - A Quantitative Approach to Testing in Quantum dot Cellular Automata: NanoMagnet Logic Case
09:50
Giovanna Turvani, Fabrizio Riente, Mariagrazia Graziano and Maurizio Zamboni
Politecnico di Torino

13C4 - A Compact Model for Phase Change Memory Cells
09:50
Erika Covi¹,², Athanasios Kiouseloglou¹,³, Alessandro Cabrini¹ and Guido Torelli¹
¹University of Pavia, ²Laboratorio MDM, IMM – CNR, ³CEA – Leti

10:10-10:40 - Coffee Break
**Session 14A: ADC/DAC/Mixed II**
Thursday, July 3rd, 10:40 – 12:20
Room: B221
Chair: Marc Sabut, STMicroelectronics

**14A1** - High Resolution Current-Mode CCO-Based Continuous Time Delta-Sigma Modulators for Sensor-Array Applications
10:40
Anouar Laifi, Mohammed Adib Al Abaji and Roland Thewes
TU Berlin

**14A2** - A 32-Channel 12-bits 65nm Wilkinson ADC for CMS Central Tracker
11:00
Tommaso Vergine\(^1,2\), Marcello De Matteis\(^1,3\), Andrea Baschirotto\(^2\) and Alessandro Marchioro\(^4\)
\(^1\)University of Pavia, \(^2\)University of Milano Bicocca, \(^3\)University of Salento, \(^4\)CERN

**14A3** - Design of a Low-Power Calibratable Charge-Redistribution SAR ADC
11:20
Soheil Aghaie, Jan Henning Mueller, Ralf Wunderlich and Stefan Heinen
RWTH Aachen University

**14A4** - A 10 bit 12.8 MS/s SAR Analog-to-Digital Converter in a 250 nm SiGe BiCMOS Technology
11:40
Johannes Digel, Markus Grözing and Manfred Berroth
University of Stuttgart

**Session 14B: Voltage and Current References**
Thursday, July 3rd, 10:40 – 12:20
Room: Petit Salon
Chair: Piero Malcovati, University of Pavia

**14B1** - Invited - Continuous Time Analog Filters Design in Nanometer-Scale CMOS Technologies
10:40
Marcelo De Matteis\(^1,2\), Andrea Baschirotto\(^3\)
\(^1\)University of Pavia, \(^2\)University of Salento, \(^3\)University of Milano Bicocca

**14B2** - A compact low-noise fully differential bandgap voltage reference with intrinsic noise filtering
11:20
Aurelio Longhitano\(^1\), Francesco Del Cesta\(^1\), Paolo Bruschi\(^1\) and Roberto Simmarano\(^2\)
\(^1\)University of Pisa, \(^2\)sensichips

**14B3** - A 65nm CMOS Technology Radiation-Hard Bandgap Reference Circuit
11:40
Tommaso Vergine\(^1,2\), Stefano Michelis\(^3\), Marcello De Matteis\(^2,4\) and Andrea Baschirotto\(^2\)
\(^1\)University of Pavia, \(^2\)University of Milano Bicocca, \(^3\)CERN, \(^4\)University of Salento
12:00 14B4 - A modified CMOS nano-power resistorless current reference circuit
Shailesh Singh Chouhan and Kari Halonen
Aalto University

Session 14C: RF/mmW Measurement & Modeling Techniques
Thursday, July 3rd, 10:40 – 12:20
Room: B225
Chair: Roc Berenguer, CEIT

14C1 - Towards the determination of GaN HEMT large signal model parameters by Time Domain Reflectometry method
10:40
Marian Bernát, Alexander Šatka, Aleš Chvála, Jaroslav Kováč, Lubomír Sládek and Daniel Donoval
Slovak University of Technology in Bratislava

14C2 - A fast and functional technique for the noise figure measurement of differential amplifiers
11:00
Yogadissen Andee, Jérôme Prouvée, François Graux and François Danneville
1CEA-Leti, 2Rohde&Schwarz, 3IEMN

14C3 - Half-Thru De-embedding Method for Millimeter-Wave and Sub-Millimeter-Wave Integrated Circuits
11:40
Vipin Velayudhan, Emmanuel Pistono and Jean-Daniel Arnould
Univ. Grenoble Alpes, IMEP-LAHC

14C4 - Design of passive filters using dual-mode embedded dielectric resonator
12:00
Úrsula Martínez-Iranzo, Bahareh Moradi and Joan Garcia-Garcia
Universidad Autónoma de Barcelona

12:00 14C5 - The Impact of the Q-Factor of the Parasitic Capacitances of RF Transistors on their Load Modulation Capabilities
12:20
David Seebacher, Wolfgang Bösch, Peter Singerl and Christian Schuberth
1TU Graz, 2Infineon Technologies Austria AG

12:20-13:20 - Lunch Break

Session 15A: Device Technical Trends
Thursday, July 3rd, 13:20 – 15:00
Room: B221
Chair: Quentin Rafhay, Univ. Grenoble Alpes IMEP-LAHC

15A1 - Comprehensive Analysis of traps in InGaP/GaAs HBT by GR noise
13:20
Ahmad Al Hajjar, Jean-Christophe Nallatamby and Michel Prigent
Xlim
15A2 - Optimization of Low-Resistance State Performance in Ge-rich GST Phase Change Memory
13:40 Athanasios Kiouseloglou¹,², Gabriele Navarro¹, Alessandro Cabrini², Guido Torelli² and Luca Perniola¹
¹CEA-Leti, ²University of Pavia

15A3 - Design Considerations for Monolithically Integrated Fully-Depleted CMOS Image Sensors
14:00 Jean-Baptiste Lincelles¹, Olivier Marcelot¹, Pierre Magnan¹ and Olivier Saint-Pé²
¹ISAE, ²Airbus Defense and Space

15A4 - TIA optimization for on-package multi-core optical network receivers
14:20 Robert Polster¹, Jose-Luis Gonzalez Jimenez¹ and Eric Cassan²
¹CEA-Leti, ²EF UMR 8622, University Paris Sud

15A5 - Characterization and modeling of low frequency noise in 0.13 µm BiCMOS
SiGe :C heterojunction bipolar transistors
14:40 Marcelino Seif¹, Fabien Pascal¹, Bruno Sagnes¹ and Sebastien Haendler²
¹IES - Université Montpellier 2, ²STMicroelectronics

Session 15B: Sensors on Flexible Substrate
Thursday, July 3rd, 13:20 – 15:00
Room: Petit Salon
Chair: Catherine Dehollain, Swiss Federal Institute of Technology (EPFL)

15B1 - Invited - Towards Flexible and Conformable Electronics
13:20 Ravinder S. Dahiyaa
University of Glasgow

15B2 - Integrated Low-Noise Current Amplifier for Glass-Based Nanopore Sensing
14:00 Pietro Ciccarella¹, Marco Carminati¹, Raquel Fraccari², Azadeh Bahrami² and Giorgio Ferrari¹
¹Politecnico di Milano, ²Imperial College London

15B3 - Bendable Piezoresistive Sensors by Screen Printing MWCNT/PDMS Composites on Flexible Substrates
14:20 Saleem Khan¹,², Leandro Lorenzelli² and Ravinder Singh Dahiyaa³
¹University of Trento, ²Fondazione Bruno Kessler, ³University of Glasgow

15B4 - Thickness effects of ZnO thin films on flexible ozone sensors
14:40 Mónica Acuautla¹, Sandrine Bernardini¹, Marc Bendahan² and Emmanuelle Pietri²
¹Aix – Marseille University - CNRS, IM2NP, ²GENES'INK
Session 15C: Analog Techniques
Thursday, July 3rd, 13:20 – 15:00
Room: B225
Chair: Lionel Geynet, Oridao

15C1 - Temperature Study of High-Drive Capability Buffer for Phase Change Memories
13:20
Athanasios Kiouseloglou\textsuperscript{1,2}, Erika Covi\textsuperscript{2,3}, Gabriele Navarro\textsuperscript{1}, Alessandro Cabrini\textsuperscript{2}, Luca Perniola\textsuperscript{1} and Guido Torelli\textsuperscript{2}
\textsuperscript{1}CEA-Leti, \textsuperscript{2}University of Pavia, \textsuperscript{3}Laboratorio MDM, IMM – CNR

15C2 - Large Bandwidth Tunable Analog Equalizers Based on an InP DHBT Differential Pair Amplifier Cell for 100-GBaud Communication Systems
13:40
Ronan Mettetal\textsuperscript{1,2}, Jean-Yves Dupuy\textsuperscript{2}, Achour Ouslimani\textsuperscript{1} and Jean Godin\textsuperscript{2}
\textsuperscript{1}ECS-Lab/ENSEA, \textsuperscript{2}III-V Lab

15C3 - Low Power Inductor-less CML Latch and Frequency Divider for Full-Rate 20 Gbps in 28-nm CMOS
14:00
Laszlo Szilagyi, Guido Belfiore, Ronny Henker and Frank Ellinger
Dresden University of Technology

15C4 - A 2.4 GHz Fast Settling Wake-Up Receiver Frontend
14:20
Christoph Tzschoppe, Robert Kostack and Frank Ellinger
Dresden University of Technology

15C5 - Design of a CMOS Image Sensor with a 10-bit Two-Step Single-Slope A/D Converter and a Hybrid Correlated Double Sampling
14:40
Yeonseong Hwang, Seongjoo Lee and Minkyu Song
Dongguk University

Closing Ceremony – Leaf Awards
Thursday, July 3rd, 15:00 – 16:00
Room: Petit Salon