IEEE COMPEL 2017

The Eighteenth IEEE Workshop on
Control and Modeling for Power Electronics

July 9th – 12th at Stanford University, USA

General Chair

Juan Rivas-Davila
Assistant Professor, Stanford University, USA

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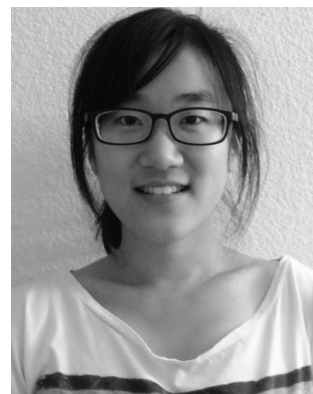Stanford University, USA

Claudio Rivetta
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Laboratory, USA

Sanghyeon Park
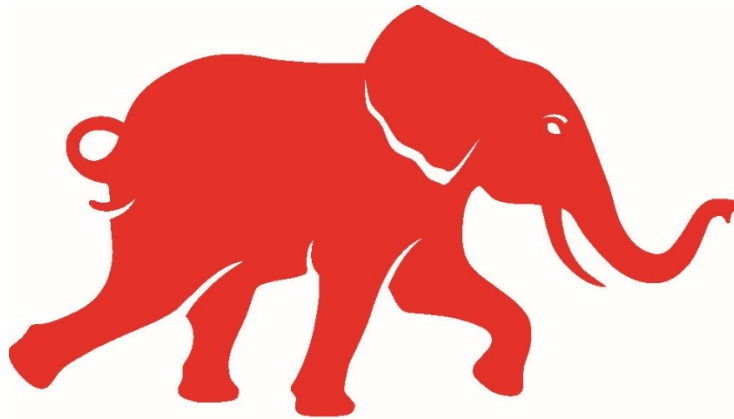Stanford University, USA

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Program Overview : Day 1-2 (Sun-Mon, July 9th -10th)

Day 1, Sunday, July 9th 2017		Day 2, Monday, July 10th 2017	
Time	Program	Time	Program
12:00p-5:00p	Registration **(Hewlett Center)**	8:30a-12:00p	Registration **(Encina Hall)**
		8:30a-8:40a	Opening & Welcome **(Encina Hall)**
		8:40a-9:15a	Keynote Speech 1 (Jim Plummer, Stanford University)
		9:15a-9:50a	Keynote Speech 2 (Ahmad Bahai, Texas Instruments)
		9:50a-10:20a	Coffee Break
		10:20a-12:00p	**Oral Session 1: Applications/Education (5 talks x 20 min)**
12:15p-1:45p	**Tutorial 1 (Hewlett Center)** (Michael Seeman, Eta One Power)	12:00p-1:00p	Lunch
1:45p-2:15p	Coffee Break	1:00p-2:40p	**Oral Session 2: Control and Modeling of Modular Converters (5 talks x 20 min)**
2:15p-5:15p	**Tutorial 2 (Hewlett Center)** (Humberto Pinheiro, Federal Univ. Santa Maria)	3:00p-7:00p	**Technical Visit to SLAC** and **Stanford Campus Tour**
5:30p-8:00p	**Welcome Reception (Encina Hall)**	7:00p-10:00p	**Mixer at Computer History Museum**

Program Overview : Day 3-4 (Tue-Wed, July 11th -12th)

Day 3, Tuesday, July 11th 2017		Day 4, Wednesday, July 12th 2017	
Time	**Program**	**Time**	**Program**
8:30a-12:00p	Registration **(Encina Hall)**	8:30a-12:00p	Registration **(Encina Hall)**
8:10a-9:50a	**Oral Session 3: HVDC/STATCOM (5 talks x 20 min)**	8:10a-9:50a	**Oral Session 7: Power Systems and Smart Grid (5 talks x 20 min)**
9:50a-10:20a	Coffee Break	9:50a-10:20a	Coffee Break
10:20a-12:00p	**Oral Session 4: Modeling and Control of Grid-level Converters (5 talks x 20 min)**	10:20a-12:00p	**Oral Session 8: AC/DC Converters (5 talks x 20 min)**
12:00p-12:50p	Lunch — TC1 Meeting (Oksenberg Room)	12:00p-12:50p	Lunch — *SystemX* private lunch (Oksenberg Room)
12:50p-2:40p	**Poster Session 1: 50 posters**	12:50p-2:40p	**Poster Session 2: 50 posters**
2:20p-2:50p	Coffee Break	2:20p-2:50p	Coffee Break
2:50p-4:30p	**Oral Session 5: DC/DC Converters (5 talks x 20 min)**	2:50p-4:30p	**Oral Session 9: Modeling of Passive Components (5 talks x 20 min)**
4:30p-4:50p	Break	4:30p-4:50p	Break
4:50p-6:30p	**Oral Session 6: Resonant Converters (5 talks x 20 min)**	4:50p-6:30p	**Oral Session 10: Modeling of Power Electronics Devices (5 talks x 20 min)**
	(No dinner planned)	6:30p-7:00p	Award Committee Meeting (Oksenberg Room)
		7:00p-10:00p	**Awards Dinner (Stanford Faculty Club)**

Computer-Aided System-Level Optimization of High-Density Power Converters

Dr. Michael Seeman, Eta One Power, Inc., USA

Abstract

With the increased popularity of new devices such as GaN, and new topologies such as the LLC, power designers hope to make dramatic improvements to the power density and efficiency of their converters. Figures of merit of these new devices suggest huge possible gains, but reality often shows it is difficult to fully utilize the promise of these new devices and topologies.

This talk will examine the loss mechanisms and other performance metrics of power converters. While understanding the trends of individual loss components is valuable in gaining intuition, one can only optimize a design by simultaneous evaluation of all relevant metrics. A software solution will be presented which enables designers to optimize their converters by making individual design decisions while simultaneously examining whole-converter performance metrics. This methodology streamlines the design process while reducing the risk associated with implementing modern technologies.

Speaker profile

Michael Seeman is the CEO and Founder of Eta One Power. Eta One Power develops advanced simulation and optimization software focusing on increasing power density and efficiency of power supplies. He was formerly the Systems and Applications Engineering Manager in the GaN Products Group at Texas Instruments. He has significant experience in cutting-edge power conversion solutions using wide-bandgap technologies and resonant converter architectures. He previously worked in two silicon-valley startups in the power electronics space. He received his S.B. degree from the Massachusetts Institute of Technology and his MS and Ph.D. degrees from UC Berkeley. He is a member of the IEEE.

Discrete Controller Design and Validation for Grid Connected Smart Inverters

Prof. Humberto Pinheiro, Federal University of Santa Maria, Brazil

Abstract

In this practically oriented workshop we will walk through the design, testing, and validation of discrete time current controllers and different synchronization methods for grid-tied smart inverters. As an example, a complete controller for 700kVA grid connected three-level neutral point clamped (3L-NPC) inverter with an LCL filter will be designed and implemented.

We will demonstrate design, testing, and performance validation of a complete digital controller. First, we will detail the overall controller architecture and develop discrete time average model of the inverter. Subsequently we will discuss different current controller architectures, yet focus on the resonant controller design and how to design optimal parameters. In addition, we will review main PLL grid synchronization algorithms and detail design and tuning of one. We will focus on practical issues for digital implementation and complete controller will be demonstrated in Texas Instruments DSP-TMS320F28335 directly interfaced with ultra-high fidelity real-time simulation. The impact of the different controllers and synchronization parameters, on the overall performance of the systems, is demonstrated with the controller Hardware in the Loop (HIL). We will introduce the HIL based methodology to test and validate the performance and robustness of the inverter controller in realistic grid tie settings (i.e. weak and strong grid conditions) and we will introduce some of the key grid support requirements for the UL1741 SA and Rule 21.

Speaker profile

Humberto Pinheiro received the B.S. degree from the Federal University of Santa Maria (UFSM), Santa Maria, Brazil, in 1983, the M.Eng. degree from the Federal University of Santa Catarina, Florianópolis, Brazil, in 1987, and the Ph.D. degree from Concordia University, Montreal, QC, Canada, in 1999. From 1987 to 1999, he was a Research Engineer with a Brazilian UPS company and a Professor with the Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brazil, where he lectured on power electronics. Since 1991, he has been with UFSM. His research interests include the modulation and control of static converters and drives, and power converters for wind energy conversion systems. Dr. Pinheiro is a member of the IEEE Power Electronics and IEEE Industrial Electronics Societies.

Power Devices: Silicon vs. New Materials

Prof. Jim Plummer, Stanford University, USA

Speaker profile

James D. Plummer was born in Toronto, Canada. He obtained his BS degree from UCLA and his MS and PhD degrees in Electrical Engineering from Stanford University. After graduating from Stanford, he worked as a research staff member in the Integrated Circuits Lab at Stanford for several years before joining the Stanford faculty in 1978 as an associate professor. He became professor of electrical engineering in 1983.

His career at Stanford has included serving as director of the IC Laboratory, senior associate dean in the School of Engineering, and chair of the Electrical Engineering Department. He was the Frederick Emmons Terman Dean of the School of Engineering from 1999 until 2014. He also holds the John Fluke Professorship in Electrical Engineering. During his tenure as dean, the school renewed or replaced much of its laboratory and classroom space, dramatically increased the number of students majoring in engineering and created interdisciplinary programs like the Bioengineering Department, which is jointly operated with the medical school, and the Hasso Plattner Institute of Design (d.school) that changed the nature of engineering education. Plummer was a strong advocate as dean, for ensuring that engineering majors take advantage of the full set of opportunities at a liberal arts institution like Stanford.

Plummer has worked in a variety of areas in the broad field of silicon devices and technology. Much of his early work focused on high-voltage ICs and on high-voltage device structures. He and his group made important contributions to integrating CMOS logic and high-voltage lateral DMOS devices on the same chip and demonstrated circuits operating at several hundred volts. This work also led to several power MOS device concepts such as the IGBT which have become important power switching devices.

Throughout the 1980s and '90s, a major focus of his work was on silicon process modeling. This work involved many students and other faculty, particularly Professor Bob Dutton, and resulted in the development of several generations of SUPREM, which has become the standard process modeling tool used worldwide today. His recent work has focused on nanoscale silicon devices for logic and memory and has demonstrated new device concepts such as the TRAM thyristor based memory cell and the IMOS device which achieves <kT/q subthreshold slopes.

Plummer is a member of the National Academy of Engineering, the American Academy of Arts and Sciences and a fellow of the IEEE. He has received many awards for his research, including the 1991 Gordon Moore medal for Solid State Science and Technology from the Electrochemical Society, the 2001 Semiconductor Industry Association University Research Award, the 2003 IEEE J. J. Ebers Award, the 2003 IEEE Van der Ziel Award and the 2007 IEEE Andrew Grove award.

He has graduated more than 80 PhD students with whom he has published more than 400 journal papers and conference presentations. These papers have won eight conference and student best paper awards including two at IEDM and three at ISSCC. His recent textbook, "Silicon VLSI Technology: Fundamentals, Practice and Modeling," is used by many universities around the world. He has also received three teaching awards at Stanford. He serves on the Board of Directors of several public companies including Intel and Cadence.

Plummer directed the Stanford Nanofabrication Facility from 1994 to 2000 and received an NSF commendation in 2000 for national leadership in building the NNUN, a consortium of universities who opened their nanofabrication facilities as national resources for industry and for students from around the nation.

Power & Electronics: The Impact of
Advanced Semiconductor Technology on Future Grid

Dr. Ahmad Bahai, Texas Instruments, USA

Speaker profile

Ahmad Bahai is the chief technologist and a senior vice president of Texas Instruments, as well as the director of TI Corporate Research, Kilby Labs. He was previously CTO of National Semiconductor and director of research labs at National Semiconductor. He also is a consulting professor at Stanford University and IEEE Fellow.

Previously, he was the technical manager of the communication and mixed-signal processing research group at Bell Laboratories until 1997 and Professor-In-Residence at University of California, Berkeley. He later co-founded Algorex, an IC and system design company for communication and acoustic applications, which was acquired by National.

Ahmad co-invented the multi-carrier spread spectrum, which is being used in many modern communication systems, such as 4G and power line communication. He authored the first textbook on orthogonal frequency-division multiplexing (OFDM) in 1999 and served as the associate editor of IEEE journals for five years. He also served in ISSCC technical steering committee until 2011.

Ahmad has served as technology advisor for many major energy initiatives in Europe and China, industrial advisory board of University of California, and visiting professor at Cheng Du University in China.

He has more than 80 IEEE/IEE publications and 38 patents on systems and circuits. He received his Master of Science degree from Imperial College, University of London and Ph.D. from University of California at Berkeley, all in electrical engineering.

Full Conference Program

July 9th 12:15-13:45 Session T1: Tutorial I

LOCATION: Hewlett 201

Michael Seeman (Eta One Power, Inc., USA)

Computer-Aided System-Level Optimization of High-Density Power Converters

July 9th 13:45-14:15 Coffee break

LOCATION: Hewlett 201

July 9th 14:15-17:15 Session T2: Tutorial II

LOCATION: Hewlett 201

Humberto Pinheiro (Federal University of Santa Maria, Brazil)

Discrete Controller Design and Validation for Grid Connected Smart Inverters

July 9th 17:30-20:00 Welcome Reception

LOCATION: Encina Hall

Day 2, Monday, July 10th

July 10th 08:30-08:40 Session W: Opening & Welcome

LOCATION: Encina Hall

Juan Rivas-Davila (Stanford University, USA)

Welcome to COMPEL 2017 at Stanford

July 10th 08:40-09:15 Session K1: Keynote Speech I

LOCATION: Encina Hall

James Plummer (Stanford University, USA)

Power Devices: Silicon vs. New Materials

July 10th 09:15-09:50 Session K2: Keynote Speech II

LOCATION: Encina Hall

Ahmad Bahai (Texas Instruments, USA)

Power & Electronics: The Impact of Advanced Semiconductor Technology on Future Grid

July 10th 09:50-10:20 Coffee break

July 10th 10:20-12:00 Session O1: Oral Session I: Applications/Education

CHAIR:

Charles Sullivan (Dartmouth College, USA)

LOCATION: Encina Hall

10:20 *Yiou He, David Perreault, Mark Woolston* (Massachusetts Institute of Technology, USA)

Modeling, Design and Implementation of a Lightweight High-Voltage Power Converter for Electro-aerodynamic Propulsion

10:40 *Sabera Talukder, Sanghyeon Park, Juan Rivas-Davila* (Stanford University, USA)

A Portable Electrostatic Precipitator to Reduce Respiratory Death in Rural Environments

11:00 *Nameer Khan, Sharif Nami, James Aziz, Youssef Elgendi, Miad Nasr, Olivier Trescases* (University of Toronto, Canada)

Power Architecture of a High-Voltage Dielectrophoresis Based Contactless Cleaning System for Solar Panels

11:20 *Rachit Goel, Gab-Su Seo, Hanh-Phuc Le* (University of Colorado Boulder, USA)

Smart-USB-Cable Buck Converter with Indirect Regulation

11:40 *Katherine Kim* (Ulsan National Institute of Science and Technology (UNIST), South Korea)
Yu-Chen Liu (National Ilan University, Taiwan)

Perspective on Developing Educational Lecture Videos for Power Electronics and Control Courses

July 10th 12:00-13:00 Lunch

July 10th 13:00-14:40 Session O2: Oral Session II: Control and Modeling of Modular Converters

CHAIRS:

Katherine Kim (Ulsan National Institute of Science and Technology (UNIST), South Korea)
Jason Stauth (Dartmouth College, USA)

LOCATION: Encina Hall

13:00 *Mohammadhadi Rouhani, Gregory Kish* (University of Alberta, Canada)

A Transformerless DC-DC MMC Based on Symmetrically Interlinked Subconverters

13:20 *Jannik Schäfer, Dominik Bortis, Johann Walter Kolar* (ETH Zurich, Switzerland)

Multi-Port Multi-Cell DC/DC Converter Topology for Electric Vehicle's Power Distribution Networks

13:40 *Mohit Sinha[1], Brian Johnson[2], Miguel Rodriguez[2], Jason Poon[3], Sairaj Dhople[1]*

([1]University of Minnesota, USA, [2]National Renewable Energy Laboratory, USA, [3]University of California at Berkeley, USA)

Decentralized Interleaving of Paralleled Dc-Dc Buck Converters

14:00 *Chang Liu, Deyu Li, Yue Zheng, Brad Lehman* (Northeastern University, USA)

Modular Differential Power Processing (mDPP)

14:20 *Dipanjan Das, Philip Krein* (University of Illinois at Urbana-Champaign, USA)

A Bidirectional Wide Load Range Multiphase Buck/Boost Converter for Differential Power Processing

July 10th 15:00-19:00 Technical Visit to SLAC & Stanford Campus Tour

July 10th 19:00-22:00 Mixer at Computer History Museum

Day 3, Tuesday, July 11th

July 11th 08:10-09:50 Session O3: Oral Session III: HVDC/STATCOM

LOCATION: Encina Hall

08:10 *Dewu Shu[1], Venkata Dinavahi[2], Qirong Jiang[1]*

([1]Tsinghua university, China, [2]University of Alberta, Canada)

Frequency-Dependent Network Equivalent for Hybrid simulations of MMC based MTDC Systems

08:30 *Yang Zhang[1], Xin Chen[1], Jian Sun[2]* ([1]Nanjing University of Aeronautics and Astronautics, China, [2]Rensselaer Polytechnic Institute, USA)

Impedance Modeling and Analysis of MMC in Single-Star Configuration

08:50 *Santiago Sanchez[1], Salvatore D'Arco[2], Gilbert Bergna[1], Marina Sanz[3], Elisabetta Tedeschi[1]* ([1]Norwegian University of Science and Technology, Norway, [2]SINTEF, Norway, [3]Universidad Carlos III de Madrid, Spain)

Impedance computation for power electronics converters with Hilbert transform

09:10 *Ignacio Vieto, Jian Sun* (Rensselaer Polytechnic Institute, USA)

On System Modeling and Analysis Using DQFrame Impedance Models

09:30 *João Cunha, Sonia Pinto, J. F. Silva*

(Instituto Superior Técnico, Universidade de Lisboa, Portugal)

Cockcroft-Walton Based HVDC System

LOCATION: Encina Hall

10:20 *Pablo Rivera, Michael McIntyre, Mohammad Mohebbi, Joseph Latham*

(University of Louisville, USA)

Nonlinear Control for Single-Stage Single-Phase Grid-Connected Photovoltaic Systems

10:40 *Toshiji Kato, Kaoru Inoue, Yuki Takami* (Doshisha University, Japan)

Stability Analysis using Poincare map in the Time-Domain for Grid-Connected Inverter

11:00 *Ahmed Allehyani, Ahmed Morsy, Prasad Enjeti* (Texas A&M University, USA)

A New Interconnected Modular Multilevel Converter (IMMC) with Sinusoidal Voltage Output Suitable for High Performance AC Drives

11:20 *Shahil Shah, Leila Parsa* (Rensselaer Polytechnic Institute, USA)

Large-Signal Impedance for the Analysis of Sustained Resonance in Grid-Connected Converters

11:40 *Minghui Lu, Frede Blaabjerg* (Aalborg University, Denmark)

Stability Identification and Robust Design of LCL Filters for Grid-Connected Inverters Considering Grid-Voltage Feedforward Regulator

July 11th 12:00-12:50 Lunch / Technical Committee 1 Meeting at Oksenberg Room
July 11th 12:50-14:40 Poster session I

CHAIRS:

Daniel Costinett (University of Tennessee, USA)

Brandon Grainger (University of Pittsburgh, USA)

Brad Lehman (Northeastern University, USA)

LOCATION: Encina Hall

Poster session I – P01: AC-DC rectifier

Usama Anwar, Dragan Maksimovic, Khurram Afridi (University of Colorado Boulder, USA)

A Simple Control Architecture for Four-Switch Buck-Boost Converter based Power Factor Correction Rectifier

Othman Ladhari, Léo Sterna, Dominique Bergogne, Pierre Perichon (CEA Leti, France)

A Novel AC/DC converter topology using a bidirectional GaN switch. Application: Led Driver

Jiayu Zhou, Fen Tang, Songwei Huang, Poh Chiang Loh (National Active Distribution Network Technology Research Center in Beijing Jiaotong University, China)

Active Power Decoupling Methods for Three-Phase Grid-Connected Converters Under Unbalanced Grid Condition

Haoran Wang, Huai Wang (Deparment of Energy Technology, Aalborg University, Denmark)

Impedance Characteristics Modeling and Voltage Feed-forward Compensation of a Two-Terminal Active Capacitor

Poster session I – P02: Applications

Wei Liang[1], Xiaofan Cui[2], Luke Raymond[1], Christine Charles[3], Rod Boswell[3], Juan Rivas Davila[1] ([1]Stanford University, USA, [2]University of Michigan, USA, [3]The Australian National University, Australia)

A compact RF power inverter with reduced EMI for a CubeSat electrothermal micro-thruster

Xupeng Chen, *Paul Stiles*, *Jeffrey de Lamare* (SLAC National Accelerator Lab, USA)

Operation Performance of DC Core Bias Power Supply of Klystron in Linac Coherent Light Source

Amin Emrani (Ford Motor Company, USA)
Mohammad Pourhomayoun (California State University, Los Angeles, USA)

Applying A Machine Learning Technique to Recognize Arc in Vehicle 48 Electrical Systems

Poster session I – P03: DC-AC inverter

Wencong Zhang, *Seth Sanders* (EECS UC Berkeley, USA)

Minimum Switching Space Vector Modulation for Z-Source Inverter

Woo-Young Choi (Chonbuk National University, South Korea)

High-Efficiency Single-Phase Three-Level Bidirectional Inverter

Songwei Huang, *Fen Tang*, *Qi Xiao*, *Poh Chiang Loh* (National Active Distribution Network Technology Research Center, Beijing Jiaotong University, Beijing, P.R. China, China)

High Performance Current Control Strategy for Grid-Connected Boost DC-AC Inverter

Zhongyi Quan, *Yunwei Li*, *Yuzhuo Li* (University of Alberta, Canada)

Internal parallelization concept for active neutral point clamped converter

Baljit Riar[1], *Tobias Geyer*[2], *Regan Zane*[1] ([1]Utah State Univeristy, USA, [2]ABB, Switzerland)

Current THD Analysis in Direct Model Predictive Control

Hannah Mundel, *Theodore Soong*, *Peter Lehn*, *Caniggia Viana* (University of Toronto, Canada)

DC Ripple Mitigation of Single-Phase Converters for Reduced Harmonic Impact

Yenan Chen, *Dehong Xu* (Zhejiang University, China)

Control of ZVS Single-phase Grid Inverter with Higher Power Quality

Victor Purba[1], *Saber Jafarpour*[2], *Brian Johnson*[3], *Francesco Bullo*[2], *Sairaj Dhople*[1]
([1]University of Minnesota, USA, [2]University of California, Santa Barbara, USA,
[3]National Renewable Energy Laboratory, USA)

Reduced-order Structure-preserving Model for Parallel-connected Three-phase Grid-tied Inverters

Alexander Lange, *Bernhard Piepenbreier*

(Friedrich-Alexander-University Erlangen-Nuremberg, Germany)

Space Vector Modulation for Three-Level Simplified Neutral Point Clamped (3L-SNPC) Inverter

Poster session I – P04: PMIC

Gabriel Gabian, *Jordan Gamble*, *Benjamin Blalock*, *Daniel Costinett*

(University of Tennessee, USA)

Modeling High Current Integrated Power Converters

Pedro Andre Martins Bezerra[1], *Riduan Khaddam-Aljameh*[1], *Florian Krismer*[1], *Johann Kolar*[1], *Arvind Sridhar*[2], *Thomas Brunschwiler*[2], *Thomas Toifl*[2]
([1]ETH Zurich, Switzerland, [2]IBM Research Zurich, Switzerland)

Novel Active Neutral Point Clamped Half-Bridge Converter Implemented with 14 nm Bulk CMOS Technology

Poster session I – P05: DC-DC converter

Timur Vekslender, *Eli Abramov, Or Kirshenboim*, *Mor Peretz*

(Ben-Gurion University of the Negev, Beer-Sheba, Israel, Israel)

Hardware Efficient Digital Auto-Tuning Average Current-Mode Controller

Akarsh Murthy, Mohamed Badawy (San Jose State University, USA)
State Space Averaging Model of a Dual Stage Converter in Discontinuous Conduction Mode

Yushi Liu, Ashish Kumar, Saad Pervaiz, Dragan Maksimovic, Khurram Afridi
(University of Colorado Boulder, USA)
A High-Power-Density Low-Profile DC-DC Converter for Cellphone Battery Charging Applications

Gab-Su Seo, Hanh-Phuc Le (University of Colorado-Boulder, USA)
Small-Signal Analysis of S-Hybrid Step-Down DC-DC Converter

Alihossein Sepahvand[1], Ashish Kumar[1], Montu Doshi[2], Vahid Yousefzadeh[2], James Patterson[2], Khurram Afridi[1], Dragan Maksimovic[1]
([1]University of Colorado Boulder, Boulder, CO, USA, [2]Texas Instruments, USA)
Current Control and PWM Dimming in an Automotive LED Driver based on a Cuk Converter

Carlos Villarreal-Hernandez[1], Jonathan Mayo-Maldonado[1], Jesus Valdez-Resendiz[1], Julio Rosas-Caro[2]
([1]Tecnologico de Monterrey, Mexico, [2]Universidad Panamericana, Mexico)
Modeling and control of an interleaved DC-DC multilevel boost converter

Byung Hee Moon, Hai Young Jung, Sung Hwan Kim, Seok-Hyun Lee
(Inha University, South Korea)
A Novel Two Switch Buck-Boost Converter with Reduced Switching and Conducting Components

Yuhei Sadanda, Takafumi Okuda, Takashi Hikihara (Kyoto University, Japan)
Direct drive of a buck converter by delta-sigma modulation at 13.56-MHz sampling

Marc Kanzian[1], Matteo Agostinelli[1], Mario Huemer[2]
([1]Infineon Technologies Austria AG, Austria, [2]Johannes Kepler University Linz, Austria)
Sliding Mode Control with Inductor Current Observer for Interleaved DC-DC Converters

Mohammad Mohebbi, Michael McIntyre, Joseph Latham, Pablo Rivera
(University of Louisville, USA)
A Filter-Based Controller for a Buck Converter

Yaqub Mahnashi, Fang Peng (Michigan State University, USA)
Systematic Approach to Optimal SC Converter Synthesis for Multi Voltage-Gain-Ratio Applications

Jan Rentmeister, Jason Stauth (Dartmouth College, USA)
Bypass Capacitance Allocation and Voltage Ripple Considerations in Resonant Switched Capacitor Converters

Poster session I – P06: Design, Modeling and Control of Power Electronic System

Ignacio Vieto[1], Xiong Du[2], Heng Nian[3], Jian Sun[1]
([1]Rensselaer Polytechnic Institute, USA, [2]Chongqing University, China,
 [3]Zhejiang University, China)
Frequency-Domain Coupling in Two-Level VSC Small-Signal Dynamics

Marlon Alberto Granda, Cristina Fernandez, Pablo Zumel, Andres Barrado
(Carlos III University of Madrid, Spain)
Quantization effects in the identification of the power converters frequency response

Jorge Rodrigo Massing , Fernanda De Morais Carnielutti, Humberto Pinheiro
(Federal University of Santa Maria, Brazil)
On discrete-time models for grid-connected converters with L- and LCL-filter in synchronous reference frame

Jeroen Tant, Johan Driesen (KU Leuven - Energyville, Belgium)
Accurate Second-Order Interpolation for Power Electronic Circuit Simulation

Xiong Du[1], Guoning Wang[1], Ying Shi[1], Yougeng Yang[1], Xiaoming Zou[1], Heng-Ming Tai[2], Yongliang Ji[3]
([1]Chongqing University, China, [2]Tulsa University, USA, [3]State Grid, China)
Using Asymmetric Current Controller to Improve the Stability of Grid-Inverter System due to PLL Effect

David Arricibita, Ernesto Barrios, Luis Marroyo (Public University of Navarre, Spain)
Simple and Robust PLL Algorithm for Accurate Phase Tracking Under Grid Disturbances

Julian Dobusch[1], Christian Oeder[2], Daniel Kuebrich[2], Thomas Duerbaum[1]
([1]Friedrich-Alexander University of Erlangen-Nuremberg, Germany,
  [2]University of Erlangen-Nuremberg, Germany)
Square Wave Based Small Signal Modeling of Frequency Controlled Converters

Tino Kahl, Sibylle Dieckerhoff (Technical University of Berlin, Germany)
Comparison of FPGA- and Microcontroller-based Control of a High-dynamic Power Electronic Converter

Mateja Novak, Ulrik Mathias Nyman, Tomislav Dragičević, Frede Blaabjerg
(Department of Energy Technology, Aalborg University, Denmark)
Analytical performance verification of FCS-MPC applied to power electronic converters: A model checking approach

Akrem Elrajoubi, Simon Ang, Ali Abushaiba (University of Kansas, USA)
TMS320F28335 DSP Programming using MATLAB Simulink Embedded Coder: Techniques and Advancements.

Przemyslaw Koralewicz, Vahan Gevorgian, Robb Wallen (NREL, USA)
Multi-Megawatt-Scale Power-Hardware-in-the-Loop Interface for Testing Ancillary Grid Services by Converter-Coupled Generation

Fang Wu, Fang Shen, Zhixiong Zhang, Jie Ye, Anwen Shen, Jinbang Xu
(Huazhong University of Science and Technology, China)
An LCPSL Filter with Multi-Tuned Traps for Grid-Connected Converters

Masaki Semasa, Toshiji Kato, Kaoru Inoue (Doshisha University, Japan)
A Simple and Effective Time Delay Compensation Method for Grid-Connected Inverter with an LCL Filter

Ramesh K Govindarajan (John Deere Electronic Solutions, USA)
Giri Venkataramanan (University of Wisconsin-Madison, USA)
Servo Control of Solenoid Actuators using Augmented Feedback Linearization

Poster session I – P07: Reliability

Jason Poon, Seth Sanders (UC Berkeley, USA)
Analysis and Design of an Adaptive Parameter Estimator for Power Electronics Circuits

Jun Li (ABB US Corporate Research Center, USA)

Yi Deng (Georgia Institute of Technology, USA)

Modelling and Evaluation of Thermal Performance of Rotor-Side Converters of DFIG Wind Turbines

July 11th 14:20-14:50 Coffee break
July 11th 14:50-16:30 Session O5: Oral Session V: DC/DC Converters

CHAIR:

Khurram Afridi (University of Colorado Boulder, USA)

LOCATION: Encina Hall

14:50 *Hassan Kiani, Jason Stauth* (Dartmouth College, USA)

Optimization and Comparison of Hybrid-Resonant Switched-Capacitor DC-DC Converter Topologies

15:10 *Mike K. Ranjram, Intae Moon, David J. Perreault* (Massachusetts Institute of Technology, USA)

Variable-Inverter-Rectifier-Transformer: A Hybrid Electronic and Magnetic Structure Enabling Adjustable High Step-Down Conversion Ratios

15:30 *Nenad Vukadinovic[1], Aleksandar Prodic[1], Brett Miwa[2], Cory Arnold[2], Michael Baker[2]*

([1]University of Toronto, Canada, [2]Maxim Integrated, USA)

Discontinuous Conduction Modes of Flying Capacitor Multi-level Dc-dc Converters and Light Load Digital Controller

15:50 *Zichao Ye, Yutian Lei, Zitao Liao, Robert Pilawa-Podgurski*

(University of Illinois at Urbana-Champaign, USA)

Investigation of Capacitor Voltage Balancing in Practical Implementations of Flying Capacitor Multilevel Converters

16:10 *Alon Cervera, Mor Mordechai Peretz* (Ben Gurion University at the Negev, Israel)

Digital Self-Tuning Controller for ZCS Resonant Converters Operating in the 10sMHz-Range

July 11th 16:30-16:50 Break
July 11th 16:50-18:30 Session O6: Oral Session VI: Resonant Converters

CHAIR:

Michael Seeman (Eta One Power, Inc., USA)

LOCATION: Encina Hall

16:50 *Phyo Aung Kyaw, Aaron L. F. Stein, Charles R. Sullivan* (Dartmouth College, USA)

Optimizing resonant tanks for high power density using standard capacitors

17:10 *Muhammad Yaqoob, Ka-Hong Loo, Yuk-Ming Lai*

(The Hong Kong Polytechnic University, Hong Kong)

Modeling the Effect of Dead-Time on Soft-Switching of Variable-Frequency Modulated Series-Resonant DAB Converter

17:30 *Sung Yul Chu, Al-Thaddeus Avestruz* (University of Michigan, USA)

Transfer-Power Measurement: A Non-Contact Method for Fair and Accurate Metering of Wireless Power Transfer in Electric Vehicles

17:50 *Tarak Saha, Hongjie Wang, Regan Zane* (Utah State University, USA)

Zero Voltage Switching Assistance Design for DC-DC Series Resonant Converter with Constant Input Current for Wide Load Range

18:10   *Kate Doubleday, Ashish Kumar, Brandon Regensburger, Saad Pervaiz, Sreyam Sinha, Zoya Popovic, Khurram Afridi* (University of Colorado Boulder, USA)

Multi-Objective Optimization of Capacitive Wireless Power Transfer Systems for Electric Vehicle Charging

Day 4, Wednesday, July 12th

July 12th 08:10-09:50 Session O7: Oral Session VII: Power Systems and Smart Grid

CHAIR:
Jian Sun (Rensselaer Polytechnic Institute, USA)
LOCATION: Encina Hall

08:10   *Tuomas Messo[1], Roni Luhtala[1], Dongsheng Yang[2], Tomi Roinila[1], Xiongfei Wang[2], Frede Blaabjerg[2]*

([1]Tampere University of Technology, Finland, [2]Aalborg University, Denmark)

Real-Time Impedance-Based Stability Assessment of Grid Converter Interactions

08:30   *Yeonjung Kim, Syam Kumar Pidaparthy, Byungcho Choi*

(Kyungpook National university, South Korea)

A Load Impedance Specification of Dc Power Systems for Desired Dc Link Dynamics and Reduced Conservativeness

08:50   *Miguel Rodriguez[1], Brian Johnson[1], Mohit Sinha[2], Sairaj Dhople[2]*

([1]National Renewable Energy Laboratory, USA, [2]University of Minnesota, USA)

Comparison of Virtual Oscillator and Droop Control in Islanded Microgrids

09:10   *Naga Brahmendra Yadav Gorla, Sandeep Kolluri, Sanjib Kumar Panda, Priyesh Jagdishchandra Chauhan* (National University of Singapore, Singapore)

A Fault Tolerant Control Approach for a Three Stage Cascaded Multilevel Solid State Transformer

09:30   *Jorge Rodrigo Massing[1], Gustavo Guilherme Koch[1], Alexandre Trevisan Pereira[1], Humberto Pinheiro[1], Vinícius Foletto Montagner[1], Ricardo Coração De Leão Fontoura Oliveira[2]*

([1]Federal University of Santa Maria, Brazil, [2]University of Campinas, Brazil)

Modeling and stability analysis of current controllers for multi-paralleled grid-connected converters with LCL-filter

July 12th 09:50-10:20 Coffee break
July 12th 10:20-12:00 Session O8: Oral Session VIII: AC/DC Converters

CHAIR:
Mohamed Badawy (San Jose State University, USA)
LOCATION: Encina Hall

10:20   *Paula Lamo, Felipe López, Alberto Pigazo, F. J. Azcondo* (University of Cantabria, Spain)

Two-Sample PLL with Improved Frequency Response applied to Single-Phase Current Sensorless Bridgeless PFCs

10:40   *Gui-Jia Su* (Oak Ridge National Laboratory, USA)

Design and Evaluation of a 6.6 kW GaN Converter for Onboard Charger Applications

11:00   *Sreyam Sinha, Ashish Kumar, Khurram Afridi* (University of Colorado Boulder, USA)

Active Variable Reactance Rectifier – A New Approach to Compensating for Coupling Variations in Wireless Power Transfer Systems

11:20 *Nathan Brooks, Shibin Qin, Robert Pilawa-Podgurski*
(University of Illinois at Urbana-Champaign, USA)

Control Design of an Active Power Pulsation Buffer Using an Equivalent Series-Resonant Impedance Model

11:40 *Niloofar Rashidi Mehrabadi, Qiong Wang, Rolando Burgos, Dushan Boroyevich*
(CPES - Virginia Tech, USA)

Multi-Objective Design and Optimization of a Vienna Rectifier with Uncertainty Quantification

July 12th 12:00-12:50 Lunch / SystemX Private Lunch (Oksenberg Room)
July 12th 12:50-14:40 Poster session II

CHAIRS:

Jose Cobos (Universidad Politecnica de Madrid, Spain)
Kazutoshi Kobayashi (Kyoto Institute of Technology, Japan)
Hanh-Phuc Le (University of Colorado Boulder, USA)
Dragan Maksimovic (University of Colorado Boulder, USA)

LOCATION: Encina Hall

Poster session II – P08: Power Devices

Gengyao Li[1], Hao Wen[1], Chengcheng Yao[1], Xi Lu[2], Zhuxian Xu[2], Ke Zou[2], Jun Kikuchi[2], Chingchi Chen[2], Jin Wang[1] ([1]The Ohio State University, USA, [2]Ford, USA))

A Simplified IGBT Behavioral Model with a Tail Current Module for Switching Losses Estimation

Heath Hofmann (The University of Michigan, USA)

Accurate, Robust Diode Rectifier Models in Simulink

Patrick Lewis[1], Shimeng Huang[2], Brandon Grainger[1]
([1]University of Pittsburgh, USA, [2]ANSYS, USA)

Silicon and SiC MOSFET Electro-Thermal Performance Assessment within Smart Distributed Generation Inverters with Dynamic Reactive Compensation Grid Support for Resilient Microgrids

Ole Christian Spro, Dimosthenis Peftitsis, Ole-Morten Midtgård, Tore Undeland
(Norwegian University of Science and Technology, Norway)

Modelling and quantification of power losses due to dynamic on-state resistance of GaN E-mode HEMT

Ramchandra Kotecha, Yuzhi Zhang, Nan Zhu, Arman Rashid, Tom Vrotsos, Alan Mantooth (University of Arkansas, USA)

An Accurate Compact Model of Gallium Nitride Gate Injection Transistor for Next-Generation of Power Electronics Design

Yuexia Liu, Meng Huang, Yi Liu, Xiaoming Zha (Wuhan University, China)

Redefinition of Safety Operating Area (SOA) Considering Transient Thermal Dynamics of IGBT Module

Poster session II – P09: HVDC

Gilbert Bergna Diaz[1], Daniele Zonetti[2], Santiago Sanchez[1], Elisabetta Tedeschi[1], Romeo Ortega[3] ([1]NTNU, Norway, [2]IMDEA Energy, Spain, [3]LSS/CNRS/Supélec, France)

Decentralized PI passivity-based control of multiterminal MMC-based HVDC transmission systems

Alejandro Garces[1], *Santiago Sanchez*[2], *Gilbert Bergna-Diaz*[2], *Elisabetta Tedeschi*[2]
([1]UTP, Colombia, [2]NTNU, Norway)

HVDC Meshed Multiterminal Networks for Oshore Wind Farms: Dynamic Model, Load Flow and Equilibrium

Xiyang Liu, Zengping Wang, Yujin Yang, Linze Li (North China Electric Power University, China)

A Concurrent Commutation Failure Detection Method for Multi-Infeed HVDC Systems

Poster session II – P10: Modular Multilevel Converters

Xin Xiang, Xiaotian Zhang, Geraint Chaffey, Yunjie Gu, Tim Green
(Imperial College London, UK)

Isolated Resonant Modular Multilevel Converters with Large Step-ratio for MVDC Applications

Sigurd Byrkjedal Wersland, Anirudh Budnar Acharya, Lars Einar Norum
(Norwegian University of Science and Technology, Norway)

Integrating Battery into MMC Submodule Using Passive Technique

Sunny Kung, Gregory Kish (University of Alberta, Canada)

A Unified Modular Multilevel DC/DC Converter Structure with Flexible AC Power Transfer Controls

Zhongyi Quan, Yunwei Li (University of Alberta, Canada)

Harmonic analysis of interleaved voltage source converters

Abel Taffese[1], *Elisabetta Tedeschi*[1], *Erik C. W. de Jong*[2]
([1]NTNU, Norway, [2]Eindhoven University of Technology, Netherlands)

A Control Scheme for Utilizing Energy Storage of the Modular Multilevel Converter in Providing Power Oscillation Damping Service

Leonardo Comparatore[1], *Jorge Esteban Rodas Benítez*[1], *Raul Gregor*[1], *Marco Rivera*[2]
([1]Facultad de ingeniería - Universidad Nacional de Asunción, Paraguay, [2]University of Talca, Chile)

Modulated Model Based Predictive Control with Switcher of Redundant States for a Three-Phase Cascade H-Bridge Multilevel STATCOM

Joan Marc Rodriguez Bernuz, *Adrià Junyent Ferré* (Imperial College London, UK)

Model Predictive Circulating Current Regulator for Single-Phase MMC

Michael Merlin[1], *Paul Judge*[2], *Geraint Chaffey*[2], *James Wylie*[2], *Tim C. Green*[2]
([1]MMC, UK, [2]Imperial College London, UK)

Soft-Switching of the Director Switch in the Alternate Arm Converter using Blocked Sub-Modules

Chinmayi (East West Institute of Technology, India)
B G Shivaleelavathi (JSS Academy for Technical Education, India)

A Novel Implementation of Digital Control Strategy for Multilevel Inverters Using FPGA Wavect Controller

Alexandre Christe, *Drazen Dujic* (POWER ELECTRONICS LABORATORY, Switzerland)

Novel Insight into the Output Current Ripple for Multilevel and Multiphase Converter Topologies

Poster session II – P11: Passives

Benedict Foo, Aaron Stein, Charles Sullivan (Dartmouth College, USA)

Can Higher Frequencies Reduce Magnetics Size? An Exploration of the Impact of Frequency on Optimized Flyback Transformers.

Yi Liu, Meng Huang, Yuexia Liu, Xiaoming Zha (Wuhan University, China)

Reliability-Oriented Design of Hybrid DC Bank in Single Phase Inverter

Bradley Reese, Charles Sullivan (Dartmouth College, USA)

The Effect of Permeability on Magnetic Core Performance Factors

Poster session II – P12: Photovoltaic Applications

Hamed Nademi[1], Lars Norum[2], Sigurd Byrkjedal Wersland[2]

([1]ABB, Norway, [2]NTNU University, Norway)

An Accurate MPPT Scheme for Photovoltaic Modular-Based Conversion Units: A Robust Sensorless Predictive Approach

Prasanth Kumar Sahu, Madhav Manjrekar (University of North Carolina at Charlotte, USA)

Maximum Power Point Tracking for Solar Panel Companion Inverters

Ye Tang, Rolando Burgos, Chi Li, Dushan Boroyevich (CPES, Virginia Tech, USA)

Stability Assessment of Utility PV Integration to the Distributed Systems Based on D-Q Frame Impedances and GNC

Jin S. Choi[1], Ji H. Kim[1], Chun T. Rim[2] ([1]KAIST, South Korea, [2]GIST, South Korea)

Incidence Solar Power Analysis of PV Panels with Curved Reflectors

Poster session II – P13: Resonant Converters

Minjie Chen (Princeton University, USA)

Magnetics Design and Optimization for Resonant Hybrid Switched Capacitor-Magnetics Power Converters

Lei Gu, Wei Liang, Juan Rivas-Davila (Stanford University, USA)

A Multi-resonant Gate Driver for VHF Resonant Converters

Hongjie Wang, Tarak Saha, Regan Zane (Utah State University, USA)

Impedance-Based Stability Analysis and Design Considerations for DC Current Distribution with Long Transmission Cable

Ashish Kumar, Saad Pervaiz, Khurram Afridi (University of Colorado Boulder, USA)

Single-Stage Isolated 48V-to-1.8V Point-of-Load Converter Utilizing an Impedance Control Network and Integrated Magnetic Structures

Phyo Aung Kyaw, Aaron L. F. Stein, Charles R. Sullivan
(Thayer School of Engineering at Dartmouth, USA)

Analysis of High Efficiency Multistage Matching Networks with Volume Constraint

Weijian Han (Northwestern Polytechnical University, China)
Luca Corradini (University of Padova, Italy)

Accurate ZVS Boundary Analysis for Bidirectional Dual-Bridge Series Resonant dc-dc Converters

Eslam Abdelhamid[1], Luca Corradini[1], Paolo Mattavelli[1], Matteo Agostinelli[2]

([1]University of Padova, Italy, [2]Infineon Technologies Austria AG, Austria)

Digital controller for optimized efficiency and extended operating range in high-frequency quasi-resonant dc-dc buck converters

Sanghyeon Park, Juan Rivas-Davila (Stanford University, USA)

Isolated Resonant DC-DC Converters with a Loosely Coupled Transformer

Or Kirshenboim, *Mor Mordechai Peretz* (Ben Gurion University of the Negev, Israel)

Combined Multi-Level Two-Phase Interleaved LLC Converter with Enhanced Power Processing Characteristics and Natural Current Sharing

Geon-Hong Min, *Jung-Ik Ha* (Seoul National University, South Korea)

Inner Supply Data Transmission of Resonant Flyback Converters Using Multiplexing Mode in Battery Chargers Application

W. Warren Chen, Baljit Riar, Regan Zane (Utah State University, USA)

A three-port series resonant converter for three-phase unfolding inverters

Poster session II – P14: Smart Grid, Power Systems

Priyesh Chauhan, Dastagiri Reddy Bonthapalle, Sanjib Kumar Panda
(National University of Singapore, Singapore)

Seamless Transitions of DGs in Standalone Microgrid for Uninterrupted Supply

Aaron Goldin (Stanford University, USA),
Claudio Rivetta (GISMo - SLAC National Accelerator Laboratory, USA)

The "Smart Dim Fuse": A New Approach to Load Control as a Distributed Energy Resource

Luis Herrera (Rochester Institute of Technology, USA), *Xiu Yao* (University at Buffalo, USA)

Computation of Stability Metrics in DC Power Systems Using Sum of Squares Programming

Saeed Rezaee, Seyyedmilad Ebrahimi, Navid Amiri, Yingwei Huang, Juri Jatskevich
(The University of British Columbia, Canada)

Accurate and Fast Power Sharing Among Inverters in AC Microgrids with Constant Power Loads

Hua Chang, Yingwei Huang, Seyyed Milad Ebrahimi, Juri Jatskevich
(University of British Columbia, Canada)

Harmonic Compensation in AC Distribution Systems Using Smart Electronic Loads with PFC Converters

Diego Langarica-Córdoba, Yuz A. Zúñiga-Ventura, Jesús Leyva-Ramos,
Luis H. Díaz-Saldierna (IPICYT, Mexico)

Exponential PI-Control for Fuel-Cell Based Power Systems

Poster session II – P15: Wireless Power Transfer

Xin Zan, *Al-Thaddeus Avestruz* (University of Michigan, USA)

Wireless Power Transfer for Artificial Heart Pumps with Piecewise Resonance to Achieve High Peak-to-Average Power Ratio

Akshay Sarin, *Al-Thaddeus Avestruz* (University of Michigan, USA)

Comparison of Switched Receivers for Direct-Sequence Spread Spectrum Wireless Power Transfer

Spencer Cochran, *Daniel Costinett* (University of Tennessee, USA)

Modeling a 6.78 MHz Synchronous WPT Rectifier with Reduced THD

Jungwon Choi, *Juan Rivas-Davila* (Stanford University, USA)

Implementation of an impedance compression network to correct deviations in a wireless power transfer system

Michal Kosik, Radek Fajtl, Jiri Lettl (CTU in Prague, Czech Republic)

Analysis of Bifurcation in Two-Coil Inductive Power Transfer

Aaron L.F. Stein, *Phyo Aung Kyaw, Charles R. Sullivan* (Dartmouth College, USA)

Figure of Merit for Resonant Wireless Power Transfer

July 12th 14:20-14:50 Coffee break

July 12th 14:50-16:30 Session O9: Oral Session IX: Modeling of Passive Components

CHAIRS:

Minjie Chen (Princeton University, USA)

David J. Perreault (Massachusetts Institute of Technology, USA)

LOCATION: Encina Hall

14:50 *Bradley Reese, Charles Sullivan* (Dartmouth College, USA)

Litz wire in the MHz range: modeling and improved designs

15:10 *Ernesto L. Barrios, Alfredo Ursua, Luis Marroyo, Pablo Sanchis*

(Public University of Navarre, Spain)

Analytical Winding Loss Calculation for High-Frequency Low-Permeability Inductors

15:30 *Grayson Zulauf, Wei Liang, Juan Rivas-Davila* (Stanford University, USA)

A Unified Model for High-Power, Air-Core Toroidal PCB Inductors

15:50 *Thomas Guillod, Jonas Huber, Florian Krismer, Johann W. Kolar*

(ETH Zurich / PES, Switzerland)

Litz Wire Losses: Effects of Twisting Imperfections

16:10 *Alberto Delgado[1] , Jesús Oliver[1] , Jose Cobos[1] , Jorge Rodriguez[2]*

([1]Universidad Politecnica de Madrid, Spain, [2]PREMO, Spain)

Axisymmetric Finite Element Modelling of Compound Magnetic Materials based on Magnetic Micro-Wires by means of Equivalent homogeneous material

July 12th 16:30-16:50 Break

July 12th 16:50-18:30 Session O10: Oral Session X: Modeling of Power Electronics Devices

LOCATION: Encina Hall

16:50 *Stefan Moench, Cristino Salcines, Yajing Li, Ingmar Kallfass*

(Institute of Robust Power Semiconductor Systems, University of Stuttgart, Germany)

Sensitivity Analysis of 600 V Lateral GaN-on-Si HEMTs to Substrate Potential by 4-Terminal IV, CV, Qg Characterization for the Improvement of HEMT Models

17:10 *Yuki Yamashita, Jun Furuta, Sho Inamori, Kazutoshi Kobayashi*

(Kyoto Institute of Technology, Japan)

Design of RCD Snubber Considering Wiring Inductance for MHz-Switching of SiC-MOSFET

17:30 *Gwilym Jones, Daniel Rogers* (Department of Engineering Science, University of Oxford, UK)

Investigation of IGBT Switching Energy Loss and Peak Overvoltage using Digital Active Gate Drives

17:50 *Ke Li, Paul Evan, Mark Johnson* (University of Nottingham, UK)

Using Multi Time-Scale Electro-thermal Simulation Approach to Evaluate SiC-MOSFET Power Converter in Virtual Prototyping Design Tool

18:10 *Kawin Surakitbovorn, Juan Rivas-Davila* (Stanford University, USA)

Evaluation of GaN Transistor Losses at MHz Frequencies in Soft Switching Converters

July 12th 18:30-19:00 Award Committee Meeting

LOCATION: Oksenberg Room

July 12th 19:00-22:00 Award Dinner & Closing Event

LOCATION: Stanford Faculty Club

Our deepest appreciation goes to all the reviewers and committee members without whom this event would not have been possible.

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Lei Gu, Stanford University

JiaLe Xu, Stanford University

Juan Rivas-Davila **(General Chair)**, Stanford University

Claudio H. Rivetta, SLAC National Accelerator Laboratory

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Francisco (Paco) Azcondo, University of Cantrabia

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