

# **2014 IEEE Transportation Electrification Conference and Expo**

**(ITEC 2014)**

**Dearborn, Michigan, USA  
15-18 June 2014**

**Pages 1-515**



**IEEE Catalog Number: CFP14TEB-POD  
ISBN: 978-1-4799-2263-5**

# Oral Presentation Sessions at ITEC 2014

## TS1: Modeling and Analysis of Electric Machines

Monday, June 16<sup>th</sup>, 2:00 pm – 3:20 pm

- 
- TS1-1      **Analytical 2-D Slot Model for Predicting AC Losses in Bar-Wound Machine Windings due to Armature Reaction**  
Wanjun Zhang and Thomas Jahns  
University of Wisconsin-Madison, USA
- 
- TS1-2      **Temperature effects on steady state performance of an Induction Machine and a Switched Reluctance Machine**  
Nasim Arbab, Wei Wang, Arash Hassanpour Isfahani and Babak Fahimi  
University of Texas at Dallas, USA
- 
- TS1-3      **Adaptive Model Predictive Current Control for DSSRM Drives**  
Xin Li and Pourya Shamsi  
Missouri University of Science and Technology, USA
- 
- TS1-4      **Outer Rotor IPM Generator With Wide Constant Power Region for Automotive Applications**  
Emanuele Fornasiero, Mattia Morandini, Nicola Bianchi, Silverio Bolognani and Enrico Carraro  
University of Padova, Italy
- 

## TS2: Thermal modeling and analysis

Monday, June 16<sup>th</sup>, 2:00 pm – 3:20 pm

- 
- TS2-1      **State-Space Based Multi-Nodes Thermal Model for Li-ion Battery**  
Ying Xiao and Babak Fahimi  
University of Texas at Dallas, USA
- 
- TS2-2      **Transient Electro-Thermal Analysis for a MOSFET based Traction Inverter**  
Kai Yang<sup>1</sup>, Jing Guo<sup>1</sup>, Hao Ge<sup>1</sup>, Berker Bilgin<sup>1</sup>, Voiko Loukanov<sup>2</sup> and Ali Emadi<sup>1</sup>  
<sup>1</sup>McMaster University, Canada, <sup>2</sup>DV Electronics Ltd, Canada
- 
- TS2-3      **Electrothermal Modeling and Experimental Validation of a LiFePO<sub>4</sub> battery cell**  
Ying Xiao and Babak Fahimi  
University of Texas at Dallas, USA
- 
- TS2-4      **Heat Response of Prismatic Li-ion Cells**  
Maryam Ghalkhani<sup>1</sup>, Gholam-Abbas Nazri<sup>2</sup>, Narayan Kar<sup>1</sup> and Mehrdad Saif<sup>1</sup>  
<sup>1</sup>University of Windsor, Canada, <sup>2</sup>Frontier Applied Sciences and Technologies, LLC, USA
- 

## TS3: Converter/Inverter Performance Analysis

Monday, June 16<sup>th</sup>, 4:20 pm – 5:40 pm

- TS3-1 **Investigating the Influence of Interconnection Parasitic Inductance on the Performance of SiC Based DC-DC Converters in Hybrid Vehicles** (\*)  
Di Han, Woongkul Lee, Jukkrit Noppakunkajorn and Bulent Sarlioglu  
University of Wisconsin-Madison, USA
- 
- TS3-2 **Stability analysis of a tightly controlled load supplied by a DC-DC boost converter with a modified sliding mode controller** (\*) &  
Louis-Marie Saublet<sup>1</sup>, Roghayeh Gavagsaz Ghojani<sup>1</sup>, Serge Pierfederici<sup>1</sup>, Babak Nahid-Mobarakeh<sup>1</sup> and Juvelino Da Silva<sup>2</sup>  
<sup>1</sup>GREEN, University of Lorraine, France, <sup>2</sup>ERTE, BOWEN, France
- 
- TS3-3 **Performance Comparison Study of Two- and Three-Level Inverter for Electric Vehicle Application** (\*), \*\*  
Abhijit Choudhury<sup>1</sup>, Pragasen Pillay<sup>1</sup>, Mohammed Amer<sup>2</sup> and Sheldon. S Williamson<sup>1</sup>  
<sup>1</sup>Concordia University, Canada, <sup>2</sup>TM4 Inc, Canada
- 
- TS3-4 **Dynamic Analysis of the Interaction between an Interleaved Boost Converter with Coupled Inductor and a Constant Power Load** (\*\*\*) (\*\*\*\*\*)  
Ruoyu Hou<sup>1</sup>, Pierre Magne<sup>1</sup>, Berker Bilgin<sup>1</sup>, Sanjaka Wirasingha<sup>2</sup> and Ali Emadi<sup>1</sup>  
<sup>1</sup>McMaster University, Canada, <sup>2</sup>Chrysler Group LLC, USA
- 

## **TS4: Industry Presentation-only Session: Advancements in Inverter Technology**

Monday, June 16<sup>th</sup>, 4:20 pm – 5:40 pm

- TS4-1 **Losses comparison of two and three level IGBT inverters** (\*)B#5  
Robert Ratz  
Ricardo, USA
- 
- TS4-2 **HV Transient Voltage Failure Mitigation in Traction Inverters** (\*)B#5  
Brian Peaslee  
Magna Electronics, USA
- 
- TS4-3 **Total Harmonics Distortion investigation of two and three level inverters as function of the switching frequency** (\*)B#5  
Robert Ratz  
Ricardo, USA
- 
- TS4-4 **Closing the Test Gap – Advanced Testing of Traction Inverters** (\*)B#5  
Horst Hammerer  
SET Power Systems GmbH, Germany
- 

## **TS5: Conductive/Inductive charging technology, battery standards**

Tuesday, June 17<sup>th</sup>, 2:00 pm – 3:20 pm

- TS5-1      **Design of a Universal Inductive Charger for Electric Vehicles**\*\*\*+\$  
Nan Liu and Thomas Habetler  
Georgia Institute of Technology, USA
- 
- TS5-2      **A bidirectional battery charger for electric vehicles with V2G and V2H capability and active and reactive power control**\*\*\*+\*  
Iason Vittorias, Michael Metzger, Dennis Kunz, Matthias Gerlich and Georg Bachmaier  
Siemens AG, Corporate Technology, Germany
- 
- TS5-3      **A High Density 3.5 kW Isolated On-Vehicle Battery Charger Using SiC SBDs and SiC DMOSFETs**\*\*\*, &  
Timothy Han, Seok Joo Jang, Jared Preston and David Ouwerkerk  
Global Power Electronics, Inc., USA
- 
- TS5-4      **EV Battery Standards Gap Analysis Related to Damaged and Recycled Batteries**\*\*\*B#5  
Rich Byczek  
Intertek, USA
- 

## **TS6: Industry Presentation-only Session: Electric Machines and Drives**

Tuesday, June 17<sup>th</sup>, 2:00 pm – 3:20 pm

- TS6-1      **Latest sintered NdFeB magnet technology "Heavy rare-earth reduction technique"**\*\*\*B#5  
Takashi Yawata  
Shin-Etsu Chemical Co., Japan
- 
- TS6-2      **Traction motor optimization to meet range objectives**\*\*\*B#5  
Brian Peaslee  
Magna Electronics, USA
- 
- TS6-3      **Performance/cost comparison of induction-motor (copper rotor & aluminum rotor) & permanent-magnet-motor in a hybrid electric car**\*\*\*B#5  
Malcolm Burwell  
International Copper Association, USA
- 
- TS6-4      **Shaft Voltages and currents in Traction Motors – Issues and Remedies**\*\*\*B#5  
Matt Roman  
Electro Static Technology, USA
- 

## **TS7: Converter/inverter control strategies**

Tuesday, June 17<sup>th</sup>, 4:20 pm – 5:40 pm

- TS7-1      **A Passive Auxiliary Circuit for Load and Line Independent Zero Voltage Switching in Full Bridge Converters with Reduced Conduction Losses for Transportation**

### **Applications** , +

Alireza Safae<sup>1</sup>, Praveen Jain<sup>2</sup> and Alireza Bakhshai<sup>2</sup>

<sup>1</sup>Bombardier Inc., Canada, <sup>2</sup>Queen's University, Canada

---

TS7-2 **DC Bus Current Harmonics of a Three-phase PWM Inverter with the Zero Sequence Injection** (

Saeid Haghbin

Chalmers University of Technology, Sweden

---

TS7-3 **Philosophy of Topology and Components Selection for Cost and Performance in Automotive Converters** %\$

Alexander Isurin and Alexander Cook

Vanner inc., USA

---

TS7-4 **High-Efficiency Pulse-Width Modulated Full-Bridge Converter for Low-Voltage Battery Charging Applications** %\$)

Min-Kwon Yang, Hyoung-Sup Cho, Seung-Jae Lee and Woo-Young Choi

Chonbuk National University, Korea (South)

---

## **TS8: Advanced battery management**

Tuesday, June 17<sup>th</sup>, 4:20 pm – 5:40 pm

TS8-1 **Optimal Power Split and Sizing of Hybrid Energy Storage System for Electric Vehicles** %%%

Junyi Shen, Amin Hasanzadeh and Alireza Khaligh

University of Maryland, USA

---

TS8-2 **Power Management for Plug-in Hybrid Electric Vehicles using Reinforcement Learning with Trip Information** %%+

Chang Liu and Yi Lu Murphey

University of Michigan-Dearborn, USA

---

TS8-3 **Battery Management System in the Bayesian Paradigm: Part I: SOC Estimation** %&'

Ienkaran Arasaratnam<sup>1</sup>, Tjong Jimi<sup>2</sup> and Ryan Ahmed<sup>1</sup>

<sup>1</sup>McMaster University, Canada, <sup>2</sup>Ford Motor Company, Canada

---

TS8-4 **Battery Operation Cycle Management for Electric Vehicles with Battery Switching Technology** %& ,

Georgios Doukas<sup>1</sup>, Pavol Bauer<sup>1</sup> and Jos van der Burgt<sup>2</sup>

<sup>1</sup>Delft University of Technology, Netherlands, <sup>2</sup>DNV KEMA, Netherlands

---

## **TS9: Energy storage system modeling, development and evaluation**

Wednesday, June 18<sup>th</sup>, 8:30 am – 10:10 am

TS9-1 **Battery evaluation in a systems context using Battery Component in the Loop** % (

Neeraj Shidore<sup>1</sup>, Namdoo Kim<sup>1</sup>, Daehung Lee<sup>1</sup>, Ram Vijayagopal<sup>1</sup>, Aymeric Rousseau<sup>1</sup>,

Jason Kwon<sup>2</sup>, Eric Haggard<sup>3</sup> and Benoit Honel<sup>3</sup>

<sup>1</sup>Argonne National Laboratory, United States, <sup>2</sup>Samsung SDI  
International, United States

Korea (South), <sup>3</sup>LMS

---

TS9-2 **A multi physical model for PEM fuel cells including a two dimensional fluidic finite element analysis in real time**

Pierre Massonnat, Fei Gao, Damien Paire, David Bouquain and Abdellatif Miraoui  
University of Technology Belfort-Montbeliard, France

---

TS9-3 **Hybrid Electric Vehicle Simulation with Integrated Battery Compact Physical Model**

Mike Arnett<sup>1</sup>, Iakovos Papadimitriou<sup>1</sup> and John Milios<sup>2</sup>  
<sup>1</sup>Gamma Technologies, Inc., USA, <sup>2</sup>Sendyne Corp., USA

---

TS9-4 **Development of a Hybrid Energy Storage System for Electric and Hybrid Electric Vehicles**

Kun Zhuge and Mehrdad Kazerani  
University of Waterloo, Canada

---

## TS10: Vehicle modeling diagnostics and testing

Wednesday, June 18<sup>th</sup>, 10:30 am – 12:10 pm

---

TS10-1 **Industry Presentation-only: Modeling Hybrid Systems Using Advanced Simulation Technology**

Emad Dlala  
ANSYS, USA

---

TS10-2 **Industry Presentation-only: Piecewise Linearization for Nonlinear Powertrain Models**

Simon O. Omekanda  
Chrysler Group LLC, USA

---

TS10-3 **Diagnosis of Open-Circuit Switch Faults in Multilevel Active-NPC (ANPC) Inverters**

Jiangbiao He and Nabeel Demerdash  
Marquette University, USA

---

TS10-4 **A discrete-time tool to analyze the stability of weakly filtered active front-end PWM converters**

Mehdi Karbalaye Zadeh<sup>1</sup>, Gavagsaz Ghochani Roghayeh<sup>2</sup>, Pierfederici Serge<sup>2</sup>, Nahid-Mobarakeh Babak<sup>2</sup> and Marta Molinas<sup>1</sup>

<sup>1</sup>Norwegian University of Science and Technology, Norway, <sup>2</sup>GREEN, University of Lorraine, France

---

TS10-5 **Simplified Electric Vehicle Powertrain Model for Range and Energy Consumption based on EPA Coast-down Parameters and Test Validation by Argonne National Lab Data on the Nissan Leaf**

John G. Hayes and Kevin Davis  
University College Cork, Ireland

---

## TS11: Vehicles charging planning and management

Wednesday, June 18<sup>th</sup>, 10:30 am – 12:10 pm

- TS11-1     **Hybrid Multi-Agent Based Resilient Control for EV connected Micro Grid System**  
Andrew Hintz, Udipi Prasanna and Kaushik Rajashekara  
The University of Texas at Dallas, USA
- 
- TS11-2     **Industry Presentation-only: HEV System Design and Validation: Virtual Supply Chains**  
Kurt Mueller  
Synopsys, USA
- 
- TS11-3     **Multiplexed Electric Vehicle Charger Provides Affordable and Flexible Level 2 Charging**  
Joseph Maurio, Christopher McClure, Liam Tallon and Larry Hajnos  
Northrop Grumman Electronic Systems, USA
- 
- TS11-4     **Game Theoretic Approach to Offering Participation Incentives for Electric Vehicle to Vehicle Charge Sharing**  
Promiti Dutta and Albert Boulanger  
Columbia University, USA
- 
- TS11-5     **Control Strategies for Electric Vehicle (EV) Charging Using Renewables and Local Storage**  
Charles Castello<sup>1</sup>, Tim LaClair<sup>2</sup> and L. Curt Maxey<sup>2</sup>  
<sup>1</sup>NASA, USA, <sup>2</sup>Oak Ridge National Laboratory, USA

## TS12: Traction Motors: Design and Optimization

Wednesday, June 18<sup>th</sup>, 10:30 am – 12:10 pm

- TS12-1     **Direct Flux Control of PM Synchronous Motor Drives for Traction Applications**  
Gianmario Pellegrino<sup>1</sup>, Boazzo Barbara<sup>1</sup> and Thomas M. Jahns<sup>2</sup>  
<sup>1</sup>Politecnico di Torino, Italy, <sup>2</sup>University of Wisconsin-Madison, USA
- 
- TS12-2     **Comparative study of Structural Rigidity of Induction Machine and Switched Reluctance Machine**  
Lizon Maharjan, Shiliang Wang, Arash Hassanpour Isfahani, Wei Wang and Babak Fahimi  
University of Texas at Dallas, USA
- 
- TS12-3     **Optimization of a traction PMASR motor according to a given driving cycle**  
Enrico Carraro, Mattia Morandin and Nicola Bianchi  
University of Padova, Italy

TS12-4 **A Novel Linear Induction Motor Equivalent-Circuit with Optimized End-Effect Model including Partially-Filled End Slots**  
Konrad Woronowicz and Alireza Safaee  
Bombardier Inc, Canada

---

TS12-5 **Multiphase Machines for Electric Vehicle Traction**  
Nigel Schofield<sup>1</sup>, Xin Niu<sup>2</sup> and Omid Beik<sup>1</sup>  
<sup>1</sup>McMaster University, Canada, <sup>2</sup>The University of Manchester, United Kingdom

---

## **TS13: Converter/Inverter Design and Control**

Wednesday, June 18<sup>th</sup>, 10:30 am – 12:10 pm

TS13-1 **Laminated Busbar Design Criteria in Power Converters for Electrified Powertrain Applications**  
Mariam Khan<sup>1</sup>, Berker Bilgin<sup>1</sup>, Pierre Magne<sup>1</sup>, Sanjaka Wirasingha<sup>2</sup> and Ali Emadi<sup>1</sup>  
<sup>1</sup>McMaster University, Canada, <sup>2</sup>Chrysler Group LLC, USA

---

TS13-2 **Design Analysis and Improvement of an IGBT Gate Drive Circuit for Magnet Power Supplies using a Physics-Based Circuit Model**  
Byeong Song and Ju Wang  
Argonne National Laboratory, USA

---

TS13-3 **Sensitivity Analysis of the Control of a Three-phase Open-End Winding H-bridge Drive**  
Abdelfatah Kollu<sup>1</sup>, Olivier Bethoux<sup>2</sup>, Alexandre De Bernardinis<sup>1</sup>, Eric Laboure<sup>2</sup> and Gerard Coquery<sup>1</sup>  
<sup>1</sup>IFSTTAR, France, <sup>2</sup>LGEP, France

---

TS13-4 **Balanced Multiphase High Frequency Micro-Distribution Power Bus For Electric Vehicles**  
Frederick Klatt  
Best Electric Machine, USA

---

TS13-5 **A two-phases interleaved One Cycle Control PFC for Automotive Application**  
Davide Giacomini and Alex Lollo  
International Rectifier, Italy

---

## **Poster Session 1: Power Electronics and Motor Drives**

Monday, June 16<sup>th</sup>, 12 pm to 2 pm

PS1-1 **Time-domain Steady-state Analysis of Fixed-Frequency Series Resonant Converter with Phase-Shift Modulation**  
Alireza Safaee<sup>1</sup>, Praveen Jain<sup>2</sup> and Alireza Bakhshai<sup>2</sup>  
<sup>1</sup>Bombardier Inc. Canada, <sup>2</sup>Queen's University, Canada

---

PS1-2 **A Hybrid PWM Approach for the Traction Motor Control of Alternative Energy**



**Vehicles** ,

Roufin Mahmood, Taimoor Shah and Habibur Rehman  
American University of Sharjah, United Arab Emirates

---

PS1-3 **A Hybrid Observer for the Full-Speed-Range Sensorless Control of Interior Permanent Magnet Motor Drives** +'

Yu Li, Allan Taylor and Kevin (Hua) Bai  
Kettering University

---

PS1-4 **High Range On-line Electric Vehicles Powered by Inductive Power Transfer** ,

Stijn Wolterink and Pavol Bauer  
Delft University of Technology, Netherlands

---

PS1-5 **Flux-weakening Loop Design for EV Drive with Permanent Magnet Synchronous Motor** , )

Quanrui Hao, Diego Mascarella and Geza Joos  
McGill University, Canada

---

PS1-6 **Efficiency Comparison of Wire and Wireless Battery Charging: Based on Connection Probability Analysis** - \$

Mohammad Kabalo<sup>1</sup>, Florence Berthold<sup>1,2</sup>, Benjamin Blunier<sup>1</sup>, David Bouquain<sup>1</sup>, Sheldon Williamson<sup>2</sup> and Abdellatif Miraoui<sup>1</sup>  
<sup>1</sup>University of Technology Belfort-Montbéliard, France, <sup>2</sup>Concordia university, Canada

---

PS1-7 **Dynamic Performance Analysis of Novel Series-connected Capacitor-run Three-phase Induction Motor Fed by Single-phase Supply** - \*

Hui Zhong<sup>1</sup>, Lin Zhao<sup>2</sup> and Yuzhe Zhang<sup>2</sup>  
<sup>1</sup>Shandong University, China, <sup>2</sup>Gannon University, USA

---

PS1-8 **Interleaved SVPWM and DPWM for Dual Three-Phase Inverter-PMSM: An Automotive Application** \$&

Subhadeep Bhattacharya, Diego Mascarella and Geza Joos  
McGill University, Canada

---

PS1-9 **Variable Speed Brushless Hybrid Permanent Magnet Generator for Hybrid Electric Vehicles** \$,

Omid Beik<sup>1</sup>, Nigel Schofield<sup>1</sup> and Ahmad Al-Adsani<sup>2</sup>  
<sup>1</sup>McMaster University, Canada, <sup>2</sup>PAAET, Kuwait

---

PS1-10 **Design and Electromagnetic Analysis of a Novel 3-DOF Deflection Type Permanent Magnet Actuator** %&

Zheng Li<sup>1</sup>, Caisheng Wang<sup>2</sup>, Qingqing Lun<sup>1</sup> and Lu Zhang<sup>1</sup>  
<sup>1</sup>Hebei University of Science and Technology, China, <sup>2</sup>Wayne State University, USA

---

PS1-11 **A Novel 3-DOF Sensing Methodology for M-DOF PM Motors** &\$

Zheng Li<sup>1</sup>, Caisheng Wang<sup>2</sup>, Manjie Guo<sup>1</sup> and Jun Ma<sup>1</sup>  
<sup>1</sup>Hebei University of Science and Technology, China, <sup>2</sup>Wayne State University, USA

---

PS1-12 **Investigation of Key Factors Influencing the Response of Permanent Magnet**

**Synchronous Machines to Three-Phase Symmetrical Short-Circuit Faults** &)

Gilsu Choi and Thomas Jahns

University of Wisconsin at Madison, USA

---

PS1-13 **Average-Value Modeling of Hysteresis Current Controlled Brushless DC Motor Drives** & %

Hanling Chen and Aaron Cramer

University of Kentucky, USA

---

PS1-14 **FPGA Based D-PLL Control Technique of CLL Resonant Converter for EV Battery Chargers** & +

Asa Erdem, Colak Kerim, Bojarski Mariusz and Czarkowski Dariusz

New York University, USA

---

PS1-15 **Investigating Safety Issues Related to Electric Vehicle Wireless Charging Technology** & (

Yabiao Gao<sup>1</sup>, Kathleen Farley<sup>2</sup> and Zion Tse<sup>1</sup>

<sup>1</sup>University of Georgia, USA, <sup>2</sup>Southern Company Services, Inc., USA

---

PS1-16 **A Fuzzy Logic Approach for Fault Diagnosis and Recovery in PHEV and EV Chargers** & ( +

Weiqiang Chen, Luo Cheng Wang, Artur Ulatowski and Ali Bazzi

University of Connecticut, USA

---

PS1-17 **Design of A Wireless Charging System Used in Light-duty Electrified Automobiles** & ) &

Yongsheng Fu and Hua (Kevin) Bai

Kettering University, USA

---

PS1-18 **Current Sensor Fault-Tolerant Operation of Dual Traction Inverters using Six-Phase Current Reconstruction Technique** & ) ,

Haizhong Ye and Ali Emadi

McMaster University, Canada

---

PS1-19 **A Drive Cycle Based Electro-Thermal Analysis of Traction Inverters** & \* (

Haizhong Ye, Kai Yang, Hao Ge, Pierre Magne and Ali Emadi

McMaster University, Canada

---

PS1-20 **Power Electronic Converters for 12/8 Switched Reluctance Motor Drives: A Comparative Analysis** & + \$

Jin Ye and Ali Emadi

McMaster University, Canada

---

PS1-21 **Design Considerations for Loosely Coupled Inductive Power Transfer (IPT) System for Electric Vehicle Battery Charging - A Comprehensive Review** & + \*

Kunwar Aditya and Sheldon Williamson

Concordia University, Canada

---

PS1-22 **A Digital PWM Current Controller for Switched Reluctance Motor Drives** & , &

Fei Peng and Ali Emadi

McMaster University, Canada

---

PS1-23	<p><b>Comprehensive Review of PV/EV/Grid Integration Power Electronic Converter Topologies for DC Charging Applications</b></p> <p>Siddhartha Anirban Singh and Sheldon Williamson Concordia University, Canada</p>
PS1-24	<p><b>Analytical Design Methodology of Double Stator Switched Reluctance Machine</b></p> <p>Mengying Luo and Babak Fahimi University of Texas at Dallas, USA</p>
PS1-25	<p><b>Inductive Power Transfer System With Improved Characteristics</b></p> <p>Dionisios Voglitsis<sup>1</sup>, Georgios Tsengenes<sup>2</sup> and Pavol Bauer<sup>1</sup> <sup>1</sup>Delft University of Technology, Netherlands, <sup>2</sup>CO-WORKER Technology, Sweden</p>
PS1-26	<p><b>Robust Nonlinear Position Control of DC Motor with Friction</b></p> <p>Maha Sabra, Bashar Khasawneh and Mohamed A Zohdy Oakland University, USA</p>
PS1-27	<p><b>Optimal Microgrid Component Sizing using Mixed Integer Linear Programming</b></p> <p>Xiang Yu, Pawel Malysz, Shahin Sirouspour and Ali Emadi McMaster University, Canada</p>
PS1-28	<p><b>Theoretical analysis and experimental investigation of a high frequency bidirectional CPT system</b></p> <p>Dionisios Voglitsis, Todor Todorcevic, Venugopal Prasanth and Pavol Bauer Delft University of Technology, Netherlands</p>
PS1-29	<p><b>A Practical Approach to Inductive-Power-Transfer Systems for Transportation Applications using Boucherot Bridge Method</b></p> <p>Konrad Woronowicz and Alireza Safaee Bombardier Inc., Canada</p>
PS1-30	<p><b>Vibration Monitoring of PM Synchronous Machine with Partial Demagnetization and Inter-turn Short Circuit Faults</b></p> <p>Zhi Yang, Xiaodong Shi and Mahesh Krishnamurthy Illinois Institute of Technology, USA</p>
PS1-31	<p><b>Analysis of Stator Winding Inter-turn Short-circuit Fault in Interior and Surface Mounted Permanent Magnet Traction Machines</b></p> <p>Chunyan Lai, Aiswarya Balamurali, Vicki Bousaba, Lakshmi Varaha Iyer and Narayan Kar University of Windsor, Canada</p>
PS1-32	<p><b>A Flux-Weakening Control Approach for Interior Permanent Magnet Synchronous Motors Based on Z-Source Inverters</b></p> <p>Muyang Li, Jiangbiao He and Nabeel Demerdash Marquette University, USA</p>
PS1-33	<p><b>A Comprehensive Evaluation of SiC Devices in Traction Applications</b></p> <p>Fei Shang, Alejandro Pozo Arribas and Mahesh Krishnamurthy Illinois Institute of Technology, USA</p>

PS1-34 **Design of a Phase-Shifted ZVS Full-Bridge Front-End DC/DC Converter for Fuel Cell Inverter Applications** (\*) \*  
Ian P. Farneth, Michael B. Satinu, Haoyu Wang and Alireza Khaligh  
University of Maryland, USA

---

PS1-35 **Review and Comparison of Bi-Directional AC-DC Converters with V2G Capability for On-Board EV and HEV** (\*) &  
Behnam Koushki<sup>1</sup>, Alireza Safaei<sup>2</sup>, Praveen Jain<sup>1</sup> and Alireza Bakhshai<sup>1</sup>  
<sup>1</sup>Queens University, Canada, <sup>2</sup>Bombardier Transportation Inc., Canada

---

PS1-36 **High Bandwidth Energy Storage Devices for HEV/EV Energy Storage System** (\*) (\* ,  
Masood Shahverdi<sup>1</sup>, Michael Mazzola<sup>1</sup>, Nicolas Sockeel<sup>2</sup> and James Gafford<sup>1</sup>  
<sup>1</sup>Mississippi State University, USA, <sup>2</sup>EPF Graduate School of Engineering, France

---

## Poster Session 2: Vehicle Powertrains and Energy Storage

Tuesday, June 17<sup>th</sup>, 12 pm to 2 pm

PS2-1 **Tabu Search based Solution to the Electric Vehicle Energy Efficient Routing Problem** (\*) (+'  
Rami Abousleiman and Osamah Rawashdeh  
Oakland University, USA

---

PS2-2 **Parameters Design and Speed Control of A Solar Race Car with In-wheel Motor** (\*) (+-  
Junnian Wang, Xu Zhang and Dan Kang  
Jilin University, China

---

PS2-3 **Improved Lithium-Ion Battery Model with Hysteresis Effect** (\*) ( , )  
Rudy Tjandra<sup>1</sup>, Suguna Thanagasundram<sup>2</sup>, King Jet Tseng<sup>1</sup> and Andreas Jossen<sup>3</sup>  
<sup>1</sup>Nanyang Technological University, Singapore, <sup>2</sup>Tum Create Centre of Electromobility, Singapore, <sup>3</sup>Technische Universitat Munchen, Germany

---

PS2-4 **Review on the aging mechanisms in Li-ion batteries for electric vehicles based on the FMEA method** (\*) (- '  
Christian Schlasza<sup>1</sup>, Peter Ostertag<sup>1</sup>, Daniela Chrenko<sup>2</sup>, Reiner Kriesten<sup>3</sup> and David Bouquain<sup>4</sup>  
<sup>1</sup>Robert Bosch GmbH, Germany, <sup>2</sup>University of Burgundy, France, <sup>3</sup>University of Applied Sciences Karlsruhe, Germany, <sup>4</sup>University of Technology Belfort-Montbéliard, France

---

PS2-5 **Testing Environment for Vehicle to Grid (V2G) Applications for Investigating a Voltage Stability Support Method** (\*) (- -  
Christoph Aldejohann, Jonas Maasmann, Willi Horenkamp, Fritz Rettberg and Christian Rehtanz  
TU Dortmund University, Germany

---

PS2-6	<p><b>Fuel Cell Modeling With dSPACE And OPAL-RT Real Time Platforms</b> ( ) \$)</p> <p>Elena Breaz<sup>1</sup>, Fei Gao<sup>2</sup>, Damien Paire<sup>2</sup> and Radu Tirnovan<sup>1</sup></p> <p><sup>1</sup>Technical University of Cluj Napoca, Romania, <sup>2</sup>University of Technology of Belfort Montbeliard, France</p>
PS2-7	<p><b>Application of Dynamic Cell Resistance for Determination of State of Charge</b> ( ) %%</p> <p>Mohammad Foad Samadi, Abbas Nazri and Mehrdad Saif</p> <p>University of Windsor, Canada, Wayne State University, USA</p>
PS2-8	<p><b>Autonomy Estimation for EV based on Road Planning Software</b> ( ) %*</p> <p>Daniela Chrenko<sup>1</sup>, Alexandre Ravey<sup>2</sup>, Robin Roche<sup>2</sup> and David Bouquain<sup>2</sup></p> <p><sup>1</sup>University of Burgundy, France, <sup>2</sup>University of Technology Belfort-Montbeliard, France</p>
PS2-9	<p><b>A Hybrid Electric Vehicle with Minimal Energy Storage System</b> ( ) &amp;\$</p> <p>Masood Shahverdi, Michael Mazzola, Matthew Doude and Quintin Grice</p> <p>Mississippi State University, USA</p>
PS2-10	<p><b>Hybrid-OD Matrix based Simulation Approach to Identify E-Charging Hotspots in Transport Network</b> ( ) &amp;*</p> <p>Eiman Y. ElBanhawy<sup>1</sup>, Ruth Dalton<sup>1</sup>, Venky N, Shankar<sup>2</sup> and Karim A. Abdel Warith<sup>3</sup></p> <p><sup>1</sup>Northumbria University, United Kingdom, <sup>2</sup>The Penn State University, USA, <sup>3</sup>Purdue University, USA</p>
PS2-11	<p><b>Powertrain Energy Management for Hybrid Electric Scooter</b> ( ) ' &amp;</p> <p>Michael Guarisco, Alexandre Ravey, Beatrice Bouriot and David Bouquain</p> <p>University of Technology Belfort-Montbeliard, France</p>
PS2-12	<p><b>A Multi-tiered Real-time Pricing Algorithm for Electric Vehicle Charging Stations</b> ( ) ' *</p> <p>Qin Yan, Ilaval Manickam, Mladen Kezunovic and Le Xie</p> <p>Texas A&amp;M University, USA</p>
PS2-13	<p><b>Agent Based Modeling of E-Mobility</b> ( ) (&amp;</p> <p>Eiman ElBanhawy<sup>1</sup>, Ruth Dalton<sup>1</sup> and Chimay Anumba<sup>2</sup></p> <p><sup>1</sup>Northumbria University, United Kingdom, <sup>2</sup>Penn State University, USA</p>
PS2-14	<p><b>A Robust Integrated Starter/Alternator Drive Adopting a Synchronous Reluctance Machine for Automotive Applications</b> ( ) ( ,</p> <p>Mattia Morandin, Emanuele Fornasiero, Nicola Bianchi and Silverio Bolognani</p> <p>University of Padova, Italy</p>
PS2-15	<p><b>Comparative Study of Series-Series and Series-Parallel Topology for Long Track EV Charging Application</b> ( ) (</p> <p>Kunwar Aditya and Sheldon Williamson</p> <p>Concordia University, Canada</p>
PS2-16	<p><b>Feasibility Analysis of EV/PHEV Support for Grid-isolated Networks (International Islanding)</b> ( ) -</p> <p>Ebrahim Saeidi<sup>1</sup>, Behzad Asaei<sup>2</sup> and Sheldon Williamson<sup>1</sup></p> <p><sup>1</sup>Concordia University, Canada, <sup>2</sup>University of Tehran, Iran</p>

PS2-17	<p><b>Model Predictive Control of a Bidirectional AC-DC Converter for V2G and G2V Applications in Electric Vehicle Battery Charger</b> * (</p> <p>Md. Parvez Akter<sup>1</sup>, Saad Mekhilef<sup>1</sup>, Nadia Mei Lin Tan<sup>2</sup> and Hirofumi Akagi<sup>3</sup></p> <p><sup>1</sup>University of Malaya, Malaysia, <sup>2</sup>Universiti Tenaga Nasional, Malaysia, <sup>3</sup>Tokyo Institute of Technology, Japan</p>
PS2-18	<p><b>Efficiency Optimization for Bidirectional IPT system</b> * + \$</p> <p>Bac Xuan Nguyen<sup>1</sup>, Don Mahinda Vilathgamuwa<sup>2</sup>, Gilbert Foo<sup>1</sup>, Udaya Madawala<sup>3</sup> and Andrew Ong<sup>1</sup></p> <p><sup>1</sup>Nanyang Technological University, Singapore, <sup>2</sup>Queensland University of Technology, Australia, <sup>3</sup>University of Auckland, New Zealand</p>
PS2-19	<p><b>Comparative Study of Transformer Topologies for Distributed IPT Systems</b> * +)</p> <p>Evangelos Lanaras, Venugopal Prasanth and Pavol Bauer</p> <p>Delft University of Technology, Netherlands</p>
PS2-20	<p><b>Stochastic Optimization for Economic Operation of Plug-in Electric Vehicle Charging Stations at a Municipal Parking Deck Integrated with On-site Renewable Energy Generation</b> * ) , ' ,</p> <p>Yi Guo, Jian Hu and Wencong Su</p> <p>University of Michigan-Dearborn, USA</p>
PS2-21	<p><b>Improved Modeling of Lithium-Based Batteries using Temperature-Dependent Resistance and Overpotential</b> * ) , -</p> <p>Larry Juang, Phillip Kollmeyer, Thomas Jahns and Robert Lorenz</p> <p>University of Wisconsin-Madison, USA</p>
PS2-22	<p><b>Vehicle Charging Stations with Solar Canopy: A Realistic Case Study within a Smart Grid Environment</b> * ) - +</p> <p>Wei Tian, Yong Jiang, Mohammad Shahidehpour and Mahesh Krishnamurthy</p> <p>Illinois Institute of Technology, USA</p>
PS2-23	<p><b>Analysis of Space-Time Behavior of Electric vehicle commuter, Experience the metropolitan and inter-cities scales</b> * * \$'</p> <p>Eiman ElBanhawy</p> <p>Northumbria University, United Kingdom</p>
PS2-24	<p><b>State-of-Health based Load Sharing Strategy in Vehicle-To-Grid Systems</b> * * \$-</p> <p>Hussam Khasawneh and Mahesh Illindala</p> <p>The Ohio State University, USA</p>
PS2-25	<p><b>Loss Optimization and Ultracapacitor Pack Sizing for Vehicles with Battery/Ultracapacitor Hybrid Energy Storage</b> * * %</p> <p>Phillip Kollmeyer, Larry Juang and Thomas Jahns</p> <p>University of Wisconsin-Madison, USA</p>
PS2-26	<p><b>Anticipative Charging of Plug-in Electric Vehicles and Its Impact on the Grid</b> * * &amp;'</p> <p>Mahdi Kefayati and Ross Baldick</p> <p>The University of Texas at Austin, USA</p>

- PS2-27 **External Short Circuit Fault Diagnosis for Lithium-Ion Batteries** &-  
Bing Xia<sup>1</sup>, Chen Zheng<sup>1</sup>, Mi Chris<sup>1</sup> and Brian Robert<sup>2</sup>  
<sup>1</sup>University of Michigan-Dearborn, USA, <sup>2</sup>Ford Motor Company, USA
- 
- PS2-28 **A data-driven bias-correction based lithium-ion battery modeling approach for electric vehicles application** \*  
Gong Xianzhi, Xiong Rui and Mi Chris  
University of Michigan-Dearborn, USA
- 
- PS2-29 **A Novel LLC Resonant Converter with Semi Bridgeless Active Rectifier** ( &  
Erdem Asa, Kerim Colak, Bojarski Mariusz and Czarkowski Dariusz  
New York University, USA
- 
- PS2-30 **Testing of Smart Charging Controller for dynamic charging from solar panels** ( ,  
Bill Bakolas<sup>1</sup>, Pavol Bauer<sup>2</sup>, Dick Prins<sup>1</sup> and Michael Coussement<sup>1</sup>  
<sup>1</sup>Cohere Energy Solutions, Netherlands, <sup>2</sup>Delft University of Technology, Netherlands
- 

## Short Courses:

- S1 **Linear Motor Drives and Applications in Rapid Transit Systems** &  
Konrad Woronowicz and Alireza Safaee  
Bombardier
- 
- S2 **Introduction to Electric Machine Design for Manufacturing** +\$\$  
Dan. M. Ionel and Marius Rosu
- 
- S3 **Fundamentals of Power-train Design for All- and Hybrid-Electric Road Vehicles** +, -  
Nigel Schofield  
McMaster University, Hamilton, Ontario, Canada
- 
- S4 **Thermal Analysis of Traction Motors** , , ,  
David Staton  
Motor Design Ltd., Ellesmere, Shropshire, UK.
- 
- S5 **Inverter and Converter Design for Electromagnetic Compliance** - ) ,  
Neal Clements  
John Deere
- 

## Tutorials:

- T1 **Affordable, Fuel Efficient Hybrids Utilizing 48-Vold Systems** B#5  
Bob Storc  
Magna (Retired)
- 
- T2 **In the Loop Understanding and Using Magnetic Material Properties** %\$\$-  
Steve Constantinides  
Arnold Magnetic Technologies Corporation
- 
- T3 **Energy Management and Optimization** %\$) \*  
Ilse Cervantes  
Hybrid Systems Laboratory IPICyT (Institute for Scientific and Technological Research of San Luis Potosi)
-