

## Technical Session Program

### Day1 : Monday, 1 October

#### A1(Special Session) Vehicle Motion Control & Dynamic Charging

Monday, 1 October 10:30-12:30 Room 1 Main Hall 1F Conference Center

*Chairs* : Hiroshi Fujimoto The University of Tokyo  
Gorazd Gotovac ELAPHE PROPULSION TECHNOLOGIES LTD

#### A1-1 Design of an Multiple Adaptive Sliding Mode Controller for Improving Handling Performance of 4-In-Wheel-Motors Driven Electric Vehicle

Minseong Chae<sup>1</sup>, Kanghyun Nam<sup>2</sup>

<sup>1</sup>Yeungnam University, Graduate School of Mechanical Engineering, Korea

<sup>2</sup>Yeungnam University, School of Mechanical Engineering, Korea

#### A1-2 Ride Blending Control for Electric Vehicles

Valentin Ivanov<sup>1</sup>, Miguel Dhaens<sup>2</sup>, Vincenzo Ricciardi<sup>1</sup>, Dzmitry Savitski<sup>1</sup>, Klaus Augsburg<sup>1</sup>

<sup>1</sup>TU Ilmenau, Automotive Engineering Group, Germany

<sup>2</sup>Tenneco Automotive, Advanced Chassis Research, Belgium

#### A1-3 Lateral Motion Estimation of Preceding Target Vehicles for Overtaking Decision and Control

Zhisong Zhou<sup>1</sup>, Yafei Wang<sup>1</sup>, Jingkai Wu<sup>1</sup>, Chengliang Yin<sup>1</sup>, Jia-sheng Hu<sup>2</sup>

<sup>1</sup>Shanghai Jiao Tong University, the School of Mechanical Engineering, China

<sup>2</sup>National University of Tainan, the Department of Greenery, Taiwan

#### A1-4 Modelling techniques for designing high-performance on-road dynamic charging systems for electric vehicles

Giuseppe Guidi<sup>1</sup>, Jon Are Suul<sup>1,2</sup>

<sup>1</sup>SINTEF Energy Research, Norway

<sup>2</sup>Department of Engineering Cybernetics, Norwegian University of Science and Technology

#### A1-5 Study of 450-kW Conductive Dynamic Charging System

Takamitsu Tajima, Yoshiyuki Tani, Tsutomu Nakamura

Honda R&D Co., Ltd., Japan

#### A1-6 EV system development for large vehicles to achieve early EV promotion in the bus / truck category

Atsushi Mizukoshi<sup>1</sup>, Toshiro Matsuda<sup>2</sup>, Naoto Kashiwagi<sup>3</sup>, Shinya Miyazaki<sup>4</sup>

<sup>1</sup>PUES Corporation, Japan

<sup>2</sup>Kumamoto University, Graduate School of Science and Technology, Japan

<sup>3</sup>Automotive Energy Supply Corporation, Japan

<sup>4</sup>IZUMISHATAI Co., Ltd., Japan

#### A2(Special Session) Power Electronic Components & System Technologies

Monday, 1 October 10:30-12:30 Room 2 301 3F Conference Center

*Chairs* : Hiromichi Imai Honda R&D Co., LTD. Automotive R&D Center  
Martin Rittner Robert Bosch GmbH

#### A2-1 A Current Detection Method for Avoiding Switching Noise of Inverter.

Takeshi Kuroda

Fuji Electric Co., Ltd., Japan

#### A2-2 A Method to Design the DC Link Voltage Controller for Minimum DC Link Voltage Driving Method of Hybrid Electric Vehicles

Jongwon Heo<sup>1</sup>, Keiichiro Kondo<sup>2</sup>

<sup>1</sup>Chiba University, Graduate School and Faculty of Engineering, Japan

<sup>2</sup>Waseda University, Department of Electrical Engineering and Bioscience, Japan

### **A2-3 High efficiency chopper based EV range extender**

Ayataro Tamura , Takayuki Ishibashi , Takuro Umihara , Yukinori Tsuruta , Hidemine Obara , Atsuo Kawamura  
Division of Electrical and Computer Engineering, Yokohama National University, Japan

### **A2-4 Experimental Verification of an Energy Management Method for Fuel Cell Hybrid Electric Vehicles with EDLC**

Toshinori Kitamura , Ryosuke Ito , Nobukazu Hoshi , Noboru Katayama  
Tokyo University of Science, Japan

### **A2-5 Development of a Transmission-Mounted Power Control Unit including 12-volt DC-DC Converter for 3rd generation Two-Motor Hybrid Systems**

Toshimitsu Kobori , Ryoji Tomokage  
Honda R&D Co., Ltd. Automobile R&D Center, Japan

### **A2-6 Development of the On-Board Charger for PHVs**

Koji Taki , Jun Takagi  
TOYOTA INDUSTRIES CORPORATION, Japan

## **A3 Batteries 1**

Monday, 1 October 10:30-12:30 Room 3 401+402 4F Conference Center

*Chairs :* Keiichiro Kondoh Waseda University  
Francois Badin IFP Energies Nouvelles

### **A3-1 High Power Battery Module - Analysis and Design of a High Power Module for 48 V Applications -**

Michael Bassett<sup>1</sup>, Jonathan Hall<sup>1</sup>, Christian Vogler<sup>1</sup>, Dave Preece<sup>1</sup>, Adrian Cooper<sup>1</sup>, Martin Berger<sup>2</sup>  
<sup>1</sup> MAHLE Powertrain Limited, United Kingdom  
<sup>2</sup> MAHLE Powertrain GmbH, Germany

### **A3-2 Evolution of U.S. Department of Energy Battery Performance Targets For Electrified Vehicles**

Ehsan Islam , Ayman Moawad , Namdoo Kim , Ram Vijayagopal , Aymeric Rousseau  
Argonne National Laboratory, USA

### **A3-3 LTO battery pack application with ultrafast charging e-buses and trolleybuses – field results**

Bartek Kras , Filip Jankun  
Impact Clean Power Technology S.A., Poland

### **A3-4 Battery Sizing for Electric Vehicles based on Real Driving Pattern in Thailand**

Bongkotchaporn Duangsrikaew<sup>1</sup>, Jiravan Mongkoltanatas<sup>2</sup>, Preechar Karin<sup>2</sup>, Katsunori Hanamura<sup>3</sup>, Chi-na Benyajati<sup>2</sup>  
<sup>1</sup> Automotive Engineering, International College, King Mongkut's Institute of Technology Ladkraban, Thailand  
<sup>2</sup> MTEC, National Science and Technology Development Agency (NSTDA)  
<sup>3</sup> Department of Mechanical Engineering, Tokyo Institute of Technology, Japan

### **A3-5 Theoretical Background of Comparatively High Frequency Probing for Estimation of State of Health of Li-ion Battery**

Atsuo Hatono  
Malaysia-Japan Higher Education Program, University Kuala Lumpur, Malaysia

### **A3-6 Characterization and Concept Validation of Lithium-Ion Batteries in Automotive Applications by Load Spectrum Analysis**

Tanja Gewald<sup>1</sup>, Christoph Reiter<sup>1</sup>, Xue Lin<sup>1</sup>, Michael Baumann<sup>1</sup>, Thilo Krahl<sup>1</sup>, Alexander Hahn<sup>2</sup>, Markus Lienkamp<sup>1</sup>  
<sup>1</sup> Institute of Automotive Technology, Department of Mechanical Engineering, Technical University of Munich, Germany  
<sup>2</sup> DEE Dräxlmaier Electric and Electronic Systems GmbH

## A4 Heavy-duty Vehicles 1

Monday, 1 October 10:30-12:30 Room 4 403 4F Conference Center

*Chair* : Omar Hegazy Vrije Universiteit Brussel (VUB)

### A4-1 How to Build a Bus Battery Case

Peter Geuting<sup>1</sup>, Daniel Fuss<sup>2</sup>, Hannes Holey<sup>1</sup>, Alexander Betz<sup>1</sup>, Axel Richter<sup>3</sup>, Christian Gloeggler<sup>1</sup>

<sup>1</sup> Daimler AG, Germany

<sup>2</sup> EDAG Engineering GmbH, Germany

<sup>3</sup> EvoBus GmbH, Germany

### A4-2 Jaworzno: achieving first 250 000 km in regular e-bus operation: challenges and the future

Adam Piotrowski<sup>4</sup>, Zbigniew Nosal<sup>2</sup>, Michał Pikuła<sup>1,5</sup>, Michał Sierszyński<sup>1</sup>, Franciszek Sidorski<sup>1,3</sup>

<sup>1</sup> Solaris Bus & Coach S.A., Research Development Department, Poland

<sup>2</sup> Przedsiębiorstwo Komunikacji Miejskiej Spółka z o.o., Poland

<sup>3</sup> Poznan University of Technology, Institute of electrical power engineering

<sup>4</sup> freelance researcher

<sup>5</sup> AGH University of Science and Technology

### A4-3 Integrated TCO Assessment of Bus Network Electrification Considering Rescheduling and Delays – Modelling Framework and Case Study –

Dominic Jefferies, Dietmar Göhlich

Technical University Berlin, Department of Methods for Product Development and Mechatronics, Germany

### A4-4 From a vision to the series production Solaris experience in e-mobility

Michał Pikuła<sup>1,2</sup>, Michał Sierszyński<sup>1</sup>, Adam Piotrowski<sup>4</sup>, Franciszek Sidorski<sup>1,3</sup>

<sup>1</sup> Solaris Bus & Coach S.A., Bus Development, Poland

<sup>2</sup> AGH University of Science and Technology

<sup>3</sup> Poznan University of Technology

<sup>4</sup> freelance researcher

### A4-5 On the energy comparison of conventional and alternative propulsion buses

Carlo Villante, Michele Anatone, Angelo De Vita

University of L'Aquila, Italy

## A5 Batteries 2

Monday, 1 October 10:30-12:30 Room 5 501 5F Conference Center

*Chair* : Shun Egusa Toshiba Infrastructure Systems & Solution Corporation

### A5-1 Internal preheat method for NMC batteries at cold climate conditions

Theodoros Kalogiannis<sup>1,2</sup>, Joris Jaguemont<sup>1,2</sup>, Noshin Omar<sup>1,2</sup>, Joeri Van Mierlo<sup>1,2</sup>, Peter Van Den Bossche<sup>1,2</sup>

<sup>1</sup> ETEC Department & MOBI Research Group, Vrije Universiteit Brussel (VUB), Belgium

<sup>2</sup> Flanders Make, Belgium

### A5-2 Lithium-Lithium BIND Battery: Innovative Hybrid Lithium-Ion Battery with High Energy Density and High Rate Capability

Tomohiko Matoba, Diwaker Bandanwal, Naoyoshi Kachi, Kazunari Kobayashi, Hajime Konishi, Hisashi Tsukamoto

CONNEX SYSTEMS Corporation, Japan

### A5-3 Experimental investigation of reaction rates during electrodeposition in Li-Sulfur battery

Shovon Goutam<sup>1,3</sup>, Izaro Laresgoiti<sup>4</sup>, Elixabete Ayerbe<sup>4</sup>, Noshin Omar<sup>1,3</sup>, Peter Van den Bossche<sup>1,2,3</sup>, Joeri Van Mierlo<sup>1,3</sup>

<sup>1</sup> Mobility Logistic and Automotive Technology Research Group (MOBI), Department of Electrical Engineering and Energy Technology (ETEC), Vrije Universiteit Brussel, Belgium

<sup>2</sup> Department of Industrial Engineering (INDI), Vrije Universiteit Brussel, Belgium

<sup>3</sup> Flanders Make, Belgium

<sup>4</sup> Materials for Energy Unit, CIDETEC Storage, Spain

**A5-4 12V BIND Battery: Simple and Effective Hybrid Battery Technology for Advanced Idling Reduction System**

Naoyoshi Kachi , Diwaker Bandanwal , Tomohiko Matoba , Hisashi Tsukamoto  
CONNEXX SYSTEMS Corporation, Japan

**A5-5 Simulation of Lithium Plating Due to Spatial Inhomogeneous Separator Strain in Lithium-Ion-Cells**

Fabian Ebert<sup>1,2</sup>, Andreas Oberbauer<sup>2</sup>, Maria Angeles Cabañero<sup>1</sup>, Gerhard SEXTL<sup>1</sup>, Markus Lienkamp<sup>2</sup>  
<sup>1</sup>Fraunhofer Institute for Silicate Research ISC, Germany  
<sup>2</sup>Institute of Automotive Technology, Technical University of Munich TUM, Germany

**A5-6 Research about influence of SOC on natural frequency of pouch cells**

Ruihe Li , Zhichao Hou , Languang Lu , Peibao Wu  
State Key Laboratory of Automotive Safety and Energy, Tsinghua University, China

**A6 V2X (V2G & V2H) 1**

Monday, 1 October 10:30-12:30 Room 6 502 5F Conference Center

*Chairs* : Tatsuya Hosotani Murata Manufacturing Co., Ltd.  
Laurent De Vroey ENGIE

**A6-1 Common Information Models for standardized distributed interoperable EV services**

Evangelia Portouli , Theodoros Theodoropoulos , Christina Anagnostopoulou , Angelos Amditis  
Institute of Communication & Computer Systems (ICCS), SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING OF NTUA, Greece

**A6-2 Suitability of Commercial V2G CHAdEMO Chargers for Grid Services V2G hardware tests with local and remote control setup: assessing the performance for quality grid services**

Antonio Zecchino , Andreas Thingvad , Peter Bach Andersen , Mattia Marinelli  
Center for Electric Power and Energy, Department of Electrical Engineering, Technical University of Denmark

**A6-3 Influence of V2G Frequency Services and Driving on Electric Vehicles Battery Degradation in the Nordic Countries**

Andreas Thingvad , Mattia Marinelli  
Center for Electric Power and Energy, Department of Electrical Engineering, DTU - Technical University of Denmark

**A6-4 Cross-brand validation of grid services using V2G-enabled vehicles in the Parker project**

Peter Bach Andersen<sup>1</sup>, Seyedmostafa Hashemi<sup>1</sup>, Tiago Sousa<sup>1</sup>, Thomas Meier Soerensen<sup>1</sup>, Lance Noel<sup>2</sup>, Bjoern Christensen<sup>3</sup>

<sup>1</sup> Department of Electrical Engineering, Technical University of Denmark

<sup>2</sup> Center for Energy Technologies, Department of Business Development and Technology, Aarhus University, Denmark

<sup>3</sup> Nuvve Corp, San Diego, USA

**A6-5 The Business Case of Vehicle-to-Grid (V2G) Charging within the current Dutch Frequency Containment Reserve Market**

Tim van Beek<sup>1</sup>, Sjoerd Moorman<sup>1</sup>, Kostas Andriopoulos<sup>2</sup>

<sup>1</sup> EVConsult, The Netherlands

<sup>2</sup> ESCP Europe Business School, UK

**A6-6 Comparison of the contribution of smart charging, V2G and energy demand reduction to the energy autonomy of a Belgian city depot**

Bram Rotthier , Bavo Derijcke , Rien Leenders , Nikolaas Van den Steen , Bart Huyck , Jan Cappelle  
KU Leuven technology campus Ghent, Belgium

**B1(Special Session) In-Wheel/Integrated Motor Technologies**

Monday, 1 October 13:20-15:20 Room 1 Main Hall 1F Conference Center

*Chairs* : Takashi Majima IHI Inspection & Instrumentation Co., Ltd.  
Valentin Ivanov TU Ilmenau

**B1-1 Development of Second Generation Wireless In-Wheel Motor with Dynamic Wireless Power Transfer**

Hiroshi Fujimoto<sup>1</sup>, Takuma Takeuchi<sup>1</sup>, Kensuke Hanajiri<sup>1</sup>, Katsuhiro Hata<sup>1</sup>, Takehiro Imura<sup>1</sup>, Motoki Sato<sup>2</sup>, Daisuke Gunji<sup>3</sup>, Giuseppe Guidi<sup>4</sup>

<sup>1</sup>The University of Tokyo, Japan

<sup>2</sup>Toyo Denki Seizo K.K.

<sup>3</sup>NSK Ltd.

<sup>4</sup>SINTEF Energy Research, Norway

**B1-2 In-wheel powertrain functions for the autonomous and connected future - Advanced powertrain functionalities enabling new possibilities for the future of mobility -**

Blaž Modic, Urška Skrt, Tomaž Motaln, Gorazd Lampič, Gorazd Gotovac

Elaphe Propulsion Technologies

**B1-3 Shock-less Shift Control Method of Wheel Hub Motor with two-speed transmission**

Takahiro Sushi, Ryuho Morita, Shin Yamamoto, Mitsuru Oike

NSK Ltd., Japan

**B1-4 Development of a High Performance & High Power Density Inverter Integrated Motor Unit**

Hiroaki Kakej, Yoshinori Nakano, Junichi Aoki, Tadashi Ashikaga

MEIDENSHA CORPORATION, Japan

**B1-5 Integrated driveline electrification with and without transmissions**

Rafel Pascual de la Cruz<sup>1</sup>, Bernd Vahlensieck<sup>2</sup>

<sup>1</sup>ZF Japan Co., Ltd., Japan

<sup>2</sup>ZF Friedrichshafen AG, Germany

**B1-6 Newly Developed Motor Cooling Method using Refrigerant**

Hidemasa Fujita, Atsushi Itoh, Tohru Urano

Mitsubishi Motors Corporation, Japan

**B2(Special Session) Power Electronic Packages & Modules**

Monday, 1 October 13:20-15:20 Room 2 301 3F Conference Center

*Chairs* : Michiaki Hiyoshi Hyundai Motor Japan R&D Center, Inc.  
Jochen Langheim EURIPIDES

**B2-1 High temperature operation of semi-conductor die attach by sintering of Ag3Sn material - Synthesis of submicron Ag3Sn particles by polyol chemistry as a new sintering material -**

Jean-Michel Morelle<sup>1</sup>, Ky Lim Tan<sup>1</sup>, Roland Mahayri<sup>2</sup>, Frédéric Schoenstein<sup>2</sup>, Noureddine Jouini<sup>2</sup>

<sup>1</sup>Valeo Group Electronics Expertise & Development Services, France

<sup>2</sup>LSPM, CNRS, France

**B2-2 Development of TLP-Ai Technology to Reduce the Thermal Stress and Thermal Resistance of Power Modules**

Rintaro Asai<sup>1</sup>, Hirofumi Ito<sup>2</sup>, Masanori Usui<sup>2</sup>, Masaki Aoshima<sup>1</sup>

<sup>1</sup>Toyota Motor Corporation, Japan

<sup>2</sup>TOYOTA CENTRAL R&D LABS., INC, Japan

**B2-3 High-power-density DC/DC Converter using a Novel Coupled Inductor to Reduce the Leakage Fluxes for New Model Plug-in Hybrid Vehicle**

Akitomo Komatsuzaki<sup>1</sup>, Satoshi Hashino<sup>2</sup>

<sup>1</sup> Honda R&D Co., Ltd., Japan

<sup>2</sup> Keihin Corporation,

**B2-4 The high capacity power module with optimal package technology**

Shoji Saito, Seiichiro Inokuchi, Shinji Hatae

Mitsubishi Electric Corporation, Japan

**B2-5 Scalable Si IGBT power module solution for growing xEV market**

Kenji Kawada

Infineon Technologies Japan KK

**B2-6 Automotive Qualification Routines for Power Electronics' Modules in Electrified Powertrains - The New ECPE Working Group 'AQG 324' Started Its Work -**

Martin Rittner<sup>1</sup>, Markus Thoben<sup>2</sup>, Peter Dietrich<sup>3</sup>, Frank Heidemann<sup>4</sup>

<sup>1</sup> Robert Bosch GmbH, Germany

<sup>2</sup> Infineon Technologies AG, Germany

<sup>3</sup> Heraeus Deutschland GmbH & Co. KG, Germany

<sup>4</sup> SET GmbH, Germany

**B3 Electric Powertrain**

Monday, 1 October 13:20-15:20 Room 3 401+402 4F Conference Center

*Chair* : Yasuhiko Kitajima Calsonic Kansei Corp.

**B3-1 Analysis of design-relevant parameters of shiftable gearboxes in electric drive systems**

Katharina Bause, Sascha Ott

IPEK - Institute of Product Engineering

**B3-2 A Low-Cost Hardware-in-the-Loop Test Bench for Powertrain of Extended-Range Electric Vehicle**

Guangqian Du<sup>1</sup>, Xinrui Yu<sup>2</sup>, Hongyu Rao<sup>2</sup>, Zhixian Fan<sup>3</sup>, Haiming Xie<sup>1</sup>, Guangyu Tian<sup>1</sup>

<sup>1</sup> State Key Laboratory of Automotive Safety and Energy, Tsinghua University, China

<sup>2</sup> Commercial Vehicle Technology Center, Shanghai Automotive Industry Corporation (SAIC), China

<sup>3</sup> Zhongtong Bus Holding Co., Ltd., China

**B3-3 Experimental Verification of Man-Machine Interface Based on Electric Power Steering Control for Advanced Driver Assistance System**

Ryo Minaki

ADTech Corporation

**B3-4 Definition of Requirements for a New Vehicle Concept for Sub-Saharan Africa – Load Collectives for Battery and Electric Motor**

Sascha Koberstaedt, Svenja Kalt, Laura Fürst, Xue Lin, Markus Lienkamp

Technical University of Munich Institute of Automotive Technology

**B3-5 Power sharing and shifting stability control for a dual input electric vehicle transmission system**

Haiqing Wang, Hanfei Wu, Jiejunyi Liang, Nong Zhang, Paul Walker, Jinchen Ji

University of Technology Sydney, Australia

**B4 Heavy-duty Vehicles 2**

Monday, 1 October 13:20-15:20 Room 4 403 4F Conference Center

*Chair* : Carlo Villante UNIVERSITY OF L'AQUILA**B4-1 Towards new challenges for the modern public transport - development of manoeuvre supporting systems for the e-buses**Bartosz Patkowski<sup>1</sup>, Adam Piotrowski<sup>3</sup>, Michał Piikuła<sup>1,2</sup>, Michał Sierszyński<sup>1</sup><sup>1</sup>Solaris Bus & Coach S.A., Research Development Department, Poland<sup>2</sup>AGH University of Science and Technology, Poland<sup>3</sup>freelance researcher**B4-2 A Two-Dimensional Perspective on the Virtualization of Validation for Electrified Powertrain Generations**Nadim Dudin<sup>1</sup>, Sascha Ott<sup>1</sup>, Albert Albers<sup>1</sup>, Rainer Misch<sup>2</sup>, Andreas Oberting<sup>2</sup><sup>1</sup>IPEK - Institute of Product Engineering<sup>2</sup>AUDI AG**B4-3 Modeling and Co-design Optimization for Heavy Duty Trucks**Dai-Duong Tran<sup>1,2</sup>, Omar Hegazy<sup>1,2</sup>, Joeri Van Mierlo<sup>1,2</sup>, Rafael Smijntink<sup>3</sup>, Jonas Hellgren<sup>3</sup>, Olof Lindgarde<sup>3</sup>, Thinh Pham<sup>4</sup>, Steven Wilkins<sup>4</sup><sup>1</sup>Vrije Universiteit Brussel, Belgium<sup>2</sup>Flanders Make, Belgium<sup>3</sup>Volvo, GTT, Adv. Powertrain Engineering, Control System, CTP-C, Sweden<sup>4</sup>TNO Powertrains, The Netherlands**B4-4 Economics of electric vehicles for city logistics**Tariq van Rooijen, Hans Quak

TNO

**B4-5 Evaluation of the state-of-the-art of full-electric medium and heavy-duty trucks**Franciscus J.R. Verbruggen, Auke Hoekstra, Theo Hofman

Eindhoven University of Technology, The Netherlands

**B4-6 Co-design Optimization Framework for Electrified Buses in Cities: Brussels Case Study**Omar Hegazy<sup>1,2</sup>, Mohamed El Baghdadi<sup>1,2</sup>, Thierry Coosemans<sup>1,2</sup>, Joeri Van Mierlo<sup>1,2</sup><sup>1</sup>Vrije Universiteit Brussel, Belgium<sup>2</sup>Flanders Make, Belgium**B5 Batteries 3**

Monday, 1 October 13:20-15:20 Room 5 501 5F Conference Center

*Chairs* : Yanagida Masahiro National Institute of Advanced Industrial Science and Technology (AIST)

Joeri Van Mierlo MOBI

**B5-1 Li-ion battery market for specialty EVs 2018-2028 - Niche markets need custom electrode chemistries -**Lorenzo Grande<sup>1</sup>, Franco Gonzalez<sup>2</sup>, Luke Gear<sup>2</sup><sup>1</sup>IDTechEx GmbH, Germany<sup>2</sup>IDTechEx Ltd., UK**B5-2 In-situ and operando Scanning Probe Facility for the study of redox processes on nanometer scale in Lithium Ion batteries - First measurement results for in situ and operando characterisation of Lithium Ion Batteries by AFM techniques -**Walter Legerstee<sup>1</sup>, Erik Kelder<sup>2</sup><sup>1</sup>Rotterdam University of Applied Sciences, The Netherlands<sup>2</sup>JTechnical University Delft, Reactor Institute Delft, Storage of electrical energy, The Netherlands

**B5-3 Automated evaluation of battery materials for more efficient and effective battery development**

Ruben Leithoff, Kai Bockwinkel, Bastian Thiede, Franz Dietrich, Sebastian Thiede, Klaus Dröder, Christoph Herrmann  
Technical University Braunschweig

**B5-4 Phase Transition Analysis of LiFePO<sub>4</sub> by Using Time-Resolved X-ray Diffraction and Improvement of Rate Capability**

Yoshiharu Uchimoto<sup>1</sup>

<sup>1</sup> Kyoto University, Japan

<sup>2</sup> Ritsumeikan University

**B5-5 Charge Compensation Mechanism of Anion Redox for Lithium-Excess Cathode materials**

Hiroyuki Nakaki<sup>1</sup>, Yoshiharu Uchimoto<sup>1</sup>, Kentaro Yamamoto<sup>1</sup>, Naoaki Yabuuchi<sup>2</sup>, Koji Nakanishi<sup>3</sup>

<sup>1</sup> Kyoto University, Japan

<sup>2</sup> Tokyo Denki University

<sup>3</sup> Ritsumeikan University

**B5-6 Assessment of battery cell assembly through non-invasive cell characterization using X-ray computer tomography**

Artem Turetskyi<sup>1,2</sup>, Ruben Leithoff<sup>1,2</sup>, Wenhao Xu<sup>2</sup>, Sebastian Thiede<sup>1,2</sup>, Franz Dietrich<sup>1,2</sup>, Klaus Dröeder<sup>1,2</sup>, Christoph Herrmann<sup>1,2</sup>

<sup>1</sup> Battery LabFactory Braunschweig (BLB), Technische Universität Braunschweig

<sup>2</sup> Institute of Machine Tools and Production Technology, Technische Universität Braunschweig

**B6 V2X (V2G & V2H) 2**

Monday, 1 October 13:20-15:20 Room 6 502 5F Conference Center

*Chairs* : Yukio Yokoi (Ret) Kyoto University RISH

Peter Bach Andersen Danmarks Tekniske Universitet

**B6-1 Providing V2X services using ISO 15118 - EV equipped with on-board bidirectional charger -**

Thomas Dreumont, Sébastien Gouraud, Arnaud Szewczyk

Groupe Renault, France

**B6-2 A Study on Suppression Method of System Oscillation by Output Variation of Solar Power Generation at V2H**

Masayoshi Hamanaka, Kazuto Yukita, Toshiro Matsumura, Yasuyuki Goto

Aichi Institute of Technology, Japan

**B6-3 Economic Implications of Lithium Ion Battery Degradation for Vehicle-to-Grid (V2X) Services**

Andrew W. Thompson<sup>1,2</sup>

<sup>1</sup> Institut VEDECOM

<sup>2</sup> University of Paris SUD

**B6-4 Smart Grid Integration of Electric Buses: Implementation of a Uni- and Bidirectional Charging Infrastructure**

Enrico Lauth<sup>1</sup>, Andreas F. Raab<sup>2</sup>, Peter Teske<sup>2</sup>, Dietmar Göhlich<sup>1</sup>, Kai Strunz<sup>2</sup>

<sup>1</sup> Department of Methods for Product Development and Mechatronics (MPM), Technical University Berlin, Germany

<sup>2</sup> Department of Sustainable Electric Networks and Sources of Energy (SENSE), Technical University Berlin, Germany

**B6-5 B2B EV smart charging: Results of a three-years experience to optimize EV charging on company sites**

Laurent De Vroey, Pierre Moench, Raphaël Gehrenbeck, Eloi Le Bastart de Villeneuve, Youssef Oualmakran

ENGIE



**B7 EV Market Development around the Globe**

Monday, 1 October 13:20-15:20 Room 7 504+505 5F Conference Center

*Chairs* : Kazuhiro Sakuma Tokyo University of Agriculture & Technology  
Angkee Sripakagorn Chulalongkorn University

- B7-1 Mapping the road to 2035 - Technology requirements for future vehicles -**  
Jon Beasley , Jon Regnart  
Advanced Propulsion Centre, UK
- B7-2 A New Decentralized Control of EVs For Load Frequency Control Retaining EV users' Convenience**  
Nozomu Magome , Shigeru Tamura  
Meiji University, Japan
- B7-3 Low Emission Vehicles Contestable Fund - Supporting Electric Vehicle Innovation in New Zealand -**  
Elizabeth Yeaman , Clem Arlidge , Paul Bull  
Energy Efficiency and Conservation Authority, New Zealand
- B7-4 Novel Approach for Determining a Sufficient Hydrogen Refueling Station Network**  
Jörn Hartmann , Fabian Gröger  
Reiner Lemoine Institut gGmbH, Germany
- B7-5 Impacts of Mileage Accumulation and Fast Charging on EV Range and Energy Usage - Part 3 -**  
Aaron Loiselle-Lapointe<sup>1</sup>, Samuel Pedroso<sup>2</sup>, Michele De Gennaro<sup>3</sup>, Elena Paffumi<sup>3</sup>, Martha Christenson<sup>2</sup>, Mike Safoutin<sup>4</sup>  
<sup>1</sup> Environment and Climate Change Canada  
<sup>2</sup> Transport Canada  
<sup>3</sup> European Commission - Joint Research Centre  
<sup>4</sup> U.S. Environmental Protection Agency
- B7-6 EV Accelerator Cities Leading the Charge in the U.S. Developing and Scaling a National Model**  
Ben Prochazka  
Electrification Coalition, United States of America

**Day2 : Tuesday, 2 October**

**C1 Wireless Power Transfer 1**

Tuesday, 2 October 10:30-12:30 Room 1 Main Hall 1F Conference Center

*Chairs* : Takehiro Imura The University of Tokyo  
Kai Song Harbin Institute of Technology

- C1-1 Analysis of Circuit for Dynamic Wireless Power Transfer by Stepping Stone System**  
Hiroshi Uno<sup>1</sup>, Jun Yamada<sup>1</sup>, Yasuyoshi Kaneko<sup>1</sup>, Toshiyuki Fujita<sup>2</sup>, Hiroyuki Kishi<sup>2</sup>  
<sup>1</sup> Saitama University, Japan  
<sup>2</sup> Technova Inc.
- C1-2 Dynamic Contactless Power Transfer System using PS Topology Considering Mutual Coupling of Transmitter Coils**  
Jun Yamada , Yoshiki Shiozawa , Yasuyoshi Kaneko  
Saitama University, Japan
- C1-3 Weight Reduction and High Efficiency of Wireless Power Transmission Coil using Magnetocoated Aluminum Plate**  
Shun Endo , Yinggang Bu , Tsutomu Mizuno  
Shinshu University, Japan

**C1-4 Efficiency Improvement for Multi-Position of Receiver in 13.56 MHz Wireless Power Transfer Coupling System**

Nguyen Tri Cuong, Kan Akatsu  
Shibaura Institute of Technology, Japan

**C1-5 Snubber-less Zero Voltage Soft-Switching Resonant Converter for Inductive Power Transfer featuring GaN-HFET**

Tomokazu Mishima, Tatsuya Kido  
Kobe University, Japan

**C1-6 Electric safety challenges with a conductive Electric Road System - Chassis potential modeling and measurement -**

Francisco J. Márquez-Fernández<sup>1</sup>, Sönke Schuch<sup>2</sup>, Lars Lindgren<sup>1</sup>, Mats Alaküla<sup>1</sup>  
<sup>1</sup>Lund University  
<sup>2</sup>RWTH Aachen University

**C2(Special Session) Advanced Components for Electric Machines**

Tuesday, 2 October 10:30-12:30 Room 2 301 3F Conference Center

*Chairs* : Akira Chiba Tokyo Institute of Technology  
Xuhui Wen Institute of Electrical Engineering, Chinese Academy of Sciences

**C2-1 Development of High Voltage Insulation for the Driving Motor in Electric Vehicles**

Shingo Nagai<sup>1</sup>, Keiichi Kaneshige<sup>1</sup>, Keiji Takizawa<sup>1</sup>, Toru Wakimoto<sup>2</sup>, Masahito Shirahase<sup>2</sup>  
<sup>1</sup>TOYOTA MOTOR CORPORATION, Japan  
<sup>2</sup>SOKEN, Japan

**C2-2 Electrical steels and their evaluation for automobile motors**

Kunihiro Senda, Masanori Uesaka, Soichiro Yoshizaki, Yoshihiko Oda  
JFE Steel Corporation

**C2-3 Study of High-speed SRM with Amorphous steel sheet for EV**

Takeo Tomioka, Kohei Aiso, Kan Akatsu  
Shibaura Institute of Technology

**C2-4 Research on Motor with Nanocrystalline Soft Magnetic Alloy Stator Cores - Achieving both high torque density and low iron loss -**

Tuyoshi Nonaka<sup>1</sup>, Shogo Makino<sup>1</sup>, Shingo Zeze<sup>1</sup>, Motomichi Ohto<sup>2</sup>  
<sup>1</sup>YASKAWA ELECTRIC CORPORATION, Japan  
<sup>2</sup>YASKAWA MOTOR CORPORATION, Japan

**C2-5 Motor Control Technologies for Improving the Driving Performance of Electric Vehicles**

Jun Motosugi<sup>1</sup>, Sho Ohno<sup>1</sup>, Akira Sawada<sup>1</sup>, Kengo Fujiwara<sup>2</sup>  
<sup>1</sup>Nissan Motor Co., Ltd., Japan  
<sup>2</sup>Nissan Motor Co., Ltd., Japan

**C2-6 Position Sensorless Control for Wound-Field Synchronous Motor with Double Three-phase Wound Stator Using New EEMF Model**

Koji Imai<sup>1</sup>, Shinji Doki<sup>1</sup>, Kiyoshi Fujii<sup>2</sup>, Sukhawa Jung<sup>2</sup>  
<sup>1</sup>Nagoya University  
<sup>2</sup>DENSO CORPORATION

**C3 Energy Storage Systems 1**

Tuesday, 2 October 10:30-12:30 Room 3 401+402 4F Conference Center

*Chairs :* Tetsuya Takahashi HIOKI E. E. CORPORATION  
Peter Van den Bossche Vrije Universiteit Brussel

**C3-1 The impact of the vehicle-to-grid strategy on lithium-ion battery ageing process**

Yi Li<sup>1,2</sup>, Maarten Messagie<sup>1,2</sup>, Maitane Berecibar<sup>1,2</sup>, Omar Hegazy<sup>1,2</sup>, Mohamed Abdel-Monem<sup>1,2</sup>,  
Noshin Omar<sup>1,2</sup>, Laurent De Vroey<sup>3</sup>, Joeri Van Mierlo<sup>1,2</sup>

<sup>1</sup> Vrije Universiteit Brussel

<sup>2</sup> Flanders Make

<sup>3</sup> ENGIE Electrabel

**C3-2 Basic Research about Cooling Technology for Sealed-Type Battery Pack**

Yoshimitsu Inoue, Kohei Yamaguchi

Denso Corporation

**C3-3 Optimal Cooling Solution for High-Power Automotive Battery Module - Design Optimization Using Finite Element Analysis and Computational Fluid Dynamics -**

Ziyi Wu<sup>1,2</sup>, Albert T. Haugg<sup>3</sup>, Hans Kemper<sup>1</sup>, Stefan Pischinger<sup>2</sup>

<sup>1</sup> FH Aachen, University of Applied Sciences Aachen, Germany

<sup>2</sup> RWTH Aachen University, Germany

<sup>3</sup> AKG Thermotechnik International GmbH & Co. KG, Germany

**C3-4 Evaluation of a validation process for a battery cooling system - direct cooling of cylindrical battery cells -**

Martin Eisele<sup>1</sup>, Daniel Werner<sup>2</sup>, Sascha Ott<sup>1</sup>

<sup>1</sup> IPEK - Institute of Product Engineering at Karlsruhe Institute of Technology (KIT)

<sup>2</sup> SHARE am KIT, Schaeffler Technologies AG & Co. KG

**C3-5 The market survey for the lithium-ion battery production in Indian climate of high temperature and humidity.**

Kazuo Chiba<sup>1</sup>, Tatsuji Numata<sup>2</sup>

<sup>1</sup> itsEV.inc., Japan

<sup>2</sup> Tohoku University, New Industry Creation Hatchery Center, Japan

**C3-6 State of Health Battery Algorithm for Real Applications**

Maitane Berecibar<sup>1,2</sup>, Igor Villarreal<sup>3</sup>, Noshin Omar<sup>1,2</sup>, Thierry Coosemans<sup>1,2</sup>, Joeri Van Mierlo<sup>1,2</sup>,  
Maarten Messagie<sup>1,2</sup>

<sup>1</sup> Vrije Universiteit Brussel

<sup>2</sup> Flanders Make, Belgium

<sup>3</sup> IK4-Ikerlan, Spain

**C4 Marketing & Car Sharing 1**

Tuesday, 2 October 10:30-12:30 Room 4 403 4F Conference Center

*Chairs :* Kazuhiko Matsunami Suzuki Motor Corporation  
Alan Jenn University of California, Davis

**C4-1 Keys to Electric Vehicle Market Growth in the U.S.**

Peter Slowik, Nicholas Lutsey

International Council on Clean Transportation

**C4-2 Company Cars as a Channel for Electrification of the Passenger Car Market**

Mats Williander, Ann-Charlotte Mellquist, Johan Wedlin, Camilla Stålstad

RISE Viktoria, Sweden

**C4-3 Using Citizen Science to Promote Electric Vehicle Uptake in New Zealand**

Donald Love<sup>1</sup>, Henrik Moller<sup>2</sup>, Dima Ivanov<sup>3</sup>, Daniel Myall<sup>4</sup>

<sup>1</sup> ResolveWare Ltd., New Zealand

<sup>2</sup> Centre for Sustainability, University of Otago, New Zealand

<sup>3</sup> PowerStats Ltd., New Zealand

<sup>4</sup> Zeno Networks Ltd., New Zealand

#### **C4-4 Promoting Electric Vehicles to New Zealanders - A Success Story!**

Dee West, Shawn Moodie, Eva Hakansson  
ChargeNet NZ, Ltd.

#### **C4-5 Method for prediction of Utilization Rate of Electric Vehicle Free-Floating Car Sharing Services using Data Mining**

Cristofer Englund<sup>1</sup>, Henrik Engdahl<sup>2</sup>, Shiva Habibi<sup>3</sup>, Stefan Pettersson<sup>1</sup>, Frances Sprei<sup>3</sup>, Alexey Voronov<sup>1</sup>, Johan Wedlin<sup>1</sup>

<sup>1</sup>RISE Viktoria, Sweden

<sup>2</sup>Nimling AB, Sweden

<sup>3</sup>Chalmers University of Technology, Sweden

#### **C4-6 Consumer EV Education Lessons Learned - A Pacific Northwest approach to E-Mobility -**

Zachary Henkin, Anne Ramzy  
Deputy Director at Forth

### **C5(Special Session) Wide Band Gap Devices & Related Issues**

Tuesday, 2 October 10:30-12:30 Room 5 501 5F Conference Center

*Chairs* : Kazuhiro Tsuruta DENSO CORPORATION  
Jean-Michel Morelle VALEO

#### **C5-1 Carrier lifetime measurements for wide gap semiconductors SiC and GaN**

Masashi Kato<sup>1,2</sup>

<sup>1</sup>Nagoya Institute of Technology, Japan

<sup>2</sup>Nagoya University, Japan

#### **C5-2 Electroluminescence in Power Electronic Applications: Utilization of p-n Junctions in Power Semiconductors as unintentional Light Emitting Diodes for Current and Temperature Sensing**

Jonathan Winkler<sup>1</sup>, Jan Homoth<sup>1</sup>, Ingmar Kallfass<sup>2</sup>

<sup>1</sup>Robert Bosch GmbH, Germany

<sup>2</sup>University of Stuttgart, Germany

#### **C5-3 Silicon Carbide Inverter for EV/HEV Application featuring Open-loop Drive Circuit Technology for Low Switching Loss and Surge Voltage Reduction**

Taku Shimomura<sup>1</sup>, Keiichiro Numakura<sup>1</sup>, Daiki Sato<sup>2</sup>, Tetsuya Hayashi<sup>1</sup>

<sup>1</sup>EV System Laboratory, Research Division, Nissan Motor Co., Ltd

<sup>2</sup>Powertrain and EV Engineering Division, Nissan Motor Co., Ltd

#### **C5-4 Analysis of the trade-off between performance and reliability of a SiC power module in electric drivetrain applications**

Laurent Beaufrenaut<sup>1</sup>, Thomas Aichinger<sup>2</sup>, Christian Schweikert<sup>1</sup>, Christian Strenger<sup>1</sup>

<sup>1</sup>Infineon Technologies AG, Germany

<sup>2</sup>Infineon Technologies AG, Austria

#### **C5-5 Power Module Concepts for Innovative Reliable Nitride based Power Devices and Applications - The EU Public Funded Project 'InRel-NPower' -**

Martin Rittner<sup>1</sup>, Ulrich Kessler<sup>1</sup>, Samuel Araujo<sup>1</sup>, Sebastian Mansfeld<sup>1</sup>, Jörg Naundorf<sup>2</sup>, Kai Kriegel<sup>2</sup>, Martin Schulz<sup>2</sup>, Hideto Miyake<sup>3</sup>, Yoshihiro Kangawa<sup>4</sup>, Gaudenzio Meneghesso<sup>5</sup>

<sup>1</sup>Robert Bosch GmbH, Germany

<sup>2</sup>Siemens AG, Germany

<sup>3</sup>University of Mie, Japan

<sup>4</sup>University of Kyushu, Japan

<sup>5</sup>University of Padova, Italy

#### **C5-6 SiC Power Components - Key Enabler for the Market Evolution of Greener Driving -**

Manuel Gärtner<sup>1</sup>, Michael Anfang<sup>1</sup>, Maurizio Ferrara<sup>2</sup>, Edoardo Merli<sup>2</sup>, Mario Saggio<sup>2</sup>, Michele Macaudo<sup>2</sup>

<sup>1</sup>STMicroelectronics, Munich, Germany

<sup>2</sup>STMicroelectronics, Catania, Italy

**C6 EV Charging Infrastructure 1**

Tuesday, 2 October 10:30-12:30 Room 6 502 5F Conference Center

*Chairs* : Tomohiko Ikeya Central Research Institute of Electric Power Industry  
Lieselot Vanhaverbeke VRIJE UNIVERSITEIT BRUSSEL

**C6-1 Future Critical Infrastructure and Security Cyberattacks on Charging Stations**

Christian Esser<sup>1</sup>, Tim Montag<sup>2</sup>, Marko Schuba<sup>3</sup>, Manuel Allhoff<sup>2</sup>

<sup>1</sup> University of Applied Sciences Aachen - Student, Germany

<sup>2</sup> P3 Group, Germany

<sup>3</sup> University of Applied Sciences Aachen - Data Networks, IT Security and Digital Forensics, Germany

**C6-2 EV charging evaluation as a resource of VPP**

Yukio Shinoda, Osamu Maruta

Tokyo Electric Power Company Holdings, Inc., Japan

**C6-3 Smart Charging of electric vehicles: Institutional bottlenecks and possible solutions**

Baerte de Brey

ElaadNL, The Netherlands

**C6-4 The Successful Business Models of EV Charging**

Charles W. Botsford

Webasto Charging Systems, Inc.

**C6-5 Valuation of charging time for electric vehicles**

Quentin De Clerck, Joeri Van Mierlo, Lieselot Vanhaverbeke

Research Group MOBI, Vrije Universiteit Brussel, Belgium

**C7(Special Session) Fuel Cell Systems**

Tuesday, 2 October 10:30-12:30 Room 7 504+505 5F Conference Center

*Chairs* : Masatoshi Fukuda PUES CORPORATION  
Theodoros Kalogiannis Vrije Universiteit Brussel

**C7-1 Fuel Cell Vehicle Development and Toward Hydrogen Society**

Takashi Moriya

Honda R&D CO., Ltd.

**C7-2 Effects of Environmental Conditions on Cathode Degradation of PEFC during Potential Cycle**

Yoshiyuki Hashimasa, Hiroshi Daitoku, Tomoaki Numata

E-mobility Research Division, Japan Automobile Research Institute

**C7-3 Development of 70MPa Hydrogen System Light-duty Truck Powered by Fuel Cell**

Kazuya Maita<sup>1</sup>, Osamu Watanabe<sup>1</sup>, Nobuhiko Okawa<sup>1</sup>, Akihiro Yamamoto<sup>1</sup>, Masatoshi Fukuda<sup>2</sup>,  
Shigeo Kishi<sup>2</sup>

<sup>1</sup> Tokyo R&D Co., Ltd.

<sup>2</sup> PUES Corporation

**C7-4 The New Hybrid System Applied to New Model Plug-in Hybrid Vehicle - Features of Newly Developed Plug-in Hybrid Power-plant -**

Tomoya Yamagishi, Takashi Ishikura

Honda R&D Co.,Ltd.Automobile R&D Center, Japan

**C7-5 Development of Technical Regulations for Fuel Cell Motorcycles in Japan - Hydrogen Safety -**

Eisuke Yamada<sup>1</sup>, Takehiko Mashiba<sup>2,3</sup>

<sup>1</sup> Japan Automobile Research Institute

<sup>2</sup> Japan Automobile Manufacturers Association, Inc.

<sup>3</sup> Suzuki Motor Corporation

**C7-6 Highly Durable and Highly Active Catalysts Supported on Electronically Conductive Oxide Supports for PEFC**

Akihiro Iiyama, Katsuyoshi Kakinuma, Makoto Uchida

Fuel Cell Nanomaterials Center, University of Yamanashi, Japan

**D1(Special Session) Wireless Power Transfer 2**

Tuesday, 2 October 14:20-16:20 Room 1 Main Hall 1F Conference Center

*Chairs* : Tomokazu Mishima Kobe University

Francisco J. Márquez-Fernández Lund University (Sweden)

**D1-1 Magnetic Coupler Design of Wireless Power Transfer System for Rotating Equipment**

Bingqing Ma<sup>1,2</sup>, Zhenjie Li<sup>1</sup>, Guang Yang<sup>1</sup>, Chunbo Zhu<sup>1</sup>, Kai Song<sup>1</sup>

<sup>1</sup> Harbin Institute of Technology, School of Electrical Engineering & Automation, China

<sup>2</sup> The 54th Research Institute of China Electronics Technology Group Corporation, China

**D1-2 Energy Saving and Peak Power Cut Effect by High Power Wireless Transmission in Railway Vehicle Traction Application**

Toranosuke Uehara<sup>1</sup>, Keiichiro Kondo<sup>2,1</sup>

<sup>1</sup> Chiba University, Graduate School of Science and Engineering, Japan

<sup>2</sup> Waseda University, Faculty of Science and Engineering, Japan

**D1-3 A 1.14 kW Magnetic Energy Harvesting Near Power Line by Considering Saturation Effect**

Bumjin Park<sup>1</sup>, Dongwook Kim<sup>1</sup>, Jaehyoung Park<sup>1</sup>, Yujun Shin<sup>1</sup>, Jay Koo<sup>2</sup>, Okhyun Jeong<sup>3</sup>,  
Seungyoung Ahn<sup>1</sup>

<sup>1</sup> Korea Advanced Institute of Science and Technology (KAIST), CCS Graduate School for Green Transportation, Korea

<sup>2</sup> Ferrarispower, Korea

<sup>3</sup> Sogang University, Department of Electronic Engineering, Korea

**D1-4 Analysis of the battery lifetime in Wireless Charger System for AGV by Model Based Development method**

Hiroshi Yamamoto, Satoru Kikuchi, Shuji Oshida, Shuji Inoue

Corporate Engineering Division AIS Company, Panasonic Corporation, Japan

**D1-5 Theoretical Analysis for Future 6.78MHz and/or 13.56MHz WPT Systems Based on the Electromagnetic Theory**

Atsuo Hatono

Malaysia-Japan Higher Education Program, University Kuala Lumpur, Malaysia

**D1-6 Comparative Verification of Radiation Noise Reduction Effect using Spread Spectrum for Inductive Power Transfer System**

Keisuke Kusaka, Kent Inoue, Jun-ichi Itoh

Nagaoka University of Technology, Dept. of Electrical, Electronics and Information, Japan

**D2(Special Session) New Motor Technologies for Electric Vehicles**

Tuesday, 2 October 14:20-16:20 Room 2 301 3F Conference Center

*Chairs* : Kan Akatsu Shibaura Institute of Technology

Libing Cao University of Hong Kong

**D2-1 Development of Motor for New Electric Vehicle - Motor shared with Fuel Cell Vehicle -**

Hirofumi Suzumori, Akinobu Iwai, Satoshi Honjo, Toshio Okazawa

Automobile R&D Center, Honda R&D Co., Ltd., Japan

**D2-2 Variable Magnetic Flux PM-Motor with Automatically Flux Weakening Technique**

Ryosuke Akaki, Kazuhiko Matsunami, Tatsuji Mori

SUZUKI Motor Corporation, EV Development Department, Japan

**D2-3 Self-Excited Wound-Field Synchronous Motors**

Masahiro Seguchi

DENSO CORPORATION, Japan

**D2-4 Hybrid Excitation Flux Switching Motor with High Filling Factor Windings**

Takashi Kosaka, Keisuke Isobe, Nobuyuki Matsui

Nagoya Institute of Technology, Department of Electrical and Mechanical Engineering, Japan

**D2-5 Study of Rotor Pole Optimization for RMS Current Reduction in Switched Reluctance Motor Operating in Flattening the Radial Force Sum**

Candra Adi Wiguna, Jihad Furqani, Masachika Kawa, Akira Chiba

Tokyo Institute of Technology, Department of Electrical and Electronic Engineering, Japan

**D2-6 5kW, 120krpm High Power Density Synchronous Machines for an ORC Waste Heat Recovery System**

David Gerada<sup>1,2</sup>, Zeyuan Xu<sup>1,2</sup>, He Zhang<sup>2</sup>, Chris Gerada<sup>1,2</sup>

<sup>1</sup> Faculty of Engineering, The University of Nottingham, UK

<sup>2</sup> Department of Engineering, The University of Nottingham, China

**D3 Energy Storage Systems 2**

Tuesday, 2 October 14:20-16:20 Room 3 401+402 4F Conference Center

*Chair* : Takaji Umeno Toyota Central R&D Labs., INC.

**D3-1 A Data-Driven Parameter and State of Charge Estimation for Lithium-ion Battery Considering Current Sensor Offset**

Bo Jiang<sup>1,2</sup>, Haifeng Dai<sup>1,2</sup>, Tianjiao Xu<sup>1,2</sup>

<sup>1</sup> National Fuel Cell Vehicle & Powertrain System Research & Engineering Center, China

<sup>2</sup> School of Automotive Studies, Tongji University, China

**D3-2 Stand-alone battery thermal management for fast charging of electric two wheelers Integrated busbar cooling**

Bastian Mayer, Michael Schier, Horst E. Friedrich

German Aerospace Center, Institute of Vehicle Concepts

**D3-3 The Wavelet-based Artificial Neural Network for State of Charge Estimation: its Reliability and Adaptability**

Wassamon Phusakulkajorn, Chi-na Benyajati, Thanya Phraewphiphat, Jiravan Mongkoltanatas

National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency (NSTDA), Thailand

**D3-4 Exploring the Attributes of Particle Filter vs Nonlinear Kalman Filter for Battery State of Charge Estimation**

Kristian Eggereide Roaldsnes, Ørjan Gjengedal, Marta Molinas

Department of Engineering Cybernetics, Norwegian University of Science and Technology, Norway

**D3-5 Disruptive new Technology in Effective Battery Control - Instead of balancing - Full control of all health parameters of each individual cell -**

Hans Harjung, Thomas Blochberger

e-moove GmbH, Austria

**D3-6 Development of high input energy storage devices for energy regeneration systems**

Shuichi Ishimoto<sup>1</sup>, Yoshihiro Minato<sup>1</sup>, Satoru Tsumeda<sup>2</sup>, Kentaro Nakaaki<sup>2</sup>, Kenji Tamamitsu<sup>1</sup>

<sup>1</sup> Basic Research Center, Nippon Chemi-Con Corporation, Japan

<sup>2</sup> Product R&D center, Nippon Chemi-Con Corporation, Japan

## D4 Marketing & Car Sharing 2

Tuesday, 2 October 14:20-16:20 Room 4 403 4F Conference Center

Chair : Yasuo Matsunaga Nissan Motor Co., Ltd.

### D4-1 Influences of Predictive Driving Algorithms on the Energy Demand of Modern Powertrains

Thorsten Plum<sup>1</sup>, Marius Wegener<sup>2</sup>, Markus Eisenbarth<sup>2</sup>, Georg Birmes<sup>1</sup>, Jakob Andert<sup>2</sup>

<sup>1</sup>FEV Europe GmbH, Germany

<sup>2</sup>Institute for Mechatronic Systems for Combustion Engines, RWTH Aachen University, Germany

### D4-2 Evolving Estimates of Emerging Eminence of Electrified Vehicles

Danilo Santini , Andrew Burnham , Paul Nelson , Yan Zhou , Shabbir Ahmed , James Miller , Marcy Rood  
Argonne National Laboratory, USA

### D4-3 The Transformation of the Cradle: Strategic Dialogue for the Automotive Sector in Baden-Württemberg

Wolfgang Fischer , Katja Gicklhorn

e-mobil BW GmbH - State Agency for New Mobility Solutions and Automotive Baden-Württemberg, Germany

### D4-4 Gasoline Savings from Electric Vehicle Adoption

Tamara L. Sheldon<sup>1,2</sup>, Rubal Dua<sup>2</sup>

<sup>1</sup>Department of Economics, Darla Moore School of Business, University of South Carolina

<sup>2</sup>King Abdullah Petroleum Studies and Research Center

### D4-5 A way of Successful EV and HEV Market in Asia

Shigeyuki Minami

Advanced Research Institute for Natural Science and Technology, Osaka City University, Japan

### D4-6 How Might the German Distribution Grid Cope With 100% Market Share of PEV? Impacts from PEV charging on low voltage distribution grids

Patrick Jochem , Alexandra März , Zongfei Wang

Institute for Industrial Production (IIP) at the Karlsruhe Institute of Technology (KIT), Germany

## D5 Power Electronic Components

Tuesday, 2 October 14:20-16:20 Room 5 501 5F Conference Center

Chairs : Shigeharu Yamagami Nissan Motor Co., Ltd.

Laurent Beurenaut INFINEON

### D5-1 New solutions in over-current protection of HVDC circuit in electric vehicle

Mitja Koprivšek

ETI Elektroelement d.o.o., Slovenia

### D5-2 Impedance Modeling for Accurate Estimation of DC-Bus Current and Voltage Ripple in Electric Vehicles

Andreas Henriksson<sup>1</sup>, John Simonsson<sup>2</sup>, Torbjörn Thiringer<sup>1</sup>

<sup>1</sup>Chalmers University of Technology, Division of Electric Power Engineering, Department of Electrical Engineering, Sweden

<sup>2</sup>Volvo Car Corporation, Sweden

### D5-3 Design Aspects of 11kW On-board Charger based on SiC Technology for Electric Vehicles

Hai-Nam Vu<sup>1,2</sup>, Dai-Duong Tran<sup>1,2</sup>, Mohamed Abdel-Monem<sup>3</sup>, Mohamed El Baghdadi<sup>1,2</sup>, Joeri Van Mierlo<sup>1,2</sup>, Omar Hegazy<sup>1,2</sup>

<sup>1</sup>Vrije Universiteit Brussel(VUB), ETEC Dept. & MOBI Research Group, Belgium

<sup>2</sup>Flanders Make, Belgium

<sup>3</sup>POWERDALE (PWD), Smart Charging Unit (SCU), Belgium



- D5-4 Multi-Modular Isolated Three-Phase AC-DC Converter for Rapid Charging with Autonomous Distributed Control**  
Masakazu Adachi , Keisuke Kusaka , Jun-ichi Itoh  
 Nagaoka University of Technology, Electrical, Electronics and Information Engineering, Japan
- D5-5 High-Power Soft-Switching Three-Level DC-DC Converter for Railway Applications**  
Yoshinobu Koji , Tomokazu Mishima  
 Kobe University, Dept. of Marie Engineering, Graduate School of Maritime Sciences, Japan
- D5-6 800 V Charging Drives the Introduction of High Power DCDC Converters with Silicon Carbide in Evs**  
Martin Brüll , Philip Brockerhoff , Markus Höevermann  
 Continental, Germany

## D6 Environmental Impact

Tuesday, 2 October 14:20-16:20 Room 7 504+505 5F Conference Center

*Chair* : Junichiro Yamabe Fukuoka University

- D6-1 Electric vehicles as a flexibility management strategy in Europe**  
Maria Taljegard , Lisa Göransson , Mikael Odenberger , Filip Johnsson  
 Chalmers University of Technology, Sweden
- D6-2 Real-world energy consumption and emissions of plug-in hybrid vehicles - Analysis of three vehicles under different conditions -**  
Simone Ehrenberger , Marcel Konrad , Franz Philipps , Herbert Hellstern  
 Institute of Vehicle Concepts, German Aerospace Center, Germany
- D6-3 Environmental Advantages of Electric Vehicles in terms of Well to Wheel CO2 Emissions - A Japanese Case Study -**  
Yuki Kudoh , Akito Ozawa  
 Research Institute of Science for Safety and Sustainability, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- D6-4 Scaling Smart EV Utility Driven Infrastructure**  
Ashley Horvat  
 Greenlots, VP of Public and Private Partnerships, USA
- D6-5 Simulation of Future Electric Vehicle Charging behavior - Effects of transition from PHEV to FEV -**  
 Igna Vermeulen<sup>2</sup> , Jurjen Rienk Helmus<sup>1</sup> , Mike Lees<sup>2</sup> , Robert Van den Hoed<sup>1</sup>  
<sup>1</sup> University of Applied Science Amsterdam, The Netherlands  
<sup>2</sup> University of Amsterdam, Science Park 904, The Netherlands
- D6-6 Impact of Increased Vehicle Weight on Energy Consumption of Diverse Powertrain Options Under Real-World Driving in Bangkok**  
Angkee Sripakagorn<sup>1</sup> , Soravas Treenok<sup>2</sup>  
<sup>1</sup> Department of Mechanical Engineering, Faculty of Engineering, Chulalongkorn University, Thailand  
<sup>2</sup> Smart Mobility Research Center, Faculty of Engineering, Chulalongkorn University, Thailand

## Day3 : Wednesday, 3 October

### E1(Special Session) Wireless Power Transfer 3

Wednesday, 3 October 10:30-12:30 Room 1 Main Hall 1F Conference Center

*Chairs :* Toshiyuki Fujita Technova Inc.  
Chris Mi San Diego State University

- E1-1 Analysis of Robustness of Wireless Power Transfer System for EVs/PHVs**  
Yoshinobu Sugiyama  
Toyota Motor Corporation, Japan
- E1-2 Development of a high efficiency wireless power transfer system for Electrified Vehicles**  
Daisuke Tsukiyama, Joli Nagamatsu, Shuhei Toga, Yoshinori Tsuruda  
DAIHEN Corporation, Japan
- E1-3 Wireless Charging System for Passenger EVs and PEVs**  
Naoki Ohmura<sup>1</sup>, Satoshi Yazaki<sup>1</sup>, Kenji Nishimura<sup>1</sup>  
<sup>1</sup> Business Development Dept., IHI Corporation, Japan  
<sup>2</sup> IHI Corporation  
<sup>3</sup> IHI Corporation
- E1-4 Bidirectional inductive charging systems economical in the electricity grid - Development and application of a technology to boost electric mobility -**  
Philipp Schumann<sup>1</sup>, Daniel Borrmann<sup>2</sup>, Akshay Mahajan<sup>3</sup>, Marco Mittelsdorf<sup>3</sup>, Tim Schember<sup>4</sup>  
<sup>1</sup> Robert Bosch GmbH, Germany  
<sup>2</sup> Fraunhofer Institute for Industrial Engineering IAO, Germany  
<sup>3</sup> Fraunhofer Institute for Solar Energy Systems ISE, Germany  
<sup>4</sup> GreenIng GmbH & Co. KG, Germany
- E1-5 Vehicle integration of wireless power transfer systems - An experimental safety investigation of underfloor impact scenarios-**  
Steve Zimmer<sup>1</sup>, Sebastian Rothenberg<sup>1</sup>, Benjamin Tattko<sup>1</sup>, Timo Baumer<sup>1</sup>, Karlheinz Baier<sup>1</sup>, Christian Glöggl<sup>1</sup>, Anja Winkler<sup>2</sup>, Niels Modler<sup>2</sup>  
<sup>1</sup> Daimler AG, Germany  
<sup>2</sup> Institut für Leichtbau und Kunststofftechnik, Technische Universität Dresden, Germany
- E1-6 85 kHz band 44 kW wireless rapid charging system for field test and public road operation of electric bus**  
Shuichi Obayashi<sup>1</sup>, Tetsu Shijo<sup>1</sup>, Masatoshi Suzuki<sup>1</sup>, Fumi Moritsuka<sup>2</sup>, Kenichirou Ogawa<sup>1</sup>, Koji Ogura<sup>1</sup>, Yasuhiro Kanekiyo<sup>1</sup>, Masaaki Ishida<sup>1</sup>, Toru Takanaka<sup>3</sup>, Nobumitsu Tada<sup>3</sup>, Fumiaki Takeuchi<sup>3</sup>, Shunsuke Take<sup>4</sup>, Yoshihiko Yamauchi<sup>5</sup>, Wei-Hsiang Yang<sup>6</sup>, Yushi Kamiya<sup>6</sup>  
<sup>1</sup> Wireless System Laboratory, Corporate R&D Center, R&D Division, Toshiba Corporation, Japan  
<sup>2</sup> Center For Semiconductor Research & Development, Toshiba Electronic Devices & Storage Corporation, Japan  
<sup>3</sup> Power and Industrial Systems R&D Center, R&D Division, Toshiba Corporation, Japan  
<sup>4</sup> Industrial Solutions Division, Toshiba Digital Solutions Corporation, Japan  
<sup>5</sup> Railway System Division, Toshiba Infrastructure Systems & Solutions Corporation, Japan  
<sup>6</sup> Graduate School of Environment and Energy Engineering, Waseda University, Japan

### E2(Special Session) Energy Storage Devices 1

Wednesday, 3 October 10:30-12:30 Room 2 301 3F Conference Center

*Chair :* Noriko Yoshizawa National Institute of Advanced Industrial Science and Technology

- E2-1 Auxiliary power supply system for Electric Power Steering (EPS) and High heat-resistant Lithium-ion capacitor**  
Takumi Mio, Koji Nishi, Yukihiro Komatsubara, Naoki Ohmi, Yusuke Kimoto, Kentaro Iizuka, Toyoki Sugiyama, Fumihiko Sato, Satoshi Shinoda, Tokuaki Hibino  
BR Electrical Power Storage Device Business Dept., JTEKT Corporation, Japan

- E2-2 DC-Link Capacitor Life Prediction For 48 V Mild Hybrid Passenger Vehicles**  
Daizou Senzai<sup>1</sup>, Kouji Yamaya<sup>1</sup>, Tsubasa Abe<sup>1</sup>, Yuhei Kobayashi<sup>1</sup>, Toshihiko Furukawa<sup>2</sup>  
<sup>1</sup> Nippon Chemi-Con Corporation, Japan  
<sup>2</sup> United Chemi-Con, Inc., USA
- E2-3 Mileage Improvement with Electrochemical Capacitors When Retrofitting Class 2 Vehicles for Hybrid Operation**  
Toshihiko Furukawa<sup>1</sup>, Naoki Akiba<sup>2</sup>, Hiroyuki Wakabayashi<sup>2</sup>, Shin Watanabe<sup>2</sup>  
<sup>1</sup> United Chemi-Con, Inc., USA  
<sup>2</sup> Nippon Chemi-Con Corporation, Japan
- E2-4 Development of the High-Voltage Battery Pack for the Hybrid Electric Vehicle**  
Yu Harada, Yasuaki Matsui, Takashi Ishibuchi, Ryuichi Miyano, Tatsuji Mori  
 SUZUKI MOTOR CORPORATION, Japan
- E2-5 Development of Li-ion Battery Cells for Hybrid and Plug-in Hybrid Vehicles**  
Machiko Abe  
 TOYOTA MOTOR CORPORATION, Japan
- E2-6 Development of New System for Light Duty Hybrid Truck**  
Nobutaka Suzuki, Satoshi Kabe, Toshihide Miyajima, Tomohiko Araki, Kunitoshi Shimizu  
 Hino Motors, Ltd., Hybrid Vehicle Development Div., Japan

## E3 Electric Vehicles

Wednesday, 3 October 10:30-12:30 Room 3 401+402 4F Conference Center

*Chair* : Yoshitaka Asakura AYE

- E3-1 Thermal simulation model for driving range improvements of electric vehicles**  
David Hemkemeyer<sup>1</sup>, Patrick Manns<sup>1</sup>, Daniel Perak<sup>1</sup>, Klaus Wolff<sup>1</sup>  
<sup>1</sup> FEV Europe GmbH, Germany  
<sup>2</sup> Lehrstuhl für Verbrennungskraftmaschinen (VKA) RWTH Aachen University
- E3-2 Integrating electric vehicles in electricity system models – representing individual driving patterns**  
Mikael Odenberger, Maria Taljegard  
 Chalmers University of Technology, Sweden
- E3-3 Development of New Generation Battery Management ECU**  
Masakazu Kouda, Masashi Deriha, Syunichi Mizobe  
 DENSO CORPORATION, Japan
- E3-4 Battery Safety for Underfloor Impact - How to deal with underfloor protection -**  
Alexander Betz, Roopesh Chodankar, Steven Lange, Peter Geuting, Christian Glöggler  
 Daimler AG, Germany
- E3-5 Strategically Targeting Plug-in Electric Vehicle Rebates and Outreach Using Characteristics of "Rebate-Essential" Consumers in 2016 – 2017**  
Brett Williams<sup>1</sup>, John Anderson<sup>1</sup>  
<sup>1</sup> Center for Sustainable Energy (CSE), USA  
<sup>2</sup> San Diego City College, USA
- E3-6 The Future of Electric Vehicles and Autonomous Driving - Regulation leading to innovation -**  
Shinichi Yamaki  
 TUV Rheinland Japan Ltd., Japan

## E4 Marketing & Car Sharing 3

Wednesday, 3 October 10:30-12:30 Room 4 403 4F Conference Center

*Chairs* : Shigeyuki Minami Osaka City University  
Yafei Wang Shanghai Jiao Tong University

### E4-1 Expected benefits of regulating zero-emission vehicles offer - Québec implements a zero-emission vehicles standard -

Marilou Gosselin

Quebec's Ministry of Sustainable development, Environment and Fight against climate change, Canada

### E4-2 Corporate demand as a driver for EV uptake - Experiences from the global corporate leadership initiative EV100 -

Sandra Roling

The Climate Group, UK

### E4-3 The Impact of Market on Adjustment Direction of Fiscal and Tax Support Policies of Global Electric Vehicles and Future Trend1

Hong Shi, Bin Liu, Haifeng Fang

China Automotive Technology and Research Center, China

### E4-4 Driving the market for plug-in vehicles - Lessons from California's ZEV Mandate -

Scott Hardman<sup>1</sup>, Alan Jenn<sup>1</sup>, Jonn Axsen<sup>2</sup>, Tom Turrentine<sup>1</sup>

<sup>1</sup> Plug-in Hybrid Electric Vehicle Research Center, Institute of Transportation Studies, University of California, Davis, USA

<sup>2</sup> Simon Fraser University, Canada

### E4-5 Meta-analysis of new passenger car registrations scenarios - Analysis of market development towards an electric vehicle market penetration -

Bent van den Adel, Matthias Kloetzke

Institute of Vehicle Concepts, German Aerospace Center, Germany

### E4-6 An in-depth examination of electric vehicle incentives: consumer heterogeneity and changing response over time

Alan Jenn, Jae Hyun Lee, Scott Hardman, Gil Tal

Plug-in Hybrid & Electric Vehicle Center, Institute of Transportation Studies, University of California, Davis, USA

## E5 Electric Machines & Advanced Components for Transportation Systems

Wednesday, 3 October 10:30-12:30 Room 5 501 5F Conference Center

*Chairs* : Hiroya Sugimoto Tokyo Institute of Technology  
Michael Schlick Ulm University of Applied Sciences

### E5-1 Examination of a Linear Generator with Variable Magnetic Flux for Free-Piston Engines

Tatsuki Suzuki<sup>1</sup>, Masami Nirei<sup>2</sup>, Mitsuhide Sato<sup>1,3</sup>, Yuichiro Yamanaka<sup>1</sup>, Takumi Goto<sup>1</sup>, Yinggang Bu<sup>1</sup>, Tsutomu Mizuno<sup>1</sup>

<sup>1</sup> Shinshu University Faculty Engineering, Japan

<sup>2</sup> National Institute of Technology, Nagano College, Japan

<sup>3</sup> Nagano Prefectural Institute of Technology, Japan

### E5-2 Improved Core Loss Modelling of Electrical Traction Motors through simulation of Skin-Effect in Laminations

Jan Rens<sup>1</sup>, Sigrid Jacobs<sup>2</sup>, Lode Vandenbossche<sup>1</sup>, Emmanuel Attrazic<sup>3</sup>

<sup>1</sup> ArcelorMittal Global R&D Gent, Belgium

<sup>2</sup> ArcelorMittal Global R&D, Belgium

<sup>3</sup> ArcelorMittal Saint-Chély d'Apcher, France

### E5-3 Efficiency Characteristics to the Ratio of Capacitor Voltage to Supply Voltage in voltage Boost type SRM Drive Circuit

Sae Yamamoto, Nobukazu Hoshi, Kosuke Uchida

Tokyo University of Science, Dept. of Electrical Engineering, Faculty of Science and Technology, Japan

**E5-4 A Novel Two Speed Planetary Transmission for Electric Vehicle Applications**

Paul David Walker, Yang Tian, Jiageng Ruan, Nong Zhang

School of Mechanical and Mechatronic Engineering, University of Technology Sydney, Australia

**E5-5 Mechatronic Track Guidance for Tramways -  $\mu$ -Synthesis Control Loop and Specially Developed Hall Sensors -**

Franz Jost<sup>1</sup>, Yunfan Wei<sup>1</sup>, Peter Gratzfeld<sup>1</sup>

<sup>1</sup>Karlsruhe Institute of Technology, Germany

<sup>2</sup>Bosch

**E5-6 Performance analysis of a heat pump system with integrated desiccant for electric vehicles**

Li Zhang, Katsumi Hashimoto, Hiromi Hasegawa, Michiyuki Saikawa

Central Research Institute of Electric Power Industry, Japan

**E6 EV Charging Infrastructure 3**

Wednesday, 3 October 10:30-12:30 Room 6 502 5F Conference Center

*Chair* : Takamitsu Tajima Honda R&D Co., LTD.

**E6-1 MoModes of fast charging: Rolling out fast chargers in cities and along corridors to meet the heterogeneity of needs among EV drivers**

Rick Wolbertus, Jurjen Helmus, S.J.F.M. Maase, Robert Van den Hoed

Amsterdam University of Applied Sciences, The Netherlands

**E6-2 Monitoring of Usage and Evaluation of Lithium-Ion Battery System by Time Backtracking Method**

Yu-hung Lin, Shiow-Huey Suen, Chein-Chung Sun, Chun-Hung Chou

Material and Chemical Research Laboratories, Industrial Technology Research Institute, Taiwan

**E6-3 User Perspectives on Electric Roads**

Conny Börjesson, Martin G. H. Gustavsson

RISE Viktoria, Sweden

**E6-4 Success or Failure: The German 300 Million € Funding Programme on Charging Infrastructure for EVs**

Sven Lierzer

BridgingIT GmbH, Germany

**E6-5 Charge the North - Characterizing Electric Vehicle Charging Profiles & Enhancing Charging Infrastructure in Canada -**

Eric Mallia, Matthew Stevens, Megan Allen, Mark Goody, Rikki Gibson, Hannah Koke

FleetCarma, Canada

**F1(Special Session) Wireless Power Transfer 4**

Wednesday, 3 October 13:20-15:20 Room 1 Main Hall 1F Conference Center

*Chairs* : Keisuke Kusaka Nagaoka University of Technology

Philipp Schumann ROBERT BOSCH GMBH

**F1-1 Design and Implementation of Sensorless Vehicle Detection System for In-motion Wireless Power Transfer**

Katsuhiro Hata<sup>1</sup>, Kensuke Hanajiri<sup>1</sup>, Takehiro Imura<sup>1</sup>, Hiroshi Fujimoto<sup>1</sup>, Yoichi Hori<sup>1</sup>, Motoki Sato<sup>2</sup>,

Daisuke Gunji<sup>3</sup>

<sup>1</sup>The University of Tokyo, Japan

<sup>2</sup>Toyo Denki Seizo K.K., Japan

<sup>3</sup>NSK Ltd., Japan

- F1-2 A study of a dynamic wireless power transfer system based on parallel- series resonant topology - Bench test and real car test -**  
Toshiyuki Fujita , Hiroyuki Kishi  
 Technova Inc., Japan
- F1-3 Combined charging solution for High power Wireless Power Transfer and conductive charging system**  
 Honggi Ko , Kyoungjin Kim , Yongbok Lee , Jeongmyung Seo  
 Renault Samsung Motors, Korea
- F1-4 Evaluation of leakage magnetic field from two wireless power transfer systems for EV / PHV driven simultaneously**  
Toshiaki Watanabe , Yusuke Hakuta  
 TOYOTA CENTRAL R&D LABS., INC., Japan
- F1-5 Harmonization of testing methods for wireless power transfer systems for passenger cars and the STILLE project - An international project supporting the global harmonization and interoperability of wireless charging systems for electric vehicles -**  
Volker Blandow<sup>1</sup>, Michael Lahrsen<sup>2</sup>  
<sup>1</sup>TÜV SÜD AG, Hong Kong  
<sup>2</sup>TÜV SÜD Product Service GmbH, Germany

## **F2(Special Session) Energy Storage Devices 2**

Wednesday, 3 October 13:20-15:20 Room 2 301 3F Conference Center

*Chairs :* Daichi Imamura Japan Automobile Research Institute  
 James Miller ARGONNE NATIONAL LABORATORY

- F2-1 DOE Battery and Electrification R&D Overview for FY 2017-2018**  
Steven Boyd , David Howell  
 Vehicle Technologies Office, U.S. Department Energy, USA
- F2-2 Development of LTO-based Lithium ion secondary battery with both high energy and high power characteristics**  
Hidesato Saruwatari<sup>1</sup>, Yoshiki Ishizuka<sup>2</sup>, Shun Egusa<sup>2</sup>  
<sup>1</sup> Toshiba Infrastructure Systems & Solutions Corporation, Battery Development Dept., Niigata, Japan  
<sup>2</sup> Toshiba Infrastructure Systems & Solutions Corporation, Kanagawa, Japan
- F2-3 LIB for Evs - Trends Overviewed by Materials Manufacturers -**  
Osamu Fujimura , Koji Abe  
 Ube Industries, Ltd., Osaka Research & Development Center, Japan
- F2-4 Safety Test Technology in Lithium-ion Batteries for xEV**  
Arata Okuyama , soh Suzuki , Takashi Kajihara  
 Espec Corp., Japan
- F2-5 Phenomenological investigation of operando lithium-ion battery for automotive application**  
Sohei Suga<sup>1</sup>, Satoshi Takaichi<sup>1</sup>, Junko Kurihara<sup>2</sup>, Takao Nakagaki<sup>3</sup>, Shuichiro Hirai<sup>4</sup>, Yuichiro Tabuchi<sup>1</sup>  
<sup>1</sup> EV System Laboratory, Nissan Research Center, Nissan Motor Co., Ltd., Japan  
<sup>2</sup> Development Division, Automotive Energy Supply Co., Ltd., Japan  
<sup>3</sup> Department of Modern Mechanical Engineering, School of Creative Science and Engineering, Waseda University, Japan  
<sup>4</sup> Department of Mechanical Engineering and Control Engineering, Graduate School of Science and Engineering, Tokyo Institute of Technology, Japan
- F2-6 Comparison of pack and cell tests of lithium-ion batteries for electric vehicles**  
Yukitaka Matsuoka , Tomoyuki Matsuda , Akihiro Kurokawa , Yasumasa Maeda , Daichi Imamura  
 Japan Automobile Research Institute, Japan

### F3 Simulation & Analysis

Wednesday, 3 October 13:20-15:20 Room 3 401+402 4F Conference Center

*Chairs* : Osamu Shimizu Nagoya University, University of Tokyo  
Mikael Odenberger CHALMERS UNIVERSITY OF TECHNOLOGY

#### F3-1 Quantitative analysis on standards about vibration of batteries in Evs

Ruixue Liu<sup>1</sup>, Yong Zhang<sup>2</sup>, Zhichao Hou<sup>1</sup>

<sup>1</sup> State Key Laboratory of Automotive Safety and Energy, Tsinghua University, China

<sup>2</sup> Nanjing Golden Dragon Bus Co.,Ltd., China

<sup>3</sup> Tsinghua University

#### F3-2 Holistic Energy Management System for Battery Electric Vehicles using Sliding Window Optimization

Katharina Minnerup, Thomas Herrmann, Matthias Steinstraeter, Markus Lienkamp

Automotive Engineering, Technical University Munich, Germany

#### F3-3 Comprehensive Study about Force Control of Electric Vehicles - Application for Vehicle in the House-

Tomoki Emmei, Hiroshi Fujimoto

The University of Tokyo, Japan

#### F3-4 Simulation of Dynamic Stresses on Battery Pack Holder from Different Road Topologies

Piyawat Paetanom<sup>1</sup>, Chi-na Benyajati<sup>2</sup>, Panya Kansuwan<sup>3</sup>, Masaaki Okuma<sup>4</sup>

<sup>1</sup> International College, King Mongkut's Institute of technology Ladkrabang, Thailand

<sup>2</sup> National Metal and Materials Technology Center, National Science and Technology Development Agency, Thailand

<sup>3</sup> Mechanical Engineering, King Mongkut's Institute of technology Ladkrabang, Thailand

<sup>4</sup> Department of Mechanical Science and Engineering, Tokyo Institute of Technology, Japan

#### F3-5 Development of Traction Force-Speed Based Fuel Consumption Prediction Model for Hybrid Vehicles

Siriorn Pitanuwat<sup>1</sup>, Hirofumi Aoki<sup>2</sup>, Satoru Iizuka<sup>1</sup>, Takayuki Morikawa<sup>1,2</sup>

<sup>1</sup> Nagoya University, Graduate School of Environmental Studies, Japan

<sup>2</sup> Nagoya University, Institute of Innovation for Future Society, Japan

### F4 Life Cycle Analysis

Wednesday, 3 October 13:20-15:20 Room 4 403 4F Conference Center

*Chairs* : Terunao Kawai National Traffic Safety and Environment Laboratory  
Norbert Schreier University of Applied Sciences

#### F4-1 Effects of integration of the electric mobility in the Italian energy sector: how to account for them in an LCA perspective

Benedetta Marmiroli<sup>1,2</sup>, Giovanni Dotelli<sup>2</sup>, Joeri Van Mierlo<sup>1,3</sup>, Maarten Messagie<sup>1</sup>

<sup>1</sup> MOBI-Mobility, Logistics and Automotive Technology Research Centre, Department of Electric Engineering and Energy Technology, Vrije Universiteit Brussel, Belgium

<sup>2</sup> Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta", Politecnico di Milano, Italy

<sup>3</sup> Flanders Make, Belgium

#### F4-2 Environmental Life Cycle Assessment of Next-generation Automobiles Installing New Polymers

Mikiaki Hasegawa, Eri Amasawa, Miyuki Ota, Hirokazu Sugiyama, Masahiko Hirao

Department of Chemical System Engineering, The University of Tokyo, Japan

**F4-3 Water Issues and Electric Vehicles - Key Aspects and Examples in Life Cycle Assessment -**

Gerfried Jungmeier<sup>1</sup>, Amgad A. Elgowainy<sup>2</sup>, Simone Ehrenberger<sup>3</sup>, Gabriela Benveniste Pérez<sup>4</sup>, Pierre-Olivier Roye<sup>5</sup>, Lim Ocktaeck<sup>6</sup>

<sup>1</sup> JOANNEUM RESEARCH, Austria

<sup>2</sup> Argonne National Laboratory, USA

<sup>3</sup> DLR, Germany

<sup>4</sup> IREC, Spain

<sup>5</sup> CIRAI, Canada

<sup>6</sup> University of Ulsan, Korea

**F4-4 Lifecycle climate change impacts of battery- and fuel cell electric vehicles - Effects of driving range and fuel chains -**

Christine Roxanne Hung, Linda Ager-Wick Ellingsen, Felipe Vásquez, Max Windsheimer, Anders Hammer Strømman

Norwegian University of Science and Technology, Norway

**F4-5 Maintenance and Repair Impacts on Electric Vehicles - Presentation of Study Layout and First Results -**

Norbert Schreier, Aljoscha Einspiegel, Ludwing Seibt

Esslingen University of Applied Sciences, Germany

**F5 Propulsion Systems & Motion Control Technologies**

Wednesday, 3 October 13:20-15:20 Room 5 501 5F Conference Center

*Chairs* : Masatsugu Takemoto Hokkaido University

Alfonso Gago-Calderon Universidad de Malaga

**F5-1 Predicting Powertrain Costs for Battery Electric Vehicles Based on Industry Trends and Component Teardowns**

Michael J. Safoutin

U.S. Environmental Protection Agency, USA

**F5-2 Improving electric city bus powertrain efficiency and costs using design space exploration**

Sebastian Krampf<sup>2</sup>, Ganesh Sethuraman<sup>1</sup>, Aditya Pathak<sup>1</sup>, Aybike Ongel<sup>1</sup>, Markus Lienkamp<sup>2</sup>

<sup>1</sup> TUMCREATE Limited, Singapore

<sup>2</sup> Institute of Automotive Technology, Technical University of Munich, Germany

**F5-3 Appropriate Design of Plug-in Hybrid Electric Vehicle Drivetrains under Consideration of User Behaviour and Component Stress**

André Ebel, Thomas Riemer, Hans-Christian Reuss

Research Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS), Germany

**F5-4 AWD for Electric Vehicles – A Revolution for Vehicle Efficiency?**

Christian Angerer<sup>1</sup>, Nikola Holjevac<sup>1</sup>, Ganesh Sethuraman<sup>2</sup>, Markus Lienkamp<sup>1</sup>

<sup>1</sup> Institute of Automotive Technology, Technical University of Munich, Germany

<sup>2</sup> TUMCREATE Ltd., Singapore

**F5-5 Motion control and multi-sensor modeling of the 4-axis propelled electric ship**

Hiroshi Kudo<sup>1</sup>, Kazuhiro Miyabara<sup>1</sup>, Tran Thanh Nhan<sup>1</sup>, Toshimasa Miyazaki<sup>1</sup>, Yoshihisa Hojo<sup>2</sup>

<sup>1</sup> Nagaoka University of Technology, Japan

<sup>2</sup> TOYODENKI SEIZO. K.K., Japan

**F5-6 Stabilization of Vehicle Dynamics by Tire Digital Control - Tire disturbance control algorithm for electric motor drive system -**

Keizo Akutagawa, Yasumichi Wakao

Bridgestone Corporation, Japan



**F6 AC & DC Charging System**

Wednesday, 3 October 13:20-15:20 Room 6 502 5F Conference Center

*Chairs* : Kenji Natori Chiba University  
Charles Botsford WEBASTO CHARGING SYSTEMS, INC.y

**F6-1 CharIN e.V. – The path to a global EV standard - Harmonization and high power charging -**

Claas Bracklo<sup>1</sup>, Michael Keller<sup>2</sup>

<sup>1</sup>BMW AG, Verband Deutscher Automobilhersteller e.v., CharIN e.V., Germany

<sup>2</sup>Volkswagen AG, CharIN e.V., Germany

**F6-2 To what extent does mobility behavior change the charging network? - will DC charging become dominant-**

Frank ten Wolde

APPM Management consultants, The Netherlands

**F6-3 EV powertrain topologies for electric road applications**

Anton Karlsson, Gabriel Domingues-Olavarria, Mats Alakula

Lund University, Div. Industrial Electrical Engineering and Automation, Sweden

**F6-4 Location-Allocation of Electric Vehicle Fast chargers - Research and Practice -**

Yutaka Motoaki

Idaho National Laboratory, USA

**F6-5 Process for Identifying Public Charging Stations in the Columbus Region**

Bud Braughton<sup>1</sup>, Edward Ungar<sup>2</sup>, Katherine Ott Zehnder<sup>2</sup>

<sup>1</sup>City of Columbus, Department of Public Service, USA

<sup>2</sup>HNTB Corporation, USA

**F6-6 Identifying Heterogeneous Electric Vehicle Charging Behavior - Mixed usage of L1, L2, DC fast chargers at different locations-**

Jae Hyun Lee, Debapriya Chakraborty, Scott Hardman, Gil Tal

Plug-In Hybrid & Electric Vehicle Research Center, Institute of Transportation Studies, University of California, Davis, USA

**F7 Fuel Cell Vehicles**

Wednesday, 3 October 13:20-15:20 Room 7 504+505 5F Conference Center

*Chairs* : Eiji Kuroda Japan Automobile Research Institute  
Kanghyun Nam Yeungnam University, School of Mechanical Engineering

**F7-1 New Tank Volume Estimation Method for Hydrogen Fueling**

Shigehiro Yamaguchi<sup>1</sup>, Yuzo Fujita<sup>1</sup>, Kiyoshi Handa<sup>2</sup>

<sup>1</sup>Honda R&D Co., Ltd. Motorcycle R&D Center, Japan

<sup>2</sup>Honda R&D Co., Ltd. Automobile R&D Center, Japan

**F7-2 A Study on Power Distribution Methods between Fuel Cell and Li-Ion Battery for a Fuel Cell Garbage Truck**

Daiki Katagiri<sup>1</sup>, Hosik Lee<sup>1</sup>, Yushi Kamiya<sup>1</sup>, Toshio Hirota<sup>1</sup>, Yuto Ihara<sup>2</sup>, Takuya Yamaura<sup>3</sup>

<sup>1</sup>Waseda University, Graduate School of Environment and Energy Engineering, Japan

<sup>2</sup>Waseda University Academic Solutions Corporation, Japan

<sup>3</sup>Flatfield Corporation, Japan

**F7-3 Calculation Energy Consumption, Range and Efficiency for Different Electric, Hybrid and Fuel Cell Vehicles**

Désirée Alcázar-García, Luis Romeral Martínez

UPC (Universitat Politècnica de Catalunya, Spain

**F7-4 Electricity as an Energy Carrier in Transport - Cost and Efficiency Comparison of Different Pathways -**

Maria Grahn , Maria Taljegard , Selma Brynolf  
Chalmers University of Technology, Sweden

**F7-5 Development of the Hydrogen System for Fuel Cell Scooter - Safety Verification through Vehicle Testing -**

Tatsuki Sugiyama , Hitoshi Muramatsu , Kengo Ikeya , Toru Eguchi , Ayumi Shimura  
SUZUKI MOTOR CORPORATION, Japan

**F7-6 Development of electrolyte membranes apply on non-humidified intermediate temperature fuel cells**

Jie Yu , Shojiro Kikuchi , Hirokazu Munakata , Kiyoshi Kanamura  
Department of Applied Chemistry, Graduate School of Urban Environmental Sciences, Tokyo Metropolitan University, Japan

**Day1 : Monday, 1 October**

**DS1(Dialogue Session) Electrical Drive 1**

Monday, 1 October 15:30-17:00 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Yoichi Hori The University of Tokyo

**DS1-1 Real-time Collision Warning System Based on Vision and V2V Communication**

Jing-Yu Liu , Hao-Yue Ma , Qun-song Wang , Zi-ran Li , Wei Yang,  
Chang'an University, School of Automobile, China

**DS1-2 Development and Promotion for Standardization of Charging Technology Accommodated to Electric Scooters in Taiwan**

Kao-Hone Chu<sup>1</sup> , Min-Chuan Wu<sup>1</sup> , Tien-Ho Gau<sup>1</sup> , Li-Song Lin<sup>1</sup> , Hung-Teh Tsai<sup>2</sup> , Ping-Hui Shieh<sup>2</sup> ,  
Nai-Jen Chang<sup>2</sup> , Li-Chung Chou<sup>2</sup> , Shan-Li Lien<sup>2</sup>

<sup>1</sup> Mechanical and System Research Laboratories, Industrial Technology Research Institute Hsinchu, Taiwan

<sup>2</sup> Department of Air Quality Protection and Noise Control, EPA, Taiwan

**DS1-3 Auto Parking System - with Vision based parking lot detection system and Multi-steps control system**

Sheng Wei Chan , Tse Lin Lee  
Industrial Technology Research Institute, Taiwan

**DS1-4 Numerical study on hybridization based on diesel ICE to motor assist mild HEV for preliminary concept design**

Sangjun Park<sup>1</sup> , Eunhee Ko<sup>2</sup> , Wonjun Yoon<sup>2</sup> , Jungsoo Park<sup>3</sup>

<sup>1</sup> LG Chemical R&D Campus Gwacheon, Republic of Korea

<sup>2</sup> Graduate School, Department of Mechanical Engineering, Chosun University, Republic of Korea

<sup>3</sup> Department of Mechanical Engineering, Chosun University, Republic of Korea

**DS1-5 First mobile Blood Donation Bus in health service**

Michał Sierszyński<sup>2</sup> , Michał Piłkuła<sup>2,3</sup> , Franciszek Sidorski<sup>1,2</sup> , Adam Piotrowski<sup>4</sup>

<sup>1</sup> Poznan University of Technology, Institute of electrical power engineering, Poland

<sup>2</sup> Solaris Bus & Coach S.A., Research Development Department, Poland

<sup>3</sup> AGH University of Science and Technology

<sup>4</sup>freelance researcher

**DS1-6 Electric cargo bike with a twist - A field test of two innovative bicycle concepts -**

Anne Yu Faxér , Ellen Olausson , Linda Olsson , Göran Smith , Stefan Pettersson  
RISE Research Institute of Sweden, Sweden

**DS1-7 Study on Engine power generation system for DPHEBus - Engine Power Generation System For Diesel Plug-in Hybrid Electric Bus Satisfying All Electric Range 30km-**

Taeun Kim , Inho Kim , Soonyong Yang  
University of Ulsan, Department of Mechanical Engineering, Korea

**DS1-8 An Empirical Study on CO2 Reduction Effect Measurement of Ultra-Compact Electric Vehicle in Japan**

Hideki Kato<sup>1</sup>, Hidekazu Suzuki<sup>2</sup>, Yasuhide Nishihori<sup>1</sup>

<sup>1</sup> Toyota Transportation Research Institute, Japan

<sup>2</sup> Meijo University, Japan

**DS1-9 Novel Non-invasive Sensor Probes for Capturing "CAN" Physical Signals from Outside Insulated Signal Cables**

Tomoharu Sakai<sup>1</sup>, Hiroyoshi Ikeda<sup>2</sup>, Shin Kasai<sup>1</sup>, Koichi Yanagisawa<sup>1</sup>

<sup>1</sup> HIOKI E.E. Corporation, Research and Development Dept., Japan

<sup>2</sup> HIOKI E.E. Corporation, Engineering Dept., Japan

**DS1-10 Ultra-Light Vehicle (ULV) for Urban Mobility**

Hugo Gabele<sup>1</sup>, Walter Janach<sup>2</sup>, Martin Ziegler<sup>3,4</sup>

<sup>1</sup> Institute for sustainable energy technology and mobility, University of Esslingen, Germany

<sup>2</sup> Luzern University of Applied Sciences, Switzerland

<sup>3</sup> Hyliontec, Germany

<sup>4</sup> University of Esslingen, Germany

**DS1-11 The development of electric powertrain systems to maximise efficiency and increase all-electric range (AER)**

Puneet Mathur, Kevin Chow, David Bridge, Greg Harris

HORIBA MIRA Ltd., UK

**DS2(Dialogue Session) Electrical Drive 2**

Monday, 1 October 15:30-17:00 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Hitoshi Fujimoto The University of Tokyo

**DS2-1 Development of Driving Cycle for Xi'an City Bus Line Based on Markov Chain**

Yaohua Li, Tianyuan Ren, Pandeng Shao, Weiping Song

School of Automotive, Chang'an University, China

**DS2-2 On Ways of Increasing Fuel Economy in the Spread of Hybridized Heavy-Duty Vehicles**

Namio Yamaguchi, Kazuo Rokkaku, Shigeyuki Minami

Research Center for Artificial Photosynthesis, Osaka City University, Japan

**DS2-3 Development of Typical Driving Cycle of Xi'an City Bus Based on the Combination of Clustering and Markov Method**

Yaohua Li, Pandeng Shao, Tianyuan Ren, Weiping Song

School of Automotive, Chang'an University, China

**DS2-4 Driving style and energy consumption with everyday use of a plug-in hybrid electric vehicle**

Magnus Hjalmdahl<sup>1</sup>, Christer Ahlström<sup>2</sup>, Per Henriksson<sup>2</sup>, Christofer Sundström<sup>3</sup>

<sup>1</sup> Sweco, Sweden

<sup>2</sup> The Swedish National Road and Transport Research Institute (VTI), Sweden

<sup>3</sup> Vehicular System, Dept. of Electrical Engineering, Linköping University, Sweden

**DS3(Dialogue Session) Charging**

Monday, 1 October 15:30-17:00 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Keiichiro Kondoh Waseda University

**DS3-1 The system of dynamic wireless charging for transport using transmitter and receiver parameters adjustment**

Rodions Saltanovs

Transfoelectric, Latvia

**DS3-2 A study on V2V charging application in a park-and-ride**

Antonino Genovese , Giancarlo Giuli , Massimo Mancini

Italian National Agency for New Technologies, Energy and the Sustainable Economic Development (ENEA), Italy

**DS3-3 DC fast charging infrastructure: EU legislation and market evolution**

Tomoko Blech<sup>1</sup> , Janka Jurisits<sup>1,2</sup> , Lauren Harry-Villain<sup>2</sup>

<sup>1</sup> CHAdeMO Association Europe, France

<sup>2</sup> L'Institut d'Etudes Politiques de Paris (SciencesPo Paris), France

**DS3-4 Multi-functional determination of locations for AC & DC charging stations in municipalities and along the highways**

Simon Haverkamp

P3 Energy & Storage GmbH, Germany

**DS3-5 Ultra-fast charging infrastructure for vehicle on-board ultracapacitors in urban public transportation applications**

Fernando Ortenzi<sup>1</sup> , Manlio Pasquali<sup>1</sup> , Giovanni Pede<sup>1</sup> , Alessandro Lidozzi<sup>2</sup> , Marco Di Benedetto<sup>2</sup>

<sup>1</sup> ENEA Italian Agency for New Technologies, Energy and Sustainable Economic Development, Italy

<sup>2</sup> ROMA TRE University, Dept. of Engineering., Italy

**DS3-6 Emergency Charging System for EV Using Parallel Operation**

Jung Hyoun Bae<sup>1</sup> , Young Eun Kim<sup>2</sup> , Young Wook Son<sup>2</sup> , Jae Seok Lee<sup>2</sup>

<sup>1</sup> MANO Co., Ltd., Korea

<sup>2</sup> Information Convergence R&D Center Smart Car Technology R&D Division, KOREA AUTOMOTIVE TECHNOLOGY INSTITUTE, Korea

**DS3-7 Distribution Switchboard for Slow Charger of EV able to Distribute Power as a Function of Available Power capacity**

Jae Seok Lee<sup>1</sup> , Young Wook Son<sup>1</sup> , Young Eun Kim<sup>1</sup> , Jae Eun Kim<sup>1</sup> , Jun Ho Cho<sup>2</sup>

<sup>1</sup> Information Convergence R&D Center Smart Car Technology R&D Division, KOREA AUTOMOTIVE TECHNOLOGY INSTITUTE, Korea

<sup>2</sup> EMI/EMC R&D Center Reliability & Safety R&D Division, KOREA AUTOMOTIVE TECHNOLOGY INSTITUTE, Korea

**DS3-8 Business Model Innovation for Non-Commercial Charging Infrastructure Sharing System in China**

Xiaoyuan Wu , Baojiang Sun , Zhelun Zuo

Tongji University, China

**DS3-9 Towards EU-wide Interoperability of charging infrastructure for electric vehicles - The Belgian Case -**

Cedric De Cauwer<sup>1</sup> , Anne Guillemont<sup>2</sup> , Gilles Cragues<sup>2</sup> , Joeri Van Mierlo<sup>1</sup> , Thierry Coosemans<sup>1</sup> , Maarten Messagie<sup>1</sup>

<sup>1</sup> Vrije Universiteit Brussel, ETEC department, MOBI Research Group, Belgium

<sup>2</sup> Ecole des Ponts ParisTech – University of Paris-Est, France

**DS3-10 Development for integrating charging infrastructure and power grid - A concept and a prototype development of EV Power Conditioning System and gateway -**

Eiichi Horiuchi , Daigo Takemura , Naohisa Kawahara , Pathom Attaviriyannupap , Hideaki Tanzan

Mitsubishi Electric Corporation, Japan

**DS3-11 Cancellation of Harmonic Magnetic Field Emitted from Wireless Power Transfer by Use of a Four Coils Setup**

Takuya Nayuki , Koshichi Nemoto , Tomohiko Ikeya

Central Research Institute of Electric Power Industry, Japan

**DS3-12 Capabilities to reduce the grid connection power of high power charging (HPC) parks for battery electric vehicles (EVs) with connection to the medium voltage grid**

Sören Schrader , Christof Bussen , Roman Scholdan , Richard Küsters

P3 group, Germany

**DS3-13 Electricity cost for electric vehicle fast charging**

Matteo Muratori , Eleftheria Kontou , Emma Elqvist , Dylan Culter , Joshua Eichman

National Renewable Energy Laboratory, Japan

**DS4(Dialogue Session) Energy Storage Systems 1**

Monday, 1 October 15:30-17:00 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chairs* : Daichi Imamura Japan Automobile Research Institute  
Yukinori Hato National Institute for Materials Science

**DS4-1 Research of Performance on Lithium Titanate Battery**

Jianguo Liu<sup>1,3</sup>, Zhuo Zhang<sup>1,3</sup>, Peng Lin<sup>2,3</sup>, Peng Jin<sup>1,2,3</sup>, Liye Wang<sup>4</sup>, Luping Wang<sup>1,3</sup>

<sup>1</sup> School of Electrical and Control Engineering, North China University of Technology, China

<sup>2</sup> Beijing Institute of Technology, China

<sup>3</sup> Collaborative Innovation Center of Electric Vehicles in Beijing, China

<sup>4</sup> Institute of Electrical Engineering, Chinese Academy of Sciences, China

**DS4-2 Design and Simulation of Battery Pack Equivalent Circuit Model For 48V Mild Hybrid System**

Jinhyeong Park<sup>1</sup>, Chang-O Yoon<sup>1</sup>, Pyeong-Yeon Lee<sup>1</sup>, Sungsoo Jang<sup>2</sup>, Jonghoon Kim<sup>1</sup>

<sup>1</sup> Department of Electrical Engineering, Chungnam National University, Korea

<sup>2</sup> Korea Aerospace Research Institute, Korea

**DS4-3 SOC Estimation for MH-Ni Batteries Based on Improved Extended Kalman Filtering**

Shuyu Xiao<sup>1,3</sup>, Peng Jin<sup>1,2,3</sup>, Cong Xie<sup>1,3</sup>, Chengxuan Tao<sup>4</sup>

<sup>1</sup> North China University of Technology, China

<sup>2</sup> Beijing Institute of Technology, China

<sup>3</sup> Collaborative Innovation Center of Electric Vehicles in Beijing, China

<sup>4</sup> Institute of Electrical Engineering, Chinese Academy of Sciences, China

**DS4-4 Fast Charge Power Prediction of Ni - MH Batteries**

Peng Jin<sup>1,2,3</sup>, Shuyu Xiao<sup>1,3</sup>, Jiaying He<sup>1,3</sup>, Shun Zhang<sup>1,3</sup>, Cong Xie<sup>1,3</sup>

<sup>1</sup> North China University of Technology, China

<sup>2</sup> Beijing Institute of Technology, China

<sup>3</sup> Collaborative Innovation Center of Electric Vehicles in Beijing, China

**DS4-5 Integrated 1D-3D coupling analysis for optimization of battery cooling and EV performance describing UDDS driving cycle - Introductory to the present and the future work -**

Wonjun Yoon<sup>1</sup>, Eunhee Ko<sup>1</sup>, Jungsoo Park<sup>2</sup>

<sup>1</sup> Graduate School, Department of Mechanical Engineering, Chosun University, Korea

<sup>2</sup> Department of Mechanical Engineering, Chosun University, Korea

**DS4-6 Predictive Battery Thermal Management Strategy for Fast Charging Electric Vehicles - Type the Subtitle of the Paper -**

Bogdan Rosca<sup>1</sup>, Steven Wilkins<sup>2</sup>

<sup>1</sup> TNO, The Netherlands

<sup>2</sup> JSAE University, Graduate School of Engineering, The Netherlands

**DS4-7 Battery Pack State Estimation Algorithms – Model Based Development and Estimation**

Bogdan Rosca<sup>1</sup>, Steven Wilkins<sup>1,2</sup>, Erik Hoedemaekers<sup>1</sup>

<sup>1</sup> TNO, The Netherlands

<sup>2</sup> Technische Universiteit Eindhoven, The Netherlands

**DS4-8 Influence of Environmental Stress Factors on SOH Of Battery for Electric-Powered Space Applications**

Mazhar Abbas, Jonghoon Kim

Chungnam National University, Department of Electrical Engineering, Korea.

**DS4-9 Development of high capacity Lithium-ion batteries consisting of nickel-based positive electrode and Silicon-based negative electrode using iron-based current collector foil**

Masanori Morishita, Akihiro Yamano, Tetsuo Sakai

Yamagata University, Research Promotion Headquarter for Integrated Organic Material Systems, Japan

## **DS4-10 Key Impact Factors on Cycling Capacity Evolution of Commercial LTO Based Pouch Cells**

Sazzad Hosen<sup>1,2</sup>, Joris de Hoog<sup>1,2</sup>, Joris Jaguemont<sup>1,2</sup>, Noshin Omar<sup>1,2</sup>, Joeri Van Mierlo<sup>1,2</sup>, Peter Van Den Bossche<sup>1,2</sup>

<sup>1</sup> Vrije Universiteit Brussel, Belgium

<sup>2</sup> Flanders Make

## **DS4-11 Evaluation Method of Battery State of Aging Based on Polarization Voltage**

Peng Lin<sup>1,3</sup>, Li Sun<sup>2,3</sup>, Peng Jin<sup>1,2,3</sup>, Luping Wang<sup>2,3</sup>, Jichao Hong<sup>1,3</sup>, Bingxin Liu<sup>4</sup>

<sup>1</sup> Beijing Institute of Technology, School of Mechatronical Engineering, China

<sup>2</sup> North China University of Technology, School of Electrical and Control Engineering, China

<sup>3</sup> Collaborative Innovation Center of Electric Vehicles in Beijing, China

<sup>4</sup> Wuhan ZhongYuan Electronics Group Co., LTD. ZhongYuan KeChuang Electronics Subcompany, Research and Development Department, China

## **DS5(Dialogue Session) Propulsion Systems & Components**

Monday, 1 October 15:30-17:00 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Hiroya Sugimoto Tokyo Institute of Technology

### **DS5-1 Evaluation of new hybrid electric vehicle drivetrain topologies - Use case specific synthesis and rating -**

Sebastian Ruoff, Marvin Busch, Katharina Bause

IPEK - Institute of Product Engineering at Karlsruhe Institute of Technology (KIT), Germany

### **DS5-2 In-Wheel Motor System for Enhanced EV Performance**

Ahmed Othman<sup>1,2</sup>, Hossam Gabar<sup>1</sup>

<sup>1</sup> Faculty of Energy Systems, University of Ontario Institute of Technology (UOIT), Canada

<sup>2</sup> Elec. Power and Machine Department, Faculty of Engineering, Zagazig University, Egypt

### **DS5-3 A Novel Dual-Motor Two-Speed Direct Drive Battery Electric Vehicle Drivetrain**

Jiageng Ruan<sup>1</sup>, Paul Walker<sup>1</sup>, Jinglai Wu<sup>2</sup>, Yang Tian<sup>1</sup>, Nong Zhang<sup>1,2</sup>

<sup>1</sup> University of Technology Sydney, Australia

<sup>2</sup> Hefei University of Technology, China

### **DS5-4 Voltage Vector Selection Strategy of IPMSM-DTC System used in Evs Based on Model Predictive Control**

Yaohua Li, Haohao Shi, Xiangzhen Meng, Qidong Yang, Jiayue Ren

School of Automobile, Chang'An University, China

### **DS5-5 A Variable Amplitude Voltage Vector Selection Strategy Based on Predictive Control for the DTC in SPMSM**

Yaohua Li, Xiangzhen Meng, Haohao Shi, Yafei Qu, Meiting Dang

School of Automobile, Chang'An University, China

### **DS5-6 Development of Torque Vectoring Control Logic and Implementation for In-wheel Vehicle**

Yonghee Lee<sup>1,2</sup>, Sangmoon Lee<sup>1</sup>, Kibok Kim<sup>1</sup>, Donghyun Kim<sup>1</sup>, Jae Wook Jeon<sup>2</sup>

<sup>1</sup> Hyundai Mobis Co. Ltd., Korea

<sup>2</sup> Sungkyunkwan University, Department of Electrical and Computer Engineering, Korea

### **DS5-7 Rotor Field Oriented Control of Resonant Wireless Electrically Excited Synchronous Motor**

Zaimin Zhong, Yong Bao, Chengyu Hu, Yijin Qin

School of Automotive Studies, Tongji University, China

**DS5-8 Development Model of Synchromesh Mechanism to optimization Transmission's Electric Vehicle**

Muhammad Adhitya<sup>1</sup>, Danardono Soemarsono<sup>1</sup>, Fuad Zainuri<sup>1,2</sup>, Sonki Prasetya<sup>1,2</sup>, Fachruddin Mochtar<sup>2</sup>, A Apriana<sup>2</sup>, E Ridwan<sup>2</sup>, T Widjatmaka<sup>2</sup>, A Azis<sup>2</sup>, D Mustofa<sup>2</sup>, Imam Wahyudi<sup>2</sup>, G Heryana<sup>3</sup>, R Siregar<sup>4</sup>

<sup>1</sup> Department of Mechanical Engineering, Universitas Indonesia, Indonesia

<sup>2</sup> Department of Mechanical Engineering, State Polytechnic of Jakarta, Indonesia

<sup>3</sup> Department of Mechanical Engineering, Sekolah Tinggi Teknologi Texmaco, Indonesia

<sup>4</sup> Department of Mechanical Engineering, Universitas Dharma Persada, Indonesia

**DS5-9 Development and Optimization of Control Strategy of Electric Driving Mode for a Novel Compound Power-Split Hybrid Electric Vehicle**

Dengfeng Shen<sup>1</sup>, Clemens Gühmann<sup>1</sup>, Ka Yao<sup>1</sup>, Tong Zhang<sup>2</sup>

<sup>1</sup> Technischen Universität Berlin, Chair of Electronic Measurement and Diagnostic Technology, Germany

<sup>2</sup> Corun CHS Technology Co., Ltd., China

**DS5-10 Development of New Compact Hybrid System**

Yuichi Uda, Satoshi Ito, Michiyasu Yamamoto

Suzuki Motor Corporation, Japan

**Day2 : Tuesday, 2 October**

**DS6(Dialogue Session) Electrical Drive 3**

Tuesday, 2 October 12:40-14:10 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Minoru Noguchi Honda Motor Co., Ltd.

**DS6-1 Charging into a Shared Future - Electrifying Transportation Networking Companies (TNCs) -**

Catherine Teebay

Forth, USA

**DS6-2 User-centric vision for mobility and transport in Europe for 2030 based on a participatory approach: the role of electrification**

Thierry Coosemans<sup>1,2</sup>, Imre Keseru<sup>1,2</sup>, Joeri Van Mierlo<sup>1,2</sup>, Cedric De Cauwer<sup>1,2</sup>, Cathy Macharis<sup>1,2</sup>, Beate Mueller<sup>3</sup>, Gereon Meyer<sup>3</sup>

<sup>1</sup> Vrije Universiteit Brussel, Mobility, Logistics and Automotive Technology Research Centre (MOBI), Belgium

<sup>2</sup> Flanders Make

<sup>3</sup> VDI/VDE-IT, Germany

**DS6-3 Transportation for All - Community Electric Vehicle Pilot Project -**

Esther Pullido

Forth, USA

**DS6-4 An Automatic Search to EV design variables using Reinforcement Learning**

Tatsuhide Sakai<sup>1</sup>, Takahiro Inabe<sup>2</sup>

<sup>1</sup> HuiSen AI Technology Ltd., China

<sup>2</sup> K.Field Ltd., Japan

**DS6-5 The Paris agreement on climate protection – consequences and challenges for the global automotive industry - The use of carbon based fuels has to come to an end and it finally must happen much sooner than it is reflected by todays strategies of most global carmakers**

Volker Blandow<sup>1</sup>, Christopher Füss<sup>2</sup>

<sup>1</sup> TUV SUD AG, Hong Kong

<sup>2</sup> TUV SUD AG, Germany

**DS6-6 A real world data based potential analysis of non-driving-related in-vehicle activities in the context of automated driving**

Michael Haag, Carsten Binz, Sebastian Stegmüller

Fraunhofer Institute for Industrial Engineering IAO, Germany

**DS6-7 Ramping up the Infrastructure - Framework Conditions and New Business Opportunities in Germany -**

Juliane Bielinski<sup>1</sup>, Tillmann Groth<sup>2</sup>, Johannes Pallasch<sup>3</sup>

<sup>1</sup> Innovationszentrum Niedersachsen, Germany

<sup>2</sup> enercity AG, Germany

<sup>3</sup> NOW GmbH National Organization Wasserstoff-und Brennstoffzellentechnologie, Germany

**DS6-8 Jeju Electric Vehicle Call Center - Assisting Local Electric Vehicle Users and Electric Vehicle Rental Car Users -**

Sanghoon Son, Suwan Kim

Jeju Research Institute, Regional and Environmental Planning Department, Korea

**DS6-9 Driverless electric vehicles at Businesspark Rivium near Rotterdam (the Netherlands): from operation on dedicated track since 2005 to public roads in 2020**

Reanne Boersma<sup>1,2</sup>, Dennis Mica<sup>2</sup>, Bart van Arem<sup>1</sup>, Frank Rieck<sup>2</sup>

<sup>1</sup> Delft University of Technology, The Netherlands

<sup>2</sup> University of Applied Sciences Rotterdam, The Netherlands

**DS7(Dialogue Session) Electrical Drive 4**

Tuesday, 2 October 12:40-14:10 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Minoru Noguchi Honda Motor Co., Ltd.

**DS7-1 Inherently Safe Design for Autonomous Driving Vehicles against Cyber Attacks**

Kenji Sugihara, Satoko Tsuru

The University of Tokyo, Quality and Healthcare Social System Engineering Laboratory, Japan

**DS7-2 A framework for designing and performing of virtual test drives concerning autonomous driving**

Martin Kehrler<sup>1</sup>, Gerd Baumann<sup>1</sup>, Hans-Christian Reuss<sup>2</sup>

<sup>1</sup> Research Institute of Automotive Engineering and Vehicle Engines (FKFS), Germany

<sup>2</sup> Institute for Internal Combustion Engines and Automotive Engineering (IVK), Germany

**DS7-3 Understanding the Adoption of Automated Vehicle Technology: - A Case-Study of Tesla Owners -**

Rosaria Berliner, Scott Hardman, Gil Tal

Plug-in Hybrid and Electric Vehicle Research Center, Institute of Transportation Studies, University of California Davis, USA

**DS7-4 Autonomous Vehicles as a Service Critical Review - Can Autonomous Vehicles as a Service Compete with Future Transport Solutions and What Demands do these Place on Existing Infrastructure -**

Richard William Merrett

Mentor, A Siemens Business, USA

**DS8(Dialogue Session) Infrastructure**

Tuesday, 2 October 12:40-14:10 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Yukio Yokoi (Ret) Kyoto University RISH

**DS8-1 A Study of Evaluating Method in Durability Test of EV Couplers for Battery-Swapping System**

Kwangmin Kim<sup>1</sup>, Ju Lee<sup>1</sup>, Sanggon Lee<sup>2</sup>

<sup>1</sup> Hanyang University, Korea

<sup>2</sup> Korea Testing Laboratory, Korea

**DS8-2 Smart management of electric fleet - Use of renewable resources for effective green transport -**

Franciszek Sidorski<sup>1,2</sup>, Justyna Michalak<sup>1</sup>, Adam Piotrowski<sup>3</sup>, Michał Sierszyński<sup>2</sup>, Bartłomiej Walczak<sup>2</sup>

<sup>1</sup> Poznan University of Technology, Institute of electrical power engineering, Poland

<sup>2</sup> Solaris Bus & Coach S.A., Research Development Department, Poland

<sup>3</sup> freelance researcher



**DS8-3 Relevance of Rare Earths recycling from Permanent Magnets - Current and future use of Rare Earth Metals in Permanent Magnets for (Electric) Vehicles and the collection potential for recycling to provide a feedstock for the REE4EU industrial scale Rare Earth recycling processes. -**

Bert Witkamp<sup>1,2</sup>

<sup>1</sup> Valaud Ltd., Belgium

<sup>2</sup> AVERE, The European Association for Electromobility, Belgium

**DS8-4 Driving style comparison of plug-in hybrids and fossil fueled vehicles based on data collection of fast sampled signals**

Stefan Pettersson<sup>1</sup>, Susanne Bjärsvik<sup>2</sup>, Cristofer Englund<sup>1</sup>, Robert Eriksson<sup>2</sup>, Veikko Koponen<sup>2</sup>, Urban Kristiansson<sup>1</sup>, Hans-Göran Milding<sup>2</sup>, Christofer Sundström<sup>1</sup>, Johan Wedlin<sup>1</sup>

<sup>1</sup> RISE Viktoria, Sweden

<sup>2</sup> Volvo Car Corporation, Sweden

**DS8-5 Making an electrification analysis tool for multiple types of transportation**

Joakim Nyman<sup>1</sup>, Oscar Enerbäck<sup>1</sup>, Stefan Pettersson<sup>1</sup>

RISE Research Institutes of Sweden

**DS8-6 Development of the Electromagnetic Design Method for the Automotive EMC Problems**

Yuki Natsume, Yuji Ohori, Shota Inudo

Subaru Corporation, Japan

**DS8-7 Energy consumption of electric city buses**

Alexander Bunzel, Martin Ufert, Bernard Bäker

Technische Universität Dresden, Germany

**DS8-8 Low carbon vehicles in 2030: multicriteria analysis of cost competitiveness and environmental impacts**

Anne Bouter<sup>1</sup>, Cyprien Ternel<sup>1</sup>, Fabrice Le Berr<sup>1</sup>, Joris Melgar Sossa<sup>1</sup>, François Badin<sup>1</sup>, Maxime Pasquier<sup>2</sup>

<sup>1</sup> IFPEN, France

<sup>2</sup> ADEME, France

**DS8-9 Measuring the service quality of EV charging point operators**

Lieselot Vanhaverbeke<sup>1</sup>, Quentin De Clerck<sup>1</sup>, Joeri Van Mierlo<sup>1</sup>

MOBI, Vrije Universiteit Brussel, Belgium

**DS8-10 A novel energy system using Electric Vehicles for expanding renewable energy**

Yoshiki Tomura<sup>1</sup>, Tsuguhiko Nakagawa<sup>1</sup>

Okayama Prefectural University Graduate School of Information Engineering., Japan

**DS8-11 Smart management of electric fleet - Use of renewable resources for effective green transport -**

Maarten Linnenkamp

Metropolitan Region Amsterdam-Electric (MRA-E)

**DS9(Dialogue Session) Energy Storage Systems 2**

Tuesday, 2 October 12:40-14:10 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Yukinori Hato National Institute for Materials Science

**DS9-1 Supercapacitors Health Prognosis for Vehicular Applications**

Asmae El Mejdoubi<sup>1</sup>, Hamid Gualous<sup>1</sup>, Hicham Chaoui<sup>2</sup>, Jalal Sabor<sup>3</sup>

<sup>1</sup> NORMANDIE UNIV, UNICAEN, LUSAC, France

<sup>2</sup> IRES research group, Department of Electronics, Carleton University, Canada

<sup>3</sup> ENSAM, Université Moulay Ismail, Morocco

## **DS9-2 Model Development of Electric Vehicles Based on Test Data Analysis.**

Namwook Kim<sup>1</sup>, Do Hyun Park<sup>1</sup>, Woong Lee<sup>1</sup>, Haeseong Jeong<sup>1</sup>, Chunhua Zheng<sup>2</sup>

<sup>1</sup>Hanyang University, Korea

<sup>2</sup>Shenzhen Institutes of Advanced Technology, China

## **DS9-3 Quick Charging Strategy Based on Temperature Characteristics.**

Jiaying He<sup>1,2</sup>, Peng Jin<sup>1,2</sup>, Shuyu Xiao<sup>1,2</sup>, Cong Xie<sup>1,2</sup>

<sup>1</sup>North China University of Technology, China

<sup>2</sup>Collaborative Innovation Center of Electric Vehicles in Beijing, China

## **DS9-4 Suppression-effect of The Bubbles in Hydrogen Reactor Fueled by NaBH<sub>4</sub> under High Pressure Condition**

Yuri Naito<sup>1</sup>, Nobukazu Hoshi<sup>1</sup>, Yusuke Oka<sup>2</sup>

<sup>1</sup>Department of Electrical Engineering, Faculty of Science and Technologies, Tokyo University of Science, Japan

<sup>2</sup>Isuzu advanced engineering center LTD., Japan

## **DS10(Dialogue Session) Electric Machines & Control Technologies**

Tuesday, 2 October 12:40-14:10 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Masatsugu Takemoto Hokkaido University

## **DS10-1 Semi-Analytical Approach to Steady-State Torque Estimation of Synchronous Reluctance Machines - by Harmonic Analysis of Phase Inductances -**

Yassine Benômar<sup>1,4</sup>, B Raes<sup>2</sup>, Björn Verrelst<sup>3</sup>, Joeri Van Mierlo<sup>1,4</sup>, Omar Hegazy<sup>1,4</sup>

<sup>1</sup>Vrije Universiteit Brussel (VUB), ETEC Dept., MOBI Research Group

<sup>2</sup>Katholieke Universiteit Leuven (KUL), Dept. of Physics and Astronomy, Laboratory of Solid State Physics and Magnetism

<sup>3</sup>Vrije Universiteit Brussel (VUB), Mech Dept.

<sup>4</sup>Flanders Make

## **DS10-2 Demystifying Rare Earths Supply - Rare Earths Supply as an Enabler of Permanent Magnet Technology Adoption for Electric Vehicle Drivetrains -**

Pol Le Roux<sup>1</sup>, Jose Ramon Garcia Santamaria<sup>2</sup>

<sup>1</sup>VP Sales & Marketing, Lynas Corporation, Australia

<sup>2</sup>General Manager Marketing, Lynas Corporation, Australia

## **DS10-3 Enhanced Output Power Characteristics of a Switched Reluctance Motor Designed for High Power Electric Vehicles**

Nanaho Kawata, Akira Chiba

Tokyo Institute of Technology, Japan

## **DS10-4 Development of Double-Rotor Vernier Permanent-Magnet Machine for Electric Vehicle Applications**

Christopher H. T. Lee<sup>1</sup>, K. T. Chau<sup>2</sup>, L. B. Gao<sup>2</sup>, T. W. Ching<sup>3</sup>, C. C. Chan<sup>2</sup>

<sup>1</sup>Research Laboratory of Electronics., Massachusetts of Technology, USA

<sup>2</sup>Department of Electrical and Electronic Engineering, The University of Hong Kong, China

<sup>3</sup>Faculty of Science and Technology, University of Macau, China

## **DS10-5 A High Power Density PM Motor for Electric Vehicle Application**

Rama Lakshmi Suresh Nimmana<sup>1</sup>, Akira Chiba<sup>1</sup>

Tokyo Institute of Technology, Japan

## **DS10-6 Problems of Temperature Distribution in Electric Wheel Hub Motors - Application of Tooth-tips Shape in Stator -**

Piotr Dukalski<sup>1</sup>, Bartłomiej Będkowski<sup>1</sup>, Tomasz Wolnik<sup>1</sup>, Tomasz Jarek<sup>1</sup>

Institute of Electrical Drives and Machines KOMEL, Poland

## **DS10-7 Performance Comparison Study of Wound Field Synchronous Motor and Interior Permanent Magnet Synchronous Motor**

Shigeo Sakurai<sup>1</sup>, Takeshi Suwazono<sup>1</sup>, Takayuki Mizuno<sup>1</sup>, Koji Nagata<sup>1</sup>, Tadashi Ashikaga<sup>1</sup>

EV Components Development Division, Meidensha Corporation, Japan

### **DS10-8 Design of Flux-switching DC-field Machines with Harmonics Suppression**

Libing Cao<sup>1</sup>, K. T. Chau<sup>1</sup>, Christopher H. T. Lee<sup>2</sup>, C. C. Chan<sup>1</sup>, T. W. Ching<sup>3</sup>

<sup>1</sup> Dept. of Electrical and Electronic Engineering, The University of Hong Kong, China

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<sup>3</sup> Faculty of Science and Technology, University of Macau, China

### **DS10-9 Development of Vehicle Collision Avoidance System Based on Impedance Control Approach**

Chun-Lin Chen<sup>1</sup>, Mi-Ching Tsai<sup>1</sup>, Ko-Lin Wang<sup>1</sup>, Jia-Sheng Hu<sup>2</sup>, Yen-Chen Liu<sup>1</sup>

<sup>1</sup> Department of Mechanical Engineering, National Cheng Kung University, Taiwan

<sup>2</sup> Department of Greenery, National University of Tainan, Taiwan

## **DS11(Dialogue Session) Power Electronic Components**

Tuesday, 2 October 12:40-14:10 Hall 2, 2F, Exhibition Hall No.1 Bldg.

*Chair* : Kimimori Hamada Toyota Motor Corporation

### **DS11-1 A Study of the Packaging Design for the Power Control Unit using SiC Power Semiconductor Devices for Electric Vehicle**

Seongjun Lee<sup>1</sup>, Namgyu Lim<sup>2</sup>, Jonghoon Kim<sup>3</sup>

<sup>1</sup> School of Mechanical System & Automotive Engineering, Chosun University, Korea

<sup>2</sup> Department of Mechanical System Engineering, Chosun University, Korea

<sup>3</sup> Department of Electrical Engineering, Chungnam National University, Korea

### **DS11-2 Optimization of a low weight electronic differential for LEVs - Efficient design for independent one axis two in-wheel engines -**

Alfonso Gago-Calderon<sup>1</sup>, Jose Fernandez-Ramos<sup>1</sup>, Jose Ramon Andres-Diaz<sup>1</sup>

Universidad de Málaga, Spain

### **DS11-3 Smart Inverter for Micro EV Capable of Driving and Charging**

Young Eun Kim<sup>1</sup>, Young Wook Son<sup>1</sup>, Jae Seok Lee<sup>1</sup>, Jun Ho Cho<sup>2</sup>

<sup>1</sup> Information Convergence R&D Center Smart Car Technology R&D Division, KOREA AUTOMOTIVE TECHNOLOGY INSTITUTE, Korea

<sup>2</sup> EMI/EMC R&D Center Reliability & Safety R&D Division, KOREA AUTOMOTIVE TECHNOLOGY INSTITUTE, Korea

### **DS11-4 Development of a 400V/1000A inverter for testing electric drivetrains**

Zoltan Szeli, Gabor Szakallas

Szechenyi Istvan University, Hungary

### **DS11-5 SiC based Onboard Charger using Peak Current Mode Control**

Kaoru Koketsu<sup>1</sup>, Shinya Goto<sup>1</sup>, Tsuyoshi Hosoda<sup>1</sup>, Kimikazu Nakamura<sup>1</sup>, Kazuhiro Shirakawa<sup>1</sup>, Keiichi Ando<sup>1</sup>, Yuichi Handa<sup>1</sup>, Yuki Yamada<sup>1</sup>, Yuji Hayashi<sup>2</sup>, Seiji Iyasu<sup>2</sup>

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<sup>2</sup> SOKEN, INC., JAPAN