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## Tuesday June 4th

### Session #2-1: Resonant Converters

#### Chair: Udaya Madawala

[Performance Analysis of Input Voltage Auto-Balanced LLC Converter with Resonant Switched Capacitor](#)\*\*\*\*%

Qingjing Luo, Sheng Zong, Haoze Luo, Yi Zhao, Wuhua Li, Xiangning He, Zhejiang University, CHINA

[Analysis and Design of Boost-LLC Converter for High Power Density AC-DC Adapter](#)\*\*\*\*\*

Jun-Ho Kim, Moon-Young Kim, Cheol-O Yeon, Gun-Woo Moon, Korea Advanced Institute of Science and Technology (KAIST) REPUBLIC OF KOREA

[A High Efficiency PFM Half-Bridge Converter Utilizing a Half-Bridge LLC Converter Under Light Load Conditions](#)\*\*\*\*%&

Jae-Bum Lee<sup>1</sup>, Jea-Kuk Kim<sup>2</sup>, Jae-Hyun Kim<sup>1</sup>, Moon-Young Kim<sup>1</sup> and Gun-Woo Moon<sup>1</sup>, <sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST) REPUBLIC OF KOREA, <sup>2</sup>Samsung Electro-Mechanics Company REPUBLIC OF KOREA

[Complete model of parasitic capacitances in a cascade voltage multiplier in the high voltage generator](#)\*\*\*\*%

Jianing Wang<sup>1</sup>, Luerkens Peter<sup>2</sup>, Sjord W.H. de Haan<sup>1</sup>, Jan A. Ferreira<sup>1</sup>, <sup>1</sup>Technology University of Delft THE NETHERLANDS, <sup>2</sup>Philips THE NETHERLANDS

[Small Signal Analysis of the Resonant LLC Converter](#)\*\*\*\*&

Juergen Stahl, T. Hieke, C. Oeder, T. Duerbaum, University Erlangen-Nuremberg GERMANY

### Session #2-2: Inverter Control Methods

#### Chair: Youngsuh Suh

[Modelling and Design of Single-Edge Oversampled PWM Current Regulators using z-domain methods](#)\*\*\*\* %

Toit Mouton<sup>1</sup>, Adriaan de Beer<sup>1</sup>, Bruno Putzeys<sup>2</sup>, Brendan McGrath<sup>3</sup>, <sup>1</sup>University of Stellenbosch SOUTH AFRICA, <sup>2</sup>Hypex Electronics BELGIUM, <sup>3</sup>RMIT University AUSTRALIA

[A Three-Level Self-Synchronizing Hysteresis Current Regulator with Constant Switching Frequency](#)\*\*\*\* ,

Reza Davoodnezhad, Grahame Holmes, Brendan McGrath, RMIT University AUSTRALIA

[An Analysis of Current Control Method for Grid Connected Front-end Three Phase AC-DC Converter](#)\*\*\*\*()

Azziddin M. Razali<sup>1</sup>, M.A. Rahman<sup>2</sup>, Nasrudin A. Rahim<sup>2</sup>, <sup>1</sup>Technical University of Malaysia MALAYSIA, <sup>2</sup>Memorial University of Newfoundland CANADA, <sup>3</sup>University of Malaya MALAYSIA

[Evaluation of Control Methods for Isolated Three-phase AC-DC converter using Modular Multilevel Converter Topology](#)\*\*\*\*) &

Toshiki Nakanishi, Jun-ichi Itoh, Nagaoka University of Technology JAPAN

[Using RC Type Damping to Eliminate Right-half plane Zeros in High Step-up DC-DC Converter with Diode-Capacitor](#)

[Network](#)\*\*\*\*) -

Yan Zhang, Jinjun Liu, Xiaolong Ma, Xi'an Jiao Tong University CHINA

### Session #2-3: Solar Converters

#### Chair: Sanjib Kumar Panda

[Current Improvement of a Grid-Connected Photovoltaic System Under Unbalanced Voltage Conditions](#)\*\*\*\*\*

Mitra Mirhosseini<sup>1</sup>, Josep Pou<sup>2</sup>, Vassilios G. Agelidis<sup>1</sup>, <sup>1</sup>The University of New South Wales, AUSTRALIA, <sup>2</sup>Technical University of Catalonia SPAIN

[D-Σ Digital Control for A Three-Phase Transformerless Bi-directional Inverter with Wide Inductance Variation](#)\*\*\*\*+'

Tsai-Fu Wu<sup>1</sup>, C.-H. Chang<sup>2</sup>, L.-C. Lin<sup>2</sup>, H.-C. Hsieh<sup>2</sup>, <sup>1</sup>National Tsing Hua University TAIWAN, <sup>2</sup>National Chung Cheng University TAIWAN

[Photovoltaic Micro-inverter with Front-end DC-DC Converter and Half-wave Cycloconverter](#)\*\*\*\*; S

Dulika Nayanasingi, Mahinda Vilathgamuwa, Douglas Maskell, Nanyang Technological University SINGAPORE

[The Demonstration Experiments to Verify the Effectiveness of the Improved PSO-based MPPT Controlling Multiple Photovoltaic Arrays](#)\*\*\*\*; \*

Vanxay Phimmason, Yuta Kondo, Natsuki Shiota, Masafumi Miyatake, Sophia University JAPAN

[DC-Link Control Strategy for the Actively Clamped Resonant DC-Link Inverter](#)\*\*\*\*- '

Yaojie Hou, Dehua Zhang, Jiao He, Zhejiang University CHINA

### Session #2-4: High Power Applications

#### Chair: Matsuo Nakaoka

[Compact Static Starting Device for Gas Turbine](#)

Ryota Okuyama, Yasuaki Matsumoto, Hiroshi Ogino, Shigeyuki Nakabayashi, Akinobu Ando, Yasuhiko Hosokawa, Toshiba Mitsubishi-Electric Industrial Systems Corporation JAPAN

[Upgrade of 4.9MW High Speed Helper Motor Drive System of LNG Hydrocarbon Gas Compressor Train: A Comparison of Voltage Source Inverter and Load Commutated Inverter Topologies](#)

Chathura Mudannayake<sup>1</sup>, John Ryan<sup>1</sup>, Akihiko Kuroiwa<sup>2</sup>, Tomoharu Kuninaga<sup>2</sup>, <sup>1</sup>Toshiba International Corporation AUSTRALIA, <sup>2</sup>Toshiba Mitsubishi-Electric Industrial Systems Corporation JAPAN

[Research on Novel Railway Uninterruptible Flexible Connector With Series-Connected Transformers and Back-to-Back Converter](#)

Xu Tian, Qirong Jiang, Yingdong Wei, Tsinghua University CHINA

[The Method for Reducing Harmonics in Input Currents of Rectifier Using a Modulation in Interphase Transformer](#)

Andrzej Kaplon, Jaroslaw Rolek, Henryk Tunia, Kielce University of Technology POLAND

[Closed Form Analysis of N-Cell Interleaved Two-Level DC-DC Converters: The DC Bus Capacitor Current Stress](#)

Petar Grbovic, Huawei Technologies GERMANY

## Session #2-5: Electric Vehicle Technology (Special Session) Chair: Nobuyuki Matsuie

[New Trend of Motor Technology for Automobiles - Introduction and Overview](#)

Kan Akatsu<sup>1</sup>, Nobuyuki Matsuie<sup>2</sup>, <sup>1</sup>Shibaura Institute of Technology JAPAN, <sup>2</sup>Chubu University JAPAN

[Current Specifications of Vehicle Motors](#)

Yoshiaki Kano<sup>1</sup>, Yukinori Inoue<sup>2</sup>, Masayuki Sanada<sup>2</sup>, <sup>1</sup>Toyota National College of Technology JAPAN, <sup>2</sup>Osaka Prefecture University JAPAN

[Recent Related Technologies for EV/HEV Applications in Japan](#)

Kan Akatsu<sup>1</sup>, Naoki Watanabe<sup>2</sup>, Masami Fujitsuna<sup>3</sup>, Shinji Doki<sup>4</sup>, Hiroshi Fujimoto<sup>5</sup>, <sup>1</sup>Shibaura Institute of Technology JAPAN, <sup>2</sup>Shin-Etsu Chemical Co. JAPAN, <sup>3</sup>Denso Co. JAPAN, <sup>4</sup>Nagoya University JAPAN, <sup>5</sup>University of Tokyo JAPAN

[Advanced Technologies of traction motor for Automobile](#)

Takashi Kato<sup>1</sup>, Ryoji Mizutani<sup>2</sup>, Hiroyuki Matsumoto<sup>3</sup>, Keiichi Yamamoto<sup>4</sup>, <sup>1</sup>Nissan Motor Co. JAPAN, <sup>2</sup>Toyota Motor Co. JAPAN, <sup>3</sup>Atsumitec Co. JAPAN, <sup>4</sup>Honda R&D Laboratory JAPAN

[State-of-Art of Research and Development of Vehicle Motors](#)

Takashi Kosaka<sup>1</sup>, Hideaki Arita<sup>2</sup>, Masayuki Sanada<sup>3</sup>, Masanori Arata<sup>4</sup>, Kazuto Sakai<sup>5</sup>, Akihiko Maemura<sup>6</sup>, <sup>1</sup>Nagoya Institute of Technology JAPAN, <sup>2</sup>Mitsubishi Electric Corporation JAPAN, <sup>3</sup>Osaka Prefecture University JAPAN, <sup>4</sup>Toshiba Corporation JAPAN, <sup>5</sup>Toyo University JAPAN, <sup>6</sup>Yaskawa Electric Corporation JAPAN

## Session #3-1: HF Converters

### Chair: Braham Ferreira

[Isolated High Frequency Link AC-AC Converter based on Sinusoidal Wave Modulation Technology for Voltage](#)

[Compensation](#)

Chushan Li, Yan Deng, Zibo Lv, Yong Tao, Wuhua Li, Xiangning He, Yousheng Wang, Zhejiang University CHINA

[Switching Control Method for Light Load Efficiency Improvement in Phase Shifted Full Bridge Converter](#)

Jong-Woo Kim<sup>1</sup>, Duk-You Kim<sup>1</sup>, Chong-Eun Kim<sup>2</sup>, Moon-Young Kim<sup>1</sup>, Gun-Woo Moon<sup>1</sup>, <sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST) REPUBLIC OF KOREA, <sup>2</sup>Samsung Electro-mechanics REPUBLIC OF KOREA

[An Isolated Ultra-Low Distortion Inverter Based on the Differential Output Structure with Widen Soft-Switching Load Range](#)

Hao Peng, Yan Deng, Ying Wang, Yong Tao, Xiangning He, Rongxiang Zhao, Zhejiang University CHINA

[Hybrid Dual Full-Bridge DC-DC Converter with Reduced Circulating Current, Output Filter and Conduction Loss of Rectifier Stage for RF Power Generator Application](#)

Young-Do Kim<sup>1</sup>, Il-Oun Lee<sup>2</sup>, In-Ho Cho<sup>2</sup>, Gun-Woo Moon<sup>2</sup>, <sup>1</sup>Samsung Electro-mechanics REPUBLIC OF KOREA, <sup>2</sup>Korea Advanced Institute of Science and Technology (KAIST) REPUBLIC OF KOREA

## Session #3-2: Multilevel Converters I

### Chair: Samir Kouro

[Comparative Study of Four Kinds of Multicarrier PWM Strategies Used In NPC Three-Level Converters](#)

Ning Li, Yue Wang, Wulong Cong, Zhao'an Wang, Xi'an Jiaotong University CHINA

[Performance Analysis of Composite Five-Level Converter with Dual T Type and Diode Modules](#) % S

Haoze Luo, Pengfei Sun, Yufei Dong, Wuhua Li, Xiangning He, Zhejiang University CHINA

[Hybrid Asymmetric Cascaded Three-Phase Inverter with Low-Order Harmonics Elimination Control Scheme](#) %)

Jiankun Cao, Shaojun Xie, Nanjing University of Aeronautics and Astronautics CHINA

[Performance Evaluation of a Large Capacity 3-level IEGT Inverter](#) %&S%

Mostafa Al Mamun, Daisuke Yoshizawa, Makoto Mukunoki, Toshiba Mitsubishi-Electric Industrial Systems Corporation JAPAN

### **Session #3-3: Wind Power Systems I**

**Chair: Pedro Rodriguez**

[Investigation of Flat and V-shaped Magnets in Interior Permanent Magnet Machine for Direct Drive Wind Turbine](#)

[Application](#) %&S,

Kazi Ahsanullah, Rukmi Dutta, Faz Rahman, The University of New South Wales AUSTRALIA

[A Series Regulated Open-Winding PM Generator Based Constant Voltage, Variable Frequency AC Distribution System](#) %&S

Di Pan<sup>1</sup>, Yang Wang<sup>2</sup>, Thomas A. Lipo<sup>3</sup>, <sup>1</sup>GE Global Research USA, <sup>2</sup>United Technology Research Centre USA, <sup>3</sup>University of Wisconsin-Madison USA

[Multi-Physics Power Hardware in the Loop Test Bench for On-Shore Wind Turbine Nacelles](#) %&S

Alexander Helmedag, Timo Isermann, Antonello Monti, Nurhan Rizqy Averous, Marco Stieneker, Rik W. De Doncker, RWTH Aachen University GERMANY

[Individual Pitch Control Design of Wind Turbines for Load Reduction Using Sliding Mode Method](#) %&S

Shuai Xiao, Geng Yang, Hua Geng, Tsinghua University CHINA

### **Session #3-4: Gate Drivers**

**Chair: Yung Liang**

[Switching Performance Evaluation of Commercial SiC Power Devices \(SiC JFET and SiC MOSFET\) in Relation to the](#)

[Gate Driver Complexity](#) %&S

Riccardo Pittini, Zhe Zhang, Michael Andersen, Technical University of Denmark DENMARK

[Light-Load Efficiency Improvement Using Load Adaptive Gate Driving Method](#) %&S

Jae-Hyun Kim<sup>1</sup>, Jae-Bum Lee<sup>1</sup>, Jong-Woo Kim<sup>1</sup>, Gun-Woo Moon<sup>1</sup>, Jae-Kuk Kim<sup>2</sup>, <sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST) REPUBLIC OF KOREA, <sup>2</sup>Samsung Electro-Mechanics REPUBLIC OF KOREA

[Dual-Function Gate Driver for a Power Module With SiC Junction Field-Effect Transistors](#) %&S

Juan Colmenares, Dimosthenis Pefitsis, Jacek Rabkowski, Hans-Peter Nee, KTH Royal Institute of Technology SWEDEN

[Design Considerations for a Self-Powered Gate Driver for Normally-ON SiC Junction Field-Effect Transistors](#) %&S

Dimosthenis Pefitsis, Jacek Rabkowski, Hans-Peter Nee, KTH Royal Institute of Technology SWEDEN

### **Session #3-5: Motor Drives I**

**Chair: Kan Akatsu Tuesday**

[Dynamic Model of Brushless Synchronous Generator with Turn-to-Turn Short Circuit Fault for Condition Monitoring](#) %&S),

Nadarajan Sivakumar<sup>1</sup>, Bicky Bhangu<sup>2</sup>, Sanjib Kumar Panda<sup>1</sup>, Amit Kumar Gupta<sup>2</sup>, <sup>1</sup>National University of Singapore SINGAPORE, <sup>2</sup>Rolls-Royce SINGAPORE

[A Position-Sensorless Vector Control of Doubly-Fed Induction Machines using Adaptive Reduced-Order Observers on](#)

[Holonomic Reference Frames](#) %&S (

Surapong Suwankawin, Jirat Udomsri, Somrat Smiththisomboon, Chulalongkorn University THAILAND

[Analysis of the Limitations of Conventional Direct Thrust Control Scheme for Linear Permanent Magnet Synchronous](#)

[Motors](#) %&S

Muhammad Ali Masood Cheema, John Edward Fletcher, The University of New South Wales AUSTRALIA

[Non-Linear Common-Mode Equivalent Circuit for Inverter-Fed Motor Drive Systems](#) %&S,

Yizhanyi Tang, Satoshi Ogasawara, Masatsugu Takemoto, Hokkaido University JAPAN

### **Session #4-1: Interface and Multiport Converters**

**Chair: Udaya Madawala**

[A Three-port High Step-up DC-DC Converter for PV System](#) %&S)

Yihua Hu, Yan Deng, Xiaoxun Lu, Yong Tao, Xiangning He, Zhejiang University CHINA

[A High Frequency Isolated Current-Fed Bidirectional DC/AC Converter for Grid-Tied Energy Storage System](#) & %  
Xiaolei Hu, King Jet Tseng, Yitao Liu, Shan Yin, Mengqi Zhang, Nanyang Technological University SINGAPORE

[Single-Switch Equalization Charger Integrating SEPIC and Equalizer Using Series-Resonant Voltage Multiplier for Series-Connected Energy Storage Cells/Modules](#) & +

Masatoshi Uno, Akio Kukita, Japan Aerospace Exploration Agency JAPAN

[A Multi-Input Single-Control \(MISC\) Battery Charger for DC Nanogrids](#) S(

Arun Sankar, Soumya Shubhra Nag, Santanu Mishra, Indian Institute of Technology Kanpur INDIA

## Session #4-2: Modular Multilevel Converters I

**Chair: Petar Grobvic**

[Design and Experiment of a Back-To-Back \(BTB\) System Using Modular Multilevel Cascade Converters for Power Distribution Systems](#) %&

Pracha Khamphakdi, Kei Sekiguchi, Makoto Hagiwara, Hirofumi Akagi, Tokyo Institute of Technology JAPAN

[Optimal Injection of Harmonics in Circulating Currents of Modular Multilevel Converters for Capacitor Voltage Ripple Minimization](#) %

Ricard Picas<sup>1</sup>, Josep Pou<sup>1,2</sup>, Salvador Ceballos<sup>3</sup>, Jordi Zaragoza<sup>1</sup>, Georgios Konstantinou<sup>2</sup> and Vassilios Agelidis<sup>2</sup>,  
<sup>1</sup>Technical University of Catalonia SPAIN, <sup>2</sup>The University of New South Wales AUSTRALIA, <sup>3</sup>Tecnalia SPAIN

[Predictive Sorting Algorithm for Modular Multilevel Converters Minimizing the Spread in the Submodule Capacitor Voltages](#) &

Kalle Ilves<sup>1</sup>, Lennart Harnefors<sup>2</sup>, Staffan Norrga<sup>1</sup>, Hans-Peter Nee<sup>1</sup>, <sup>1</sup>KTH - Royal Institute of Technology SWEDEN, <sup>2</sup>ABB Corporate Research SWEDEN

[Circulating Current Control and Evaluation of Carrier Dispositions in Modular Multilevel Converters](#) &

Rosheila Darus<sup>1,2</sup>, Josep Pou<sup>1,3</sup>, Georgios Konstantinou<sup>1</sup>, Salvador Ceballos<sup>4</sup>, Vassilios Agelidis<sup>4</sup>, <sup>1</sup>The University of New South Wales AUSTRALIA, <sup>2</sup>Universiti Teknologi Mara MALAYSIA, <sup>3</sup>Technical University of Catalonia SPAIN, <sup>4</sup>Tecnalia SPAIN

## Session #4-3: Micro-Grid Control

**Chair: Md Azizur Rahman**

[Cost-Based Droop Scheme with Lower Generation Costs for Microgrids](#) -

Inam Ullah Nulkani<sup>1</sup>, Poh Chiang Loh<sup>2,3</sup>, Frede Blaabjerg<sup>3</sup>, <sup>1</sup>Experimental Power Grid Centre SINGAPORE, <sup>2</sup>Nanyang Technological University SINGAPORE, <sup>3</sup>Aalborg University DENMARK

[Accurate Power Sharing Strategy for Complex Microgrid based on Droop Control Method](#) ((

Yixin Zhu, Fang Zhuo, Hongtao Shi, Xi'an Jiaotong University CHINA

[A Novel Seamless Transferring Control Method for Microgrid Based on Master-Slave Configuration](#) ) %

Xin Chen<sup>1</sup>, Yan Hong Wang<sup>2</sup>, Yun Cheng Wang<sup>1</sup>, <sup>1</sup>Nanjing University of Aeronautics and Astronautics CHINA, <sup>2</sup>Shenyang Aircraft Airworthiness Certification Centre CHINA

[Power Sharing Strategy in Parallel Operation of Inverters for Distributed Power System Under Line Impedance Inequality](#) ),

Byung-Geuk Cho, Seung-Ki Sul, Seoul National University REPUBLIC OF KOREA

## Session #4-4: Wide-Band-Gap Device Applications

**Chair: Hans-Peter Nee**

[Resonant Gate Driver for Normally-On GaN High-Electron-Mobility Transistor](#) \*)

Takaharu Ishibashi<sup>1,5</sup>, Masayuki Okamoto<sup>2,5</sup>, Eiji Hiraki<sup>1,5</sup>, Toshihiko Tanaka<sup>1,5</sup>, Tamotsu Hashizume<sup>3,5</sup>, Tetsu Kachi<sup>4,5</sup>,  
<sup>1</sup>Yamaguchi University JAPAN, <sup>2</sup>Ube National College of Technology JAPAN, <sup>3</sup>Hokkaido University JAPAN, <sup>4</sup>Toyota Central R&D Labs JAPAN, <sup>5</sup>Japan Science and Technology Agency (JST) JAPAN

[Volume Evaluation of a PWM Inverter with Wide Band-Gap Devices for Motor Drive System](#) +&

Jun-ichi Itoh, Takahiro Araki, Nagaoka University of Technology JAPAN

[Analytical Modelling of High Temperature Characteristics on the DC Responses for Schottky-Gate AlGaIn/GaN HEMT Devices](#) +

Yun-Hsiang Wang<sup>1</sup>, Yung C. Liang<sup>1</sup>, Ganesh S. Samudra<sup>1</sup>, Ting-Fu Chang<sup>2</sup>, Chih-Fang Huang<sup>2</sup>, Li Yuan<sup>3</sup>, Guo-Qiang Lo<sup>3</sup>, <sup>1</sup>National University of Singapore SINGAPORE, <sup>2</sup>National Tsing Hua University TAIWAN, <sup>3</sup>A\*STAR Institute of

Microelectronics SINGAPORE

[Gate Oxide Reliability of a Commercial SiC MOSFET used in Aeronautic Applications](#) ( , )

Thomas Santini<sup>1</sup>, Morand Sebastien<sup>1</sup>, Miller Florent<sup>1</sup>, Luong-Viêt Phung<sup>2</sup>, Bruno Allard<sup>2</sup>, <sup>1</sup>EADS Innovation Works FRANCE, <sup>2</sup>Ampere Laboratory INSA de Lyon FRANCE

## Session #4-5: Sustainable Systems

**Chair: Ron Hui**

[Voltage Balancing Circuit for Energy Harvesting from a Stack of Serially-Connected Microbial Fuel Cells](#) ( &

Firas Khaled<sup>1</sup>, Olivier Ondel<sup>2</sup>, Bruno Allard<sup>1</sup>, Nicolas Degrenne<sup>3</sup>, Ampere Laboratory <sup>1</sup>University of Lyon FRANCE, <sup>2</sup>University Claude Bernard Lyon, <sup>3</sup>Ecole Centrale de Lyon, FRANCE

[A Supercapacitor Remaining Energy Control Method for Smoothing a Fluctuating Renewable Energy Power](#) ( - ,

Wujong Lee, Hanju Cha, Chungnam National University REPUBLIC OF KOREA

[Ubiquitous Power for Sectional Compact Emergency Shelter](#) ( ( S(

Toshihiko Tanaka<sup>1</sup>, Keiichi Kato<sup>1</sup>, Shinichi Noriyasu<sup>1</sup>, Eiji Hiraki<sup>1</sup>, Makoto Koganei<sup>1</sup>, Fusanori Miura<sup>1</sup>, Masayuki Okamoto<sup>2</sup>, <sup>1</sup>Yamaguchi University JAPAN, <sup>2</sup>Ube National College of Technology JAPAN

[A BESS Control System for Reducing Fuel-Consumption and Maintenance Costs of Diesel-Hybrid Mini-Grids with High Penetration of Renewables](#) ( ( S-

Nayeem Ninad, Luiz Lopes, Concordia University CANADA

## Wednesday June 5th

### Session #5-1: Multi-Module Converters

**Chair: Dushan Boroyevich**

[Generalized Stability Criterion of Multi-Module Distributed System](#) ( ( %

Liu Fangcheng, Liu Jinjun, Zhang Bin, Zhang Haodong, Hasan Saad Ul, Xi'an Jiaotong University CHINA

[General Impedance/Admittance Stability Criterion for Cascade System](#) ( ( &&

Liu Fangcheng, Liu Jinjun, Zhang Bin, Zhang Haodong, Hasan Saad Ul, Xi'an Jiaotong University CHINA

[Multi-Input DC-AC Converter for Renewable Energy Applications](#) ( ( &

Devendra Patil, Vivek Agarwal, Indian Institute of Technology Bombay INDIA

[High Power Supply Rejection Wideband Low-Dropout Regulator](#) ( ( ' \*

Thomas Coulot<sup>1</sup>, Emmanuel Rouat<sup>1</sup>, Frederic Hasbani<sup>1</sup>, Estelle Lauga-Larroze<sup>2</sup>, Jean-Michel Fournier<sup>2</sup>, <sup>1</sup>STMicroelectronics FRANCE, <sup>2</sup>IMEP-LAHC Laboratory

### Session #5-2: Modular Multilevel Converters II

**Chair: Richardt Wilkinson**

[A Novel Space Vector Control with Capacitor Voltage Balancing for a Multilevel Modular Matrix Converter](#) ( ( ( &

Yushi Miura, Tomoya Mizutani, Mitsutaka Ito and Toshifumi Ise, Osaka University JAPAN

[Control of Parallel-Connected Modular Multilevel Converters](#) ( ( (-

Feng Gao<sup>1</sup>, Decun Niu<sup>1</sup>, Chunjuan Jia<sup>1</sup>, Nan Li<sup>1</sup>, Yong Zhao<sup>1</sup>, <sup>1</sup>Shandong University CHINA, <sup>2</sup>Shandong Electric Power Co. CHINA

[A Brief Comparison of Series-connected Modular Topology in STATCOM Application](#) ( ( ) \*

Sixing Du, Jinjun Liu, Xi'an Jiaotong University CHINA

[Bidirectional Modular Multilevel DC-DC Converter Control and Loss Modelling for Energy Extraction from Electro](#) ( (

[Active Polymer Wave Energy Generator](#) ( ( ( \* %

Todor Todorčević<sup>1</sup>, Pavol Bauer<sup>1</sup>, Jan Abraham Ferreira<sup>1</sup>, Rick van Kessel<sup>2</sup>, <sup>1</sup>Delft University of Technology THE NETHERLANDS, <sup>2</sup>SBM Offshore THE NETHERLANDS

### Session #5-3: DER Applications

**Chair: Toshihisa Shimizu**

[Impact of Large Scale Photovoltaic System on Static Voltage Stability in Sub-Transmission Network](#) ( ( ( \* ,

Shahariar Kabir, Mithulanthan Nadarajah, Ramesh Bansal, University of Queensland AUSTRALIA

[Operation and control of a Multi-terminal DC Network](#) ( ( ( +(

Rodrigo Teixeira Pinto<sup>1</sup>, Silvio Fragoso Rodrigues<sup>1</sup>, Pavol Bauer<sup>1</sup>, Jan Pierik<sup>2</sup>, <sup>1</sup>Delft University of Technology THE NETHERLANDS, <sup>2</sup>Energy Research Centre of The Netherlands THE NETHERLANDS

[Grid Connection Design and Control of LCL+ Trap Filter Based Two-Level VSC for Wave Power Plant Applications](#) (, %, *Antoni M. Cantarellas<sup>1</sup>, Elyas Rakhshani<sup>1</sup>, Daniel Remon<sup>1</sup>, Alvaro Luna<sup>2</sup>, Pedro Rodriguez<sup>1,2</sup>, <sup>1</sup>ABENGOA Research SPAIN, <sup>2</sup>Technical University of Catalonia SPAIN*

[Primary Frequency Regulation with Li-ion Battery Energy Storage System: a Case Study for Denmark](#) (, + *Maciej Swierczynski, Daniel Stroe, Ana Stan, Remus Teodorescu, Aalborg University DENMARK*

## Session #5-4: Storage Technology

**Chair: Mahinda Vilgathamuwa**

[Verification of Parallel Operation of Flywheel Energy Storage with High Speed Network Operation](#) (- ' *Kazuo Tsuchida<sup>1</sup>, Masashi Koga<sup>1</sup>, Tetsuya Ueda<sup>2</sup>, Tomoki Yokoyama<sup>1</sup>, <sup>1</sup>Tokyo Denki University JAPAN, <sup>2</sup>Sanken Electric Company JAPAN*

[Control Algorithm of Bi-directional Power Flow Rapid Charging System for Electric Vehicle Using Li-Ion Polymer Battery](#) ( - - *Taewon Kang, Beomseok Chae, Yongsug Suh, Chonbuk National University REPUBLIC OF KOREA*

[A New Cell-to-Cell Balancing Circuit with a Center-Cell Concentration Structure for Series-connected Batteries](#) ( \* *Moon-Young Kim, Jun-Ho Kim, Jae-Bum Lee, Jong-Woo Kim, Gun-Woo Moon, Korea Advanced Institute of Science and Technology (KAIST) REPUBLIC OF KOREA*

[High Accuracy State-of-Charge Online Estimation of EV/HEV Lithium Batteries Based on Adaptive Wavelet Neural Network](#) ( ) % *Fengwu Zhou, Lujun Wang, Huiping Lin, Zhengyu Lv, Zhejiang University CHINA*

## Session #5-5: Motor Drives II

**Chair: Ralph Kennel**

[A New Algorithm for Instantaneous Speed and Position Estimation of Surface-Mounted Permanent Magnet Synchronous Motors](#) ( ) % *Jian Yin<sup>1</sup>, Chi Kwan Lee<sup>1</sup>, Ron Hui<sup>1</sup>, Yash Shrivastava<sup>2</sup>, <sup>1</sup>The University of Hong Kong HONG KONG, <sup>2</sup>The University of Sydney AUSTRALIA*

[Capacitance Estimation of DC-Link Capacitor in Brushless DC Motor Drive Systems](#) ( ) & *Jong-Joo Moon, Won-Sang Im, Jang-Mok Kim, Pusan National University REPUBLIC OF KOREA*

[Evaluation of Motor-Drive Segmentation Strategies for Fault-Tolerance](#) ( ) ' S *Michael Rottach, C. Gerada, Pat Wheeler, University of Nottingham UNITED KINGDOM*

[Total Loss Comparison of Inverter Circuit Topologies with Interior Permanent Magnet Synchronous Motor Drive System](#) ( ) ' + *Daisuke Sato, Jun-ichi Itoh, Nagaoka University of Technology JAPAN*

## Session #6-1: Poster Session I

**Chair: Brendan McGrath**

[Single-Phase Bidirectional AC-DC Boost Rectifier for DC Distribution System](#) ( ( *Jee-Hoon Jung<sup>1</sup>, Ho-Sung Kim<sup>2</sup>, Myoung-Hyo Ryu<sup>2</sup>, Jong-Hyun Kim<sup>2</sup>, Ju-Won Baek<sup>2</sup>, <sup>1</sup>Ulsan National Institute of Science and Technology (UNIST) REPUBLIC OF KOREA, <sup>2</sup>Korea Electrotechnology Research Institute (KERI) REPUBLIC OF KOREA*

[Harmonic Impedance Calculation and Measurement for an Islanded Microgrid](#) ( ) S *Lixiang Hou, Hongtao Shi, Zhen Yang, Fang Zhuo, Xi'an Jiaotong University CHINA*

[Current Status of Silicon Carbide Power Devices and Their Application in Photovoltaic Converters](#) ( ) ) *Taekyun Kim, Minsoo Jang and Vassilios Agelidis, The University of New South Wales AUSTRALIA*

[Permanent Magnet Synchronous Motor for Electric Tractor of 35 Horsepower](#) ( ) \* S *Jung-Moo Seo<sup>1</sup>, Young-Kyun Kim<sup>1</sup>, In-Soung Jung<sup>1</sup>, Hyun-Kyo Jung<sup>2</sup>, <sup>1</sup>Korea Electronics Technology Institute REPUBLIC OF KOREA, <sup>2</sup>Seoul National University REPUBLIC OF KOREA*

[Application of High-Sampling-Frequency Control in Low-Switching-frequency LCL-Filtered System](#) ( ) \*\* *Guofei Teng, Guochun Xiao, Zhibo Zhang, Jinjun Liu, Xi'an Jiaotong University CHINA*

[Design of FPGA-Controlled Power Electronics and Drives Using MATLAB Simulink](#) ( ) +% *Yam P. Siwakoti, Graham E. Town, Macquarie University AUSTRALIA*

[Carrier Based Implementation of Reduced Common Mode Voltage PWM Strategies](#)\*\*\*\*) +,  
*Kai Li, Ting Lu, Zhengming Zhao, Lu Yin, Fang Liu, Liqiang Yuan, Tsinghua University CHINA*

[A New Virtual-Flux-Vector Based Droop Control Strategy for Parallel Connected Inverters in Microgrids](#)\*\*\*\*) , )  
*Jiefeng Hu<sup>1</sup>, Jianguo Zhu<sup>1</sup>, Yanqing Qu<sup>1</sup>, Josep Guerrero<sup>2</sup>, <sup>1</sup>University of Technology Sydney AUSTRALIA, <sup>2</sup>Aalborg University DENMARK*

[The Study of Active Power Filter Using a Universal Harmonic Detection Method](#)\*\*\*\*) - %  
*Haihong Huang, Huan Xue, Xin Liu, Haixin Wang, Hefei University of Technology CHINA*

[Determination of the Optimal Sub-mode for Bidirectional Dual-Active-Bridge DC-DC Converter with Multi-Phase-Shift Control](#)\*\*\*\*) - \*  
*Huiqing Wen, Xi'an Jiaotong-Liverpool University CHINA*

[Sag Detection Algorithm for Dynamic Voltage Restorer used in Wind Farms under Unbalanced and Distorted Grid Voltage Conditions](#)\*\*\*\*\*) S%  
*Zhou Sizhan, Liu Jinjun, Zhou Linyuan, Zhu Yangque, Yang Xu, Xi'an Jiaotong University CHINA*

[A Three-Level Five-Phase Inverter with Coupled Inductors and DC Flux Cancellation](#)\*\*\*\*\*) S+  
*Cheng Tan, John Fletcher, The University of New South Wales AUSTRALIA*

[Research of Different Modulation Methods for Single-Phase Single-Stage AC/AC Converter](#)\*\*\*\*\*) %  
*Xinyu Wang, Jinjun Liu, Taotao Xu, Shaodi Ouyang, Xiaojian Wang, Fei Meng, Riffat Javed, Xi'an Jiaotong University CHINA*

[Modified Unified PWM Control to Operate the Dual Active Bridge Converters Under ZVS In the Whole Load Range](#)\*\*\*\*\*) &S  
*Jun Huang, Yue Wang, Yuan Gao, Wanjun Lei, Ning Li, Xi'an Jiaotong University CHINA*

[Impedance Measurement Based on Binary Tree and Stack Structure](#)\*\*\*\*\*) &#  
*Xiaolong Yue, Fang Zhuo, Zhenghua Zhang, Hongtao Shi, Lixiang Hou, Xi'an Jiaotong University CHINA*

[LCL-Filter Design for Grid-connected Three-phase PWM Converter Based on Maximum Current Ripple](#)\*\*\*\*\*) %  
*Fang Liu<sup>1</sup>, Xing Zhang<sup>1</sup>, Changzhou Yu<sup>1</sup>, Zhangping Shao<sup>1</sup>, Wei Zhao<sup>2</sup>, Hua Ni<sup>2</sup>, <sup>1</sup>Hefei University of Technology CHINA, <sup>2</sup>Sungrow Power Supply Co. CHINA*

[Modular Multilevel Converters with Integrated Arm Inductors for High Quality Current Waveforms](#)\*\*\*\*\*) \*  
*Xiaojie Shi, Zhiqiang Wang, Leon M. Tolbert and Fred Wang, The University of Tennessee USA*

[Modeling, Analysis, and Design of a Frequency-Droop-Based Virtual Synchronous Generator for Microgrid Applications](#)\*\*\*\*\*) ('  
*Yan Du<sup>1</sup>, J. M. Guerrero<sup>2</sup>, Liuchen Chang<sup>1,3</sup>, Jianhui Su<sup>1</sup>, Meiqin Mao<sup>1</sup>, <sup>1</sup>Hefei University of Technology CHINA, <sup>2</sup>Aalborg University DENMARK, <sup>3</sup>The University of New Brunswick CANADA*

[New Control Method for Boost Converter in Discontinuous Conduction Mode with Synchronous Rectification and Zero Voltage Switching](#)\*\*\*\*\*) S  
*Junfei Wang<sup>1</sup>, Feng Zheng<sup>1</sup>, Yu Zhang<sup>1</sup>, Peikang Wang<sup>1</sup>, Xiaoyu Yang<sup>1</sup>, Depeng Bai<sup>2</sup>, <sup>1</sup>Xidian University CHINA, <sup>2</sup>Academy of Space Electronic Information Technology CHINA*

[Design of Flux-Switching Hybrid Excitation Machine with Bypass-Bridges](#)\*\*\*\*\*) )  
*Zegang Xu, Shaojun Xie, Jiankun Cao, Nanjing University of Aeronautics and Astronautics CHINA*

[Dynamic Model and Dynamic Characteristics of Solar Cells](#)\*\*\*\*\*) -  
*Ling Qin<sup>1,2</sup>, Shaojun Xie<sup>1</sup>, Chen Yang<sup>1</sup>, Jiankun Cao<sup>1</sup>, <sup>1</sup>Nanjing University of Aeronautics and Astronautics CHINA, <sup>2</sup>Nantong University CHINA*

[Real-Time Estimation of Single-Phase Grid Voltage Frequency Using a Modulating Function Based Technique](#)\*\*\*\*\*) \* (   
*Md. Shamim Reza, Mihai Ciobotaru, Vassilios Agelidis, The University of New South Wales AUSTRALIA*

[A Variable-Band Hysteresis Modulated Multi-Resonant Sliding-Mode Controller for Three-Phase Grid-Connected VSI With an LCL-Filter](#)\*\*\*\*\*) +S  
*Yang Li, Xiang Hao, Xu Yang, Ruiliang Xie, Tao Liu, Xi'an Jiaotong University CHINA*

[Dimensioning of Modular High Frequency Converter for drives](#)\*\*\*\*\*) +)  
*Martin Schulz, Lukas Lambertz, Rainer Marquardt, The University of Bundeswehr GERMANY*

[Initial Rotor Position Detecting Algorithm of PM Synchronous Motor using Incremental Encoder](#)\*\*\*\*\*) \* , %  
*Hyunchal Oh<sup>1</sup>, Ki Young Song<sup>1</sup>, Kwan Yuhl Cho<sup>1</sup>, Hag Wone Kim<sup>1</sup>, Byung Moon Han<sup>2</sup>, <sup>1</sup>Korea National University of Transportation REPUBLIC OF KOREA, <sup>2</sup>Myungji University REPUBLIC OF KOREA*

[Improved Control of Rotor- and Load-Side Converters of Stand-Alone DFIGs under Nonlinear Loads Conditions](#)\*\*\*\*\*) \* , +



*Feng Wei, Mahinda Vilathgamuwa, San Shing Choi, Xinan Zhang, Nanyang Technological University SINGAPORE*

[Operation Analysis of Stand-alone DC Micro-grid with Coordinated Droop Control](#)\*\*\*\*- &

*Hyun-Jun Kim, Tae-Hee Han, Byung-Moon Han, Myongji University REPUBLIC OF KOREA*

[Automated Multi-Motor Condition Monitoring Based on IEC 61850](#)\*\*\*\*\*- -

*Fang Duan, Rastko Zivanovic, The University of Adelaide AUSTRALIA*

[Estimation of Transformer Parameters and Loss Analysis for High Voltage Capacitor Charging Application](#)\*\*\*\*+S(

*Prasanth Thummala, Henrik Schneider, Ziwei Ouyang, Zhe Zhang, Michael A. E. Andersen, Technical University of Denmark DENMARK*

[A Parallel-Series Connected Four-Transformer Half Bridge DC-DC Converter for Electric Vehicle Application](#)\*\*\*\*+%

*Seoung Woon Lee<sup>1</sup>, Je Hyun Yi<sup>1</sup>, Woo Sup Kim<sup>2</sup>, Bo Hyung Cho<sup>1</sup>, <sup>1</sup>Seoul National University REPUBLIC OF KOREA, <sup>2</sup>LSIS REPUBLIC OF KOREA*

[A Circulating Current Suppressing Control in Modular Multilevel Converter Based Unified Power Quality Conditioner](#)\*\*\*\*+%

*Hao Wang<sup>1</sup>, Guihua Mei<sup>1</sup>, Jinjun Liu<sup>2</sup>, Fangcheng Liu<sup>2</sup>, <sup>1</sup>Electric Power Research Institute of Guangdong Power Grid Corporation CHINA, <sup>2</sup>Xi'an Jiaotong University CHINA*

[An Energy Efficient and Environmentally Friendly Elevator System Using Ultracapacitor and Fuel Cell with Power](#)

[Factor Correction](#)\*\*\*\*+&%

*Shreelakshmi MP, Vivek Agarwal, Indian Institute of Technology Mumbai INDIA*

[Discretized Proportional Base Driver for Silicon Carbide Bipolar Junction Transistors](#)\*\*\*\*+&

*Georg Tolstoy<sup>1</sup>, Dimosthenis Pefitsis<sup>1</sup>, Jacek Rabkowski<sup>1,2</sup>, Hans-Peter Nee<sup>1</sup>, Patrick R. Palmer<sup>3</sup>, <sup>1</sup>KTH Royal Institute of Technology SWEDEN, <sup>2</sup>Warsaw University of Technology POLAND, <sup>3</sup>University of Cambridge UNITED KINGDOM,*

[Low-Cost Gate Drive for Enhancement Mode SiC JFET Devices](#)\*\*\*\*+ \*

*Yoong Heng Chan<sup>1</sup>, Yung C. Liang<sup>1</sup>, David Tien<sup>2</sup>, <sup>1</sup>National University of Singapore SINGAPORE, <sup>2</sup>Charles Sturt University AUSTRALIA*

[Design and Control of a Bi-Directional Resonant DC-DC Converter For Automotive Engine/Battery Hybrid Power](#)

[Generators](#)\*\*\*\*+( S

*Junsung Park, Minho Kwon, Sewan Choi, Seoul National University of Science and Technology REPUBLIC OF KOREA*

[Multi-Port Converter Integrating Boost Converter and Switched Capacitor Converter for Single-Cell Battery Power](#)

[System in Small Satellite](#)\*\*\*\*+( +

*Masatoshi Uno, Akio Kukita, Japan Aerospace Exploration Agency JAPAN*

[A Novel Phase-Shift Full-Bridge DC-DC Converter Using Magneto-Rheological Fluid Gap Inductor](#)\*\*\*\*+)

*Su-Han Kim, Honnyong Cha, Dong-Hun Kim, Se-Hee Lee, Heung- Geun Kim, Byungcho Choi, Kyungpook National University REPUBLIC OF KOREA*

[Estimated Flux Compensation For Direct Torque Control in M-T Frame Synchronized with Stator Flux-Linkage Vector](#)\*\*\*\*+)-

*Tomohiro Seki, Yukinori Inoue, Shigeo Morimoto, Masayuki Sanada, Osaka Prefecture University JAPAN*

[Topology and Control Strategy Design for AC Chopper Based Var Compensators](#)\*\*\*\*+\*)

*Wei Wu, Shaojun Xie, Jiankun Cao, Nanjing University of Aeronautics and Astronautics CHINA*

## **Session #8-1: Poster Session II**

### **Chair: Brendan McGrath**

[A Low Complexity Control System for a Hybrid Battery-Ultracapacitor Power Source](#)\*\*\*\*++S

*Branislav Hredzak<sup>1</sup>, Vassilios Agelidis<sup>1</sup>, Georgios Demetriades<sup>2</sup>, <sup>1</sup>The University of New South Wales AUSTRALIA, <sup>2</sup>ABB Corporate Research SWEDEN*

[Modeling of Pulse Transformer with Nano-second Excitation Source Using Jiles-Atherton Method](#)\*\*\*\*+\*\*

*Emily Gao, Daming Zhang, John Fletcher, The University of New South Wales AUSTRALIA*

[Sensorless Control of PMSM Based on Low Frequency Voltage Injection at Low Speeds and Standstill](#)\*\*\*\*+, %

*Yituo Li<sup>1</sup>, Hai Feng Lu<sup>1</sup>, Wenlong Qu<sup>1</sup>, Shuang Sheng<sup>1</sup>, Zhengyu Wang<sup>2</sup>, <sup>1</sup>Tsinghua University CHINA, <sup>2</sup>Hunan CSR Times Electric Vehicle Co. CHINA*

[Load Matching Analysis of Magnetically-Coupled Resonant Wireless Power Transfer](#)\*\*\*\*+, ,

*Yiming Zhang, Zhengming Zhao, Kainan Chen, Tsinghua University CHINA*

[A Fixed Switching Frequency Integral Resonant Sliding Mode Controller for Three-Phase Grid-Connected Photovoltaic](#)\*\*\*\*

[Inverter With LCL-Filter](#)\*\*\*\*+ '

Xiang Hao, Xu Yang, Ruiliang Xie, Lang Huang, Tao Liu, Yang Li, Xi'an Jiaotong University CHINA

[Sensorless Control Method of IPMSM with Current Derivative Information of Q-Axis Without High Frequency Component Injection at Low Speed Region](#)\*\*\*\*+ -

Yuji Hosogaya, Hisao Kubota, Meiji University JAPAN

[Adaptive Hysteresis Band Control for DC-DC Buck Converter](#)\*\*\*\*, S(

Jinbin Zhao<sup>1</sup>, Yongxiao Liu<sup>1</sup>, Keqing Qu<sup>1</sup>, Hua Geng<sup>2</sup>, <sup>1</sup>Shanghai University of Electric Power CHINA, <sup>2</sup>Tsinghua University CHINA

[Overview of Supercapacitor cell Voltage Balancing Methods for an Electric Vehicle](#)\*\*\*\*, %\$

Yanqing Qu, Jianguo Zhu, Jiefeng Hu, Bill Holiday, University of Technology Sydney AUSTRALIA

[Performance Analysis of High Step-Up Interleaved ZCS Converter with Built-In Transformer Voltage Multiplier](#)\*\*\*\*, %

Yi Luo<sup>1,3</sup>, Wuhua Li<sup>1,2</sup>, Weichen Li<sup>2</sup>, Haoze Luo<sup>2</sup>, Chi Xu<sup>2</sup>, Xiangning He<sup>2</sup>, <sup>1</sup>Jiangsu Province Engineering Research Center for Photovoltaic Generation CHINA, <sup>2</sup>Zhejiang University CHINA, <sup>3</sup>Zhejiang Tianda Environmental Protection Co. CHINA

[A Novel Voltage Balancing Modulation Scheme Used in Cascaded H-bridge Multilevel STATCOMs](#)\*\*\*\*, &\$

Yang Rong-feng, Chen He, Sui Sun-ke, Yu Yong, Xu Dian-guo, Harbin Institute of Technology CHINA

[Boost-Buck Power Factor Correction Converter with Integrated Different Current Control Methods](#)\*\*\*\*, &\$

Peng Mao<sup>1</sup>, Hongyun Jia<sup>1</sup>, Chuanyun Wang<sup>2</sup>, Ming Xu<sup>2</sup>, <sup>1</sup>Nanjing University of Information Science and Technology CHINA, <sup>2</sup>FSP-Powerland Technology CHINA

[A General Active Damping Method Based on Capacitor Voltage Detection for Grid-Connected Inverter](#)\*\*\*\*, &

Changzhou Yu<sup>1</sup>, Xing Zhang<sup>1</sup>, Fang Liu<sup>1</sup>, Haizhen Xu<sup>1</sup>, Caixia Qiao<sup>1</sup>, Zhangping Shao<sup>1</sup>, Wei Zhao<sup>2</sup>, Hua Ni<sup>2</sup>, <sup>1</sup>Hefei University of Technology CHINA, <sup>2</sup>Sungrow Power Supply Co. CHINA

[Dead-time Compensation Scheme for Adjustable Dead-time Controlled Three-Phase Resonant Snubber Inverter](#)\*\*\*\*, ' \*

Takuya Morohoshi, Nobukazu Hoshi, Junnosuke Haruna, Tokyo University of Science JAPAN

[Power Management Strategy Research for a Photovoltaic-Hybrid Energy Storage System](#)\*\*\*\*, (&

Yixin Zhu, Fang Zhuo, Hongtao Shi, Xi'an Jiaotong University CHINA

[Assessment of a Wind Energy Conversion System based on a Six-phase Permanent Magnet Synchronous Generator with a Twelve-Pulse PWM Current Source Converter](#)\*\*\*\*, (-

I. Abdelsalam, G.P. Adam, D. Holliday and B.W. Williams, University of Strathclyde UNITED KINGDOM

[Improved Instantaneous Current Control for the Three-Phase Dual-Active Bridge DC-DC Converter](#)\*\*\*\*, ))

Stefan P. Engel, Nils Soltau, Hanno Stagge, Rik W. De Doncker, RWTH Aachen University GERMANY

[Consideration about Novel Cell Voltage Equalization Circuit for Battery/EDLC](#)\*\*\*\*, \*%

Daiki Satou, Nobukazu Hoshi, Junnosuke Haruna, Tokyo University of Science JAPAN

[The Multi-modular Shunt APF Based on Direct Current Control and Frequency Doubling Carrier Phase-shifted SPWM](#)\*\*\*\*, \*+

Wang Yafang, Gu Juping, Chen Ruixiang, Qin Ling, Chen Juan, Nantong University CHINA

[EMI Filter Optimization by Adjusting Common Mode Noise Impedance of a Balanced Boost Converter](#)\*\*\*\*, +&

Peikang Wang, Feng Zheng, Yu Zhang, Junfei Wang, Xiaoyu Yang, Xidian University CHINA

[The Interfacing Stability of Photovoltaic Cells and Current-fed MPPT Converter](#)\*\*\*\*, ++

Ling Qin<sup>1,2</sup>, Shaojun Xie<sup>1</sup>, Chen Yang<sup>1</sup>, Jinming Xu<sup>1</sup>, <sup>1</sup>Nanjing University CHINA, <sup>2</sup>Nantong University CHINA

[Small-Signal Stability Analysis of a Microgrid Operating in Droop Control Mode](#)\*\*\*\*, , &

Hongtao Shi, Fang Zhuo, Lixiang Hou, Xiaolong Yue, Dong Zhang, Xi'an Jiaotong University CHINA

[Study on Efficiency Maximization Design Principles for Wireless Power Transfer System Using Magnetic Resonant Coupling](#)\*\*\*\*, , ,

Hongchang Li, Xu Yang, Kangping Wang, Xiaoshuai Dong, Xi'an Jiaotong University CHINA

[Modeling and Design of an Integrated Sliding-Mode Buck Converter with Regulated Switching Frequency Suitable for Mobile Devices](#)\*\*\*\*, -'

Benoit Labbe<sup>1</sup>, David Chesneau<sup>1</sup>, Bruno Allard<sup>2</sup>, Xuefang Lin-Shi<sup>2</sup>, <sup>1</sup>ST-Ericsson FRANCE, <sup>2</sup>Ampere Laboratory INSA Lyon FRANCE

[Position Control Of BLDC Motor with Modified Bipolar PWM for Clutch System Of PHEV](#)\*\*\*\*- \$\$

*Ki Young Song<sup>1</sup>, Yong Sin Jin<sup>2</sup>, Hag Wone Kim<sup>1</sup>, Kwan Yuhl Cho<sup>1</sup>, Byung Moon Han<sup>3</sup>, <sup>1</sup>Korea National University of Transportation REPUBLIC OF KOREA, <sup>2</sup>Technology Research Lab. VC Tech. REPUBLIC OF KOREA, <sup>3</sup>Myungji University REPUBLIC OF KOREA*

[PWM for Active Thermal Protection in Three Level Neutral Point Clamped Inverters](#)\*\*\*\*- S\*

*The-minh Phan<sup>1</sup>, Gernot Riedel<sup>2</sup>, Nikolaos Oikonomou<sup>2</sup>, Mario Pacas<sup>1</sup>, <sup>1</sup>University of Siegen GERMANY, <sup>2</sup>ABB Corporate Research SWITZERLAND*

[A Fast State-of-Charge Estimation Algorithm for LiFePO<sub>4</sub> Batteries Utilizing Extended Kalman Filter](#)\*\*\*\*- %&

*Chang Yoon Chun<sup>1</sup>, Gab-Su Seo<sup>1</sup>, Bo-Hyung Cho<sup>1</sup>, Jonghoon Kim<sup>2</sup>, <sup>1</sup>Seoul National University REPUBLIC OF KOREA, <sup>2</sup>Samsung SDI REPUBLIC OF KOREA*

[Photovoltaic Module-Level DC-DC Converter with Arc Fault Protection Scheme for DC Distribution System](#)\*\*\*\*- %

*Gab-Su Seo<sup>1</sup>, Bo-Hyung Cho<sup>1</sup>, Kyu-Chan Lee<sup>2</sup>, Seoul National University REPUBLIC OF KOREA, <sup>2</sup>Interpower Co. REPUBLIC OF KOREA*

[Analysis on the Asymmetrical Operation Ability of Y-Connected CMIs](#)\*\*\*\*- &{

*Liansong Xiong, Fang Zhuo, Xi'an Jiaotong University CHINA*

[A New Circulating-Current Restraining Method for Modular Multilevel Converter](#)\*\*\*\*- ' S

*Ming Lei, Yaohua Li, Qiongquan Ge, Xiaoxin Wang, Chinese Academy of Sciences CHINA*

[Hybrid Winding Concept for Toroids](#)\*\*\*\*- ' \*

*Henrik Schneider, Thomas Andersen, Arnold Knott, Michael Andersen, Technical University of Denmark DENMARK*

[Integrated DC-DC Chopper Using Energy Harvesting](#)\*\*\*\*- (%

*Tomohiro Takahashi, Kan Akatsu, Shibaura Institute of Technology JAPAN*

[Robust Estimation of Real-Time Single-Phase Grid Voltage Frequency Under Distorted Grid Conditions](#)\*\*\*\*- (,

*Md. Shamim Reza, Mihai Ciobotaru, Vassilios Agelidis, The University of New South Wales AUSTRALIA*

[Compensation of Current-Measurement Error in Half-Bridge PWM Inverter for Linear Compressor](#)\*\*\*\*- ))

*Dong-Youn Kim<sup>1</sup>, Jang-Mok Kim<sup>1</sup>, Je-Wook Park<sup>1</sup>, Seon-Hwan Hwang<sup>2</sup>, <sup>1</sup>Pusan National University REPUBLIC OF KOREA, <sup>2</sup>Kyungnam University REPUBLIC OF KOREA*

[Comparison of Inertia Control Methods for DFIG-Based Wind Turbines](#)\*\*\*\*- \* S

*Zhiheng Zhang, Yi Wang, Heming Li, Xiaoqing Su, North China Electric Power University CHINA*

[A Novel Approach for Voltage Control of Multi-Terminal DC Grids With Offshore Wind Farms](#)\*\*\*\*- \*)

*Kumars Rouzbehi<sup>1</sup>, Arash Miranian<sup>2</sup>, Alvaro Luna<sup>1</sup>, Pedro Rodriguez<sup>1,3</sup>, <sup>1</sup>Technical University of Catalonia SPAIN, <sup>2</sup>University of Tehran IRAN, <sup>3</sup>Abengoa Research SPAIN*

[Hysteretic Self-Oscillating Bandpass Current Mode Control for Class D Audio Amplifiers Driving Capacitive Transducers](#)\*\*\*\*- +%

*Dennis Nielsen, Arnold Knott, Michael Andersen, Technical University of Denmark DENMARK*

[Driving an Ultrasonic Transducer with a Multicell Inverter](#)\*\*\*\*- +\*

*Rory Pentz<sup>1</sup>, Jacques Wheeler<sup>1</sup>, Gerhard de Jager<sup>1</sup>, Richardt Wilkinson<sup>2</sup>, <sup>1</sup>Cape Peninsula University of Technology SOUTH AFRICA, <sup>2</sup>RMIT University AUSTRALIA*

[A Novel Compound Control Strategy to Achieve Input Voltage Sharing and Output Current Sharing for Distributed](#)

[Input-Series-Output-Parallel Inverter System](#)\*\*\*\*- , %

*Jian Wang, Tianzhi Fang, Junjie Hua, Nanjing University of Aeronautics and Astronautics CHINA*

## Thursday June 6th

### Session #10-1: DC-DC Converters

**Chair: Dinesh Segaran**

[The Partial-Resonant Single Active Bridge DC-DC Converter for Conduction Losses Reduction in the Single Active](#)

[Bridge](#)\*\*\*\*- , +

*Yeh Ting, Sjoerd de Haan, Jan Ferreira, Delft University of Technology THE NETHERLANDS*

[Performance Analysis of Coupled Inductor based Multiple-Input DC/DC Converter with PWM Plus Phase-Shift \(PPS\)](#)

[Control Strategy](#)\*\*\*\*- - (

*Chi Xu, Yunjie Gu, Haoze Luo, Yihua Hu, Yi Zhao, Wuhua Li, Xiangning He, Zhejiang University CHINA*

[Unexpected Bi-Directional Operation of Phase-Shift Full-Bridge Converter in Parallel Operation System](#)\*\*\*\*- - -

*Yeonho Jeong<sup>1</sup>, Shin-Young Cho<sup>1</sup>, Duk-You Kim<sup>1</sup>, Gun-Woo Moon<sup>1</sup>, Chong-Eun Kim<sup>2</sup>, <sup>1</sup>Korea Advanced Institute of Science and Technology REPUBLIC OF KOREA, <sup>2</sup>Samsung Electro-Mechanics REPUBLIC OF KOREA*

[Disabling Standby Converter with Phase-Shifted Full-Bridge Converter in Server Power Supplies](#)

Jong-Woo Kim<sup>1</sup>, Duk-You Kim<sup>1</sup>, Chong-Eun Kim<sup>2</sup>, Jae-Hyun Kim<sup>1</sup>, Gun-Woo Moon<sup>1</sup>, <sup>1</sup>Korea Advanced Institute of Science and Technology REPUBLIC OF KOREA, <sup>2</sup>Samsung Electro-Mechanics REPUBLIC OF KOREA

## Session #10-2: Multilevel Converters II

**Chair: Vassilios Agelidis**

[Space Vector Modulation Strategy for Three-phase Multilevel Current-fed Inverter with Unequal DC-link Currents](#)

Vishal Vekhande, B. G. Fernandes, Indian Institute of Technology Bombay INDIA

[Impact and Compensation of Dead Time on Common-Mode Voltage Elimination Modulation for Neutral-Point-Clamped Three-Phase Inverters](#)

Xuning Zhang, Dushan Boroyevich, Rolando Burgos, Paolo Mattavelli, Fred Wang, Virginia Tech-CPES USA

[PSO-Based LQR Controller for Multi Modular Converters](#)

Elyas Rakhshani<sup>1</sup>, Antoni M. Cantarellas<sup>1</sup>, Daniel Remon<sup>1</sup>, Alvaro Luna<sup>2</sup>, Pedro Rodriguez<sup>1,2</sup>, <sup>1</sup>ABENGOA Research SPAIN, <sup>2</sup>Technical University of Catalonia SPAIN

[Four-Level Medium Voltage Converter for High Power Applications](#)

Samir Kouro<sup>1</sup>, Marcelo Perez<sup>1</sup>, Jose Rodriguez<sup>1</sup>, Bin Wu<sup>2</sup>, <sup>1</sup>Universidad Tecnica Federico Santa Maria CHILE, <sup>2</sup>Ryerson University CANADA

## Session #10-3: Wireless Energy Transfer

**Chair: Takahashi Kosaka**

[Analysis and Design of Wireless Power Transfer System with an Intermediate Coil for High Efficiency](#) (

SangCheol Moon<sup>1</sup>, Bong-Chul Kim<sup>2</sup>, Shin-Young Cho<sup>1</sup>, Gun-Woo Moon<sup>1</sup>, <sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST) REPUBLIC OF KOREA, <sup>2</sup>Samsung Advanced Institute of Technology (SAIT) REPUBLIC OF KOREA

[Wireless Power Transmission Using LC Cancellation](#) (%)

Yusuke Kawamura, Masahito Shoyama, Kyushu University JAPAN

[Inductive Contactless Power Transfer System with Coaxial Coreless Transformer for DC Power Distribution](#) (%) (\*

Satoshi Ojika, Yushi Miura, Toshifumi Ise, Osaka University JAPAN

[Series-Series Compensated Wireless Power Transfer at Two Different Resonant Frequencies](#) (%) &

Shin-Young Cho<sup>1</sup>, Il-Oun Lee<sup>1</sup>, SangCheol Moon<sup>1</sup>, Gun-Woo Moon<sup>1</sup>, Bong-Chul Kim<sup>2</sup>, Ki Young Kim<sup>2</sup>, <sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST) REPUBLIC OF KOREA, <sup>2</sup>Samsung Advanced Institute of Technology (SAIT) REPUBLIC OF KOREA

[A Bi-directional Inductive Power Transfer System with Individually Controlled Tracks and Pick-Ups](#) (%) -

SM Asif Iqbal, Duleepa J. Thrimawithana, Udaya K. Madawala, Akshya Swain, The University of Auckland NEW ZEALAND

## Session #10-4: Magnetic and Passive Components

**Chair: Bruno Allard**

[High Power Transformer and Motor Drive System Design for an Electric Helicopter](#) (%) (\*

Naoya Kawakami, Kan Akatsu, Shibaura Institute of Technology JAPAN

[Printed Circuit Board Embedded Inductors for Very High Frequency Switch-Mode Power Supplies](#) (%) +%

Mickey Madsen<sup>1</sup>, Arnold Knott<sup>1</sup>, Michael Andersen<sup>1</sup>, Anders Mynster<sup>2</sup>, <sup>1</sup>Technical University of Denmark DENMARK, <sup>2</sup>DELTA DENMARK

[Investigations on On-Chip Planar Inductor Design with Post-Processed Magnetic Core for DC-DC Converter Applications](#) (%) +

Taewook Kang, Jaeha Kim, Seoul National University REPUBLIC OF KOREA

[Compensation of Asymmetric Transformers in High-Power DC-DC Converters](#) (%) , (

Nils Soltau, Stefan P. Engel, Hanno Stagge, Rik W. De Doncker, RWTH Aachen University GERMANY

[Thermal Performance of Double-Sided SMT Capacitors: Operation and Soldering](#) (%) - %

Ivan Josifovic<sup>1</sup>, Till Huesgen<sup>2</sup>, Jelena Popovic-Gerber<sup>1</sup>, Jan Abraham Ferreira<sup>1</sup>, <sup>1</sup>Delft University of Technology, <sup>2</sup>ABB Corporate Research SWITZERLAND

## Session #10-5: Machine Applications I

**Chair: Andrej Kaplon**

[Sensorless Vector Control of Linear Permanent Magnet Synchronous Motor](#)

Muhammad Ali Masood Cheema, John Edward Fletcher, The University of New South Wales AUSTRALIA

[Characteristics of a Switched Reluctance Motor using Grain-Oriented Electric Steel Sheet](#)

Yutaro Sugawara, Kan Akatsu, Shibaura Institute of Technology JAPAN

[A Simple Unipolar Excitation Strategy for Switched Reluctance Motors by Using PWM Current Control](#)

Noriya Nakao, Kan Akatsu, Shibaura Institute of Technology JAPAN

[Negative Sequence Control Strategy for a Doubly Fed Induction Generator in Medium Voltage Wind Power System under Unbalanced Grid Conditions](#)

Yonggyun Park, Daesu Han, Yongsug Suh, Chonbuk National University REPUBLIC OF KOREA

## **Session #11-1: EMI and EMC**

### **Chair: Dushan Boroyevich**

[Conducted EMI from SiC BJT Boost Converter and its Dependence on the Output Voltage, Current, and Heatsink Connection](#)

Konstantin Kostov<sup>1</sup>, Jacek Rabkowski<sup>2</sup>, Hans-Peter Nee<sup>1</sup>, <sup>1</sup>KTH Royal Institute of Technology SWEDEN, <sup>2</sup>Warsaw University of Technology POLAND

[Characterising and Modelling Extended Conducted Electromagnetic Emission](#)

Inus Grobler, M.N. Gitau, University Pretoria SOUTH AFRICA

[Effective CM Reduction in a Flyback by means of Passive Cancellation](#)

Juergen Stahl, Sebastian Wiecek, Martin Schmidt, Manfred Albach, University Erlangen-Nuremberg GERMANY

[Low Cost Power Lead Extended Pre-Compliance Conducted EMI Measurement Setup and Diagnostics with Compact LISN](#)

Inus Grobler, M.N. Gitau, University Pretoria SOUTH AFRICA

## **Session #11-2: Utility Interface Converters**

### **Chair: Maciej Swierczynski**

[Managing Harmonic Current Distortion for Grid Connected Converters with Low Per-Unit Filter Impedances](#)

Stewart Parker, Brendan McGrath, Grahame Holmes, RMIT University AUSTRALIA

[Current Control Based on Zero-Placement Strategy for Grid-Connected LCL-Filtered Inverters](#)

Jinming Xu, Shaojun Xie, Nanjing University of Aeronautics and Astronautics CHINA

[Compensation Characteristics and Power Rating of a Single-Phase Active Filter with Frequency Limitation Function](#)

Hidehito Yoshida, Keiji Wada, Toshihisa Shimizu, Tokyo Metropolitan University JAPAN

[Optimization of Weighted Current Control for Grid-Connected LCL-Filtered Inverters](#)

Jinming Xu, Shaojun Xie, Nanjing University of Aeronautics and Astronautics CHINA

## **Session #11-3: Wind Power Systems II**

### **Chair: Mihai Ciobotaru**

[LVRT Performance Verification of PCS for Wind Power Generation](#)

Hiroyoshi Komatsu, Takehiro Takahashi, Tatsuaki Ambo, Toshiba Mitsubishi-Electric Industrial Systems Co. JAPAN

[Ride-Through and Grid Support of the DFIG based Wind Farm During Asymmetrical Faults](#)

Hua Geng, Geng Yang, Tsinghua University CHINA

[Multi-Objective Optimization of a PMSG Control System through Small-Signal Analysis](#)

Silvio Rodrigues<sup>1</sup>, Rodrigo Teixeira Pinto<sup>1</sup>, Pavol Bauer<sup>1</sup>, Jan Pierik<sup>2</sup>, <sup>1</sup>Technical University of Delft THE NETHERLANDS, <sup>2</sup>Energy Research Center (ECN) THE NETHERLANDS

[A Novel Simulator Based on Voltage Source Inverter for Direct-Drive PMSG Wind Generation System](#)

Meiqin Mao<sup>1</sup>, Chengyu NIU<sup>1</sup>, Liuchen Chang<sup>2</sup>, <sup>1</sup>Hefei University of Technology CHINA, <sup>2</sup>University of New Brunswick CANADA

## **Session #11-4: Predictive Control**

### **Chair: Toit Mouton**

[Predictive Current Control of Multi-Pulse Flexible-Topology Thyristor AC/DC Converter and Its Application in Wind](#)

[Energy Conversion System](#)

Zhang Damin<sup>1</sup>, Lin Huipin<sup>1</sup>, Lu Zhengyu<sup>1</sup>, Wang Shitao<sup>2</sup>, <sup>1</sup>Zhejiang University CHINA, <sup>2</sup>State Grid of China Technology College CHINA

[Model Predictive Control with a Fixed Switching Frequency for a #5-Level Flying Capacitor Converter](#)

Males Tomlinson<sup>1</sup>, Toit Mouton<sup>1</sup>, Ralph Kennel<sup>2</sup>, Peter Stolze<sup>2</sup>, <sup>1</sup>University of Stellenbosch SOUTH AFRICA, <sup>2</sup>Technical University of Munich GERMANY

[Generalized Predictive Direct Power Control for AC/DC Converters](#)

Ricardo P. Aguilera<sup>1</sup>, Daniel E. Quevedo<sup>1</sup>, Sergio Vazquez<sup>2</sup>, Leopoldo Franquelo<sup>2</sup>, <sup>1</sup>The University of Newcastle AUSTRALIA, <sup>2</sup>University of Seville SPAIN

[Heuristic Finite-Set Model Predictive Current Control for Induction Machines](#)

Peter Stolze<sup>1</sup>, Males Tomlinson<sup>2</sup>, Ralph Kennel<sup>1</sup>, Toit Mouton<sup>2</sup>, <sup>1</sup>Technical University of Munich GERMANY, <sup>2</sup>University of Stellenbosch SOUTH AFRICA

## Session #11-5: Electric Vehicle Technology

### Chair: Dean Patterson

[A Model for Estimating Grid Side Harmonics of Matrix Converter based Bi-directional IPT Systems](#)

Saranga Weerasinghe<sup>1</sup>, Udaya Madawala<sup>1</sup>, Duleepa Thrimawithana<sup>1</sup>, Mahinda Vilathgamuwa<sup>2</sup>, <sup>1</sup>The University of Auckland NEW ZEALAND, <sup>2</sup>Nanyang Technological University SINGAPORE

[A High-Frequency, High-Efficiency Silicon Carbide Based Phase-Shifted Full-Bridge Converter as a Core Component for a High-Density on-board Vehicle Battery Charging System](#)

Bret Whitaker, Adam Barkley, Zach Cole, Brandon Passmore, Ty McNutt, Alex Lostetter, Arkansas Power Electronics International (APEI) USA

[A Three-Phase to Single-Phase Matrix Converter based Bi-Directional IPT System for Charging Electric Vehicles](#)

Saranga Weerasinghe<sup>1</sup>, Udaya Madawala<sup>1</sup>, Duleepa Thrimawithana<sup>1</sup>, Mahinda Vilathgamuwa<sup>2</sup>, <sup>1</sup>The University of Auckland NEW ZEALAND, <sup>2</sup>Nanyang Technological University SINGAPORE

[Switching Loss Reduction Modulation Scheme Based Inverter for Electric Vehicle](#)

Tae-Woong Kim<sup>1</sup>, Choon-Ho Cho<sup>1</sup>, Jaeho Cho<sup>2</sup>, <sup>1</sup>Gyeongsang National University REPUBLIC OF KOREA, <sup>2</sup>Chungbuk National University REPUBLIC OF KOREA

## Session #12-1: PFC and Lighting Control

### Chair: Jeehoon Jung

[Dynamic Performances of Ballast for T5 Fluorescent Lamps](#)

Chung-Chuan Hou, Chi-Pong Lo, Chung Hua University TAIWAN

[Dimmable Multi-Channel RGB LED Driver](#)

Meriam Gay Bautista<sup>1</sup>, Wan-Rone Liou<sup>1</sup>, Mei-Ling Yeh<sup>2</sup>, <sup>1</sup>National Taipei University TAIWAN, <sup>2</sup>National Taiwan Ocean University TAIWAN

[Losses Evaluation of Two-Level and Three-Level PFC Topologies Based on Semiconductor Measurements](#)

Bas Vermulst, J.L. Duarte, Eindhoven University of Technology THE NETHERLANDS

[A Power Factor Correction Circuit Capable of Ultra-Wide Input Voltage Range](#)

River Tin-ho Li, Francisco Canales, Andreas Ecklebe, ABB SWITZERLAND

## Session #12-2: Utility Interface Applications

### Chair: Mihai Ciobotaru

[Load Impedance Estimation and Iterative-Learning Control for a Three-Phase Four-Wire Inverter](#)

Tsai-Fu Wu<sup>1</sup>, L.-C. Lin<sup>2</sup>, C.-H. Chang<sup>2</sup>, Y.-R. Chang<sup>3</sup>, Y.-D. Li<sup>3</sup>, <sup>1</sup>National Tsing Hua University TAIWAN, <sup>2</sup>National Chung Cheng University TAIWAN, <sup>3</sup>Institute of Nuclear Energy Research (INER) TAIWAN

[Advanced Single-Phase SOGI-FLL Using Self-Tuning Gain Based on Fuzzy Logic](#)

Jin-Sang Park<sup>1</sup>, Dong-Choon Lee<sup>1</sup>, Tan Luong Van<sup>2</sup>, <sup>1</sup>Yeungnam University REPUBLIC OF KOREA, <sup>2</sup>Ho Chi Minh City Electric Power College VIETNAM

[Modelling of Islanding Detection by Sensing Jump Change of Harmonic Voltage at PCC by the Combination of a Narrow Band-pass Filter and Wavelet Analysis](#)

Daming Zhang, H.C. Niu, Meng Jiang, The University of New South Wales AUSTRALIA

## Session #12-3: Renewable Energy Technology

### Chair: Luiz Lopes

[Development of Power Conditioning System \(PCS\) for Battery Energy Storage Systems](#)

*Haiqing Li, Yukihiisa Iijima, Noriko Kawakami, Toshiba Mitsubishi-Electric Industrial Systems Co. JAPAN*

[100kW High-Power PV PCS with No Cooling Fans - High Efficiency and Low Running Cost](#)

*Takehiro Takahashi, Eiichi Ikawa, Inzunza Ruben, Tatsuaki Ambo, Toshiba Mitsubishi-Electric Industrial Systems Co. JAPAN*

[Feed Forward Control for Permanent Magnet Synchronous Generator Based Wind Turbines Aimed at Output Power Smoothing](#)

*Linyuan Zhou, Jinjun Liu, Sizhan Zhou, Yangque Zhu, Fangcheng Liu, Xi'an Jiaotong University CHINA*

[A High Gain DC-DC Converter With Voltage Multiplier](#)

*Rakesh Sharma, Vivek Agarwal, Indian Institute of Technology Bombay INDIA*

## **Session #12-4: Multi-Phase Inverter Control**

**Chair: Jinjin Lui**

[Enhanced Pulsewidth Modulation Strategy of Six-Switch Converter for Single Phase Online Uninterruptible Power](#)

[Supply](#)

*Feng Gao<sup>1</sup>, Nan Li<sup>1</sup>, Decun Niu<sup>1</sup>, Tianbao Zhang<sup>2</sup>, <sup>1</sup>Shandong University CHINA, <sup>2</sup>Shandong Electric Power Economic Research Institute CHINA*

[Single Phase Transformerless Semi-Z-Source Inverter with Reduced Total Harmonic Distortion \(THD\) and DC Current](#)

[Injection](#)

*Tofael Ahmed<sup>1</sup>, Saad Mekhilef<sup>1</sup>, Mutsuo Nakaoka<sup>2</sup>, <sup>1</sup>University of Malaya MALAYSIA, <sup>2</sup>Kyungnam University REPUBLIC OF KOREA*

[Space Vector PWM for Five-to-Three Phase Conventional Matrix Converter with d#2-q2 Vector Elimination](#)

*Merlin Chai, Rukmi Dutta, John Fletcher, The University of New South Wales AUSTRALIA*

[Comparison of Two Advanced Modulation Strategies for a Hybrid Cascaded Converter](#)

*Grain Adam<sup>1</sup>, I. Abdelsalam<sup>1</sup>, S.J. Finney<sup>1</sup>, D. Holliday<sup>1</sup>, B.W. Williams<sup>1</sup> and John Fletcher<sup>2</sup>, <sup>1</sup>University of Strathclyde UNITED KINGDOM, <sup>2</sup>The University of New South Wales AUSTRALIA*

## **Session #12-5: Machine Applications II**

**Chair: Ricardo Aguilera**

[Study of Variable Reluctance Vernier Motor for Hybrid Electric Vehicle](#)

*Masahiro Takano, Shoji Shimomura, Shibaura Institute of Technology JAPAN*

[Machine Parameter Independent Control of a Grid-Connected Variable Speed Doubly-Fed Induction Generator for Gas](#)

[Engine Generation Systems](#)

*Ahmad Bashar Ataji<sup>1</sup>, Yushi Miura<sup>1</sup>, and Toshifumi Ise<sup>1</sup>, Hiroki Tanaka<sup>2</sup>, <sup>1</sup>OSAKA University JAPAN, <sup>2</sup>Osaka Gas Co. JAPAN*

[A Principle of Next Generation Spintronics Motor](#)

*Saori Furukawa, Kan Akatsu, Shibaura Institute of Technology JAPAN*