Conference Information

- **Date & Venue**

Date: May 31 – June 4, 2026
Venue: DEJIMA MESSE NAGASAKI
4-1 Onouemachi, Nagasaki City, Nagasaki Prefecture, 850-0058, JAPAN

- **Official Language**

The working language of the conference will be English.
All submissions and presentations must be in English.

- **Registration**

The Registration Desk is in the Foyer of Event & Exhibition Hall (1F) and open during the following hours:

Open Hours:	May 31 (Sun.)	12:00 – 20:00
	June 1 (Mon.)	7:00 – 18:00
	June 2 (Tue.)	7:00 – 18:00
	June 3 (Wed.)	7:00 – 18:00
	June 4 (Thu.)	7:00 – 15:00

- **Cloak**

Cloak is located in the Foyer on 1st floor and open during the following hours:

Open Hours:	June 4 (Thu.)	8:00 – 16:30

- **Secretariat**

The secretariat office is at Room 105/106 (1F) during conference period.

- **Badge**

All the participants including accompanying persons are asked to wear their name badges to enter the session rooms and to take part in social programs. Please wear your name badge at all the time during the conference period.
Name printed on the badge will be the name registered at the time of registration. Please note that the registered name cannot be changed. In addition, transfers are not allowed.

- **Lunch**

Lunch is served for all participants with Lunch Ticket.

Place & Time:	Event & Exhibition Hall B (1F)	June 1 (Mon.)	12:20 –
		June 2 (Tue.)	12:00 –
		June 3 (Wed.)	12:00 –
	Convention Hall (2F)	June 4 (Thu.)	12:30 –

- **Coffee Break**

Place & Time:	Event & Exhibition Hall B (1F)	
	June 1 (Mon.)	10:45 – 11:15 / 16:10 – 16:30
	June 2 (Tue.)	10:15 – 10:45 / 16:00 – 16:20
	June 3 (Wed.)	10:15 – 10:45 / 16:00 – 16:20
	June 4 (Thu.)	9:50 – 10:10

Conference Information

- **Internet (Wi-Fi)**

[1F] SSID: dejimach1 PW: nagasakich1 [2F] SSID: dejimach2 PW: nagasakich2
[Event & Exhibition Hall (1F)] SSID: dejimaeh PW: nagasakieh

- **Message Board**

Any program changes or urgent announcements from the secretariat and person to person messages will be posted on the Message Board located near the Registration Desk. Please check the board occasionally.

- **Authors' Breakfast**

The Authors' Breakfast Meeting will be held from 7:20 to 8:20 at Event & Exhibition Hall 1F. All oral presenters and session chairpersons are requested to attend on the day of their session.

For on-line Participants

- **Access to On-line Session Room (Zoom) & Platform**

There are 14 online sessions in total. For these sessions, no dedicated rooms or screen projection facilities will be provided.
If you would like to attend the online sessions, please join using your own laptop or other personal device.
If necessary, you may use the lunch venue in the Event and Exhibition Hall (1F).

- **Photography and Recording**

Photography / Recording in the sessions is strictly prohibited. Taking photos / screenshots of presentation materials without any approval from authors is also prohibited.

Sponsored Meetings

- **Women in Engineering**

June 1 (Mon.) 12:50 – 14:10 at Room 107 (1F)

Other Meetings

- **APECC (Asian Power Electronics Coordinate Committee) Meeting**

June 1 (Mon.) 13:00 – 14:30 at Room 110 (1F)

- **Magnetics Roadmap Leadership Meeting**

June 3 (Wed.) 10:30 – 12:00 at Room 110 (1F)

- **ECCE-Asia Coordination Committee Meeting**

June 3 (Wed.) 12:40 – 14:10 at Room 110 (1F)

Conference Information

Social Programs

1. Welcome Reception
Date & Time: Sunday, May 31, 18:00 – 19:30
Venue: Event & Exhibition Hall B (1F), DEJIMA MESSE NAGASAKI
Dress Code: Casual
Fee: Included in Registration fee
All registered participants and their accompanying persons are invited to attend free of charge.
A light meal and drinks will be served.

2. Banquet
Date & Time: Wednesday, June 3, 19:00 – 21:00
Venue: Hall 1 – 4 (2F), DEJIMA MESSE NAGASAKI
Dress Code: Informal
Fee: [Regular] 10,000JPY [Student] 5,000JPY
A full course meal and entertainment will be provided.
Participants are required to purchase extra tickets in advance. If you don't have one but wish to attend, please contact the Registration Desk on-site.

Conference Information

Public Meeting

- **Meet PELS Leaders**

Date & Time: Tuesday, June 2, 12:15 – 12:40
Venue: Room 103 (1F), DEJIMA MESSE NAGASAKI

IEEE Power Electronics Society President, Johan Enslin, is delighted to invite you to "Meet PELS Leaders".

This meeting will provide an opportunity to engage with fellow PELS members, gain insights into the society's initiatives, and share ideas towards shaping the future of power electronics.

PELS will present one of the PELS Best Chapter Awards and kick off the global PELS Day celebrations to commemorate its anniversary with a festive cake-cutting ceremony.

All PELS members, from students to professionals, are encouraged to come together to strengthen professional network, foster collaboration, and enjoy light refreshments!

Let's Power a Sustainable Future Together!

- **PELS Region-10 Chapter Chairs Meeting**

Date & Time: Tuesday, June 2, 12:40 – 14:10
Venue: Room 103 (1F), DEJIMA MESSE NAGASAKI

The IEEE PELS Region 10 Chair Meeting is for PELS Chapter and Student Branch Chapter Chairs within the region who are interested in engaging, collaborating, and sharing ideas with other PELS chapters. This meeting will provide an open forum for chapter chairs to discuss chapter activities, membership growth, successes, challenges, and IEEE and PELS resources.

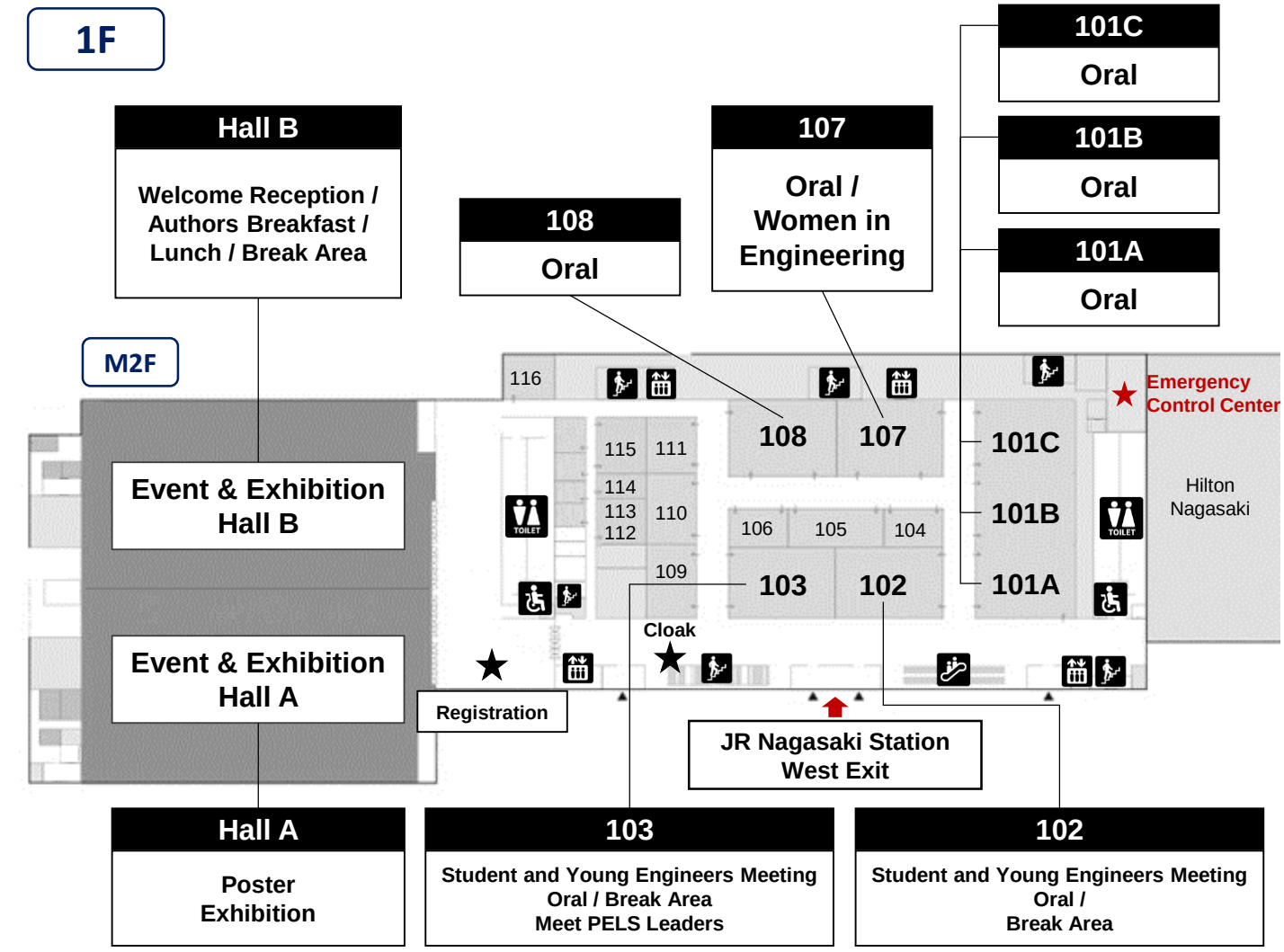
Presented by:
Sanjib K. Panda, Region 10 Co-Chair (South & Southeast Asia), IEEE PELS
Kai Sun, Region 10 Co-Chair (East Asia & Oceania), IEEE PELS
Tao Yang, VP of Membership, IEEE PELS

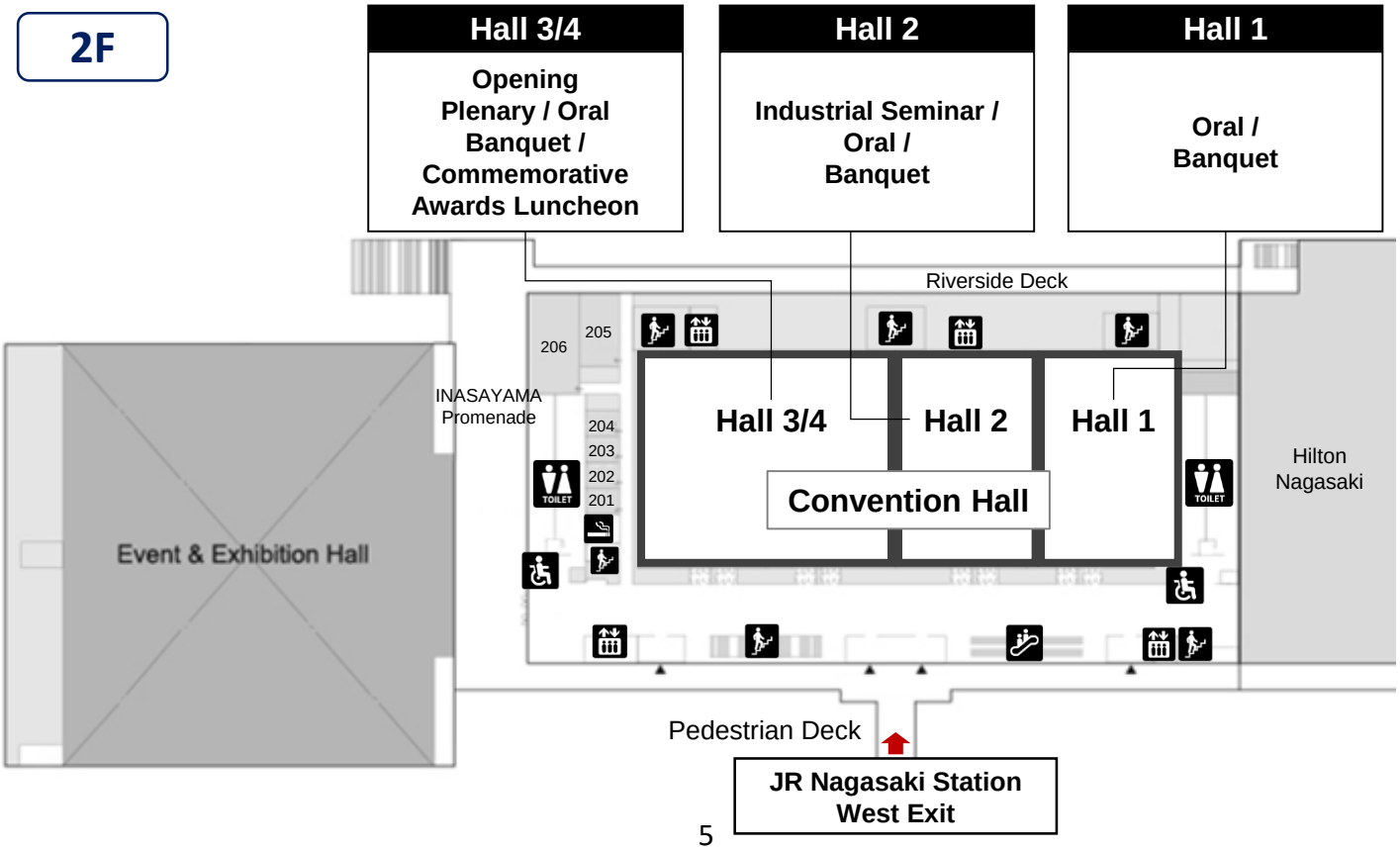
Stamp Rally

Once you have completed registration at the reception desk, we will provide you with a stamp rally sheet. You can collect stamps by visiting the corporate exhibits. We have prizes available for those who collect four stamps, so please join in.

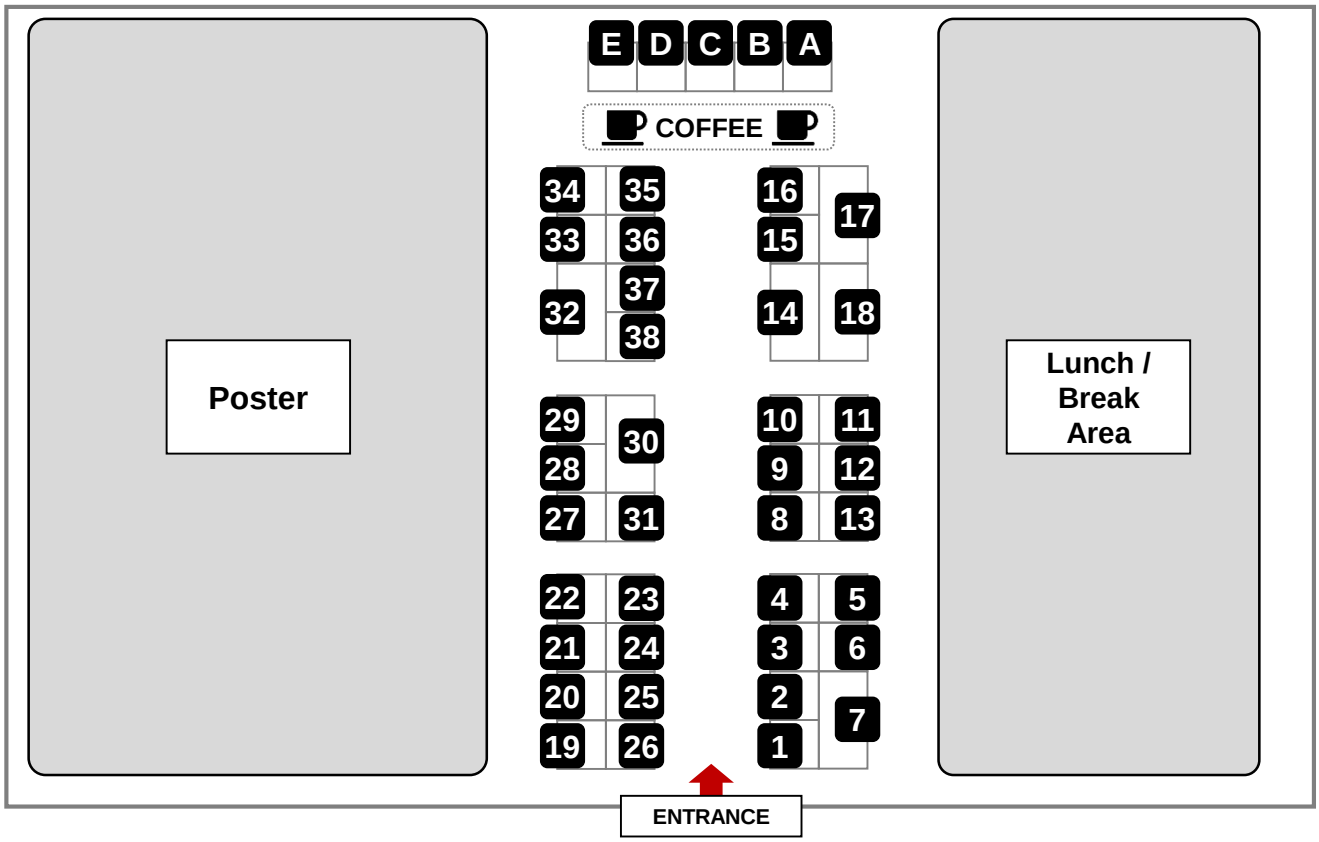
Pickup Location: 1F Registration Counter Exchange
Time: (June 1) 14:00 – 17:00 (Jun 2 –) 10:30 – 17:00
Exchange Condition: Collect stamps from 4 or more different companies
*Please exchange for a mug as soon as possible, as the number of mugs is limited.

Floor Plan


1F
Hall B
Welcome Reception / Authors Breakfast / Lunch / Break Area
108
Oral
107
Oral / Women in Engineering
101C
Oral
101B
Oral
101A
Oral
M2F
Event & Exhibition Hall B
Event & Exhibition Hall A
Registration
Cloak
Emergency Control Center
Hilton Nagasaki
JR Nagasaki Station West Exit
Hall A
Poster Exhibition
103
Student and Young Engineers Meeting Oral / Break Area Meet PELS Leaders
102
Student and Young Engineers Meeting Oral / Break Area


2F
Hall 3/4
Opening Plenary / Oral Banquet / Commemorative Awards Luncheon
Hall 2
Industrial Seminar / Oral / Banquet
Hall 1
Oral / Banquet
Riverside Deck
INASAYAMA Promenade
Event & Exhibition Hall
Convention Hall
Hilton Nagasaki
Pedestrian Deck
JR Nagasaki Station West Exit

Exhibition Floor Map / Exhibitors



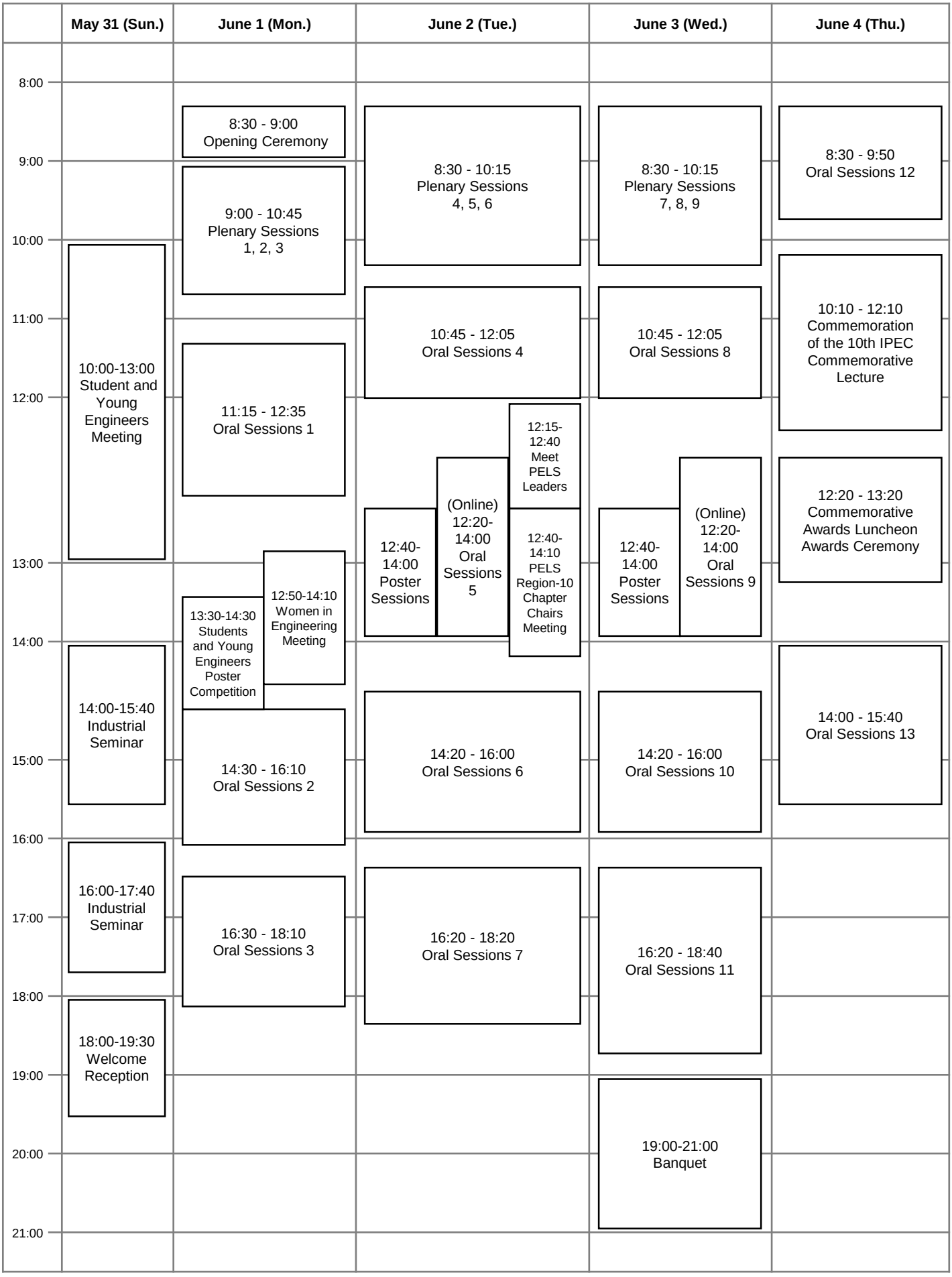
1	Japan Power Electronics Association
2	Myway Plus Corporation
3	Typhoon HIL
4	Nuvoton
5	Chroma Japan Corp.
6	HIOKI E.E. CORPORATION
7	TMEIC Corporation
8	CITIZEN FINEDEVICE CO.,LTD.
9	Imperix
10	High Voltage Asia Pte Ltd
11	Hitachi, Ltd.
12	OMRON
13	Fuji Electric Co., Ltd.
14	AVL JAPAN K.K.
15	dSPACE Japan K.K.
16	SHIZUKI ELECTRIC CO., INC.
17	SANYO DENKI CO., LTD.
18	IWATSU
19	ISAHAYA ELECTRONICS CORPORATION
20	Yokogawa Test & Measurement Corporation
21	Smart Energy Laboratory Co.,Ltd.
22	PUES
23	RTDS TECHNOLOGIES

24	TAIYO KOGYO CO., LTD.
25	MathWorks
26	IHI Corporation
27	Mersen Japan K.K.
28	Headspring Inc.
29	DSP Technology Co.,Ltd.
30	PONY ELECTRIC CO.,LTD
31	Plexim GmbH
32	EICH.CORPORATION CO.,LTD
33	TEXIO TECHNOLOGY CORPORATION
34	ICPE 2027-ECCE Asia
35	The Japan Steel Works, Ltd.
36	ModelingTech Energy Technology Co., Ltd.
37	TAKASAGO, LTD.
38	KYOWAKIDEN INDUSTRY CO.,LTD.

■ EV Parts Display

A	Furukawa Electric Co., Ltd.
B	Mitsubishi Electric Corporation
C	AISIN CORPORATION
D	DENSO CORPORATION
E	Meidensha Corporation

Program at a Glance



Industrial Seminar

Sunday, May 31 14:00 – 15:40 ---------- **Convention Hall 2 (2F)**

Chairs: Prof. Kan Akatsu (Yokohama National University)
Prof. Kantaro Yoshimoto (Tokyo Denki University)


Dr. Manabu Souda

[Seminar 1] 14:00 – 14:30
Dr. Manabu Souda
TMEIC
“Power Electronics Technology Enables a Carbon Neutral Society”


Dr. Masahiro Sasaki

[Seminar 2] 14:35 – 15:05
Dr. Masahiro Sasaki
Fuji Electric, Co., Ltd.
“Technical Trend of Silicon Carbide Power Semiconductor Devices”


Dr. Zhongwei Guo

[Seminar 3] 15:10 – 15:40
Dr. Zhongwei Guo
Shindengen Electric Mfg. Co., Ltd.
“Control Techniques for Three-Phase Bidirectional
Vehicle-to-Everything(V2X) Systems”


Dr. Ryohei Kitayoshi

[Seminar 4] 16:00 – 16:30
Dr. Ryohei Kitayoshi
Yaskawa Electric Corporation
“Σ-X series: AC Servo Drive for Achievement of Digital Solution”


Dr. Koji Terashima

[Seminar 5] 16:35 – 17:05
Dr. Koji Terashima
Isuzu Advanced Engineering Center, Ltd.
“Progress and Challenges of Ultra-High-Speed Motors for Vehicle Drive”


Dr. Yoshinori Yamashita

[Seminar 5] 17:10 – 17:40
Dr. Yoshinori Yamashita
Mitsubishi Electric
“Synchronous Reluctance Motor Systems for Railway Vehicles and
Energy-Saving Technologies”

Plenary Sessions

Plenary Session 1/2/3 ..... **Convention Hall 3/4 (2F)**

Monday, June 1 9:00 – 10:45

[Plenary Session 1]
Prof. Frede Blaabjerg
Aalborg University
“Power Electronics Technology - Trends and Applications”


Prof. Frede Blaabjerg

[Plenary Session 2]
Prof. Akira Chiba
Institute of Science Tokyo
“Developments of Bearingless Motor and Drives”


Prof. Akira Chiba

[Plenary Session 3]
Prof. Shin-ichiro Sakai
JAXA (Japan Aerospace Exploration Agency)
“Looking Back on SLIM's Moon Landing, Looking Ahead to the Future”


Prof. Shin-ichiro Sakai

Plenary Sessions

Plenary Session 4/5/6 ..... **Convention Hall 3/4 (2F)**

Tuesday, June 2 8:30 – 10:15

[Plenary Session 4]
Prof. Fang Z. Peng
University of Pittsburgh
"Taming the Beast – A Personal Journey and Research Quest for Safe and Resilient Electricity"


Prof. Fang Z. Peng

[Plenary Session 5]
Prof. Yuting Gao
Wuhan University
"Research on High-Inertia Brushless Doubly-Fed Flywheel Energy Storage Motor System"


Prof. Yuting Gao

[Plenary Session 6]
Prof. Sehoon Oh
Daegu Gyeongbuk Institute of Science and Technology
"Robot Control in the Era of Physical AI: Bridging the Gap Between Learning and Precision Control"


Prof. Sehoon Oh

Plenary Sessions

Plenary Session 7/8/9 ..... **Convention Hall 3/4 (2F)**

Wednesday, June 3 8:30 – 10:15

[Plenary Session 7]
Prof. Sewan Choi
SEOULTECH
"EV OBC at a Turning Point: Beyond Two-Stage Limits to De-Risked, Cost-Competitive Single-Stage Architectures"


Prof. Sewan Choi

[Plenary Session 8]
Prof. Jinjun Liu
Xi'an Jiaotong University
"The Quest for a Fully Autonomous Distribution-Grid/Microgrid Incorporating DERs"


Prof. Jinjun Liu

[Plenary Session 9]
Dr. Kansuke Fujii
Fuji Electric Co., Ltd.
"Developing Power Conditioning System (PCS) for Renewable Energy in Japan"


Dr. Kansuke Fujii

Technical Sessions: Oral Sessions 1

Monday, June 1 11:15 – 12:35

Room 101A (1F)

[Oral] Motor Drive and Control

[O1-1] Control Theory for Motor Drives 1
Chairs: Ikuya Sato (Fuji Electric Co., Ltd.)
Mateja Novak (Aalborg University)

[O1-1-01]
Reinforcement Learning-Based Current Control of PMSMs using PPO with Temporal Memory
*Juan Escarate[1], Esin Ilhan Caarls[1], Jan M. Schellekens[1], Georgios Papafotiou[1] (1. Eindhoven University of Technology (Netherlands))

[O1-1-02]
Online Parameter Estimation for MTPA Control of PMSMs in Stator Flux Linkage Synchronous Frame
*Kosuke Motoi[1], Yukinori Inoue[1], Masayuki Sanada[1] (1. Osaka Metropolitan University (Japan))

[O1-1-03]
Estimation Method for Iron Loss Equivalent Resistance of Permanent Magnet Synchronous Motor
*Takumi Takemae[1], Kantaro Yoshimoto[1] (1. Tokyo Denki University (Japan))

[O1-1-04]
Vector control of switched reluctance motors with adjustable tradeoff between torque ripple and RMS current
*Hayato Takahashi[1], Keitaro Kawarazaki[1], Nobukazu Hoshi[1] (1. Tokyo University of Science (Japan))

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Sophisticated Modulation, control and analysis

[O1-2] Advanced Digital Control and Adaptive Algorithms
Chairs: Bulent Sarlioglu (University of Wisconsin-Madison)
Tomoyuki Mannen (Utsunomiya University)

[O1-2-01]
Experimental Validation of an LLM-Based PI Gain Auto-tuning Method for a Half-bridge Inverter
*Wataru Kodaka[1], Ryosuke Ota[1], Keiji Wada[1] (1. Tokyo Metropolitan University (Japan))

[O1-2-02]
Experimental Verification of Multi-Sampling Deadbeat Control in a MW-class Grid-tied Inverter with an LC-type Output Filter
*Sota Kado[1], Kohsuke Seki[2], Yoshihiro Tawada[2], Tomoki Yokoyama[1] (1. Tokyo Denki University (Japan), 2. TMEIC (Japan))

[O1-2-03]
An Adaptive Nonlinear Control for Power Converters to Mitigate Transient Overreach of Distance Relays
*Qianli Xing[1], Henrik Johansson[1], Nathaniel Nathaniel taylor[1], Ilka Jahn[1], Zhenbin Zhang[2] (1. KTH Royal Institute of Technology (Sweden), 2. Shandong University (China))

[O1-2-04]
Fully Closed-Loop Control with Propagation Delay Compensation for the Soft-Switched Bidirectional Phase-Shifted Full Bridge Converter
*JT Luterbach[1], Andrew M. Knight[1], Philippe Gray[1] (1. University of Calgary (Canada))

Technical Sessions: Oral Sessions 1

Room 101C (1F)

[Oral] Semiconductor Power Conversion » Emerging technologies in Packaging, thermal management, system integration and Reliability (Advanced fault protection systems, Diagnostics)

[O1-3] Monitoring and Diagnostics of Semiconductor Devices and Capacitors
Chairs: Guo-Quan Lu (Virginia Tech)
Kenji Natori (Chiba University)

[O1-3-01]
Analysis of Relationship between Gate Drive Condition and Detection Sensitivity of Bond Wire Lift-Off in IGBT Modules using Convolutional Neural Networks (CNNs)
*Thatree Mamee[1], Katsuhiro Hata[2], Makoto Takamiya[3], Takayasu Sakurai[3], Shin-ichi Nishizawa[4], Wataru Saito[4]
(1. Pilot Plant Development and Training Institute (PDTI), King Mongkut's University of Technology Thonburi (KMUTT) (Thailand), 2. College of Engineering, Shibaura Institute of Technology (Japan), 3. Institute of Industrial Science, The University of Tokyo (Japan), 4. Research Institute for Applied Mechanics, Kyushu University (Japan))

[O1-3-02]
Fully Integrated Active Gate Driver IC With Real-Time Timing Control of Drive-Strength Switching Using Gate Current Sensing for SiC MOSFETs
Taiyu Liu[1], Michihiro Ide[1], *Makoto Takamiya[1] (1. The University of Tokyo (Japan))

[O1-3-03]
Condition Monitoring of a DC-link Capacitor with the Instantaneous Output Power of a Propulsion Inverter with One-Pulse Modulation
*Kazunori Hasegawa[1], Takuma Yamasoto[1], Kazuki Fujimoto[2], Yuji Oyama[2], Norifumi Iida[2] (1. Kyushu Institute of Technology (Japan), 2. TOYO DENKI SEIZO K.K. (Japan))

[O1-3-04]
Analysis and Experimental Verification of Current Sharing among Parallel-Connected DC-Link Capacitors with Stray Inductances
*Kazunori Hasegawa[1], Sakurako Nasu[1] (1. Kyushu Institute of Technology (Japan))

Room 102 (1F)

[Oral] Industrial Instrumentation and Control

[O1-4] Industrial Instrumentation and Control 1
Chairs: Reon Sasaki (The University of Tokyo)
Subham Sahoo (Aalborg University)

[O1-4-01]
A Comparison of Linear and Sliding Mode Formation Control for a Multi Quadrotor System
Luis F. Canaza Ccari[1], *Muhammad Rehan[1] (1. KFUPM (Saudi Arabia))

[O1-4-02]
High-Robustness and High-Responsiveness Motion Control Based on Multi-Sampling Deadbeat Control
Hiroki Kubota[1], *Masami Iwase[1], Tomoki Yokoyama[1] (1. Tokyo Denki University (Japan))

[O1-4-03]
LLM-Guided Multi-Agent Co-Design Framework for Circuit Parameter Design and Power Device Selection in Power Converters
*Qingyang Tan[1], Keiji Wada[1] (1. Tokyo Metropolitan University (Japan))

[O1-4-04]
Feedforward Flow Rate Control for Pipe Resonance Cancellation via Iterative Learning-Based Parameter Identification
*Koki Hattori[1], Wataru Ohnishi[1], Takafumi Koseki[1] (1. The University of Tokyo (Japan))

Technical Sessions: Oral Sessions 1

Room 103 (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O1-5] Converter-Grid Interactions Under Unbalanced and Distorted Conditions
Chairs: Hiroki Ishikawa (Gifu University)
Zong-Zhen Yang (National Taiwan University of Science and Technology)

[O1-5-01]
Impedance Asymmetricity: How Control Design Shapes Converter-Grid Instability
*Chirag Ramgopal Shah[1], Marta Molinas[1], Sjur Føyen[1], Roy Nilsen[1] (1. Norwegian University of Science and Technology (Norway))

[O1-5-03]
Deduction and Analysis of Transient Synchronization Model of DFIG-Based Wind Turbines Considering DC Voltage Dynamics
*Jingyi Bu[1], Zhanqi Huang[1], Chao Wu[1], Yong Wang[1] (1. Shanghai Jiao Tong University (China))

[O1-5-04]
Passivity-Based Voltage Regulation of a PV-Fed
Boost for Colombia's Distributed Generation: Design and Validation
*Juan David Noriega[1], Fredy Martinez[1] (1. Universidad Distrital Francisco Jose De Caldas (Colombia))

Room 107 (1F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O1-6] Resonant Converters
Chairs: Wilmar Martinez (KU Leuven - EnergyVille)
Kazuhiro Umetani (Kyushu University)

[O1-6-02]
Talkative Power Conversion on IPOS LLC Resonant Converter Using Multi-Spread Phase Shift Keying Under Spread Spectrum Modulation
*Young-Min Lee[1], Jun-Suk Lee[1], Jee-Hoon Jung[1] (1. Ulsan National Institute of Science and Technology (UNIST) (Korea))

[O1-6-03]
A High-Power-Density IPT-based CLLC Converter With the Air-Core PCB Transformer
*Junrui Liu[1], Bowang Zhang[1], Yilin Zhang[1], Youhao Hu[1], Wei Han[1] (1. HKUST(GZ) (China))

[O1-6-04]
Enhanced Magnetics Utilization and Core Size Reduction in CLLC Converters
*Jamil Hassan[1], Aswin Palanisamy[1], Jun-ichi Itoh[2], Dylan Lu[1], Yam Siwakoti[1] (1. University of Technology Sydney (UTS) (Australia), 2. Nagaoka Univerisity of Technology (Japan))

Technical Sessions: Oral Sessions 1

Room 108 (1F)

[Oral] Semiconductor Power Conversion

[O1-7] Medium Voltage Power Electronics
Chairs: Shiori Idaka (Mitsubishi Electric Europe B.V.)

[O1-7-01] Invited Paper
Solid-State Transformers for Medium Voltage PV Applications
Jiacai Zhuang[1,2], Minle Shi[2], *Wei Liu[1], Guoqing Cai[1], Yuan Zhuang[1] (1. Sungrow Power Supply Co. Ltd. (China), 2. Hefei University of Technology (China))

[O1-7-02] Invited Paper
Characterization of 3.3 kV SiC Switches: Short-Circuit Robustness of Uni-directional MOSFETs and Switching Performance of Monolithic BiDFETs
Qihao Luo[1], Pengyu Fu[1], Juchen Yang[1], Euler Valdivieso[1], Yizhou Cong[1], Zhining Zhang[1], *Jin Wang[1], Anant Agarwal[1], Ajit Kanale[2], Ashish Kumar[2], Stanley Atcitty[3] (1. The Ohio State University (USA), 2. Wolfspeed, Inc. (USA), 3. Sandia National Laboratories (USA))

[O1-7-03] Invited Paper
10kV-rated Power Electronics Building Block with Series-Connected 3.3kV SiC MOSFETs
*Drazen Dujic[1], Jules Mace[1], Rui Wang[2] (1. Power Electronics Laboratory, EPFL (Switzerland), 2. Hunan University (China))

[O1-7-04] Invited Paper
The High Power Grid Lab: A novel PHiL Research Infrastructure for Medium-Voltage Power Electronics
*Christina Bischoff[1], Georg Zieglmaier[1], Rüdiger Schwendemann[1], Lukas Stefanski[1], Marc Hiller[1] (1. Karlsruhe Institute of Technology (KIT) (Germany))

Hall 1 (2F)

[Oral] Vehicle Electrification-related Technologies

[O1-8] Technologies for 50,000rpm traction motor of XEV Part I
Chairs: Kan Akatsu (Yokohama National University)

[O1-8-01] Invited Paper
Power Converter Topologies and PWM Strategies for Ultra-High-Speed Motor Drives in Electric Vehicles
*Keitaro Kawarazaki[1], Yuichiro Deguchi[1], Nobukazu Hoshi[1] (1. Tokyo University of Science (Japan))

[O1-8-02] Invited Paper
Control Technique for High-speed Motor Drive Systems
*Kantaro Yoshimoto[1], Yuto Hirao[1], Towa Shibuya[1], Tomoki Yokoyama[1] (1. Tokyo Denki University (Japan))

[O1-8-03] Invited Paper
Dynamic Behavior of a Passive Common-Noise Canceller During Control Transitions in Three-Phase PWM Inverter-Fed Motor Drives
*Jinxing Zhou[1], Koji Orikawa[2] (1. Hokkaido University (Japan), 2. Hokkaido University of Science (Japan))

[O1-8-04] Invited Paper
Measurement of Stator AC Losses in a High-Speed Machine with Aluminum Distributed Winding
*Hiroya Sugimoto[1], Shoichi Oaku[1], Yuto Yamada[1], Itsuki Fukasawa[1], Jun Ebinuma[1] (1. Tokyo Denki University (Japan))

Technical Sessions: Oral Sessions 1

Hall 2 (2F)

[Oral] Linear Drives

[O1-9] Industrial/Medical Applications of Magnetic Bearings
Chairs: Junichi Asama (Shizuoka University)
Wolfgang Gruber (Johannes Kepler University, Austria)

[O1-9-01] Invited Paper
Sensorless Detection and Prevention of Thrombus Using Magnetic Bearing in Blood Pump
*Wataru Hijikata[1], Kohei Hatakenaka[1], Tatsuki Fujiwara[1], Katsuhiro Ohuchi[2], Yusuke Inoue[3] (1. Institute of Science Tokyo (Japan), 2. Juntendo University (Japan), 3. Asahikawa Medical University (Japan))

[O1-9-02] Invited Paper
Stability and Robustness Evaluation of the Miniature MagLev Drive System in NeoVAD Prototype: In Vitro Static and Pulsatile Study
*Yaxin Wang[1], Nobuyuki Kurita[1,2], Victor Tedesco[1], Ethan Maddin[1], Hoi Houng Chan[1], O. H. Frazier[1] (1. Baylor College of Medicine (USA), 2. Texas Children Hospital (USA))

[O1-9-03] Invited Paper
Proposal of a Modeling Method for Axial Magnetic Bearing Actuators Considering Magnetic Saturation and Eddy Currents and Its Verification on an Actual Device
*Daiki Miwa[1], Atsushi Sakawaki[1], Ryota takeuchi[1] (1. Daikin Industries, LTD (Japan))

[O1-9-04] Invited Paper
Sensorless Bearingless Slice Motor Using Magnet-Free Rotor for Extracorporeal Circulatory Blood Pumps
*Tadahiko Shinshi[1], Zeqiang He[1] (1. Institute of Science Tokyo (Japan))

Online Session (Online)

[Oral] Motor Drive and Control

[O1-10] Rotating Machines and Motor Drives
Chairs: Yuto Kobayashi (National Institute of Technology, Akita College)

[O1-10-01]
Optimization Design for Enhancing Thermal Performance of High–Speed Permanent Magnet Motors Based on Taylor-Couette Flow Characteristics
*Jiayu Zhang[1], Shan Li[1], Jiayi Yao[1], Dengjie Lu[1], Wei Sun[1] (1. SMERI (China))

[O1-10-02]
Improved Current Sampling Scheme for Sensorless Control of SPMSM Drives with Two Shunt Resistors
*Zhongyu Li[1], Zhicong Xu[2], Peng Ouyang[2], Hanbing Dan[1], Mei Su[1] (1. Central South University (China), 2. Aecc South Industry Company Limited (China))

[O1-10-03]
Magnitude and Symmetrical Optimal Based Parameter Design Method for Direct Torque Control Driven-PMSM
*Jinhui Wang[1], Yixiao Luo[1], Kai Yang[1] (1. School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan (China))

[O1-10-04]
An Improved Torque Control Method to Simulate the Propeller Characteristics under Various Inflow Velocities and Rotational Speeds
*Jianzhi Zhu[1], Jiaying Zhu[1], Bowei Chen[1], Yilin Ma[1], Huan Yang[1], Rongxiang Zhao[1] (1. Zhejiang Univ. (China))

Technical Sessions: Oral Sessions 1

Monday, June 1 12:50 – 14:30

Online Session (Online)

[Oral] Semiconductor Power Conversion

[O1-2-1] Control and Diagnostic Technologies
Chairs: Rintaro Kusui (Nagaoka University of Technology)

[O13-5-05]
Power Distribution Control of a Photovoltaic-Electric Vehicle Integrated System Based on Reinforcement Learning
*Xian Zhou[1], Yu Zeng[1], Yujia Kuang[1], Dehong Zhou[1], Xin Liu[1], Zhan Li[2], Jianxiao Zou[1], Josep Pou[3] (1. University of Electronic Science and Technology of China (China), 2. Hunan University (China), 3. City University of Hong Kong (Hong Kong))

[P1-13-01] A Voltage-Only Control of Series-Stacked Active Power Decoupler for Wide Capacitance Range
*Lyuyi Lin[1,2], Biliang Huang[2], Ji Xiang[1] (1. Zhejiang University (China), 2. JOULWATT TECHNOLOGY CO., LTD. (China))

[P1-13-17] Diagnosis of Open-Circuit Faults in Three-Level ANPC Inverters Based on Digital Twin
*Chang Li[1], Zhiyao Lu[1], YiLan Xue[1], PengYu Luo[1], WeiLin Li[1], WenJie Liu[1] (1. Northwestern Polytechnical University (China))

[O7-1-02]
Power-decoupled DAB-buck Converter with Discrete Pulse Control for Fast Lithium-ion Battery Charging
Xiao Li[1], Chengpeng Zhou[1], *Jin Sha[1], Xuanyan Liu[1], Jinsong Shen[2] (1. School of Electrical Engineering of Southwest Jiaotong University (China), 2. Monolithic Power Systems (China))

[O8-3-01]
Loss-Aware DC-Bus Voltage Control for Open-Winding PMSM in Electric Vehicles
*Xuanyi Zhu[1], Zechuan Lin[2], Kemeng Chen[1], Yifei Han[1], Xi Xiao[1] (1. Tsinghua University (China), 2. Maynooth University (Ireland))

Technical Sessions: Oral Sessions 2

Monday, June 1 14:30 – 16:10

Room 101A (1F)

[Oral] Motor Drive and Control

[O2-1] Sensorless Control
Chairs: Atsushi Shinohara (Kagoshima University)
Somboon Sangwongwanich (Chulalongkorn University)

[O2-1-01]
Simple Unity Power Factor Control Method for Direct Torque Control of Permanent Magnet Synchronous Motor Drives
*Hiroshi Enokura[1], Yukinori Inoue[1], Masayuki Sanada[1], Taichi Kawakami[2] (1. Osaka Metropolitan University (Japan), 2. Osaka Metropolitan University College of Technology (Japan))

[O2-1-02]
Model-based Spatial Harmonic Compensation in Signal-Injection Sensorless Control of IPMSMs
*Hirotaka Kato[1], Jun-ichi Itoh[1], Gyu Cheol Lim[2], Jung-Ik Ha[2] (1. Nagaoka University of Technology (Japan), 2. Seoul National University (Korea))

[O2-1-03]
Low Speed Sensorless Control Using a Dynamic Range ADC under Sinusoidal PWM Excitation
*Kaito Watanabe[1], Sari Maekawa[1], Naoya Yamashita[2], Akihiro Doi[2], Akihisa Mieda[2] (1. Meiji University (Japan), 2. DAIKIN INDUSTRIES (Japan))

[O2-1-04]
ANN based Sinusoidal Modulation Low Speed Sensorless Control Without Signal Injection
*Ning Ma[1], Sari Maekawa[1] (1. Meiji University (Japan))

[O2-1-05]
A Novel Position Sensorless Flux Vector Control Combined with V/f Control for Permanent Magnet Synchronous Motors
*Taiki Mikami[1], Tetsuya Matsuyama[2], Masato Komizo[2], Nobukazu Hoshi[1] (1. Tokyo University of Science (Japan), 2. Panasonic Industry Co., Ltd. (Japan))

Technical Sessions: Oral Sessions 2

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Sophisticated Modulation, control and analysis

[O2-2] Implementation and Analysis of Next-Gen GaN and UHF Circuits
Chairs: Yu Zuo (Katholieke Universiteit Leuven)
Masataka Minami (Kindai University)

[O2-2-01]
Verification of Boost DC-DC Converter with 1MHz Multi-Sampling Deadbeat Control
*Takumi Hamauzu[1], Yuki Ueda[1], Shigenori Nakatani[1], Ryo Saito[2], Atsuo Kawamura[3], Tomoki Yokoyama[1] (1. Tokyo Denki University (Japan), 2. Hasetec (Japan), 3. Yokohama National University (Japan))

[O2-2-02]
Novel GaN MBDS-Based Current-Source Three-Phase Buck–Boost PFC Rectifier System
*takanobu ohno[1], Johann Walter Kolar[1], Matthias Kasper[2], Spasoje Miric[1] (1. Vienna University of Technology (Austria), 2. Infineon (Austria))

[O2-2-03]
Triangular Current Mode Control for High-Frequency Inverter Operation without Bottom-Current Detection
*Yuki Mashita[1], Rintaro Kusui[1], Takumi Iwamoto[1], Kodai NIshikawa[1], Hiroki Watanabe[1], Jun-ichi Itoh[1] (1. Nagaoka University of Technology (Japan))

[O2-2-04]
Multidimensional Capacitance Characterization of Monolithic Bidirectional GaN HEMTs using Four-Port S-Parameter Measurements
*Magnus Haitz[1,2], Cristino Salcines[1], Mathias C. J. Weiser[2], Aline Reck[2], Ingmar Kallfass[2] (1. Robert Bosch GmbH (Germany), 2. University of Stuttgart (Germany))

[O2-2-05]
Multidimensional Capacitance Model for Monolithic Bidirectional GaN HEMTs
*Magnus Haitz[1,2], Cristino Salcines[1], Ingmar Kallfass[2] (1. Robert Bosch GmbH (Germany), 2. University of Stuttgart (Germany))

Technical Sessions: Oral Sessions 2

Room 101C (1F)

[Oral] Semiconductor Power Conversion » Emerging technologies in Packaging, thermal management, system integration and Reliability (Advanced fault protection systems, Diagnostics)

[O2-3] Thermal Management for Semiconductor Devices 1
Chairs: Frede Blaabjerg (Aalborg University)
Shuhei Fukunaga (The University of Osaka)

[O2-3-01]
Advanced Thermal Management Solutions for WBG-based Integrated Modular Motor-Drives
*Alberto Castellazzi[1], Imad Mohamed Ameer[1] (1. Kyoto University of Advanced Science (Japan))

[O2-3-02]
Cooling System Design Tool for Converter Thermal Analysis and Junction Temperature Estimation
*Tian Luo[1], Haiyan Ma[1], Weichi Zhang[1], Yunni Li[2], Wiktoria Rubak[3], Pablo Arevalo-Aguilar[4] (1. Hitachi Energy China Ltd (China), 2. Hitachi Energy Ltd. (Switzerland), 3. Hitachi Energy Poland Sp. z o.o. (Poland), 4. Hitachi Energy Spain s.a.u (Spain))

[O2-3-03]
Compact Two-Phase Dielectric Fluid Cooling System for Power-Dense PCBs
*Lars van Eeuwijk[1], Jasper Kadijk[1], Remco Bonten[1], Jan Schellekens[1], Bas Vermulst[1] (1. Eindhoven University of Technology (Netherlands))

[O2-3-04]
Thermal and Mechanical Characterization of One-Component, Non-Curing Gap Fillers for Top-Side Cooled MOSFETs
*Joel Schön[1], Zerdest Pervane[1], Jörg Franke[1], Patrick Bründl[1] (1. Institute for Factory Automation and Production Systems, Universität Erlangen-Nürnberg (Germany))

[O2-3-05]
POD-CGaNet for Fast PCB Thermal Prediction and Heatsink Design
*Jiaze Kong[1], Bangli Du[1], Xiaobing Shen[1], Yu Zuo[1], Wilmar Martinez[1] (1. KU Leuven - Energyville (Belgium))

Technical Sessions: Oral Sessions 2

Room 102 (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O2-4] Dual- and Multi-Active-Bridge Converters
Chairs: Bashir Bakhshideh Zad (University of Mons)
Ryo Haneda (Keio University)

[O2-4-01]
A Simplified Variable-Frequency plus DPS Control for Minimized Current Stress of DAB Converter Within the Whole Operating Range
*Mulinsen Zhang[1], Linxiao Gong[1], Weidong Qie[1], Lingfeng Jiang[1], Yong Wang[1] (1. Shanghai Jiao Tong University (China))

[O2-4-02]
Voltage-Gain-Based Control of Dual-Active-Bridge DC–DC Converters with Fast Dynamic Response and DC-Bias Current Suppression
*gaoxiang chen[1], Ka-Hong Loo[1], chuan sun[2] (1. The Hong Kong Polytechnic University (Hong Kong), 2. Macau University of Science and Technology (Macau))

[O2-4-03]
Analytical closed form solution of minimum ZVS currents in a DC-DC Dual Active Bridge Converter
*PROSEN DEY[1], Kaushik Basu[1] (1. Indian Institute of Science Bangalore (India))

[O2-4-04]
Analytical Quantification of the Soft Switching Boundaries for Triple Active Bridge Converters
*Samuel Ghobrial[1], Carlos Teixeira[1], Brendan McGrath[1], Richardt Wilkinson[1] (1. School of Engineering, RMIT University (Australia))

[O2-4-05]
Control Strategy for MVDC to LVDC Modular Quadruple-Active-Bridge Converter Station
*Hyunggun Jung[1], Sungmin Kim[1] (1. Hanyang University ERICA Campus (Korea))

Room 103 (1F)

[Oral] Semiconductor Power Conversion » New generation Power device, Passive components and materials

[O2-5] Wide-Bandgap Power Devices Gate Driving and Reliability
Chairs: Morten Rahr Nielsen (Aalborg University)
Takashi Sawada (Nagoya University)

[O2-5-01]
Short-circuit Protections of Parallel-Connected SiC MOSFET Modules Based on Electro-thermal Design with Internal Capacitance
*Makiko Hirano[1], Kazuya Kodani[1], Akihisa Matsushita[1] (1. Toshiba Corporation (Japan))

[O2-5-02]
Implementation of Gate Oscillation Suppression Method that Does Not Deteriorate Switching Characteristics
*Ryoga Kiguchi1, Hiromu Takubo1, Masakazu Gekinozu[1] (1. Fuji Electric Co., Ltd. (Japan))

[O2-5-03]
Trade-off Design on Gate-Circuit for Paralleled 2.3kV SiC MOSFET Power Modules
*Narendra Shankar Walawalkar[1], Nianzun Qi[1], Morten Rahr Nielsen[1], Stig Munk-Nielsen[1] (1. Aalborg University (Denmark))

[O2-5-04]
Evaluating Bidirectional GaN HEMT, SiC MOSFET, and Si IGBT for ARCP Inverter Auxiliary Circuits
*Thomas Lehmeier[1], Yan Zhou[1], Adrian Amler[1], Ajay Poonjal Pai[2], Martin März[1] (1. Institute of Power Electronics, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany), 2. Sanan Semiconductor (Germany))

[O2-5-05]
Potential of a Darlington Configuration using Si-SJBJT and Si-SJMOSFET as a Power-switching Device
*Koji Yano[1], Daiki Mitsui[1] (1. University of Yamanashi (Japan))

Technical Sessions: Oral Sessions 2

Room 107 (1F)

[Oral] Semiconductor Power Conversion » Latest solution for EMI and EMC

[O2-6] EMI Analysis and Reduction Techniques for Power Converters
Chairs: Marcelo Lobo Heldwein (Technical University of Munich)
Katsuya Nomura (Kwansei Gakuin University)

[O2-6-01]
Common-mode Noise Reduction through the Combination of Passive Common-noise Cancellers with Various Turn Ratios
*Koji Mitsui[1], Koki Notake[1] (1. IHI Corporation (Japan))

[O2-6-02]
Aggregated EMI modeling for single-phase PFC multi-converter system
*Shuting Li[1], Dinesh Kumar[2], Pooya Davari[1] (1. Aalborg Univ. (Denmark), 2. Danfoss Drives A/S (Denmark))

[O2-6-03]
Steering Electromagnetic Interference Spectrum to Reduce EMI Filters in Power Converters
Le Yang[1], *SHUO WANG[1] (1. University of Florida (USA))

[O2-6-04]
Automated Near-Field EMI Scanning System Using Robotic Arm for Wide-Bandgap-Based Power Converters
Yuyang Wang[1], Haodong Yang[1], Qiang Wu[1], Weiping Fu[1], Xiaoqing Song[1], *Alan H. Mantooth[1] (1. University of Arkansas (USA))

[O2-6-05]
Comparison of Machine Learning Techniques for Analysing Wide Bandgap Switching Behavior and EMI in Half-Bridge Structures
Thrisha Rajkumar[1], Mark Ford[1], *Ian Laird[1], Saeed Jahdi[1] (1. University of Bristol (UK))

Room 108 (1F)

[Oral] Semiconductor Power Conversion

[O2-7] Reliability of Passive Components and Power Semiconductor Devices
Chairs: Kazunori Hasegawa (Kyushu Institute of Technology)

[O2-7-01] Invited Paper
Application-oriented capacitor testing method with realistic electro-thermal stress emulation
*Bo Yao[1], Zhaoxin Wang[1], Xing Wei[1], Yichi Zhang[1], Lei Qi[2], Huai Wang[1] (1. Aalborg university (Denmark), 2. North China Electric Power University (China))

[O2-7-02] Invited Paper
Impedance monitoring method of a DC-link capacitor in a V2X EV charger with three bidirectional converters
*Tomoyuki Nagano[1,2], Kazunori Hasegawa[2], Shigeki Yamate[1], Atsushi Tokii[1] (1. GS Yuasa International Ltd. (Japan), 2. Kyushu Institute of Technology (Japan))

[O2-7-03] Invited Paper
EMC: a Limiting Factor of WBG Power Electronics Development ?
*Jean-Luc Schanen[1], Genevieve Frantz[1] (1. Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab (France))

[O2-7-04] Invited Paper
A Novel Method for Compensating the Parastic Oscillation of Conduction Voltage Drop in IGBT Modules
*Lele Wei[1], Shuangzhe Chen[1], Dangsheng Zhou[2], Sufei Wang[2], Tianhao Wu[2], Ke Ma[1] (1. School of Electrical Engineering, Shanghai Jiao Tong University (China), 2. R&D Center Shenzhen Hopewind Electric Co., Ltd., Shenzhen (China))

Technical Sessions: Oral Sessions 2

Hall 1 (2F)

[Oral] Vehicle Electrification-related Technologies

[O2-8] Technologies for 50,000rpm traction motor of XEV Part II
Chairs: Keiichiro Kondo (Waseda University)

[O2-8-01] Invited Paper
Design of 50,000 rpm motor (IPMSM)
*Ren Tsunata[1], Riku Shinohara1, Masaki Kimura[1], Masatsugu Takemoto[1], Jun Imai[1] (1. Okayama University (Japan))

[O2-8-02] Invited Paper
Experimental Study on High-speed Quasi-coreless SPMSM for Vehicle Drives
Ayaka Sakuma[1], *Takashi Kosaka[1], Shota Yasuo[1], Mio Tamaki[1] (1. Nagoya Institute of Technology (Japan))

[O2-8-03] Invited Paper
Basic Study on Iron Loss Estimation Technique for Non-oriented Electrical Steel Sheets under High-Frequency Excitation including Harmonics
*Daisuke Miyagi[1], Mayu Fukuoka[1], Yuta Saito[1], Hiroyasu Kobayashi[1] (1. Chiba University (Japan))

[O2-8-04] Invited Paper
Improvement of PMSM loss estimation accuracy focusing on over 50,000 rpm
*Kan Akatsu[1], Atsuya Sano[1] (1. Yokohama National University (Japan))

Hall 2 (2F)

[Oral] Industrial Instrumentation and Control

[O2-9] Ultra-high-speed Control System Based on USPM Controller
Chairs: Naoki Motoi (Kobe University)
Masato Koyama (Mie University)

[O2-9-01] Invited Paper
Development of an FPGA-Based Drone Controller Equipped with a 50 MHz ADC
*Daisuke Hiroe[1], Takumi Hamauzu[1], Yuki Ueda[1], Yu Kasakawa[1], Tetsuya Fukushima[1], Hinata Nishimura[1], Tomoki Yokoyama[1] (1. Tokyo Denki University (Japan))

[O2-9-02] Invited Paper
Improvement of PMSM Online Identification and Position-Sensorless Drive Using High-Frequency Injection by USPM's 1MHz Sampling
*Masato Koyama[1], Yuki Takahashi[1], Mikito Satake[1], Naomichi Ogawa[1] (1. Mie University (Japan))

[O2-9-03] Invited Paper
High-Speed Force Control Using 10-MHz Multi-Sampling Deadbeat Control and 10-MHz Disturbance Observer
*Koki Kodama[1], Daisuke Hiroe[2], Tomoyuki Shimono[1], Hidemine Obara[1], Tomoki Yokoyama[2] (1. Yokohama National Univ. (Japan), 2. Tokyo Denki Univ. (Japan))

[O2-9-04] Invited Paper
10MHz Multisampling Deadbeat Position Control of Piezoelectric Actuator
*Shohei Arikawa[1], Tomoki Yokoyama[2], Naoki Motoi[1] (1. Kobe University (Japan), 2. Tokyo Denki University (Japan))

[O2-9-05] Invited Paper
Experimental Verification of Velocity Control for a PMLSM Drive System Using 10 MHz Multi-Layer Multi-Sampling Deadbeat Control
Takuma Yabuki[1], Daisuke Hiroe[1], Takumi Hamauzu[1], Tomoyuki Shimono[2], Atsuo Kawamura[2], *Tomoki Yokoyama[1] (1. Tokyo Denki University (Japan), 2. Yokohama National University (Japan))

Technical Sessions: Oral Sessions 2

Online Session (Online)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O2-10] Semiconductor Power Conversion
Chairs: Sihoon Choi (Nagoya University)
Pengfeng LIN (Shanghai Jiao Tong University)

[O2-10-01]
A constant current/voltage charging system for EV wireless power transfer with zero phase angle input
*zijian tang[1], miaomiao cheng[1] (1. Hunan University (China))

[O2-10-02]
A Talkative Power Conversion Scheme with Peak Current Control for 1-MHz SEPIC Converter
*Yiwen Liu[1], Wanying Weng[1], Keming Liu[1], Guoao Li[1], Jiande Wu[1], Xiangning He[1] (1. Zhejiang University (China))

[O2-10-03]
A Reconfigurable Multi-Topology Inverter Platform with Per-Unit Mapping for Power Electronics Education
*Yuying Zheng[1], Zefan Rong[1], Xin Xiang[1], Heya Yang[1], Wuhua Li[1] (1. Zhejiang University (China))

[O2-10-04]
A Coupled Electrochemical-Hydraulic Model for Loss Analysis in Vanadium Redox Flow Battery
*Runtian Li[1], Yue Wang[1], Tianyi Zhang[1], Mengyang Du[1], Gan Liang[1], Yonghui Liu[1] (1. School of Electrical Engineering, Xi'an Jiaotong University (China))

[O1-5-02]
Voltage Vector Decomposition-Based Power Decoupling Strategy for Grid-Connected Dual-Output Converter Under Unbalanced Grid Faults
*Kai Liao[1], Dehong Zhou[1], Yu Zeng[1], Xin Liu[1], Zewei Shen[1], Jianxiao Zou[1] (1. University of Electronic Science and Technology of China (China))

Technical Sessions: Oral Sessions 3

Monday, June 1 16:30 – 18:10

Room 101A (1F)

[Oral] Vehicle Electrification-related Technologies

[O3-1] Battery Diagnosis and Estimation
Chairs: Xing Wei (Aalborg University)
Yuki Okuda

[O3-1-01]
Fault Detection and Diagnosis Within Battery Systems Using Autoencoders and Explainable AI
*Michael Theiler[1], Can Karaali[1], Christian Endisch[1] (1. Technische Hochschule Ingolstadt, Institute of Innovative Mobility (IIMo), Research team Electromobility and Learning Systems (Germany))

[O3-1-02]
Robust State-of-Health Estimation for Lithium-Ion Batteries Using Impedance-Optimized Parameters and an Ensemble Learning Approach
*Yura Kim[1], Jaehyeong Lee[1], Dongcheol Lee[1], Woonki Na[2], Jonghoon Kim[1] (1. Chungnam National University, Department of Electrical Engineering (Korea), 2. California State University Fresno, Department of Electrical Engineering (USA))

[O3-1-03]
Dynamic EIS for Battery Temperature Estimation under Real-time Operating Conditions
*Jaea Lee[1], Miyoung Lee[1], Yura Kim[1], Jiwoong Kim[1], Woonki Na[2], Jonghoon Kim[1] (1. Chungnam National University (Korea), 2. California State University (USA))

[O3-1-04]
BMIC-Based Electrochemical Impedance Spectroscopy Calibration Method for Battery Modules with Parasitic Element Compensation
*Miyoung Lee[1], Yura Kim[1], Jaea Lee[1], Jiwoong Kim[1], Woonki Na[2], Jonghoon Kim[1] (1. Chungnam National University (Korea), 2. California state university (USA))

[O3-1-05]
Explainable XGBoost-SHAP-Based Classification of Battery Degradation Environments Using Multi Features
*Garam Yang[1], Jonghoon Kim[1], Woonki Na[2] (1. Chungnam National University, Department of Electrical Engineering (Korea), 2. California State University, Department of Electrical Engineering (USA))

Technical Sessions: Oral Sessions 3

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Sophisticated Modulation, control and analysis

[O3-2] High-Efficiency Soft-Switching and Loss Optimization
Chairs: Tomokazu Mishima (Yamaguchi University)

[O3-2-01]
ZVS Modulation Using DCM for Four-Quadrant Operation of Full-Bridge Grid-Tied Inverters
*Cheng Huang[1], Sota Sasaki[1], Takanori Isobe[1] (1. University of Tsukuba (Japan))

[O3-2-02]
Duty Cycle Calculations for Soft-Switched GaN-based Current Source Converters
*Gean Sousa[1], Christos Leontaris[1], Marcelo Lobo Heldwein[1] (1. Technical University of Munich (Germany))

[O3-2-03]
RMS Current Reduction Method in DAB Matrix Converters Using Variable-Carrier-Frequency PWM
*Yu Hashizume[1], Shunsuke Takuma[1], Satoshi Miyawaki[1], Yoshiya Ohnuma[1] (1. Nagaoka Power Electronics Co., Ltd. (Japan))

[O3-2-04]
Analysis and Optimal Selection of Modulation Methods for CHB Inverters Based on Harmonic and Efficiency Performance
*Duho Eum[1], Min-Sol Kim[1], Youngjong Ko[1] (1. Pukyong National University (Korea))

[O3-2-05]
Enhanced Single Pulse Width Modulation for Achieving Wide-Range ZVS and High Efficiency in Multi-Active-Bridge Converters
*Seul Lee[1], Byengjoo Byen[2], Eun S. Lee[1] (1. Hanyang University (Korea), 2. LG Energy Solution (Korea))

Room 101C (1F)

[Oral] Semiconductor Power Conversion » Emerging technologies in Packaging, thermal management, system integration and Reliability (Advanced fault protection systems, Diagnostics)

[O3-3] Reliability and Lifetime Assessment of Semiconductor Devices
Chairs: Homer Alan Mantooth (University of Arkansas)
Kazunori Hasegawa (Kyushu Institute of Technology)

[O3-3-01]
Predicting the switching lifetime of GaN HEMTs in LLC converters and Totem-Pole PFCs
*Hiroshi Yamashita[1], Hirokazu Oki[1], Toshiyuki Zaitsu[1] (1. ROHM Co., Ltd. (Japan))

[O3-3-02]
Lifetime Predictive Model of SiC MOSFETs using Neural Network for Condition Monitoring Application
*KIATTISAK TONGON[1], Surin Khomfoi[1] (1. King Mongkut's Institute of Technology Ladkrabang (Thailand))

[O3-3-03]
Outlier Screening of Predicted Cycle Life for Lifetime Modeling in Power Cycling Tests of Power Semiconductor Devices
*Yichi Zhang[1], Yi Zhang[2], Bo Yao[1], Jiahong Liu[1], Frede Blaabjerg[1], Huai Wang[1] (1. Aalborg University (Denmark), 2. Hong Kong Polytechnic University (Hong Kong))

[O3-3-04]
Comparative Life-Cycle Environmental Impact Analysis of L and LCL Filter Topologies for Three-Phase Inverters
Ning Wang[1], Chaochao Song[1], Fabio Sporchia[1], Massimo Pizzol[1], *Ariya Sangwongwanich[1] (1. Aalborg University (Denmark))

[O3-3-05]
Components Degradation and Failure Interdependence in Power Electronics Converters
*Jinwoo Song[1], Claudia Fecarotti[1], Antonis Stathatos[1], Chengmin Li[1], Georgios Papafotiou[1] (1. Eindhoven University of Technology (Netherlands))

Technical Sessions: Oral Sessions 3

Room 102 (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O3-4] Converter-Based Power System Applications
Chairs: Michael Hartmann (TU Graz, Austria)
Yushi Koyama (Toshiba Corporation)

[O3-4-01]
Active Source-Decoupling Strategy Using Virtual DC Machine for UPS Applications with Hybrid Energy Storage
*DongHwan Lee[1], JaeJung Jung[1] (1. School of Electronic and Electrical Engineering, Kyungpook Nation Univ. (Korea))

[O3-4-02]
Novel Unified Power Flow Controller (UPFC)
based on Active Coupled-Inductor π-Network
*Amirhossein Malekipour[1], Michael M.C. Merlin[1], Bortecene Yildirim[2], Mohamed Dahidah[2] (1. The University of Edinburgh (UK), 2. Newcastle University (UK))

[O3-4-04]
Line Current Interruption Using a Full-Bridge Series Compensator in Loop Distribution Systems
*Takasumi Hiratsuka[1], Tomoyuki Mannen[1] (1. Utsunomiya University (Japan))

[O3-4-03]
A Wideband Harmonic Compensation Method for Distributed Converters
*Lucas Savoi Araujo[1], Daniel dos Santos Mota[1], Giuseppe Guidi[1] (1. SINTEF Energy Research (Norway))

[O3-4-05]
A Fast and Adaptive Fisher Discriminant Analysis
Framework for Robust Fault Detection in HVDC Transmission Lines
Mohamed Mostafa Ahmed[1], Faizan Mustafa[2], Mohamed Abdel-fattah[1], Muhammad Khalid[3,4], Ijaz Ahmed[3], *Hasnain Ahmad[3], A. M. Hamada[5] (1. Faculty of Technology and Education, Helwan university (Egypt), 2. Pakistan Institute of Engineering and Applied Sciences (Pakistan), 3. Interdisciplinary Research Center for Sustainable Energy Systems (IRC-SES), King Fahd University of Petroleum and Minerals (Saudi Arabia), 4. Electrical Engineering Department, (KFUPM) (Saudi Arabia), 5. Faculty of Industrial and Energy Technology, Borg Al Arab Technological University (Egypt))

Room 103 (1F)

[Oral] Semiconductor Power Conversion
» New generation Power device, Passive components and materials

[O3-5] Application Circuits of New Generation Power Devices
Chairs: Wai Keung Mo (The University of Southern Denmark)
Ryohei Okada (Takusyoku Univeristy)

[O3-5-01]
5 kW 2.79 MHz four-cells series connected Class-E push-pull using GaN HEMT and scaling power to 60 kW for Float Zone Silicon Production
*Faheem Ahmad[1], Hassan Mujtaba[1], Stefan Liccardi[1], Jannick Kjaer Jorgensen[1], Benoit Biddogia[2], Stig Munk-Nielsen[1] (1. Aalborg University (Denmark), 2. Topsil Globalwafers A/S (Denmark))

[O3-5-02]
Voltage Balancing of Dual-Output IPOS LLC Resonant Converter Using an Integrated Transformer
Seunghoon Lee[1], *Youngwoo Jo[2], Jaeseong Lim[2], Honnyong Cha[2] (1. Hyosung Corporation (Korea), 2. Kyungpook National University (Korea))

[O3-5-03]
Analysis and Design of an Integrated-Transformer TriMagiC ConverterTM for 48 V-to-1 V PoL Applications
*Ryota Nozaki[1], Itsuki Masuda[1], Sihoon Choi[2], Yu Yonezawa[2], Jun Imaoka[2], Masayoshi Yamamoto[2], Mitsunao Fujimoto[3], Katsuya Kameda[3] (1. Department of Electrical Engineering, Nagoya University (Japan), 2. Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University (Japan), 3. Research and Development dept, Diamet Corporation (Japan))

[O3-5-04]
Estimation of Switching Losses at Zero-Voltage Switching Considering the AC Winding Resistance of an Extremely Highly Efficient 850-V 100-kW 16-kHz Dual-Active-Bridge Converter
*Ryo Haneda[1], Masahiro Isoda[1], Hirofumi Akagi[2], Takahiro Nozaki[1] (1. Keio University (Japan), 2. Institute of Science Tokyo (Japan))

[O3-5-05]
An Active Technique for Turn-On Current Overshoot Suppression in GaN HEMT Half-Bridges
Manish Mandal[1], Harish S[1], *Kaushik Basu[1] (1. Indian Institute of Science Bengaluru (India))

Technical Sessions: Oral Sessions 3

Room 107 (1F)

[Oral] Rotating Electrical Machine » Permanent Magnet Machines

[O3-6] Permanent Magnet Machines
Chairs: David Gerada (University of Nottingham, UK)
Junji Kitao (Mitsubishi Electric Corporation)

[O3-6-01]
Effect of Magnetic Path Width on Torque and Power Density of a Distributed Winding SPMSM
*Mahiro Yoshimatsu[1], Masayuki Sanada[1], Yukinori Inoue[1] (1. Osaka Metropolitan University (Japan))

[O3-6-02]
Design of a Novel Multi-unit Hetero-topology Compound Stator Permanent Magnet Machine for Wide-Speed-Range High-Efficiency Drive
Zaixin Song[1], Yongtao Liang[1], *Yuan Gao[1], Zhijian Zhang[1] (1. The Hong Kong Polytechnic University (Hong Kong))

[O3-6-03]
Robust Design and Optimization of PM Servo Machine Considering Manufacturing Tolerances
*Cheng Peng[1,2], Dawei Li[1,2], yu zhao[1,2], Ronghai Qu[1,2] (1. State Key Laboratory of High-Density Electric Energy Conversion (China), 2. School of Electrical and Electronic Engineering Huazhong University of Science and technology (China))

[O3-6-04]
Effect of Parallel Conductor Arrangement on Circulating Current Loss in Permanent Magnet Synchronous Motors with Different Capacities
*Sota Hoshiyasu[1], Takayuki Komine[2], Yasuhito Takahashi[1], Koji Fujiwara[1] (1. Doshisha Univ. (Japan), 2. Toyo Denki Seizo K.K. (Japan))

[O3-6-05]
Study of Bridge Shape for Iron Loss Reduction in Variable Flux-Linkage IPMSM with Bridges in Stator Slots
*Takuto Yabu[1], Masayuki Sanada[1], Yukinori Inoue[1] (1. Osaka Metropolitan University (Japan))

Room 108 (1F)

[Oral] Semiconductor Power Conversion

[O3-7] Recent trends and applications of multilevel power conversion technologies
Chairs: Makoto Hagiwara (Hokkaido University)

[O3-7-01] Invited Paper
Design of Modular Multilevel Converters Incorporating Internal Energy-Based Virtual Inertia Control for HVDC Transmission
*Kenichiro Sano[1], Masatoshi Ito[1], Mitsuyoshi Enomoto[1] (1. Institute of Science Tokyo (Japan))

[O3-7-02] Invited Paper
A New Heatsink-Less MMCC-based Active Power Filter for Air Conditioners
*Yohei Kubota[1], Motoki Nishio[1], Natsumi Obinata[1], Keiichi Kato[1], Keiichi Ishida[1], Shinya Shimizu[1], Takuro Arai[2] (1. Carrier Japan Corporation (Japan), 2. Toshiba Corporation (Japan))

[O3-7-03] Invited Paper
Impact of Negative-Sequence Current Injection on Converter Design of Modular Multilevel Converters
*Takuya Kajiyama[1], Kaho Nada[1], Toshiyuki Fujii[1] (1. Mitsubishi Electric Corporation (Japan))

[O3-7-04] Invited Paper
Design and Evaluation of a Control Scheme for the Single-Phase Solid-State Transformer
*Yi-Hua Pan[1], Yu-Chen Su[1], Hong-Quan Nguyen[2], Ming-Hung Yu[2] (1. National Tsing Hua University (Taiwan), 2. Industrial Technology Research Institute (Taiwan))

[O3-7-05] Invited Paper
Modular Magnetic-Coupled Converter (MMCC) Based Power Electronic Transformer with Mixed Voltage-Levels Switches for System Volume Reduction
*Zhan Wang[1], Sixing Du[1], jinjun Liu[1] (1. School of Electrical Engineering, Xi 'an Jiaotong University (China))

Technical Sessions: Oral Sessions 3

Hall 1 (2F)

[Oral] Education in Electrical Engineering

[O3-8] Engineering Education for Power Electronics, Motion Control, and Related Technologies
Chairs: Masataka Minami (Kindai University)

[O3-8-01] Invited Paper
Undergraduate Research from Energy Storage to Intelligent Systems
*Jimin Oh[1] (1. Kyungpook National University, Korea, Republic of (Korea))

[O3-8-02] Invited Paper
Initiatives to Develop Human Resources in the Field of Electrical Engineering
*Hideo Ishii[1] (1. Waseda University (Japan))

[O3-8-03] Invited Paper
Modernizing Electrical Engineering Education with Simulation-Based Learning
*Jiro Doke[1] (1. MathWorks (Japan))

[O3-8-04] Invited Paper
Introduction to power electronics engineer education at the Japan Power Electronics Association
Kei Kitani[1], Kenichi Hiramoto[1], *Toshihisa Shimizu[2] (1. Japan Power Electronics Association (Japan), 2. Tokyo Metropolitan University (Japan))

[O3-8-05] Invited Paper
Overview of Yokohama Power Electronics College for Recurrent and Reskilling Education
*Atsuo Kawamura[1], Hidemine Obara[1], Masataka Shiraki[2] (1. Yokohama National University (Japan), 2. Yokohama Universities Venture Club (Japan))

Hall 2 (2F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O3-9] AC-DC and DC-AC Converters
Chairs: Jong-Won Shin (Seoul National University)
Kazuto Takagi (GS Yuasa International Ltd.)

[O3-9-04]
Voltage control of a three-phase boost integrated inverter using an unfolding strategy for rectifier loads
*So Watanabe[1], Tomoyuki Mannen[1] (1. Utsunomiya University (Japan))

[O3-9-01]
EMI Analysis and Comparison: Interleaved Totem-Pole Based Single-Stage and Two-Stage Topology
*Thong Van Minh Ta[1], Ba Phu Do[1], Ngoc Quy Do[1], Minji Kim[1], Sewan Choi[1] (1. Seoul National University of Technology and Science (Korea))

[O3-9-02]
An Enhanced Input Impedance Control Strategy with Third Harmonic Injection for Interleaved Vienna Rectifier
*Jizhe Wang[1], Shuai Yang, Tadashi Suetsugu[2], Fujio Kurokawa[3] (1. Oita University (Japan), 2. Fukuoka University (Japan), 3. Nagasaki Institute of Applied Science (Japan))

[O3-9-03]
Expanding an Output Voltage Range of a Matrix DAB AC-DC Converter with Power Decoupling Operation
*Makoto Ishii[1], Shohei Komeda[1], Shunsuke Takuma[2], Yoshiya Ohnuma[2] (1. Tokyo University of Marine Science and Technology (Japan), 2. Nagaoka Power Electronics Co., Ltd., (Japan))

[O3-9-05]
Overvoltage Mitigation with Integrated Minimum-Loss Discontinuous PWM in SiC Inverter Systems
*Ji-Soo Park[1], Kyo-Beum Lee[1], Bong-ki Lee[2] (1. Ajou University (Korea), 2. LS Electric (Korea))

Technical Sessions: Oral Sessions 3

Hall 3 & 4 (2F)

[Oral] Semiconductor Power Conversion

[O3-10] Recent Digital Active Gate Drive Technologies
Chairs: Hidemine Obara (Yokohama National University)

[O3-10-01] Invited Paper
A New Active Gate-Drive Circuit and Control Signal Generation Method for a One-Pulse Active Gate Control
*Daiki Yamaguchi[1], Shinji Sato[1], Fumiki Kato[1] (1. National Institute of Advanced Industrial Science and Technology (Japan))

[O3-10-02] Invited Paper
A Development of a 4-bit Logic Active Gate Driver to Improve the Performance of Three-Phase Inverters
Thanh-Hoa Nguyen-Thi[1,3], Long Van Pham[1], *Chi-Hieu Pham[1], Trong-Minh Tran[1], Obara Hidemine[2] (1. Hanoi University of Science and Technology (Viet Nam), 2. Yokohama National University (Japan), 3. Hung Vuong University (Viet Nam))

[O3-10-03] Invited Paper
A Real-Time Feedback Control of Surge Voltage in a Three-Phase Inverter by Digital Active Gate Drive
*Hidemine Obara[1], Katsuhiro Hata[2] (1. Yokohama National University (Japan), 2. Shibaura Institute of Technology (Japan))

[O3-10-04] Invited Paper
Feedback Control of Conducted EMI in a Three-Phase Inverter Using Digitally Controlled Gate Drive
Shimon Shigetomi[1], *Katsuhiro Hata[1], Hidemine Obara[2] (1. Shibaura Institute of Technology (Japan), 2. Yokohama National University (Japan))

[O3-10-05] Invited Paper
Turn-ON Peak Current Suppression of SiC-MOSFETs Under Variable Switching Current Utilizing Gate Resistor Array
*Tomoyuki Mannen[1] (1. Utsunomiya University (Japan))

Online Session (Online)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O3-11] Semiconductor Power Conversion
Chairs: Kenji Natori (Chiba University)
Xiaoling Xiong (North China Electric Power University)

[O3-11-01]
A Novel Hybrid Capacitive-Inductive Isolated DC Solid State Transformer for MVDC Power Distribution System
*Borui Wang[1], Jingyuan Wang[1], Yuying He[2], Jingxin Hu[1] (1. Nanjing University of Aeronautics and Astronautics (China), 2. Hohai University (China))

[O3-11-02]
Calculaiton of Port Short-circuit Fault Current for T-type Non-isolated Converter in HVDC Grids
*Xingran Peng[1], Yingzhou Peng[1], Qinghua Chen[1], Jiaye Yan[1], Xiaoliang Yu[1], Zhikang Shuai[1] (1. College of Electrical and Information Engineering, Hunan University (China))

[O3-11-03]
Enhanced Damping for Coordinated Operation of Multiple Photovoltaic-Battery Grid-Forming Systems
*Kai Yin[1], Zhe Zhang[2], Yongheng Yang[1] (1. College of Electrical Engineering, Zhejiang University, Hangzhou, China (China), 2. Monolithic Power Systems, Inc., Hangzhou, Zhejiang, China (China))

[O3-11-04]
Improved Equivalent Circuit Model-Based Grid Support Capacity Estimation for Lithium-ion Battery Energy Storage Systems
Shaoxin Shi[1], *Qiao Peng[1], Jinhao Meng[2] (1. Sichuan University (China), 2. Xi'an Jiaotong University (China))

[O3-11-05]
Optimal Inter-Phase SOC Balancing Control Strategy Based on Output Current Synthesis in Cascaded Battery Energy Storage Systems
*Yuqi Shen[1], Chunzhen Liu[1], Tong Liu[1], Alian Chen[1] (1. Shandong University (China))

Technical Sessions: Oral Sessions 4

Tuesday, June 2 10:45 – 12:05

Room 101A (1F)

[Oral] Motor Drive and Control

[O4-1] Control Theory for Motor Drives 2
Chairs: Akio Toba (Fuji Electric Co., Ltd.)
Shih-Gang Chen (National Taipei University of Technology)

[O4-1-01]
Employing the Magnetic Coenergy for Precise Torque Ripple Calculation from Flux Linkages
*Stephan Goehner[1], Johannes Stoss[1], Aaron Griessbaum[1], Marc Hiller[1], Andreas Liske[1] (1. Karlsruhe Institute of Technology (Germany))

[O4-1-02]
A Radial Force Mode Control for Resonance Vibration Suppression in IPMSM Using Multi-phase Motor
*Yoshinari Tsuji[1], Shojiro Fujita[1], Kan Akatsu[1] (1. Yokohama National University (Japan))

[O4-1-03]
Auto-Tuning Algorithm of PI Gains for Current and Speed Controllers of PMSM Drives
*Yunchan Bae[1], Belete Belayneh Negesse[2], Jang-Mok Kim[1] (1. Pusan National University (Korea), 2. Hyowon Power Tech (Korea))

[O4-1-04]
The Role of Filters in Sensorless Vector Control Systems for Induction Motors Using Rotor-Flux-Induced Voltage Method
*Ayumi Obitsu[1], Keiichiro Kondo[1], Shunsuke Tobayashi[2] (1. Waseda University (Japan), 2. TMEIC (Japan))

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Sophisticated Modulation, control and analysis

[O4-2] Grid-Tied Systems and Stability Control for Decentralized Power
Chairs: Pooya Davari (Aalborg University)
Toshiji Kato (Doshisha University)

[O4-2-01]
Precise Virtual Admittance Synthesis for Enhanced Grid-Forming Performance
Ruzica Cvetanovic[1], Paolo Sbabo[4], *Lazar Stojanović[2], Paolo Mattavelli[2], Massimo Bongiorno[3] (1. Innovation Center of the School of Electrical Engineering in Belgrade, University of Belgrade (Serbia), 2. Department of Management and Engineering, University of Padua (Italy), 3. Department of Electrical Engineering, Chalmers University of Technology (Sweden), 4. Department of Information Engineering, University of Padua (Italy))

[O4-2-02]
Experimental Validation of Inertial Response Speed Equivalence Between Grid-Following and Grid-Forming Inverters
*Ryoki Shimizu[1], Kenichiro Sano[1] (1. Institute Science Tokyo (Japan))

[O4-2-03]
Impedance-Based Characterization and Experimental Stability Analysis of Grid-Forming Converters with Virtual Admittance Control
*Dominik Schulz[1], Lucas Ehrlich[1], Rüdiger Schwendemann[1], Andreas Liske[1], Marc Hiller[1] (1. Institute of Electrical Engineering (ETI), Karlsruhe Institute of Technology (KIT) (Germany))

[O4-2-04]
The Impact of Voltage Feedforward Strategies on Voltage-Source Characteristics and Stability of Grid-Forming Converters
*Yongzihao Dai[1], Chao Wu[1], Xiaoling Xiong[2], Yong Wang[1] (1. Shanghai Jiao Tong University (China), 2. North China Electric Power University (China))

Technical Sessions: Oral Sessions 4

Room 101C (1F)

[Oral] Semiconductor Power Conversion » Emerging technologies in Packaging, thermal management, system integration and Reliability (Advanced fault protection systems, Diagnostics)

[O4-3] Thermal Management for Semiconductor Devices 2
Chairs: Alberto Castellazzi (Kyoto University of Advanced Science)
Paul Sochor (Infineon Technologies)

[O4-3-01]
Fabrication-Friendly 3D Structural Design of a High-Power-Density Three-Phase Inverter for Liquid Immersion Cooling
*Norihiro Izu[1], Daiki Satou[1] (1. Tokyo Denki University (Japan))

[O4-3-02]
Shunt Resistor-Integrated Power Module with Slit Design for Reduced Temperature Coefficient of Resistance
*Sihoon Choi[1], Thiyu Sansika Warnakulasooriya[1], Jun Imaoka[1], Masayoshi Yamamoto[1], Keishi Nakamura[2], Koji Shigesawa[2] (1. Nagoya University (Japan), 2. KOA Co., Ltd. (Japan))

[O4-3-03]
Design and Prototyping of A 3.3 kV Double Side Cooled SiC MOSFET Power Module with Porous Silver Interconnect and Microchannel Cooler
Li Zhang[1], Zachary Zintak[1], Peiyuan Sun[1], Joshua Gardner[1], *Guo-Quan Lu[1] (1. Virginia Tech (USA))

[O4-3-04]
Effect of Temperature-Dependent Saturation Current on Voltage Balancing of Series-Connected SiC MOSFETs during Short-Circuit Events
*Enyao Xiang[1], Chengmin Li[1], Dongsheng Yang[1] (1. Eindhoven University of Technology (Netherlands))

Room 102 (1F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O4-4] Isolated DC-DC Converters
Chairs: Jeehoon Jung (Ulsan National Institute of Science and Technology)
Kodai Nishikawa (Nagaoka University of Technology)

[O4-4-01]
Comprehensive Comparison of the Single-Phase and Three-Phase Unidirectional DC/DC Converters for High-Power Medium-Voltage Applications
*Stefan Subotic[1], Max Dupont[1], Ralph Burkart[2], Thomas Gradinger[2], Drazen Dujic[1] (1. Power Electronics Laboratory, EPFL, Lausanne, Switzerland (Switzerland), 2. Hitachi Energy Research, Baden-Dattwil, Switzerland (Switzerland))

[O4-4-02]
Analysis of Three-Level Full -Bridge ZVZCS DC-DC Converter with Double Phase-Shift PWM
Jirasak Songboonkaew[1], Anuwat Jangwanitlert[1], *Prasopchok Hothongkham[2] (1. King Mongkut's Institute of Technology Ladkrabang ,Bangkok (Thailand), 2. Rajamangala University of Technology Rattanakosin, Nakhon Prathom (Thailand))

[O4-4-03]
800 V : 1 V Direct-to-Chip Single-Stage Isolated DC-DC Converter Architecture
*Aswin Palanisamy[1], Jamil Hassan[1], Ricardo P Aguilera[1], Dylan Lu[1], Dong Dong[2], Yam P Siwakoti[1] (1. University of Technology Sydney (Australia), 2. Virginia Polytechnic Institute and State University (USA))

[O4-4-04]
Implement Inductor less Input for GaN High Step-Up Push-Pull Resonant Converter Based on Boundary Condition Mode
*Peerawat Poomsuwan[1], Anusak Bilsalam[1], Koson Chaicharoenaudomrung[1] (1. King Mongkut’s University of Technology North Bangkok (Thailand))

Technical Sessions: Oral Sessions 4

Room 103 (1F)

[Oral] Semiconductor Power Conversion
» New generation Power device, Passive components and materials

[O4-5] Passive Components and Materials Advanced Modeling
Chairs: Yuhao Zhang (The University of Hong Kong)
Jun Imaoka (Nagoya University)

[O4-5-01]
Supervised Machine Learning for Magnetic Core Loss Modeling with Symbolic Regression
*Wonju Lee[1], Haoran Li[1], Minjie Chen[1] (1. Princeton University (USA))

[O4-5-02]
AI for Magnetics: Extracting Physical Parameters of Power Magnetics from Pre-trained Neural Networks
*Davit Grigoryan[1], Han Cui[2], Minjie Chen[1] (1. Princeton University (USA), 2. University of Tennessee Knoxville (USA))

[O4-5-03]
MagLearn 2: A Short-Window Seq2Seq Framework for Transient Modelling of Power Magnetics under PWM Excitations
Binyu Cui[1], *Jingrong Yang[1], Yuming Huo[1], Lizhong Zhang[1], Alfonso Martinez[2], Song Liu[1], Jun Wang[1] (1. Univ. of Bristol (UK), 2. Wurth Elektronik (Germany))

[O4-5-04]
Duty-Dependent Steinmetz Parameter Fitting for Improved Core Loss Modeling under DC Bias
Yu-Chen Liu[1], *Ya-Chih Hsiao[1], Yun-Shan Hsieh[1] (1. National Taipei University of Technology (Taiwan))

Room 107 (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O4-6] Converter-Based Energy Resources Control and Modeling
Chairs: Daifei Zhang (University of Toronto)
Naomitsu Urasaki (University of the Ryukyus)

[O4-6-01]
Novel AI-Based Input Current Control of Three-Phase PFC Rectifiers
*Patrick Mederitsch[1], Johann Kolar[1], Uwe Drofenik Drofenik[1] (1. TU Wien (Austria))

[O4-6-02]
An HRA Based PSO MPPT Algorithm for Photovoltaic Power Systems
YA-TING Lee[2], Sy Ngo[3], *Min-Hsuan Hung[1], chian-song Chiu[1] (1. Chung-Yuan Christian University (Taiwan), 2. National Taichung University of Science and Technology (Taiwan), 3. Thu Dau Mot University (Viet Nam))

[O4-6-03]
Loss-Compensated Modeling and Multi-Objective Optimization for DCPO in Photovoltaic Systems
Meilin Yang[1], *Guanying Chu[1], Ruihang Li[1], Qinglei Bu[1] (1. Xi'an Jiaotong-Liverpool University (China))

[O4-6-04]
Active Power Disparity Limits of Cascaded H-Bridge Converter-Based Energy Systems Under Inter-Phase Power Imbalances
*Enrique Alejandro Nunes Di Pierri[1], Gaowen Liang[2], Ezequiel Rodriguez Ramos[2], Glen Ghias Farivar[3], Amer Mohammad Yusuf Mohammad Ghias[1], Salvador Ceballos[4], Josep Pou[5] (1. Nanyang Technological University (Singapore), 2. Nanyang Technological University (Singapore), 3. University of Melbourne (Australia), 4. Tecnalia, Basque Research and Technology Alliance (BRTA) (Spain), 5. City University of Hong Kong (Hong Kong))

Technical Sessions: Oral Sessions 4

Room 108 (1F)

[Oral] Industrial Instrumentation and Control

[O4-7] Advanced Control Strategies for Intelligent Mechatronic Systems
Chairs: Shota Yabui (Tokyo City University)
Takenori Atsumi (Chiba Institute of Technology)

[O4-7-01] Invited Paper
Simple Robust Loop-Shaping Method for Multi-Actuator HDD Servo Control
*Takenori Atsumi[1], Shota Yabui[2] (1. Chiba Institute of Technology (Japan), 2. Tokyo City University (Japan))

[O4-7-02] Invited Paper
Accurate Parameter Design Method for P-PI Controller with Feedforward in Motor Positioning Systems
*Yoshiyuki Urakawa[1] (1. Nippon Institute of Technology (Japan))

[O4-7-03] Invited Paper
Real-Time Delay Estimation Using Sequentially Updated Correlation Computation
*Takuto Fujiwara[1], Tomoyuki Shimono[1] (1. Yokohama National University (Japan))

[O4-7-04] Invited Paper
Loop-Shaping Method for Multiple AFCs Based on Time Response to Compensate Periodic Disturbances in HDDs
*Shota Yabui[1], Takumi Kobayashi[1], Takenori Atsumi[2] (1. Tokyo City University (Japan), 2. Chiba institute of technology (Japan))

Hall 1 (2F)

[Oral] Vehicle Electrification-related Technologies

[O4-8] Vehicle Electrification technologies
Chairs: Takashi Kato (Nissan Motor Co.,LTD)

[O4-8-01] Invited Paper
Development of a High Torque Density Motor for Electric Vehicle Using Variable Magnetic Flux Halbach Array Magnets
*Tsuyoshi Goda[1], Yu Kuwahara[1], Hiroaki Kajiura[1], Takuro Nakaoka[1] (1. DENSO CORPORATION (Japan))

[O4-8-02] Invited Paper
Novel Voltage Pulse-Pattern for Loss Reduction with Torque Ripple Mitigation of PMSMs Operated by Voltage Source Inverter
*Toru Matsuura[1], Kensuke Sasaki[1] (1. NISSAN MOTOR CO., LTD. (Japan))

[O4-8-03] Invited Paper
T-Type Three Level Inverter as a Next Milestone of EV Efficiency – a View from System and Semiconductor Perspective
*Dusan Graovac[1], Mark Münzer[1], Waldemar Jakobi[1], Christoph Bauer[1], Bijan Hatam[1], Radovan Vuletic[1], Mathias Weinmann[1], Tatsuya Arai[2], Holger Müller[1] (1. Infineon AG (Germany), 2. Infineon Technologies Japan K.K. (Japan))

[O4-8-04] Invited Paper
Integrated Bi-Directional Chopper with a Single-Cell Auxiliary Converter for Dual-Source Traction Systems
*Ryota Kondo[1], Kenji Fujiwara[1], Yusuke Shirouchi[1], Kikuo Izumi[1], Atsuya Suzuki[2], Takahiro Urakabe[2], Makoto Hagiwara[2] (1. Mitsubishi Electric Corporation (Japan), 2. Institute of Science Tokyo (Japan))

Technical Sessions: Oral Sessions 4

Hall 2 (2F)

[Oral] Rotating Electrical Machine

[O4-9] Motor and Actuator Specialized for Robot
Chairs: NOBORU NIGUCHI

[O4-9-01] Invited Paper
A Novel Axial Strain-Wave Magnetic Gear with High Torque Density and High Reduction Ratio
*Masahiko Sakai[1] (1. Kobe City College of Technology (Japan))

[O4-9-02] Invited Paper
Design and Evaluation of Motors for Service Robots with High Back Drivability Balancing Inertial and Steady State Components
*Yoshihiro Okumatsu[1], Yohei Okamoto[1] (1. Toyota motor corporation (Japan))

[O4-9-03] Invited Paper
Development of a bio-inspired underwater robot using quasi-direct-drive
*Muhammad Naveed Raza[1], Kaisei Harada[1], Shuto Uchikai[1], Yuto Konno[1], Jun Shintake[1] (1. The Department of Mechanical and Intelligent Systems Engineering, The University of Electro-communications (Japan))

[O4-9-04] Invited Paper
Design and torque estimation of magnetic strain wave gear for lightweight lower limb exoskeletons
*Fumiya Kitayama[1], Yuto Matsumoto[1], Ota Tsujimoto[1] (1. Ibaraki university (Japan))

Hall 3 & 4 (2F)

[Oral] Motor Drive and Control

[O4-10] Bearingless Machines and Drives 1
Chairs: Junichi Asama (Shizuoka University)
Takahiro Noguchi (University of Minnesota)

[O4-10-01] Invited Paper
Comparative Evaluation of Bearingless Motor Topologies for a 9 kW Compressor
*Wolfgang Gruber[1], Andreas Josef Pröll[1], Josef Passenbrunner[2], Sebastian Mezger[3] (1. Johannes Kepler University Linz (Austria), 2. Linz Center of Mechatronics GmbH (Austria), 3. ebm-papst Mulfingen GmbH & Co. KGaA & Co. KG (Germany))

[O4-10-02] Invited Paper
Experimental Validation of Control Strategy of Outer Rotor Multi-Monopole Bearingless Motors with Combined Winding
*Hiroya Sugimoto[1], Ryosuke Yamanaka[1], Hiroki Komurasaki[1] (1. Tokyo Denki University (Japan))

[O4-10-03] Invited Paper
Design and Evaluation of a Magnetically Levitated Axial Gap Motor for Low-Pressure Venous Blood Pumping in Fontan Patients
*Nobuyuki Kurita[1,2], Victor Tedesco[1,3], Ethan Maddin[1,3], Iki Adachi[1,2], Junichi Asama[4], Yaxin Wang[1,3] (1. Baylor College of Medicine (USA), 2. Texas Children's Hospital (USA), 3. Texas Heart Institute (USA), 4. Shizuoka University (Japan))

[O4-10-04] Invited Paper
4-DOF Rotor Dynamics of an Interior Permanent Magnet Bearingless Slice Motor
*Jungha Kim[1], Minkyun Noh[1] (1. Korea Advanced Institute of Science and Technology (KAIST) (Korea))

Technical Sessions: Oral Sessions 4

Online Session (Online)

[Oral] Application of Power Electronics in Electric Railway and Related Public Transportation » Application of Power Electronics in Electric Railway and Related Public Transportation

[O4-11] Application of Power Electronics in Electric Railway and Related Public Transportation 1
Chairs: Takafumi Koseki (The University of Tokyo)

[O4-11-01]
Research on Retrofit of Flexible Traction Power Supply System Based on MMC Architecture
*Jinpeng ZHU[1], Xiaoqiong HE[1], Kun YANG[1], Chengxuan LI[1], Haocheng Sun[1] (1. Southwest Jiaotong University (China))

[O4-11-02]
Voltage Balance Control for Single-Phase Cascaded H-Bridge Rectifier Based on Improved FCS-MPC
*Jia Tang[1], Xiaoqiong He[1], Chengxuan Li[1], Zitong Huang[1] (1. Southwest Jiaotong University (China))

[O4-11-03]
Improved Coordinated Droop-Control Strategy for Flexible Traction Power Supply Systems
*Hongxin Peng[1], Xiaoqiong He[1], Chengxuan Li[1], Jinpeng Zhu[1] (1. Southwest Jiaotong University (China))

Technical Sessions: Oral Sessions 5

Tuesday, June 2 12:20 – 14:00

Online Session (Online)

[Oral] Power Electronics Applied to Home Appliance and V2X

[O5-1] Power Electronics Applied to Home Appliance and V2X
Chairs: Toshiyuki Zaitsu (Rohm Co., Ltd.)

[O5-1-01]
Bi-Level ADMM Optimization Architecture for Energy Routers Based on Graph Theory
*Zhenshuo Ma[1], Zilong Wang[1], Yanjie Cui[1], Alian Chen[1] (1. Shandong University (China))

[O5-1-02]
A Bridge-Arm Reused Quasi-Single-Stage AC-DC Converter and Its Modulation Strategy
*Jinyu Li[1], Fei Liu[1], Xinbo Ruan[1] (1. Nanjing University of Aeronautics and Astronautics (China))

[O5-1-03]
Dynamic Analysis of PV Converters Considering Input Capacitance and Sampling Frequency
*Yifeng Han[1], Zhilei Yao[1] (1. Shanghai Maritime University (China))

[O5-1-04]
Two-stage Autonomous Thermal Anomaly Tracking for Lithium-Ion Energy Storage Systems with Vision Foundation Model
Huixin Xu[1], *Chaoyu Dong[2], Qian Xiao[1], Yu Jin[1], Lijun Deng[3], Hongjie Jia[1] (1. Tianjin University (China), 2. Nanyang Technological University (Singapore), 3. Jiangxi Science and Technology Normal University (China))

[O13-5-01]
An Enhanced Physics-Informed Neural Network for Lithium-Ion Battery State-of-Health Prediction
*Beier Huang[1], Yu Zeng[1], Dehong Zhou[1], Chenyao Xu[2], Xiaozhou Han[3], Zewei Shen[1], Jianxiao Zou[1], Josep Pou[2] (1. University of Electronic Science and Technology of China (China), 2. City University of Hong Kong (Hong Kong), 3. The Hong Kong Polytechnic University (Hong Kong))

Technical Sessions: Oral Sessions 6

Tuesday, June 2 14:20 – 16:00

Room 101A (1F)

[Oral] Motor Drive and Control

[O6-1] Controls and Drives of Electric Machines 1
Chairs: Hitoshi Haga (Shizuoka University)
Dong-Choon Lee (Yeungnam University)

[O6-1-01]
Hybrid Remote-State PWM for Zero-Sequence Current Suppression in Open-End Winding PMSM
*Gwangseop Lee[1], Minkyu Kim[1], Hojoong Kim[1], Taeyoung Chung[2], Honggeuk Park[2], Sanghun Han[2], Jaeho Hwang[2], Min Kim[2], Kibok Lee[1] (1. Korea University (Korea), 2. Hyundai Motor Company (Korea))

[O6-1-02]
Comparative Evaluation of IGBT and SiC AC–DC Converters for a SynRG Biogas Generator
*Azusa Takahashi[1,2], Tatsuya Higashi[2], Takeshi Serizawa[2], Junichi Asama[3], Ryunosuke Hayashi[1], Wataru Kitagawa[1], Takaharu Takeshita[1] (1. Nagoya Institute of Technology (Japan), 2. Daihatsu Motor Co., Ltd. (Japan), 3. Shizuoka Univ. (Japan))

[O6-1-03]
Validation of instantaneous MPPT control for wind power generation using high-efficiency and high-gear-ratio gearbox
*Takahiro Kohri[1], Masato Koyama[1], Yasutaka Fujimoto[2], Hiroshi Matsuki[3], Kenta Nagano[4] (1. Mie University (Japan), 2. Yokohama National University (Japan), 3. Ashikaga University (Japan), 4. Tokyo University of Science (Japan))

[O6-1-04]
Design and Analysis of Modular Multilevel Converters for Wind Turbines with Trapezoidal EMF Profiles in MVDC Collector Systems
*Peizhou Xia[1], MJ Jansen[1], Paul Judge[1] (1. The University of Edinburgh (UK))

[O6-1-05]
Active Damping Control Utilizing Zero-Sequence Current in Three-Phase Electrolytic Capacitor-Less Dual Inverter
*Taiju Sakurai[1], Hitoshi Haga[1] (1. Shizuoka University (Japan))

Technical Sessions: Oral Sessions 6

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Sophisticated Modulation, control and analysis

[O6-2] Advanced Control and Design of Multi-Cell and Multi-Port Power Converters
Chairs: Yu Chen, Liu (National Taipei University of Technology)
Masataka Ishihara (Okayama University)

[O6-2-01]
Sensor-less Voltage Balancing of Flying Capacitor Multi-Level Converters in Current Control Systems
*Asahi Mori[1], Kenji Natori[1], Yukihiko Sato[1] (1. Chiba University Department of Electrical and Electronics Engineering (Japan))

[O6-2-02]
A Time-Sharing Control for Multi-Active-Bridge Converters Enabling Advanced Modulations
*Martin Scohier[1], Olivier Deblecker[1], Bashir Bakhshideh Zad[1] (1. University of Mons (Belgium))

[O6-2-03]
Variable-Amplitude Modulation for Non-isolated MMC DC-DC Transformer with Light-load Efficiency Elevation
*Zhiqing Ren[1], Jianjun Ma[1], Runbo Chen[1], Wei Cheng[2], Dazhen Xu[1], Miao Zhu[3] (1. Colleage of Smart Energy, Shanghai Jiao Tong University Shanghai, Shanghai, China (China), 2. State Power Investment Corporation Limited (China), 3. School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University, Shanghai, China (China))

[O6-2-04]
Design Methodology for Minimization of Output Inductor and Precise Control in a Non-Isolated DC-DC Converter with Auxiliary H-Bridge Cells
*Yusuke Sato[1], Hidemine Obara[1], Noboru Shimosato[2], Jin Xu[2] (1. Yokohama National University (Japan), 2. Myway Corporation (Japan))

[O6-2-05]
Experimental Verification of a Circuit Design Method for Improving Frequency Characteristics of a ZETA Converter Based on Eliminating Right-Half-Plane Zero
*Keishi Takenaka[1], Iori Inui[1], Hiroshi Enokura[1], Taichi Kawakami[1], Takanori Isobe[2] (1. Osaka Metropolitan University College of Technology (Japan), 2. University of Tsukuba (Japan))

Technical Sessions: Oral Sessions 6

Room 101C (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O6-3] Modular Multilevel Converters
Chairs: Yu-Chen Su (National Tsing Hua University)
Wataru Kawamura (TMEIC Corporation)

[O6-3-01]
Four-Dimensional Trapezoidal Modulation for MMC-Based Push-Pull Inter-Line DC Power Flow Controller: Concept and Implementation
*Zhiqi Jin[1], Hongyi Zhang[1], Miao Zhu[1], Jin Xu[2], Pengfeng Lin[1] (1. Shanghai Jiao Tong University (China), 2. Myway Plus Corporation (Japan))

[O6-3-02]
SDBC-Based Unidirectional 3-Phase AC/DC Converters Using Square-Wave Zero-Sequence Voltage Control
*Atsuya Suzuki[1], Makoto Hagiwara[2] (1. Institute of Science Tokyo (Japan), 2. Hokkaido University (Japan))

[O6-3-03]
Experimental Verification of SDBC-Based DC/Three-Phase Converter Applying Virtual Inertia Control and Volt-Var Control
*Naoya Kashimura[1], Atsuya Suzuki[1], Makoto Hagiwara[2] (1. Institute of Science Tokyo (Japan), 2. Hokkaido University (Japan))

[O6-3-04]
Experimental Validation of Virtual Inertia Control
Using Modular Multilevel Converters
*Masaya Shimizu[1], Kenichiro Sano[1] (1. Institute of Science Tokyo (Japan))

[O6-3-05]
Three-Phase AC–DC Single-Stage MMC Enabled by Bidirectional-Switch Based Submodules with Ultra-Low-Capacitance
*Philippe Adrien Gray[1], Khai Huynh[1], Flavio Alegretti Ramos[1], Phuc Luong[1] (1. University of Calgary (Canada))

Room 102 (1F)

[Oral] Industrial Instrumentation and Control

[O6-4] Industrial Instrumentation and Control 2
Chairs: Takenori Atsumi (Chiba Institute of Technology)
Jingxuan Wu (Aalborg University)

[O6-4-01]
Unlocking Embodied Probabilistic Computational Features in Motor Drives
*Subham Sahoo[1], Huai Wang[1], Frede Blaabjerg[1] (1. Aalborg University (Denmark))

[O6-4-02]
Quantized Probabilistic AI for Gear Fault Diagnosis in Motor Drives
*Subham Sahoo[1], Huai Wang[1], Frede Blaabjerg[1] (1. Aalborg University (Denmark))

[O6-4-03]
Sampled Current Offset Compensation in Remote-State PWM-Driven Torque Control System
*Yuto Kobayashi[1] (1. National Institute of Technology, Akita College (Japan))

[O6-4-04]
Design and Control of a Multi-Degree-of-Freedom Magnetically Levitated Planar Motor
*Keigo Nakata[1], Wataru Ohnishi[1], Takafumi Koseki[1], Yuichiro Nakamura[2], Kenji Takahashi[2], Hiroyuki Sekiguchi[2] (1. The University of Tokyo (Japan), 2. Mitsubishi Electric (Japan))

[O6-4-05]
Integration of Gaussian Process Regression and Iterative Learning Control for Scanning Stage with Iron-Core Linear Motors
*Reon Sasaki[1], Wataru Ohnishi[1], Pai-Hsueh Yang[2], Houng-Joong Kim[3], Koichi Sakata[4], Takafumi Koseki[1] (1. The University of Tokyo (Japan), 2. Nikon Research Corporation of America (USA), 3. Kovery (Korea), 4. Nikon (Japan))

Technical Sessions: Oral Sessions 6

Room 107 (1F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O6-5] Non-Isolated DC-DC Converters
Chairs: ching-jan chen (National Taiwan University)
Kansuke Fujii (Fuji Electric)

[O6-5-01]
Precise output voltage trajectory tracking control for boost converters with variable current loads based on nonlinear noncausal stable inversion
*Wataru Ohnishi[1], Shota Miyoshi, Takafumi Koseki[1], Motoki Sato[2] (1. The University of Tokyo (Japan), 2. Toyo Denki Seizo K.K. (Japan))

[O6-5-02]
Three-Level Buck Converter With Moderate-Range Input Operation: Comparison of CRM and Fixed-Frequency Control
*Si-Yun Ding[1], Jhih-Cheng Hu[1], Xiang-Yu Xie[1], Chih-Chia Liao[2], Yu-En Li[1], Ming-Shi Huang[1] (1. National Taipei University of Technology(NTUT) (Taiwan), 2. Delta Electronics, Inc. (Taiwan))

[O6-5-03]
Compact Single-Turn Coupled Inductor for MHz-Range Buck Converters with Zero-Voltage Switching
*Adrian Keil[1], Gean Maia de Sousa[2], Vincent Lorentz[3,1], Thomas Heckel[1], Marcelo Lobo Heldwein[2] (1. Fraunhofer Institute for Integrated Systems and Device Technology IISB (Germany), 2. Technical University of Munich (Germany), 3. University of Bayreuth (Germany))

[O6-5-04]
High-Current 48-V Converter with Integrated Coupled Inductors for Extreme Power Density
*Jonas Brüsshaver Andresen[1], Michael Andersen[1], Ziwei Ouyang[1] (1. Technical University of Denmark (Denmark))

[O6-5-05]
A New Full-Bridge Buck-Boost Converter with Coupled-Inductor Inverter for EV Solar Roof Application
*Kahee Kim[1], Dongmin Choi[1], Seongjun Kim[1], Jaeil Baek[1], Gun-Woo Moon[1] (1. KAIST (Korea))

Room 108 (1F)

[Oral] Semiconductor Power Conversion

[O6-6] AC Grid-Tied Power Converters Promising Harmonics/EMC Reductions and Voltage Stabilizations
Chairs: Kazuto Takagi (GS Yuasa International Ltd.)
Hidemine Obara (Yokohama National University)

[O6-6-01] Invited Paper
Harmonic Generation and Assessment in Grid-Connected Inverter-Based Resources
*Naotaka Okada[1], Kentaro Fukushima[1], Hiro Nakayama[1] (1. Central Research Institute of Electric Power Industry (Japan))

[O6-6-02] Invited Paper
Control method for three-phase PWM inverters with common-mode voltage elimination
*Shinji Sato[1], Daiki Yamaguchi[1], Fumiki Kato[1] (1. National Institute of Advanced Industrial Science and Technology (AIST) (Japan))

[O6-6-03] Invited Paper
Analysis of Common-mode Voltage in Parallel Operation of Transformerless UPS
*Koji Kato[1], Hisakatsu Igarashi[1] (1. GS Yuasa International Ltd. (Japan))

[O6-6-04] Invited Paper
An Effect of Tri-Port Transformer on Line-Interactive UPS
Toshiro Hirose[1], *Kazuhide Domoto[1], Kei Egashira[1] (1. Nishimu Electronics Industries (Japan))

[O6-6-05] Invited Paper
Concept of Quasi-Grid-Forming Converter and Its Accurate Low-Frequency Oscillation Damping Using State-Feedback Control
*Yuxin Pu[1], Jia Liu[1], Canyu Li[1], Jinjun Liu[1] (1. Xi'an Jiaotong University (China))

Technical Sessions: Oral Sessions 6

Hall 1 (2F)

[Oral] Semiconductor Power Conversion

[O6-7] Power Conversion Technologies to Advance Green Transformation
Chairs: Satoshi Ikeda (Panasonic Corporation)

[O6-7-01] Invited Paper
Analysis of a Medium Voltage DC-DC Converter
*Uwe Drofenik[1], Bernhard Suppan[1] (1. TU Wien (Austria))

[O6-7-02] Invited Paper
Control of Grid-Forming HVDC Converters for Offshore Wind Application
*Jian Sun[1], Benjamin Lee[1] (1. Rensselaer Polytechnic Institute (USA))

[O6-7-03] Invited Paper
Effective Generated Power Control for a Hybrid Power Generation System of Solar Power Generation and Micro Wind Power Generation
Hiroki Ishikawa[1], *Irham Izzatur Rahman[1], Kazuma Yamawaki[1], Kouhei Budo[1] (1. Gifu University (Japan))

[O6-7-04] Invited Paper
Cooperative Control for Multiple VSM Inverters using Estimators to Compensate the Wireless Communication Time Delays
*Yushi Miura[1], Ryuta Waizumi[1] (1. Nagaoka University of Technology (Japan))

[O6-7-05] Invited Paper
Three-phase Inverter Based on Floating-Output Series Boost-Cells Operated with Multiple Sources for Renewable Energy Applications
*Masataka Minami[1], Haruki Inoue[1], Hinano Ushiba[1], Alberto Castellazzi[2] (1. Kindai University (Japan), 2. Kyoto University of Advanced Science (Japan))

Hall 2 (2F)

[Oral] Rotating Electrical Machine

[O6-8] Evaluation of Motor Life Cycle CO2 Emission
Chairs: Kensuke Sasaki (Nissan Motor)

[O6-8-01] Invited Paper
Evaluation of Motor Life Cycle CO2 Emission - Trends of Life Cycle Assessment -
Yoshihiro Miyama[1], *Yoshihiro Miyama[2], Shogo Miyazaki[3] (1. Tohoku University (Japan), 2. Mitsubishi Electric Corporation (Japan), 3. Honda Motor Co., Ltd. (Japan))

[O6-8-02] Invited Paper
CO2 Emissions from the Manufacture of Motor Steel and Magnet Wire
*Kohei Aiso[1], Keiichi Tomizawa[2], Keiji Fukaura[3] (1. Shibaura Institute of Technology (Japan), 2. Furukawa Electric Co., Ltd. (Japan), 3. Essex Solutions (Japan))

[O6-8-03] Invited Paper
Life Cycle Assesment of CO2 Emissions in Electric Machines: Materials and Manufacturing of Permanent Magnets, Aluminum, and Resins
Hiroya Sugimoto[1], Fumihiko Saito[2], Takashi Matsumoto[3], Keiji Takizawa[3], Tomohiro Iwasaki[4], *Tomohira Takahashi[5] (1. Tokyo Denki University (Japan), 2. Shin-Etsu Chemical Co., Ltd. (Japan), 3. TOYOTA MOTOR CORPORATION (Japan), 4. Sumitomo Bakelite Co., Ltd. (Japan), 5. Mitsubishi Electric Co. (Japan))

[O6-8-04] Invited Paper
CO2 Life Cycle Assessment of Electrical Machines
*Junichi Asama[1], Tomohira Takahashi[2], Kensuke Sasaki[3], Shuhei Sakima[4], Shojiro Naka[5] (1. Shizuoka University (Japan), 2. Mitsubishi Electric Corporation (Japan), 3. Nissan Motor Co., Ltd. (Japan), 4. Yaskawa Electric Corporation (Japan), 5. Daikin Industries, Ltd. (Japan))

[O6-8-05] Invited Paper
CO2 Evaluation in Life Cycle Assessment of Electrical Machines
-Techniques for CO2 reduction-
*Kan Akatsu[1], Tomoyuki Okubo[1,2], Tomohiro Iwasaki[3], Daichi Washio[1] (1. Yokohama National University (Japan), 2. JFE steel Corporation (Japan), 3. Sumitomo Bakelite Co., Ltd (Japan))

Technical Sessions: Oral Sessions 6

Hall 3 & 4 (2F)

[Oral] Motor Drive and Control

[O6-9] Enhanced Sensorless Drives with New Technology
Chairs: Kazuhiro Ohyama (Fukuoka Institute of Technology)

[O6-9-01] Invited Paper
The Investigation of Robustness against Motor Parameter Variations of Redefined Extended Electromotive Force on the VSD Coordinate for Dual Three-Phase Synchronous Motor
Shinji Doki[1], *Rongjiao HAO[1], Yugo Yoshida[1] (1. Nagoya University (Japan))

[O6-9-02] Invited Paper
Online Inductance Identification Without Signal Injection Using Oversampling for Sensorless Control of PMSMs
*Ryosuke Morita[1], Sari Maekawa[1], Takeshi Shibayama[2], Toshimitsu Aizawa[2] (1. Meiji University (Japan), 2. Toshiba Corporation (Japan))

[O6-9-03] Invited Paper
Torque and Current Control Systems for PMSM Drives in a Stator Flux-Linkage Synchronous Frame
*Yukinori Inoue[1], Masayuki Sanada[1] (1. Osaka Metropolitan Univ. (Japan))

[O6-9-04] Invited Paper
Experimental Results of Fast Startup Tuning with Motor Type Identification for IM and PM
*Yoshiyasu Takase[1,2], Kazuhiro Ohyama[2], Yasumasa Hamabe[1], Noor Aamir Baloch[1] (1. YASKAWA ELECTRIC CORPORATION (Japan), 2. Fukuoka Institute of Technology (Japan))

[O6-9-05] Invited Paper
Position Sensorless Control of Interior Permanent Magnet Synchronous Motors for Low-Speed Operation Based on Model Predictive Control
*Atsushi Matsumoto[1] (1. Chubu University (Japan))

Technical Sessions: Oral Sessions 6

Online Session (Online)

[Oral] Semiconductor Power Conversion » Emerging technologies in Packaging, thermal management, system integration and Reliability (Advanced fault protection systems, Diagnostics)

[O6-10] Semiconductor Power Conversion
Chairs: Tomoyuki Mannen (Utsunomiya University)
Wei Han (Hong Kong University of Science and Technology (Guangzhou))

[O6-10-01]
IGBT Junction Temperature Monitoring Under Practical Operating Conditions Considering Conduction Voltage Drop Variations
*Shuangzhe Chen[1], LeLe Wei[1], Dangsheng Zhou[2], Sufei Wang[2], Tianhao Wu[2], Ke Ma[1] (1. School of Electrical Engineering, Shanghai Jiao Tong Univerisity (China), 2. R&D Center Shenzhen Hopewind Electric Co., Ltd., Shenzhen (China))

[O6-10-02]
Hybrid Collaborative FCS-MPC Strategy for Junction Temperature Optimization of Power Switching Devices in MMC
*Chengxuan Li[1], Dong Wang[1], Xiaoqiong He[1], Hongxin Peng[1], Yuhao Hui[1] (1. Southwest Jiaotong University (China))

[O6-10-03]
An Optimized Update-Time Method for Mitigating Transient DC-Bias in Triple Active Bridge Converters
*Zitong Huang[1], Xiaoqiong He[1], Jia Tang[1] (1. Southwest Jiaotong University (China))

[O6-10-05]
Design, Packaging and Evaluation of a Si/SiC Hybrid Five-Level ANPC Power Module
*Ziyu Gu[1], Jupeng Pang[1], Chao Wang[1], Ruifeng Yue[1], Yan Wang[1], Kui Wang[1], Yongdong Li[1] (1. Tsinghua University (China))

[P1-1-10] Unified Soft-Switching Control for Bridgeless Buck PFC–EF_2 Class Resonant Single-Stage LED Driver
*Ramin Khalili[1], Tey Kok Soon[1], Saad Mekhilef[2,3], Marizan Mubin[2] (1. Department of Computer System & Technology, Faculty of Computer Science & Information Technology, University of Malaya, 50603, Kuala Lumpur, Malaysia. (Malaysia), 2. Power Electronics & Renewable Energy Research Laboratory (PEARL), Department of Electrical Engineering, Faculty of Engineering, University of Malaya, 50603, Kuala Lumpur, Malaysia. (Malaysia), 3. School of Engineering, Swinburne University of Technology, Hawthorn, VIC 3122, Australia. (Australia))

Technical Sessions: Oral Sessions 7

Tuesday, June 2 16:20 – 18:00

Room 101A (1F)

[Oral] Vehicle Electrification-related Technologies

[O7-1] EV Chargers and Power Conversion
Chairs: Subrata Saha (aisin corporation)
Ryota Kondo (Mitsubishi Electric Corporation)

[O7-1-01]
Input-Parallel Output-Parallel LLC Resonant Converter Design for 400V and 800V Charging Compatibility
*Yu Zuo[1], Qingcheng Sui[1], Bangli Du[1], Jiaze Kong[1], Yang Li[1], Hans Wouters[1], Diego Acevedo[1], Wilmar Martinez[1] (1. KU Leuven (Belgium))

[O7-1-03]
Comprehensive Efficiency Evaluation of DC Electric Vehicle Charger
*Jeykishan Kumar K[1] (1. Central Power Research Institute (India))

[O7-1-04]
An all-in-one magnetic integration for single-stage onboard charger
*Dinh Bao-Hung Nguyen[1], Ba Phu Do[1], Huu-Phuc Kieu[2], Sewan Choi[1] (1. Seoul National University of Science and Technology (Korea), 2. Van Lang University (Viet Nam))

[O7-1-05]
Active Power Decoupling Using a Single Load-Side Inductor for Isolated AC-DC Converters in OBCs
*Yuki Yamaguchi[1], Masamichi Yamaguchi[1], Kodai Nishikawa[1], Hiroki Watanabe[1], Jun-ichi Itoh[1] (1. Nagaoka University of Technology(Japan))

Technical Sessions: Oral Sessions 7

Tuesday, June 2 16:20 – 18:00

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Sophisticated Modulation, control and analysis

[O7-2] System Identification, Synchronization, and Stability Analysis Methods
Chairs: Tomasz Pajchrowski (Poznan University of Technology)
Taichi Kawakami (Osaka Metropolitan University College of Technology)

[O7-2-01]
Modeling and Analysis of Grid-Forming Wind Power Converter Under the LTP Framework
*Tianyu Jiang[1], Chen Zhang[1], Haoxiang Zong[1], Marta Molinas[2] (1. Shanghai Jiao Tong University (China), 2. Norwegian University of Science and Technology (Norway))

[O7-2-02]
Enhanced Three-Phase Phase Lock Loop for Per-Phase Detection under Unbalanced Condition
*Bi Yu[1], Seong-Jong Kim[1], Hyun-Jun Choi[1], Sang-Heon Chae[2], Jung-Sik Choi[2] (1. Kumoh National Institute of Technology (Kit) (Korea), 2. Korea Electronics Technology Institute (Korea))

[O7-2-03]
A Comparative Study of Passivity-Based Stability Analysis Methods for Grid-Connected Converters
*Tsai-Yen Hao[1], Yu-Chen Su[1] (1. National Tsing Hua University (Taiwan))

[O7-2-04]
Improved Lyapunov-Hamiltonian Control Law Applied to Three-Phase AC/DC for Stabilizing AC/DC Grid Interconnection
Mickael Cotonnec[1], *Burin Yodwong[2], Pongsiri Mungporn[2], Serge Pierfederici[1], Phatiphat Thounthong[2] (1. Université de Lorraine (France), 2. King Mongkut's University of Technology North Bangkok (Thailand))

[O7-2-05]
Uneven-Phase Quaternary Random Pulse Position Modulation with Inductor Current Ripple Suppression
Hung-Chi Chen[1], *HSIANG-KAI Wu[1] (1. National Yang Ming Chiao Tung University (NYCU) (Taiwan))

Technical Sessions: Oral Sessions 7

Room 101C (1F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O7-3] Multilevel Converters
Chairs: Behrooz Bahrani (Monash University)
Hitoshi Haga (Shizuoka University)

[O7-3-01]
Voltage Balancing Control of Input Capacitors in a Three-Level Buck/Boost Converter
*Moritz Bosch[1], Raffael Schwanninger[2], Martin März[2] (1. Fraunhofer Institute for Integrated Systems and Device Technology IISB (Germany), 2. Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany))

[O7-3-02]
A New Scalable Control Method for a DC-DC Converter Combining a Multilevel Converter and a Linear Circuit
*Ryoji Tsuruta[1], Takahiro Urakabe[2], Hideaki Fujita[2] (1. Mitsubishi Electric Corporation (Japan), 2. Institute of Science Tokyo (Japan))

[O7-3-03]
Experimental Investigation of a T-type Multi-level Linear Amplifier
*Tomohiko Igarashi[1,2], Hirohito Funato[2] (1. The Polytechnic University of Japan (Japan), 2. Utsunomiya University (Japan))

[O7-3-04]
Efficiency Improvement of Active-Clamped Linear Amplifier by Multi-stage
Shuto Yagawa[1], *Moeka Sasaki[1], Hirohito Funato[1] (1. Utsunomiya university (Japan))

[O7-3-05]
Control and Communication Network for a Three-Phase 13.8 kV Power Conditioning System Based on a Multilevel Flying-Capacitor Topology
Vladimir Mitrovic[1], Arthur Coimbra Mendes[2], Mingze Gao[2], David Nam[2], Rolando Burgos[3], *Dushan Boroyevich[3] (1. Research Associate (USA), 2. Student (USA), 3. Professor (USA))

Room 102 (1F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O7-4] Solid-State Transformers
Chairs: Uwe Drofenik (TU Wien)
Takanori Isobe (University of Tsukuba)

[O7-4-02]
System-Level Modeling of Single-Phase Solid-State Transformers for High-Speed, Resource-Efficient FPGA-Based Real-Time Simulation
*Deokyong Woo[1], Sungmin Kim[1] (1. Hanyang University ERICA Campus (Korea))

[O7-4-03]
Circulating Current Mitigation in Capacitively Coupled DC/DC Converters of Solid-State Transformers
*Daniel Neuner[1], Michael Hartmann[1] (1. Graz University of Technology (Austria))

[O7-4-04]
An Overload-Capability-Enhanced SPS-VF Control for DAB Converters in SST Application
*Weidong Qie[1], Linxiao Gong[1], Mulinsen Zhang[1], Lingfeng Jiang[1], Ming Liu[1], Yong Wang[1] (1. Shanghai Jiao Tong University (China))

[O7-4-05]
A Novel Single-Stage Isolated Three-Phase-HF-Link Matrix-Type Three-Phase Cycloconverter (i3X-CCV)
*Yifan Zhao[1], Isabelle Tung[1], Daifei Zhang[1] (1. University of Toronto (Canada))

Technical Sessions: Oral Sessions 7

Room 103 (1F)

[Oral] Industrial Instrumentation and Control

[O7-5] Industrial Instrumentation and Control 3
Chairs: Jun ISHIKAWA (Tokyo Denki University)
Youssof Fassi (CEA)

[O7-5-01]
Electromagnetic Measurement Based Defect Detection of Metal Pipes Using Machine Learning
*Seiya Hiroki[1,2], Kuniyuki Motojima[1] (1. Gunma University (Japan), 2. YOKOWO Co., Ltd. (Japan))

[O7-5-02]
Feature-Enhanced Sensorless Metallic Object Detection in Wireless Power Transfer Systems Using Machine Learning
*Dat Khanh Nguyen[1], YEN-CHI PAN[1], YING-SHAN KE[1], KUN-CHE HO[1] (1. National Formosa University (Taiwan))

[O7-5-03]
Aging-aware Home Energy Management System under Probabilistic Forecasts
*Dario Slaifstein[1], Jhon Jairo Quiñones Cortes[1], Laura Ramírez-Elizondo[1], Mathijs de Weerdt[1], Pavol Bauer[1] (1. Delft University of Technology (Netherlands))

[O7-5-04]
An Adaptive Fisher Discriminant Analysis Framework for Intelligent Fault Detection in Overhead AC Transmission Networks
Mohamed Mostafa Ahmed[1], Faizan Mustafa[2], Mohamed Abdel-fattah[1], Muhammad Khalid[3,4], *Ijaz Ahmed[3], A. M. Hamada[5] (1. Faculty of Technology and Education, Helwan university (Egypt), 2. Pakistan Institute of Engineering and Applied Sciences (Pakistan), 3. Interdisciplinary Research Center for Sustainable Energy Systems (IRC-SES), King Fahd University of Petroleum and Minerals (Saudi Arabia), 4. 4Electrical Engineering Department, (KFUPM) (Saudi Arabia), 5. Faculty of Industrial and Energy Technology, Borg Al Arab Technological University (Egypt))

[O7-5-05]
Noncausal State Estimation for Iterative Learning Control
*Kentaro Tsurumoto[1], Wataru Ohnishi[1], Takafumi Koseki[1], Nard Strijbosch[2], Tom Oomen[2] (1. The University of Tokyo (Japan), 2. Eindhoven University of Technology (Netherlands))

Room 107 (1F)

[Oral] Rotating Electrical Machine

[O7-6] Induction and Reluctance Motors
Chairs: David Gerada (University of Nottingham, UK)
Kyohei Kiyota (Institute of Science Tokyo)

[O7-6-01]
A Study on Optimization of Rotor Ventilation Hole Shape in Induction Motor using Genetic Algorithms
*Shigekazu Sakabe[1], Tsuyoshi Funaki[1], Masahiko Miwa[2], Masatsugu Oyamada[3] (1. Osaka-Univ. (Japan), 2. JSOL (Japan), 3. TMEIC (Japan))

[O7-6-02]
Hybrid Inverse Design for Reducing Stray Load Losses in Induction Motors via Machine Learning
*Masatsugu Oyamada[1], Sunao Wakasugi[1], Sadaaki Kunimatsu[2], Ikuro Mizumoto[2] (1. TMEIC Corporation (Japan), 2. Kumamoto University (Japan))

[O7-6-03]
Loss evaluation of the High-speed solid rotor induction motor with grooves
*Kosei Kiyoura[1], Tadahiro Matsumoto[1], Sho Uchiyama[1], Takashi Okitsu[1], Takayuki Mizuno[1] (1. Meidensha Corporation (Japan))

[O7-6-04]
Stability Enhancement of Compensated V/f Induction Motor Drive Using Active Damping
*Dongyeob Han[1], Sungmin Kim[1] (1. Hanyang University (Korea))

[O7-6-05]
Overload Operation Capability of Synchronous Reluctance Motors
*Nicola Bianchi[1], Lino Di Leonardo[1], Ludovico Ortombina[1], Wen Soong[2] (1. University of Padova (Italy), 2. Adelaide University (Australia))

Technical Sessions: Oral Sessions 7

Room 108 (1F)

[Oral] Power Electronics Applied to Home Appliance and V2X

[O7-7] Next-generation power electronics and data science applications in home and consumer appliances
Chairs: Hideki Omori

[O7-7-01] Invited Paper
Control of the LLC Converter with Wide Load Range
*Xin Wu[1], Haoxiang Wang[1], Haihong Long[1], Wenxin Wang[1], Dehong Xu[1] (1. Zhejiang University (China))

[O7-7-02] Invited Paper
Analysis of Single-Stage Isolated Three-Phase Power Factor Corrector
*Yun Yen Chen[1], Chun Ming Tsai[1], Yu Chen Chang[1], Huang Jen Chiu[1] (1. TAIWAN TECH (Taiwan))

[O7-7-03] Invited Paper
Light-Load Efficiency Enhancement of a Two-Phase Interleaved Flyback Converter with Hybrid Buffer for 54 V DC Distribution
Ching-Ming Lai[1], *Chuan-Min Ke[1], Syuan-Ming Liou[1], Tomokazu Mishima[2] (1. National Chung Hsing University (Taiwan), 2. Yamaguchi University (Japan))

[O7-7-04] Invited Paper
Recent Advances in Air Conditioning Power Electronics and a Preliminary Study Using Artificial Intelligence and Data Science
*Haruka Matsuo[1], Masafumi Jochi[2], Koichi Arisawa[1] (1. Living Environment Systems Laboratory, Mitsubishi Electric Corporation (Japan), 2. Power Device Works, Mitsubishi Electric Corporation (Japan))

[O7-7-05] Invited Paper
Split-Phase Energy Management System
using Low Voltage GaN Devices
*Pelle Weiler[1], Toshiyuki Fujita[1], Hiroshi Fujimoto[1], Takayuki Miyajima[2], Yoshiki Yasuda[2], Akio Yamagiwa[2] (1. The University of Tokyo (Japan), 2. Daikin Industries, Ltd. (Japan))

[O7-7-06] Invited Paper
Investigation of enhancing household energy efficiency through time-shifting of heat pump water heaters in DC power supply systems
*Keito Yokomichi[1], Atsushi Morimoto[1], Yoshiki Yasuda[1], Akio Yamagiwa[1], Yumiko Iwafune[2], Toshiyuki Fujita[3], Hiroshi Fujimoto[3] (1. Daikin Industries, Ltd. (Japan), 2. Institute of Industrial Science, The University of Tokyo (Japan), 3. Graduate School of Frontier Sciences, The University of Tokyo (Japan))

Hall 1 (2F)

[Oral] Semiconductor Power Conversion

[O7-8] EMI Reduction and Reliability in Next-Generation Power Electronics
Chairs: Katsuya Nomura (Kwansei Gakuin University)

[O7-8-01] Invited Paper
A study on smoothing and DC-link capacitor layout for EMI mitigation design of SiC power module
*Takaaki Ibuchi[1], Tsuyoshi Funaki[1] (1. Univ. of Osaka (Japan))

[O7-8-02] Invited Paper
Noise Feedback Mechanisms Causing Turn-Off Switching Instability for Next-Generation Power Devices Packaged in Power Module
*Hiroto Sakai[1,2], Kotaro Kobashi[1], Masataka Ishihara[2], Kazuhiro Umetani[3], Eiji Hiraki[2] (1. ROHM Co., Ltd. (Japan), 2. Okayama Univ. (Japan), 3. Kyushu Univ. (Japan))

[O7-8-03] Invited Paper
Passive Cancellation for Reduction of Input and Output Side Common-Mode Noise in Three-Phase PWM Inverters
*Shotaro Takahashi[1], Yuta Miwa[2], Masashi Kato[2] (1. Nagoya Institute of Technology (Japan), 2. Akita University (Japan))

[O7-8-04] Invited Paper
Active and Integrated Approaches for High-Density EM Noise Mitigation in Power Electronics Converters
*Fang Luo[1], Ali Anwar[1], Masayaki Hijikata[1], Yuxuan Wu[1] (1. Stony Brook University (USA))

[O7-8-05] Invited Paper
Thermomechanical Stress Analysis of Planar Coils with Ceramics and FR4 Substrates
*Masaki Takahashi[1], Shaokang Luan[1], Zhongchao Sun[1], Ariya Sangwongwanich[1], Hongbo Zhao[1] (1. AAU Energy, Aalborg University (Denmark))

Hall 2 (2F)

[Oral] Semiconductor Power Conversion

[O7-9] Power Semiconductors
Chairs: Shiori Idaka (Mitsubishi Electric Europe B.V.)

[O7-9-01] Invited Paper
SiC Device Technology: Past, Present, and Future
*Alan Mantooth[1], Zhong Chen[1], Thomas White[1] (1. University of Arkansas (USA))

[O7-9-02] Invited Paper
Testing Automotive Power Modules according to AQG 324
*Markus Thoben[1], Peter Dietrich[2], Gabor Farkas[3], Thomas Harder[4], Frank Heidemann[5], Waldemar Jakobi[6], Martin Rittner[7], Stefan Schmitt[8], Oliver Senftleben[9], Stefan Thiemann[10], Marc Tüllmann[6] (1. FH Dortmund (Germany), 2. Richardson RFPD (Germany), 3. Siemens Digital Industries (Hungary), 4. ECPE European Center for Power Electronics (Germany), 5. NI / Emerson T&M (Germany), 6. Infineon Technologies (Germany), 7. Robert Bosch (Germany), 8. Semikron Danfoss (Germany), 9. BMW AG (Germany), 10. Valeo (Germany))

[O7-9-03] Invited Paper
Adjustable Hybrid Switch Converter for EV and PV Applications
Tanya Thekemuriyil[1], Jaspera Rohner[1], Munaf Rahimo[2], Silvia Mastellone[1], Thiago Batista Soeiro[3], *Renato Minamisawa[1] (1. University of Applied Sciences and Arts of Northwestern Switzerland (Switzerland), 2. MTAL Gmbh (Switzerland), 3. University of Twente (Netherlands))

[O7-9-04] Invited Paper
Next-Generation Power Devices: Emerging Materials, Architectures, and Applications (Invited)
*Yuhao Zhang[1], Xin Yang[1], Zineng Yang[1], Hehe Gong[1] (1. The University of Hong Kong (Hong Kong))

Technical Sessions: Oral Sessions 7

Hall 3 & 4 (2F)

[Oral] Semiconductor Power Conversion

[O7-10] Emerging Power Conversion Technologies and Applications
Chairs: Sen-Tung Wu (National Taiwan University of Science and Technology)

[O7-10-01] Invited Paper
Analysis and Design of Current-Fed Dual Active Bridge Converter
*Wei Yu Chen[1], Yun Yen Chen[1], Yu Chen Chang[1], Huang Jen CHANG Chiu[1] (1. TAIWAN TECH (Taiwan))

[O7-10-02] Invited Paper
Three-Level Half-Bridge Series-Series Resonant Converter for Solid-State Transformer System in Microgrid Applications
*Laskar Pamungkas[1], Yu-Chen Chang[2], Wei-Yang Du[2], Huang-Jen Chiu[2] (1. Enercentrik Tech. Co., Ltd. (Taiwan), 2. National Taiwan University of Science and Technology (Taiwan))

[O7-10-03] Invited Paper
Design of a High-Capacity Inductor Evaluation Inverter Using an LCCL Resonant Circuit
*Kaiki Ueda[1], Ryosuke Ota[1], Keiji Wada[1] (1. Tokyo Metropolitan University (Japan))

[O7-10-04] Invited Paper
Transient Response Optimization Techniques for Digital Buck Converter
Yi-Feng Lin[1], *Zi-Xian Yang[1], Ciao-Yi Lin[1] (1. National Ilan University (Taiwan))

[O7-10-05] Invited Paper
Development of a Low Voltage Stress 800V Electric Vehicle Charger
*Zhan-Qing Qiu[1], Yao-Hui Xu[2], Sen-Tung Wu[1] (1. National Taiwan University of Science and Technology (Taiwan), 2. National Formosa University (Taiwan))

Online Session (Online)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O7-11] Semiconductor Power Conversion
Chairs: Satoshi Ikeda (Panasonic Corporation)
Zhenbin Zhang (Shandong Uni. & TU-Munich)

[O7-11-01]
A Dual-mode Modulation Strategy for Integrated LLC-Buck-Boost Converter with High Power Efficiency
*Hengkai Dang[1], Sixing Du[1], Jinjun liu[1] (1. Xi'an Jiaotong University (China))

[O7-11-02]
Design of High-Frequency Magnetically Integrated Transformer for LLC Resonant Converter
*Ximo Wang[1], Zilong Li[2], Jing Sheng[3], Yu Dou[1], Nihan Tong[3], Chushan Li[1,3] (1. ZJU-UIUC Institute, Zhejiang University (China), 2. Hebei Key Laboratory of Equipment and Technology Demonstration of Flexible DC Transmission, Hebei University of Technology (China), 3. College of Electrical Engineering, Zhejiang University (China))

[O7-11-03]
Isolated ZVS Buck-Boost Converter Suitable for Wide Input or Output Voltage Ranges
*Lingxuan Xiao[1], Xinbo Ruan[1] (1. Nanjing University of Aeronautics and Astronautics Nanjing, China (China))

[O7-11-04]
A Parallel Resonant Soft-Switching Power Amplifier for Active Magnetic Bearing
*Cai Li[1], Miaomiao Cheng[1] (1. College of Electrical and Information Engineering, Hunan University (China))

[O1-6-01]
A Hybrid Modulation for Three-Phase LLC Converter With Enhanced Efficiency Over Wide Voltage Range
*Ning Guo[1], Jinjun Liu[1], Sixing Du[1], Zhifeng Deng[1], Hengkai Dang[1] (1. School of Electrical Engineering, Xi'an Jiaotong University (China))

[P1-12-10] Power-Flow-Path-Constructed Topology Derivation Method for Multiport Inverters
*Chuanjing Chen[1], Dehong Zhou[1], Kai Liao[1], Yu Zeng[1], Xin Liu[1], Zewei Shen[1], Jianxiao Zou[1] (1. University of Electronic Science and Technology of China (China))

Technical Sessions: Oral Sessions 8

Wednesday, June 3 10:45 – 12:05

Room 101A (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O8-1] Grid-Forming Converters Control Principles and Stability
Chairs: Georgios Konstantinou (UNSW Sydney)
Hiroaki Kakigano (Ritsumeikan University)

[O8-1-01]
An Enhanced Dispatchable Virtual Oscillator Control With Explicit Large-Signal Stability Boundary
*Zheran Zeng[1], Dongsheng Yang[1] (1. Eindhoven University of Technology (Netherlands))

[O8-1-02]
Impact of Virtual Impedance Position on the Transient Stability of Dual-Loop Grid-Forming Converters
*zhenzhen xie[1], Chuanxu Zhang[2], Chao Wu[1], Yong Wang[1] (1. Shanghai Jiao Tong University (China), 2. Shanghai University of Electric Power (China))

[O8-1-03]
High-Frequency Passivity Analysis of Virtual Admittance–Based Dual-Loop Grid-Forming Converters
*STEPHEN ARINZE OBI[1], JAE-JUNG JUNG[1] (1. Kyungpook National Univ. (Korea))

[O8-1-04]
Performance Comparison of Grid-Forming/Grid-Following IBRs Using Large Signal Stability Analysis Methods
*Takuro Umihara[1], Guoqing Gao[1], Frede Blaabjerg[1] (1. Aalborg University (Denmark))

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O8-2] Switched Capacitor DC-DC Converters
Chairs: Younghoon Cho (Konkuk University)
Keisuke Kusaka (Nagaoka University of Technology)

[O8-2-01]
Experimental Verification of a Modified Series-Parallel Switched-Capacitor Converter Intended for High-Voltage Input and Low-Power DC Supply
*Wataru Kawamura[1], Takuya Yokoyama[1], Hiroshi Mochikawa[2], Koji Maki[2] (1. TMEIC Corporation (Japan), 2. Toshiba Corporation (Japan))

[O8-2-02]
Automatic Current Sharing of Two-Phase Series Capacitor Always-Dual-Path Hybrid DC-DC Converter Based on Interleaved Operation
*Ryota Onuma[1], Katsuhiro Hata[1], Sho Kobayshi[1] (1. Shibaura Institute of Technology (Japan))

[O8-2-03]
Experimental Verification of Two-Phase Series Capacitor Always-Dual-Path Hybrid DC-DC Converter with Fixed Duty Cycle Suitable for High Step-Down Ratio and Large Output Current
*Sho Kobayashi[1], Ryota Onuma, Katsuhiro Hata (1. Shibaura Institute of Technology (Japan))

[O8-2-04]
Analysis and Digital Implementation of Current-Mode Control for a Hybrid Switched-Capacitor Converter for Datacenter
Yu-Rong Wu[1], *Kai-Yu Huang[1], Ching-Jan Chen[1], Yi-Rong Huang[2], Kuo-Chi Liu[3], Yi-Min Shiu[3], Shih-Hao Kuo[3] (1. National Taiwan University (Taiwan), 2. National Taiwan University of Science and Technology (Taiwan), 3. Richtek Technology (Taiwan))

Technical Sessions: Oral Sessions 8

Room 101C (1F)

[Oral] Vehicle Electrification-related Technologies

[O8-3] Design and Control of Automotive Inverters
Chairs: Ariya Sangwongwanich (Aalborg University)
Yuki Hidaka (Ritsumeikan University)

[O8-3-02]
Enhancing the Lifetime of Electric Semi-Truck Drive Inverters through Adaptive Switching
Md Tariquzzaman[1], *Yue Cao[1] (1. Oregon State University (USA))

[O8-3-03]
An Integrated On-Board Charger Configuration with a Dual Two-Level Inverter Open-End Winding Motor for Common-Mode Voltage Elimination
Yuttana Kumsuwan[1], *Thidarat Thanakam[1] (1. Chiang Mai University (Thailand))

[O8-3-04]
Hybrid Framework for Efficient Space-Vector Modulation of Three-Level Traction Inverters
*Alexander Pavlenko[1,2], Marcelo Lobo Heldwein[1] (1. Technical University of Munich (Germany), 2. Audi AG (Germany))

Room 102 (1F)

[Oral] Motor Drive and Control

[O8-4] Controls and Drives of Electric Machines 2
Chairs: Tetsuya Kojima
Ming-Yen Wei (Department of Electrical Engineering, National Formosa University, Taiwan)

[O8-4-01]
Unified Control Framework for a uniCSC-Based Variable Reluctance Machine Drive System
David Sirianni[1], *takanobu Ohno[1,2], Matthias Reiser[1], Spasoje Miric[1,2] (1. University of Innsbruck (Austria), 2. TU Wien (Austria))

[O8-4-02]
Asymptotic Tracking of Multi-Frequency Currents for Switched Reluctance Motors Using a Multiple Synchronous Rotating Frame Approach
*Shou Qiu[1], Fabio Muhammad Rizal[1], Kyohei Kiyota[1] (1. Institute of Science Tokyo (Japan))

[O8-4-03]
Post-Fault Control Strategy of Open-Winding Machines Under Inverter Open-Circuit Fault With Torque Ripple Reduction
*ABD ALRAHMAN DAWARA[1], Annette Muetze (1. Graz University of Technology (Austria))

[O8-4-04]
Required Current Control Bandwidth and Allowable Voltage-Detection Delay for DSP-Based Current-Source-Type Electric Motor Emulator
*Gensui Tanaka[1], Hiroki Watanabe[1], Junichi Itoh[1] (1. Nagaoka University of Technology (Japan))

Room 103 (1F)

[Oral] Power Electronics Applied to Home Appliance and V2X

[O8-5] Power Electronics Applied to Home and V2X 1
Chairs: Yasuhito Takahashi (Doshisha University)
Drazen Dujic (Power Electronics Laboratory, EPFL)

[O8-5-01]
Efficiency-Oriented Design of LLC Resonant Converters Using Time-Domain Analysis and Particle Swarm Optimization
*Bing-Hong Su[2], Che-Wei Hsu[1], Chyi-Jiunn Lee[1], Yu-Shan Cheng[4], Zong-Zhen Yang[2], Yi-Feng Luo[3], Yi-Hua Liu[1] (1. Department of Electrical Engineering, National Taiwan University of Science and Technology (Taiwan), 2. Graduate Institute of Energy and Sustainability Technology, National Taiwan University of Science and Technology (Taiwan), 3. Graduate Institute of A.I. Cross-disciplinary Technology, National Taiwan University of Science and Technology (Taiwan), 4. Department of Electrical Engineering, National Taiwan Ocean University (Taiwan))

[O8-5-02]
Development of Low Leakage Inductance Transformer Using Multilayer Flexible Printed Circuit Folding Coil
*Naoki Takagi[1,2,3], Tsutomu Hamada[3], Kuniaki Hattori[3], Tetsuo Endoh[1,2], Yoshikazu Takahashi[1] (1. Center for Innovative Integrated Electronic Systems,TOHOKU UNIVERSITY (Japan), 2. School of Engineering, TOHOKU UNIVERSITY (Japan), 3. Tamura Corporation (Japan))

[O8-5-03]
A Three-Level LLC Resonant Converter Integrated With An Interleaved Buck Converter For Photovoltaic Energy Storage Combined Systems
*Po Chen Liu[1], Bo Fong Xie[1], Wei Tong Shi[1], Cheng Chi Yu[1], Ching Chun Chuan[1] (1. National Kaohsiung University of Science and Technology (Taiwan))

[O8-5-04]
ZVS-Enhanced Design of a Single-Stage DAB Microinverter Using Dual Inductors Based on Bidirectional-GaN devices
*Wenhao Wu[1], Yuxuan Li[1], Mingzhi Nie[1], Wen Yuan[2], Xuebei Ren[2], Junzhong Xu[1], Yong Wang[1] (1. Shanghai Jiao Tong University (China), 2. Xiaomi Corporation (China))

Room 107 (1F)

[Oral] Application of Power Electronics in Electric Railway and Related Public Transportation

[O8-6] Application of Power Electronics in Electric Railway and Related Public Transportation 2
Chairs: Hiroyasu Kobayashi (Chiba University)
Ibrahim Diab (Delft University of Technology (TU Delft))

[O8-6-01]
Transient Characteristics and Traction System Performance of Series Resonant Permanent Magnet Synchronous Generator Systems During Railway Vehicle Traction
*Kenshin Murashima[1], Keiichiro Kondo[1], Minoru Kondo[2] (1. Waseda University (Japan), 2. Railway Technical Research Institute (Japan))

[O8-6-02]
Proposal of Braking Method for Reducing Mechanical Brake Loss Using a Train Automatic Stop-Position Controller in DC Electric Railways
*Yuji Kagaya[1], Keiichiro Kondo[1], Hiroyasu Kobayashi[2], Toshiya Ando[3], Toshio Hosaka[3], Takumi Nagashima[3] (1. Waseda University (Japan), 2. Chiba University (Japan), 3. Odakyu Electric Railway Co. (Japan))

[O8-6-03]
Verification Test for Electric Power Coordination Control System Incorporating Onboard Energy Storage System
*Takeshi Konishi[1], Yoshiaki Taguchi[1], Aruto Watanabe[1] (1. Railway Technical Research Institute (Japan))

[O8-6-04]
Analysis of Error in Modeling Traction Vehicles as Current Sources in Power Flow Simulations
*Yiannis Tsitouridis[1], Ibrahim Diab[1], Pavol Bauer[1] (1. TU Delft (Netherlands))

Technical Sessions: Oral Sessions 8

Room 108 (1F)

[Oral] Motor Drive and Control

[O8-7] Bearingless Machines and Drives 2
Chairs: Minkyun Noh (Korea Advanced Institute of Science and Technology, Korea)
Wolfgang Gruber (Johannes Kepler University, Austria)

[O8-7-01] Invited Paper
Performance Enhancement of Miniature Twin ps = 1 Bearingless Motors for RVAD and Fontan Circulation Assist Devices
Eric Severson[1], *Takahiro Noguchi[1], Pranava Sinha[2], William Smith[3] (1. University of Minnesota (USA), 2. Department of Surgery, University of Minnesota (USA), 3. Perfusion Solution Inc. (USA))

[O8-7-02] Invited Paper
Review on True Sensorless Control of Bearingless Motors with High Frequency Signal Injection
Zeqiang He[1], Zhengzhang Yan[1], Zikai Yang[1], *Jiahao Chen[1] (1. ShanghaiTech University (China))

[O8-7-03] Invited Paper
Investigation of Unbalanced Magnetic Pull Torque in Axial-Flux Bearingless Motor Using Unequal-Tooth-Pitch Stator
*Junichi Asama[1], Tomoki Sugita[1], Nobuyuki Kurita[2] (1. Shizuoka University (Japan), 2. Baylor College of Medicine (USA))

[O8-7-04] Invited Paper
Force and Torque Generation Mechanism of Bearingless Split Teeth Flux Reversal Motor
*Krishan Kant[1], David Trumper[2] (1. IIT Delhi (India), 2. MIT (USA))

Online Session (Online)

[Oral] Semiconductor Power Conversion » Sophisticated Modulation, control and analysis

[O8-8] Semiconductor Power Conversion
Chairs: Hongyi Zhang (Shanghai Jiao Tong University)
kenichi sakimoto (Kawasaki Heavy Industries, Ltd.)

[O8-8-01]
GaN-Based High-Frequency Inverter with Load-Independent Resonant Filter for Wide-Range Time-Varying Loads in Electrosurgery
*Xinchun Feng[1], Ziyue Guo[1], Feishuang Sun[1], Yu Dou[1], Chushan Li[1], Wuhua Li[1] (1. Zhejiang University (China))

[O8-8-02]
Characterization and Modeling of Nonlinear Transistor Output Impedance for Very High Frequency Converters
*Sixue Li[1], Matthieu Beley[2], Loris Pace[2], Arthur Perodou[2], Fan Zhang[1] (1. State Key Laboratory of Electrical Insulation and Power Equipment (China), 2. Ecole Centrale Lyon, INSA Lyon, Univ. Claude Bernard Lyon 1, Ampère CNRS UMR 5005 (France))

[O8-8-03]
Efficient Electromagnetic Parameter Evaluation for High-Frequency Transformers Using MATLAB-COMSOL Collaboration
*Zilong Li[1,2], Chushan Li[3,4], Yu Dou[4], Rui Lu[3], Ximo Wang[4], Yongjian Li[1,2], Wuhua Li[3] (1. State Key Laboratory of Intelligent Power Distribution Equipment and System, Hebei University of Technology (China), 2. Hebei Key Laboratory of Equipment and Technology Demonstration of Flexible DC Transmission, Hebei University of Technology (China), 3. College of Electrical Engineering, Zhejiang University (China), 4. Zhejiang University–University of Illinois at Urbana-Champaign Institute, Zhejiang University (China))

[O8-8-04]
Double Open Circuit Faults and Power Flow Analysis for Triple-Active-Bridge Converter with Tolerant Strategy
*Zetong Li[1], Qinglei Bu[1], Guanying Chu[1], Xu Han[2], Xue Wang[2] (1. Xi'an Jiaotong-Liverpool Univ. (China), 2. Suzhou City Univ. (China))

Technical Sessions: Oral Sessions 9

Wednesday, June 3 12:20 – 14:00

Online Session (Online)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O9-1] Semiconductor Power Conversion
Chairs: Ching-Chun Chuang (National Kaohsiung University of Science and Technology)
Yoshiya Ohnuma (Nagaoka Power Electronics)

[O9-1-01]
An MTOGI-Based Parallel Control with DC-Offset Rejection for Multi-Harmonic Voltage Emulation in Single-Phase DC–AC Inverters
Haoming Chen[1], Heng Guo[1], Junhui Luo[1], Wenlong Ding[1], *Bin Duan[1], Chenghui Zhang[1] (1. Shandong Univ. (China))

[O9-1-02]
Dead-Time Effect Mitigation Strategy for TCM-Based Grid-Tied Microinverter With Hysteresis Current Control
*Jiaxiong Xu[1], Jiawei Zhang[1], Miao Yu[1] (1. Zhejiang University (China))

[O9-1-03]
P/Q–ω/E Admittance Modeling of Multi-GFM Microgrid System Considering Power Coupling and Analysis of Power Response Characteristics
*Yilin Yin[1], Wanjun Lei[1], Weiqi Zhu[1], Haonan Teng[1], Ziyue Wang[2] (1. Xi'an Jiaotong University (China), 2. State Grid Beijing Urban District Power Supply Company (China))

[O9-1-04]
Dual Time-Scale Coordinated Harmonic Mitigation Strategy for Distribution Networks with High Penetration of Power Electronics
*Xiaoqing Yin[1], Hao Yi[1], Zebin Yang[1], Zhenxiong Wang[1], Yao Zhang[1] (1. Xi'an Jiaotong University (China))

[O9-1-05]
Predictive Fault-Tolerant Control Strategy for Multi-phase Interleaved Parallel DC-DC Converter
*Zhenning Hou[1], Zhiyao Lu[1], Chang Li[1], Yilan Xue[1], Zefan Yang[1], Weilin Li[1], Wenjie Liu[1] (1. Northwestern Polytechnical University (China))

Technical Sessions: Oral Sessions 10

Wednesday, June 3 14:20 – 16:00

Room 101A (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O10-1] Grid-Forming Converters Fault Ride Through and Grid Support
Chairs: Jae-Jung JUNG (Kyungpook National University)
Kenichiro Sano (Institute of Science Tokyo)

[O10-1-01]
Energization of Power Transformer from Low Power Rating Grid-Forming VSI under Black Start Scenario
*Dev Kumar Manhar[1], Ayush Bhatia[1], Avanish Tripathi[6], Rabindra Mohanty[2], Sunil Kumar Aharwal[3], Purn Prakash Chand[4], Rahul Negi[5] (1. Indian Institute of Technology Delhi (India), 2. Indian Institute of Technology Delhi (India), 3. NRLDC, Grid-India (India), 4. NRLDC, Grid-India (India), 5. NRLDC, Grid-India (India), 6. Indian Institute of Technology Delhi (India))

[O10-1-02]
Overcurrent-Limiting Control Method for Grid-Forming Inverters Based on Seamless Transition to GFL Mode
*Hojun Lee[1], Eunsoo Lee[1], Hyunjun Kim[2], Eunsuk Shin[2] (1. Department of Electrical Engineering, Hanyang University (Korea), 2. ZetaElec Co., Ltd (Korea))

[O10-1-03]
An Implementation of Current-Limiting Scheme on 60 kVA Three-Phase Four-Wire Grid-Forming Inverter Using Dynamic Virtual Impedance
*Preenapan Panya[1], Surapong Suwankawin[1] (1. Chulalongkorn University (Thailand))

[O10-1-04]
Negative Sequence Injection during Ride-Through in Grid Forming Inverters
Ruben Alexis Inzunza[1], *Daisuke Kanda[1] (1. TMEIC (Japan))

[O10-1-05]
Study and Implementation of a Three-Phase Three-Level Neutral-Point Clamped Inverter with Virtual Inertia Characteristics
Hsiang-Chun Cheng[1], Tsorng-Juu Liang[1], Kai-Hui Chen[1], Wen-Chung Chen[1], *Yi-Shin Chen[1], Ching-Feng Liu[1] (1. National Cheng Kung University (Taiwan))

Technical Sessions: Oral Sessions 10

Room 101B (1F)

[Oral] Motor Drive and Control

[O10-2] Controls and Drives of Electric Machines 3
Chairs: Tetsuji Daido (Nagasaki University)
Ki-Bum Park (KAIST)

[O10-2-01]
Voltage Phase Control Characteristics of Square-Wave-Driven PMASynRM Considering Cross-Saturation
*Soichiro Bunno[1], Masayuki Sanada[1], Yukinori Inoue[1], Makoto Yoshida[2] (1. Osaka Metropolitan University (Japan), 2. SMAC (Japan))

[O10-2-02]
Torque Ripple Reduction Control of a 12-Phase PMSM under Unbalanced Short-Circuit-Induced Back-EMF
*Taeyun Kim[2], Kyubeom Lee[2], Jaehoon Choi[3], Yongsug Suh[1] (1. Department of Electrical Engineering, Jeonbuk National University, Jeonju (Korea), 2. Dept. of Graduate school of Mechanical-Aerospace-Electric Convergence Engineering, Jeonbuk National University, Jeonju (Korea), 3. Power Conversion System Research Center, Korea Electrotechnology Research Institute, Gwangju (Korea))

[O10-2-03]
Study on Magnet Eddy Current Loss Driven by Voltage Source Inverter and Voltage Pulse Pattern for its Loss Reduction
*Kensuke Sasaki[1], Kan Akatsu[2] (1. Nissan Motor Co., Ltd. (Japan), 2. Yokohama National University (Japan))

[O10-2-04]
Saliency-Based Rotor Temperature Estimation of Permanent Magnet Synchronous Motors
*Andreas Lang[1,2], Richard Spießberger[3], Manfred Schrödl[4], Gerald Kalteis[3] (1. Project Assistant (Austria), 2. Software Engineer (Germany), 3. Univ. Assistant (Austria), 4. Professor (Austria))

[O10-2-05]
Circulating Bearing Currents and Inductive Coupling in Coaxial Electrical Drive Systems
*Hans-Georg Kneidinger[1], Annette Muetze[1] (1. Graz University of Technology (Austria))

Technical Sessions: Oral Sessions 10

Room 101C (1F)

[Oral] Vehicle Electrification-related Technologies

[O10-3] Power Systems and Infrastructure
Chairs: Sebastian Rivera (Technische Universiteit Delft)
Kenta Emori (Nissan Motor Co., Ltd.)

[O10-3-01]
Ultra-High-Efficiency EV Charging System Powered by PV Panels
*Yasuyuki Kanai[1], Fujio Kurokawa[2] (1. EXEO Group, Inc. (Japan), 2. Nagasaki Institute of Applied Science (Japan))

[O10-3-02]
Grid expansion planning for HDEVs charging
*Manfredo Sartori[1], Laura Ramirez Elizondo[1], Pavol Bauer[1] (1. TU Delft (Netherlands))

[O10-3-03]
Active isolated converters for single-galvanic isolation stage based multi-outlet EV fast charging station
*Indrashis Haldar[1,2], Levy Costa[1], Dongsheng Yang[1], Bas Vermulst[1], Xinwei Xu[2], Thomas Gerrits[2] (1. Eindhoven University of Technology (Netherlands), 2. Siemens eMobility B.V. (Netherlands))

[O10-3-04]
Redundant and Fault-Tolerant Three-Port Bidirectional HV/LV DC-DC Converter for On-Board Automotive Applications: Design and Control
*Muhammad Attique Qamar[1], Arya Venugopal[1], Patrick Salcher[1], Thomas Langbauer[1], Roberto Petrella[2,3] (1. Architectures & Topologies, Division Power Electronics, Silicon Austria Labs GmbH (SAL) (Austria), 2. System Level Integration Technologies, Division Power Electronics, Silicon Austria Labs GmbH (SAL) (Austria), 3. Polytechnic Department of Engineering and Architecture (DPIA), University of Udine (Italy))

[O10-3-05]
Three-Phase and Single-Phase Grid Compatible Bidirectional On-Board Charger
*CHANDRIMA CHATTERJEE[1], Adnan Khan[1], Soumya Shubhra Nag[1] (1. Indian Institute of Technology Delhi (India))

Room 102 (1F)

[Oral] Semiconductor Power Conversion
» New generation Power device, Passive components and materials

[O10-4] Passive Components and Other Devices
Chairs: Koji Orikawa (Hokkaido University of Science)
Hongbo Zhao (Aalborg University)

[O10-4-01]
Rethinking the Anhysteretic Curve of Soft Magnetic Materials based on Instantaneous Core loss
Binyu Cui[1], *Jun Wang[1] (1. University of Bristol (UK))

[O10-4-02]
An Improved Modeling for Capacitance Network of Planar Transformer Using The Section-Based Voltage Distribution
Yu-Chen Liu[1], *Quang-Huy Nguyen[1], Kuan-Yi Chen[1], Shang-Syun Wu[1] (1. National Taipei University of Technology (Taiwan))

[O10-4-03]
Inductor Design for Multilevel Converters Based on a Waveform-Emulation Iron-Loss Evaluation Method
*Yuto Saito[1], Keiji Wada[1] (1. Tokyo Metropolitan University (Japan))

[O10-4-04]
Pareto Optimization of Mn-Zn Ferrite Inductors with Elliptical Cross-Sections
*Till Piepenbrock[1], Sebastian Schachten[1], Jakub Kucka[1], Joachim Böcker[1] (1. Paderborn University (Germany))

[O10-4-05]
Model and thermal considerations for a DC current limiter based on high mobility semiconductor
*Luiz Guilherme Enger[1], Fabian Gartner[1], Nikolaos Fotias[2], Jochen Bardong[1], Peter Leitner[1], Jérémy Létang[1] (1. Silicon Austria Labs GmbH (Austria), 2. Eaton Research Labs, Eaton European Innovation Centre (Czech Republic))

Room 103 (1F)

[Oral] Power Electronics Applied to Home Appliance and V2X

[O10-5] Power Electronics Applied to Home and V2X 2
Chairs: Motoshi Matsushita (DAIKIN INDUSTRIES, LTD.)
Ching-Ming Lai (National Chung Hsing University)

[O10-5-01]
A Switched Capacitor Equalizer with Variable Switching Frequency for Battery Packs
*Cheng-Hsiang Huang[1], Zong-Zhen Yang[2], Yi-Hua Liu[1], Yi-Feng Luo[3], Guan-Jhu Chen[4], Bo-Jun Xu[1] (1. Department of Electrical Engineering, National Taiwan University of Science and Technology (Taiwan), 2. Graduate Institute of Energy and Sustainability Technology National Taiwan University of Science and Technology (Taiwan), 3. A.I. Cross-disciplinary Technology National Taiwan University of Science and Technology (Taiwan), 4. Department of Electrical Engineering National Changhua University of Education (Taiwan))

[O10-5-02]
Cascaded Voltage and Current Control for Boost-type Third-Harmonic Current Injection Active Filter
*Subin Kang[1], Minhyeok Yun[1], Hyeonsik Kim[1] (1. Gachon University (Korea))

[O10-5-03]
A 1.2 MHz Phase-Shift Self-Oscillating Class-D Amplifier Using GaN Power Stage Design
YU-CHEN LIU[1], *Rou-An Chen[1], De-An Sun[1] (1. National Taipei University of Technology (NTUT), Department of Electrical Engineering (Taiwan))

[O10-5-04]
Efficient LED Dimming Solutions Through Twin Bus Design
*Che-Wei Hsu[1], Bing-Hong Su[2], Tsung-Hui Chen[1], Yu-Shan Cheng[4], Zong-Zhen Yang[2], Yi-Feng Luo[3], Yi-Hua Liu[1] (1. Department of Electrical Engineering, National Taiwan University of Science and Technology (Taiwan), 2. Graduate Institute of Energy and Sustainability Technology, National Taiwan University of Science and Technology (Taiwan), 3. Graduate Institute of A.I. Cross-disciplinary Technology, National Taiwan University of Science and Technology (Taiwan), 4. Department of Electrical Engineering, National Taiwan Ocean University (Taiwan))

[O10-5-05]
Charge Pump Circuits for Negative Voltage Turn-Off in Gate Drivers
Won Hyo Jeong[1], Gyu Cheol Lim[1], *Minha Kim[1], Jung-Ik Ha[1] (1. Seoul National University (Korea))

Technical Sessions: Oral Sessions 10

Room 107 (1F)

[Oral] Application of Power Electronics in Electric Railway and Related Public Transportation

[O10-6] Application of Power Electronics in Electric Railway and Related Public Transportation 3
Chairs: Ryo Takagi (Kogakuin University)
Takeshi Konishi (Railway Technical Research Institute)

[O10-6-01]
Resonance Suppression Method on Train Depots for AC Electric Traction Systems in Consideration of the Voltage Stiff Converters
*Masataka Akagi[1], Hiroaki Morimoto[1], Gaku Morita[1], Akinori Hori[1], Yoshihisa Noto[2], Tomoaki Ito[2] (1. Railway Technical Research Institute (Japan), 2. Japan Railway Construction, Transport and Technology Agency (Japan))

[O10-6-02]
Current Reduction in MMC-SDBC Based STATCOM for Negative-Sequence Compensation Using Integrated Battery Energy Storage
*SUMAN CHANDRA GHOSH[1], Sano Kenichiro[1] (1. INSTITUTE OF SCIENCE TOKYO (Japan))

[O10-6-03]
Real-world evidence of interoperability problems in AC traction power systems
*Carla Petta[1], Mattias Carlehäll[2], Lars Abrahamsson[2], Johnny Holmberg[3], Steinar Danielsen[4], Ilka Jahn[1], Stefan Östlund[1], Staffan Norrga[1] (1. KTH (Sweden), 2. Trafikverket (Sweden), 3. Alstom (Sweden), 4. Bane NOR (Norway))

[O10-6-04]
Suppression of Transient Recovery Voltage in a Hybrid DC Circuit Breaker Using an IGBT and Two-Stage Fuse Configuration
*Hiroya Ichike[1], Taichi Nakano[1], Reon Sasaki[1], Yuki Inada[2], Yasushi Yamano[2], Wataru Ohnishi[1] (1. The University of Tokyo (Japan), 2. Saitama University (Japan))

[O10-6-05]
A Novel Substation Output Voltage Control Method Aiming at Maximum Energy Efficiency of DC-electrified Railway
*Hiroyasu Kobayashi[1], Taichi Kanto[1], Daisuke Miyagi[1] (1. Chiba University (Japan))

Technical Sessions: Oral Sessions 10

Room 108 (1F)

[Oral] Human Factor and Image Recognition

[O10-7] Advanced Technologies in Human Factors and Related Fields
Chairs: Sho Yokota (Toyo University)
Kaoru Mitsuhashi (Teikyo University)

[O10-7-01] Invited Paper
Ease Chair: an low-cost, highly reliable manual wheelchair driving assistance device utilizing servo brakes
*Daisuke Chugo[1], Yikun Yang[1], Satoshi Muramatsu[2], Sho Yokota[3], Takayuki Ishii[4], Isamu Nishiwaki[5], Hiroshi Hashimoto[6] (1. Kwansei Gakuin University (Japan), 2. Tokai University (Japan), 3. Toyo University (Japan), 4. Office Ishii, Inc. (Japan), 5. Amena (Japan), 6. Advanced Institute of Industrial Technology (Japan))

[O10-7-02] Invited Paper
Study on Tacit Knowledge from Focal and Non-Focal Gaze Point
*Koji Makino[1], Hidenori Omori[2], Masahiro Nakamura[2], Shoma Sasamoto[1], Xiao Sun[1], Hidetsugu Terada[1] (1. University of Yamanashi (Japan), 2. Kofu Municipal Hospital (Japan))

[O10-7-03] Invited Paper
Skill Evaluation of Deburring in Manufacturing using Motion Curved Surface
*Kaoru Mitsuhashi[1], Atsushi Shimohira[2], Akihito Suzuki[2], Takehiro Fujimoto[2] (1. Teikyo University (Japan), 2. Fujimoto Kogyo Co., Ltd. (Japan))

[O10-7-04] Invited Paper
Effectiveness of Gamification in Contest-Based and PBL Manufacturing Education Course
*Kaoru Mitsuhashi[1] (1. Teikyo University (Japan))

[O10-7-05] Invited Paper
Development of Golf Putting Training System with Real-Time Feedback
*Sho Yokota[1], Daisuk Chugo[2], Hiroshi Hashimoto[3] (1. Toyo University (Japan), 2. Kwansei Gakuin University (Japan), 3. Advanced Institute of Industrial Technology (Japan))

Online Session (Online)

[Oral] Industrial Instrumentation and Control

[O10-8] Industrial Instrumentation and Control
Chairs: Tomoyuki Shimono (Yokohama National University)
Yuto Kobayashi (National Institute of Technology, Akita College)

[O10-8-01]
Detecting Sensor Spoofing Attacks on Grid-Tied Photovoltaic Inverters via Physical Watermark
*Yiqi Chen[1], Kaikai Pan[1], Qidi Zhong[1], Rui Wang[1] (1. Zhejiang University (China))

[O10-8-02]
Finite Control Set Collaborative Model Predictive Control of Three Port DC Converters Based on Inductance Parameter Identification
*Jiaqi Zhao[1], Wanjun Lei[1], Linqiang Hu[1], Banghong Liu[1], Hongyi Zhou[1] (1. Xi'an Jiaotong University (China))

[O10-8-03]
Distributed Cooperative Control of Wind Farm for Inertial Response Enhancement
*Le Li[1], Jiale Liu[2,3], Weisi Deng[2], Weidong Gao[2], Pengying Zou[2], Xudong Zou[1], Donghai Zhu[1] (1. State Key Laboratory of Advanced Electromagnetic Technology (Huazhong University of Science and Technology) (China), 2. Power Dispatching and Control Center, China Southern Power Grid Co., Ltd. (China), 3. South China University of Technology (China))

[P1-6-08] Nonlinear Friction Identification and Economic Model Predictive Control of Built-in Direct-Drive Wave Energy Converters
*Guodong Fan[1], Weimin Wu[1,2], Yunfeng Xu[1], Chengqi Xiao[1], Hengyu Wang[1], Mingsan Ouyang[2], Wei Zhu[1] (1. Shanghai Maritime University (China), 2. Anhui University of Science and Technology (China))

Technical Sessions: Oral Sessions 11

Wednesday, June 3 16:20 – 18:40

Room 101A (1F)

[Oral] Semiconductor Power Conversion

[O11-1] Research Results of MEXT Program Innovative Power Electronics Technologies
Chairs: Toshihisa Shimizu (Tokyo Metropolitan University)

[O11-1-07] Invited Paper
Present Status and Future Prospects of GaN Vertical Power Devices
*Hiroshi Amano[1,2], Jun Suda[2,1] (1. Instatitute for Materials and Systems for Sustainability (IMaSS), Nagoya Univesrity (Japan), 2. Department of Electronics, Nagoya University (Japan))

[O11-1-01] Invited Paper
Solid-State Transformers Connected to 6.6-kV Distribution System in Japan
*Keiji Wada[1], Ryosuke Ota[1], Kan Akatsu[2], Hidemine Obara[2], Takao Tsuji[2], Takanori Isobe[3], Tomoyuki Mannen[4] (1. Tokyo Metropolitan University (Japan), 2. Yokohama National University (Japan), 3. Tsukuba University (Japan), 4. Utsunomiya University (Japan))

[O11-1-02] Invited Paper
Development of high-switching-frequency power converters with GaN power devices
*Hiroo Sekiya[1], Daisuke Miyagi[1], Kenji Natori[1], Hiroyasu Koabayashi[1], Hiroshi Osawa[1], Wenqi Zhu[2], Yukihiko Sato[1] (1. Chiba University (Japan), 2. Tokyo University of Science (Japan))

[O11-1-03] Invited Paper
Integrated Power Electronics Technology with WBG devices
*Yoshikazu Takahashi[1], keita Suzuki[1], Naoki Takagi[1], Yoshihiro Tateishi[1], Akira Kitamura[1], Satoharu Tanai[1], Shoichiro Otani[1], Tetsuo Endoh[1] (1. Tohoku University (Japan))

[O11-1-04] Invited Paper
Ultra-low loss magnetic materials for innovative power electronics
*Satoshi Okamoto[1] (1. Tohoku University (Japan))

[O11-1-05] Invited Paper
Development of Transformers and Inductors for High-Frequency Power Conversion Using Magnetic Anisotropic Soft Magnetic Materials
*Tsutomu Mizuno[1], Toshiro Sato[1] (1. Faculty of Engineering, Shinshu University (Japan))

[O11-1-06] Invited Paper
Development of novel capacitors for next-generation power electronics systems: antiferroelectric ceramic capacitors and high-voltage/high-temperature polymer solid capacitors
*Hiroki Habazaki[1], Hiroki Taniguchi[2] (1. Hokkaido University (Japan), 2. Nagoya University (Japan))

Room 101B (1F)

[Oral] Motor Drive and Control

[O11-2] Controls and Drives of Electric Machines 4
Chairs: Kohei Aiso (Shibaura Institute of Technology)
Tomasz Pajchrowski (Poznan University of Technology)

[O11-2-01]
Comparative Study of Motor Parameter Identification in IPMSM Drive System
*Ryoya Matsuzawa[1], Yukinori Inoue[1], Masayuki Sanada[1] (1. Osaka Metropolitan University (Japan))

[O11-2-02]
Torque estimation using DC-Link Current Control and Loss Compensation for permanent magnet synchronous motors
*Koicih Takae[1], Kan Akatsu[2] (1. Nidec Corporation (Japan), 2. National university in Yokohama (Japan))

[O11-2-03]
Comparative Study of a Multiphase Single-Tooth H-Bridge VSI and a Three-Phase Two-Level VSI for a PMSM
*Felix Gliese[1], Christoph Sachs[1], Jürgen Haag[1], David Cello[1], Jörg Roth-Stielow[2] (1. Esslingen University (Germany), 2. University of Stuttgart (Germany))

[O11-2-04]
A Hybrid Control Strategy for Single-Inverter Dual Parallel IPMSM Drives
*Byung-Joon Jung[1], Kyo-Beum Lee[1] (1. Ajou University (Korea))

[O11-2-05]
Torque Control of PMSM in Flux-Weakening Region Based on Cascaded-Loop Voltage Angle Control
*Hyeonho Jeong[1], Jiwon Yoo[1] (1. Inha University (Korea))

Room 101C (1F)

[Oral] Vehicle Electrification-related Technologies » Vehicle Electrification-related Technologies

[O11-3] Charging Optimization and Energy Management
Chairs: Arman Oshnoei (Aalborg University)
Hiroaki Matsumori (Nagoya Institute of Technology)

[O11-3-01]
Iterative Coordination of Mobility-Aware V2G Optimization and Power Flow in Distribution Networks
*Alvaro Menendez Agudin[1], Manfredo Sartori[1], Gautham Ram Chandra Mouli[1] (1. TU Delft (Netherlands))

[O11-3-02]
Ship energy management method based on conditional diffusion interval prediction and distributed DeePC
Liangwang ma[1], *Liang zou[1], Xingdou liu[1], Zhiyun han[1], Rongzhao jia[1] (1. Shandong University (China))

[O11-3-03]
A Swarm Intelligence Approach to Optimize Vehicle-to-Vehicle Charging Considering Dynamic Pricing Scenario
*MAHWISH MEMON[1], Ijaz Ahmed[2], Muhammad Rehan[2,3], Amjad Ali[2,3], Muhammad Khalid[2,3], Claudio Rossi[1] (1. Department of Electrical, Electronic, and Information Engineering “Guglielmo Marconi”, University of Bologna, 2. Interdisciplinary Research Center for Sustainable Energy Systems, King Fahd University of Petroleum and Minerals (KFUPM), 3. (KFUPM))

[O11-3-04]
When Wolves Manage the Load: Multi-Objective EV Charging in Residential Grids
*Yanty Rumengan[1], Fransisco Danang Wijaya[1], Lesnanto Multa Putranto[1], M Isnaeni B.S[1] (1. Universitas Gadjah Mada (Indonesia))

[O11-3-05]
Charging Strategy Impact on EV Battery: From DC Fast Charging to Dynamic Wireless Charging
*Cristian Giovanni Colombo[1], Harutaka Suzuki[2], Ryosuke Ota[2], Michela Longo[1] (1. Politecnico di Milano (Italy), 2. Tokyo Metropolitan University (Japan))

Technical Sessions: Oral Sessions 11

Room 102 (1F)

[Oral] Motor Drive and Control

[O11-4] Model Predictive Control
Chairs: Takayuki Miyajima (Daikin Industries)
Frede Blaabjerg (Aalborg University)

[O11-4-01]
Enhanced Model Predictive Current Control for OW-PMSM System
*Chenguang Zhang[1], Niko Nevaranta[1], Pasi Peltoniemi[1] (1. Lappeenranta-Lahti University of Technology LUT (Finland))

[O11-4-02]
Inductance Compensation Based Model Predictive Current Control for PMSM System
*Chenguang Zhang[1], Niko Nevaranta[1], Pasi Peltoniemi[1] (1. Lappeenranta-Lahti University of Technology LUT (Finland))

[O11-4-03]
Two-Step Model Predictive Current Control for OW-PMSM System
*Chenguang Zhang[1], Niko Nevaranta[1], Pasi Peltoniemi[1] (1. Lappeenranta-Lahti University of Technology LUT (Finland))

[O11-4-04]
Modulated Model Predictive Current Control Based on Flux Saturation Model of IPMSMs
*Yongho Kim[1], Young-Doo Yoon[2] (1. Department of Automotive Engineering(Automotive-Computer Convergence), Hanyang University (Korea), 2. Department of Automotive Engineering, Hanyang University (Korea))

[O11-4-05]
Computationally Efficient Sphere Decoder based Model Predictive Control for 5L-ANPC Converters
Jiyuan Gong[1], *Zhixun Ma[1], Fuad Afif Herya[2], Tri Desmana Rachmildha[2] (1. Tongji University (China), 2. Institut Teknologi Bandung (Indonesia))

[O11-4-06]
CHIL-Based 3-Level GaN Motor Drive Modeling for Hydrogen-Electric Aircraft Digital Twin Study
Xuli Quan[1], Hui Li[1], *Jiangbiao He[2] (1. Florida State Univ. (USA), 2. University of Tennessee, Knoxville (USA))

Technical Sessions: Oral Sessions 11

Room 103 (1F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O11-5] Wireless Power Transfer Circuits and Control Techniques
Chairs: Amir Babaki (The University of Southern Denmark)
Ryosuke Ota (Tokyo Metropolitan University)

[O11-5-01]
Dual-Transitter Coil-Based Series-Stacked Class E Inverter with Optimal Operating Strategy for High-Frequency WPT System
*Chang-Yeob Chu[1], Dongmin Kim[2], Youngseok Lee[1], Ki-Bum Park[1] (1. Korea Advanced Institute of Science and Technology (Korea), 2. Korea University of Technology and Education (Korea))

[O11-5-02]
Model-Based Current Balancer Design for MHz-Band Paralleled Inverters in Wireless Power Transfer Systems
*Masamichi YAMAGUCHI[1], Kodai NISHIKAWA[1], Hiroki WATANABE[1], Jun-ichi Itoh[1] (1. Nagaoka University of Technology (Japan))

[O11-5-03]
MHz-Driven Synchronous Rectification and Pulse-Width-Modulation Receiver-side Power Control for Class-E2 Wireless Power Transfer
*Tomokazu Mishima[1], Tianyu Yang[2], Shigehiro Yamamoto[2], Ching-Ming Lai[3] (1. Yamaguchi University (Japan), 2. Kobe University (Japan), 3. National Chung Hsing University (Taiwan))

[O11-5-04]
Performance Comparison of Analog and Digital Implementations of a Synchronous Rectification Method for 6.78 MHz Applications
*Israel Yepez Lopez[1], Jiasheng Huang[1], Drazen Dujic[1] (1. Power electronics laboratory (PEL), École Polytechnique Fédérale de Lausanne (EPFL) (Switzerland))

[O11-5-05]
Multi-Step Finite Control Set-Model Predictive Control for Pulse-Skipping Operation in Inductive Power Transfer Systems with Constant Voltage Load
Zeinab Karami Hassan Abadi[1], *Giuseppe Guidi[2], Jon Are Suul[3] (1. Department of Engineering Cybernetics, Norwegian University of Science and Technology (NTNU), Trondheim, Norway. (Norway), 2. SINTEF Energy Research, Trondheim, Norway (Norway), 3. Department of Engineering Cybernetics, NTNU,)

[O11-5-06]
Fundamental Study on Transmission-Power Compensation in a Dynamic Wireless Power Transfer System with an Active Buffer Circuit
*Riku Takahashi Takahashi[1], Ryosuke Ota[1], Shohei Komeda[2], Daniel-Ioan Stroe[3] (1. Tokyo metro politan University (Japan), 2. Tokyo University of Marine Science and Technology (Japan), 3. Aalborg University (Denmark))

Room 107 (1F)

[Oral] Application of Power Electronics in Electric Railway and Related Public Transportation

[O11-6] Advanced Power Conversion and Control for Railways
Chairs: Takafumi Koseki (The University of Tokyo)

[O11-6-01] Invited Paper
Development of methods to mitigate fluctuations in power supply voltage caused by variations in the load of Shinkansen trains
*Haruna Ohnishi[1], Toshimasa Shimizu[1], Ken Kunomura[1] (1. Central Japan Railway Company (Japan))

[O11-6-02] Invited Paper
Effective Energy Management Using Battery Systems Installed in Railway Ground-based or Onboard Equipment
*Mami Mizutani[1], Masayuki Nogi[1], Makoto Ide[1], Isao Takahashi[1], Manato Mori[1] (1. Toshiba Corp. (Japan))

[O11-6-03] Invited Paper
Reduction of power compensators in AC feeding system by feeder voltage regulation by train's power converters
*Yuto Uchiyama[1], Yuta Mori[1], Ken Kunomura[1], Hidemitsu Tanaka[1], Tsutomu Uranaka[1], Toyokazu Hamajima[1], Toshiaki Takami[1], Akihiro Koyanagi[1], Haruna Ohnishi[1], Kota Yamaguchi[1] (1. Central Japan Railway Company (Japan))

[O11-6-04] Invited Paper
Future Vision of Railway EMS with Serendie
*Kosuke Shinji[1], Ryuta Higuchi[1], Yasutaka Imamura[1], Takuma Ishiyama[1], Jungo Sato[1] (1. Mitsubishi Electric Corporation (Japan))

Room 108 (1F)

[Oral] Semiconductor Power Conversion

[O11-7] Modeling and Control of Grid-Forming Converters
Chairs: Xiongfei Wang (Tsinghua University)

[O11-7-01] Invited Paper
The Impact of Frequency Coupling in dq frame on the Passivity Properties of Grid-connected Converter.
*Chirag Ramgopal Shah[1], Marta Molinas[1], Shan He[2], Sjur Føyen[1], Roy Nilsen[1] (1. Norwegian University of Science and Technology (Norway), 2. Hefei University of Technology (China))

[O11-7-02] Invited Paper
A General Control Solution for Offshore AC, DC, and Hybrid Energy Hubs
*Liang Huang[1], Alban Jacques Duvivier[2], Daniel Muller[2], Ching-Shu Shu[3], Lorenzo Zeni[3], Frede Blaabjerg[1] (1. Aalborg University (Denmark), 2. Technical University of Denmark (Denmark), 3. Ørsted A/S (Denmark))

[O11-7-03] Invited Paper
A Single-Phase Grid-Forming Converter Using a Single DC-link Current Sensor
*Wenzhuo Cui[1], Zicheng Zhang[1], Jingyang Fang[1], Le Fang[2], Wei Dong[2], Ying Yang[2] (1. Sch. Control Sci. Eng., Shandong Univ., Jinan (China), 2. State Grid Zhejiang Electr. Power Res. Inst., Hangzhou, Zhejiang (China))

[O11-7-04] Invited Paper
Impedance Modeling and Verification of Grid-Forming Inverters in Different Reference Frames
*Yiyang Liao[1], Yitong Li[1], Yaoyu Hu[1], Wenjie Ning[1], Jinjun Liu[1] (1. State Key Laboratory of Electrical Insulation and Power Equipment, School of Electrical Engineering, Xi'an Jiaotong University (China))

[O11-7-05] Invited Paper
Fast Current and Power Response of Grid-Forming Converters During Fault Ride-Through
*Liang Zhao[1], Zejie Li[2], Fangzhou Zhao[3], Zhangcan Xu[1], Xiongfei Wang[3] (1. KTH Royal Institute of Technology (Sweden), 2. National Institute of Clean and Low Carbon Energy (China), 3. Tsinghua University (China))

[O11-7-06] Invited Paper
Simplified Virtual Impedance Implementation Without Sequence Decomposition for Independent Positive/Negative-Sequence Shaping in Grid-Forming Converters
*Jaekeun Lee[1], Yifei Li[2], Xiongfei Wang[3], Jae-Jung Jung[4], Shenghui Cui[1] (1. Department of Electrical and Computer Engineering, Seoul National University (Korea), 2. Department of Energy, Aalborg University (Denmark), 3. Department of Electrical Engineering, Tsinghua University (China), 4. School of Electronic and Electrical Engineering, Kyungpook National University (Korea))

Technical Sessions: Oral Sessions 11

Online Session (Online)

[Oral] Semiconductor Power Conversion

[O11-8] Semiconductor Power Conversion
Chairs: Chengxuan Li (Southwest Jiaotong University)
Shin-ichi Hamasaki (Nagasaki University)

[O11-8-01]
A 48-V to 12-V/150-A Hybrid Switched-Capacitor Converter with CLC Output Fliter
*Shunliang Liu[1], Yenan Chen[1] (1. Zhejiang University (China))

[O11-8-02]
Simplified Adaptive Duty-Cycle Class E Power Amplifier Suitable for On-Chip Integration
*Chang Liu[1], Shuang Li[1], Ruihan Ma[1], Ming Liu[2], Chengbin Ma[1] (1. Global College, Shanghai Jiao Tong University (China), 2. School of Electrical Engineering, Shanghai Jiao Tong University (China))

[O11-8-03]
Enhanced Grid-forming Architecture with Both Voltage Support and Agile Power Feed-in for Renewable Energy Generation
Hongwei Zhou[1,2], *Ronghui AN[1], Ziwen Zhao[1], Jinjun Liu[1] (1. Xi'an Jiaotong University (China), 2. TBEA Xi'an Electric Technology Co., Ltd (China))

[O11-8-04]
All-Pass Filter Phase Reshaping Strategy for Suppressing Synchronous Resonance in Virtual Oscillator-based Grid-Forming Inverters
*Mingyue Wang[1], Yaopeng Huang[1], Xianzhe Pang[1], Zhida Shang[1], Alian Chen[1], Cheng Cheng[1], Wenbo Wang[2] (1. Shandong university (China), 2.

[O11-8-05]
Analysis and Enhancement of Transient Stability for Grid-Forming Inverters During Deep Voltage Sag Recovery
*Shumei Chi[1], Chunzhen Liu[1], Xianzhe Pang[1], Rui Zhang[1], Alian Chen[1], Yangbin Ke[2] (1. Shandong University (China), 2. TBEA Xi'an Electric Technology Co., Ltd. (China))

[O11-8-06]
Sensitivity Analysis on Impedance Matching Network in Wireless Power Transfer System Considering Capacitors Tolerance
*Yu Xiao[1], Zhan Liu[1], Shuang Li[1], Ming Liu[1], Chengbin Ma[1] (1. Shanghai Jiao Tong University (China))

Technical Sessions: Oral Sessions 12

Thursday, June 4 8:30 – 9:50

Room 101A (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O12-1] Grid-Following Converters Synchronization and Grid Connection
Chairs: Surapong Suwankawin (Chulalongkorn University)
Cheng Huang (University of Tsukuba)

[O12-1-01]
Initial Synchronization Schemes for Grid-connected Three-phase Inverters
Asma Ahmad Mirza[1], *Inam Nutkani[1], Carlos Teixeira[1], Brendan McGrath[1] (1. RMIT University, Melbourne, Australia (Australia))

[O12-1-02]
Development of a Grid-Compliant Single-Phase DC–AC Converter
*Chao- Hsu Liao[1], Hong-Ying Jian[1], Wei-Tong Yin[1], Ming-Shi Huang[1], Chun-Yen Chen[1] (1. National Taipei University of Technology (Taiwan) (Taiwan))

[O12-1-03]
Implementation and Analysis of a PR Controller for Efficient Bidirectional Power Flow in Single-Phase Converters
*Vishnu K[1], Sumit Kumar Pramanick[1], Anil Verma[1] (1. Indian Institute of Technology Delhi (India))

[O12-1-04]
A Study on Time-Synchronized Grid-Tied Inverters Controlled by GPS Signals Without Voltage Sensors
*Daichi Kawamoto[1], Hidemine Obara[1] (1. Yokohama National University (Japan))

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O12-2] Auxiliary-Circuit-Based Converters for Soft Switching and Performance Enhancement
Chairs: Wai Keung Mo (The university of southern denmark)
Ryosuke Ota (Tokyo Metropolitan University)

[O12-2-01]
Experimental Verification and Loss Analysis of Non-isolated Boost Converter Utilizing an Auxiliary Chopper for Fuel Cell Vehicles
*Hironobu Shakado[1], Makoto Hagiwara[2] (1. Institute of Science Tokyo (Japan), 2. Hokkaido University (Japan))

[O12-2-02]
High Conversion Ratio Single Switch Integrate Boost-Flyback DC-DC Converter Based on Quasi-Resonant Technique
Anusak Bilsalam[1], Natthakamon Pradumsuk[1], Jirachaya Jumpa[1], *Wachiravit Patarapongsatit[1], Juthathip Haema[1] (1. King Mongkut's University of Technology North Bangkok (Thailand))

[O12-2-03]
Isolated, Multi-Resonant, Soft-Switching DC-DC Converter With a Fractional-Turn Planar Transformer for Ultra-High Step-Down Applications
*Kumar Joy Nag[1], Aleksandar Prodic[1] (1. University of Toronto (Canada))

[O12-2-04]
Cost-Effective Electrical Variable Capacitor Utilizing Fast Recovery Diode for RF Plasma
*Heewon Choi[1], Yongsug Suh[1] (1. Jeonbuk National University, Korea (Korea))

Room 101C (1F)

[Oral] Semiconductor Power Conversion » Latest solution for EMI and EMC

[O12-3] Active Gate Drive Techniques for EMI Reduction in Power Converters
Chairs: Sari Maekawa

[O12-3-01]
Optimized SiC MOSFET Switching Control with Adaptive Dynamic Gate Resistance
*Pratik Limbu[1], Sui Ping Cheung[1], Tin Ho Li[1] (1. Hong Kong Applied Science and Technology Research Institute (ASTRI) (Hong Kong))

[O12-3-02]
A Study on Efficiency Improvement of a Three-Phase Inverter by Partial Active Gate Control Considering Load Power Factor
*Daisuke Saito[1], Hidemine Obara[1], Katsuhiro Hata[2] (1. Yokohama National University (Japan), 2. Shibaura Institute of Technology (Japan))

[O12-3-03]
EMI Suppression in Asymmetric H-Bridge SRM Drives Using Active Gate Drive
*Hajime Takayama[1], Kazuki Matsumoto[1], Shiu Mochiyama[2], Shuhei Fukunaga[3], Michihiro Shintani[1], Takashi Hikihara[2] (1. Kyoto Institute of Technology (Japan), 2. Kyoto University (Japan), 3. The University of Osaka (Japan))

[O12-3-04]
EMI Optimization of Capacitive Power Transfer as Scalable Low-Cost Multi-Load Supply for Isolating Gate Drivers
*Adrian Amler[1], Thomas Lehmeier[1], Madlen Hoffmann[1], Martin März[1,2] (1. Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany), 2. Fraunhofer Institute for Integrated Systems and Device Technology IISB (Germany))

Room 102 (1F)

[Oral] Rotating Electrical Machine

[O12-4] Special Machines
Chairs: Doga Ceylan (Eindhoven University of Technology)
Takahiro Noguchi (University of Minnesota)

[O12-4-01]
Experimental Verification of Magnetization Position Dependence for Concentrated-Winding Variable Magnetomotive Force Memory Motors
*Manari Mizuno[1], Kazuto Sakai[1], Sari Maekawa[1] (1. Meiji University (Japan))

[O12-4-03]
Flux-Modulated-type Magnetic Gear for AAMs featuring a Halbach Array Magnet Rotor and Unequally Divided Magnets
*Emiri Asahina[1], Yuichi Tachiya[1], Kenji Nakamura[1], Motoki Ohta[2], Mamoru Kimura[2], Shin Kusase[3] (1. Tohoku University (Japan), 2. Shimane University (Japan), 3. MARC Institute Co., Ltd. (Japan))

[O12-4-04]
Simplifying Acoustic Connection Conditions for Thermoacoustic Generators Using a Three-Phase Inverter With Vector Control
*Shunya Ichikawa[1], Roi Aoki[1], Tsutomu Mizuno[1], Mitsuhide Sato[1], Mariko Senga[2], Shinya Hasegawa[2] (1. Shinshu University (Japan), 2. Tokai University (Japan))

Technical Sessions: Oral Sessions 12

Room 103 (1F)

[Oral] Power Electronics Applied to Home Appliance and V2X
» Power Electronics Applied to Home Appliance and V2X

[O12-5] Power Electronics Applied to Home and V2X 3
Chairs: Koichi Arisawa
Giuseppe Guidi (SINTEF Energy)

[O12-5-01]
Frequency Domain Performance Analysis of Dynamic Decoupling Current Control in Buck and Boost Multiple Converters
*Toshiyuki Fujita[1], Masahiro Mae[1], Hiroshi Fujimoto[1], Takayuki Miyajima[2], Yoshiki Yasuda[2], Akio Yamagiwa[2] (1. The University of Tokyo (Japan), 2. Daikin Industries ltd. (Japan))

[O12-5-02]
Unified Framework for Nonlinear Modeling and Stability Analysis of Grid-Following and Grid-Forming Converters
*Shuai Yuan[1], Zhixiang Zou[1] (1. Southeast University (China))

[O12-5-03]
Enhanced Inertia Provision of Grid-Forming MMC in HVDC Systems
*Zhangcan Xu[1], Liang Zhao[1], Xiongfei Wang[2], Ilka Jahn[1] (1. KTH Royal Institute of Technology (Sweden), 2. Tsinghua University (China))

[O12-5-04]
Optimal cost analysis of grid-connected electric vehicle station with integrated PV array and ESU
*Nedim Tutkun[1], Mehmet Simsir[2] (1. Istanbul Ticaret University (Turkey), 2. Karabük University (Turkey))

Room 107 (1F)

[Oral] Motor Drive and Control

[O12-6] Industry Technology Session in Motor Drive and Control
Chairs: Akio Toba (Fuji Electric Co., Ltd.)
Dong-Choon Lee (Yeungnam University)

[O12-6-01]
Latest Technologies for an Adjustable-Speed Pumped-Storage Hydropower System with Doubly-Fed Induction Machine and Secondary Excitation Converter
*Yushi Koyama[1], Hironari Kaneda[1], Junji Mori[1], Tomoyoshi Toshimitsu[1], Ayumu Tokiwa[2] (1. Toshiba Corporation (Japan), 2. TMEIC Corporation (Japan))

[O12-6-02]
Voltage Distortion Reduction and Low-Voltage Compensation Using Combined Two-Phase Overmodulation PWM
*Yuichiro Minato[1] (1. Murata machinery, LTD (Japan))

[O12-6-03]
Development of an LSTM Based Motor and Reduction Gear Vibration Detection Technology for Electric Vehicles Without Additional Sensors
*Jae Sang Lim[1], Youngrock Chung[1], Seok Ham[1], Yong Hyun Ryu[1], Ho Rim Choi[1], Dae Un Sung[1] (1. Hyundai Motor Company (Korea))

[O12-6-04]
Simplified Real-time Simulation for Evaluating Power Electronics Systems
*Naoto Kikuchi[1], Soichiro Ichikawa[1], Hayato Honda[2] (1. TMEIC Corporation (Japan), 2. Mitsubishi Electric Software Corporation (Japan))

Technical Sessions: Oral Sessions 12

Room 108 (1F)

[Oral] Application of Power Electronics in Electric Railway and Related Public Transportation

[O12-7] Key technology for green transformation and efficient energy management in electric railway systems
Chairs: Ken Kunomura (Central Japan Railway Company)

[O12-7-01] Invited Paper
Development of Tokaido Shinkansen Rolling Stock and its Energy Conservation
*Keiji Sato[1], Toyokazu Hamajima[1] (1. Central Japan Railway Company (Japan))

[O12-7-02] Invited Paper
Voltage lowering operation at DC traction substations for making use of regenerative energy
*Shun Iwatsuki[1], Takehiko Nakamura[1], Daisuke Kumagai[1] (1. East Japan Railway Company (Japan))

[O12-7-03] Invited Paper
Two-stage Energy Management for PV-Integrated DC Railway Traction Systems
*Wei Liu[1], Qian Xu[1], Haonan Liu[1], Xiaodong Zhang[1], Dingxin Xia[1], Jingjie Chen[1] (1. Southwest JIaotong University (China))

[O12-7-04] Invited Paper
Study on replacing all frequency converters on the Tokaido Shinkansen with electronic frequency converters
*Kota Yamaguchi[1], Toshimasa Shimizu[1], Yuto Uchiyama[1], Haruna Onishi[1] (1. Central Japan Railway Company (Japan))

Hall 1 (2F)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O12-8] Reliability of power converters with control and diagnosis
Chairs: Kyo-Beum Lee (Ajou University)

[O12-8-01] Invited Paper
Variable Timing Control for Switching Loss
Reduction in Active Gate Driver
*Jinkyung Kim[1], Younghoon Cho[1] (1. Konkuk Univ. (Korea))

[O12-8-02] Invited Paper
Output Current Ripple Minimization for Capacitor Reliability Optimization in High Step-Down Multiphase Interleaved Buck Converters
Mei-Fang Wang[1], *Wei Chang[1], Ting-Yu Ling[1], Sung-Ping Chen[1], Yu-Zhen Zhu[1], Tzung-Lin Lee[1] (1. National Sun Yat-sen University (Taiwan))

[O12-8-03] Invited Paper
Open-Fault Diagnosis of a Dual Active Bridge Converter using Convolutional Neural Networks
*Jae-Hwan Moon[1], Kyo-Beum Lee[1] (1. Ajou University (Korea))

[O12-8-04] Invited Paper
A Fault Diagnosis for OEW-IPMSM Drives Fed by Common DC Bus using High-Frequency Injection
*Jeong-Hwan Jeon[1], Kyo-Beum Lee[1] (1. Ajou University (Korea))

Technical Sessions: Oral Sessions 12

Online Session (Online)

[Oral] Motor Drive and Control » Controls and Drives of Electric Machines

[O12-9] Controls and Drives of Electric Machines
Chairs: Keitaro Kawarazaki (Tokyo University of Science)
Shin-ichi Hamasaki (Nagasaki University)

[O12-9-01]
A Data-Driven Method for Motor Topology Generation Using Latent Diffusion Model
*Bowei Chen[1], Shihao Zhang[1], Jianzhi Zhu[1], Yilin Ma[1], Huan Yang[1], Rongxiang Zhao[1] (1. Zhejiang univ (China))

[O12-9-02]
Deep Transfer Learning-based Fault Diagnosis Scheme for Auxiliary Inverter Drive Systems in Unmanned Ships with Multi-source Signal Monitoring
*Dengjie Lu[1], Shan Li[2,1], Jiayu Zhang[1], Shan Jiang[1], Zhi Yang[1] (1. Shanghai Marine Equipment Research Institute (SMERI) (China), 2. College of Electrical Engineering,Zhejiang University (China))

[P2-7-15] Duty Cycle Division-Based Power Allocation Control of Dual-DC-Port Inverters for Multisource Electric Vehicles
*Tiecheng Lan[1], Dehong Zhou[1], Kai Liao[1], Jianxiao Zou[1], Yu Zeng[1] (1. University of Electronic Science and Technology of China (China))

[O12-4-02]
Design and Evaluation of a High-Power Density Axial-Flux Motor-Propeller System for eVTOL Distributed Electric Propulsion
*Yanlei Yu[1], Chengming Liu[1], Christopher. H. T. Lee[1] (1. Nanyang Technological University (Singapore))

Technical Sessions: Oral Sessions 13

Thursday, June 4 14:00 – 15:40

Room 101A (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O13-1] Grid-Following Converters Power Quality and Parallel Operation
Chairs: Morten Rahr Nielsen (Aalborg University)
Hiroki Watanabe (Nagaoka University of Technology)

[O13-1-01]
A Novel Single-Phase Three-Wire Inverter with a Decoupling Circuit
*Noriyuki Nosaka[1], Satoshi Iwai[1], Mitsuru Sato[1], Qingyun Piao[1], Takeshi Uematsu[1] (1. OMRON Corporation (Japan))

[O13-1-02]
Inherent Damping Characteristics of Feedforward-Based Harmonic Current Controllers in Active Power Filters
*Juhee Park[1], Deokyong Woo[1], Sungmin Kim[1] (1. Hanyang University ERICA Campus (Korea))

[O13-1-03]
Current Limiting Method for Extending Grid Compensation Capability of Single-Star Multilevel Converter with Zigzag Transformer
*Yeongung Kim[1], Jae-Jung Jung[1] (1. Kyungpook National University (Korea))

[O13-1-04]
Optimal Power Oscillation Mitigation in Parallel Converters Under Unbalanced AC Grid
*Guillermo Huerta[1], Maurice Roes[1], George Papafotiou[1] (1. Eindhoven University of Technology (Netherlands))

[O13-1-05]
Qualification Challenges of Solid-State Transformers: Standards, Medium Voltage Power Semiconductors, and Auxiliary Circuits
Ahmed Eldistawy[1], Debi Prasad Nayak[1], Nadia Mei Lin Tan[2], *Marco Liserre[1,2] (1. Fraunhofer ISIT (Germany), 2. Kiel university (Germany))

Technical Sessions: Oral Sessions 13

Room 101B (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O13-2] Wireless Power Transfer Systems and Coil Design Techniques
Chairs: Ki-Bum Park (KAIST)
Shohei Komeda (Tokyo University of Marine Science and Technology)

[O13-2-01]
Preliminary Study on a Misalignment-Tolerant Coil Structure for Dual-Field Dynamic Wireless Power Transfer Systems
*Ryosuke Ota[1], Harutaka Suzuki[1], Hiroyuki Yano[1], Cristian Giovanni Colombo[2], Michela Longo[2] (1. Tokyo Metropolitan University (Japan), 2. Politecnico di Milano (Italy))

[O13-2-02]
Design Method of Transmitter and Receiver Coils Applied to Rotating Dynamic Wireless Power Transfer Experimental System
*Yusuke Tanaka[1], Daiki Satou[1] (1. Tokyo Denki University (Japan))

[O13-2-03]
Multiple Transmitters with Controlled Amplitude and Phase of Transmitter Currents to Eliminate Cross-Interference Effects for Large-Area Wireless Power Transfer Systems
*Masataka Ishihara[1], Kodai Matsuura[1], Akihiro Konishi[2], Kazuhiro Umetani[3], Eiji Hiraki[1] (1. Okayama University (Japan), 2. Sojo University (Japan), 3. Kyushu University (Japan))

[O13-2-04]
Modeling of Wave Propagation in Spatially Distributed Multi-Load Capacitive Power Transfer for Wireless Charging Applications
*Adrian Amler[1], Lukas Best[1], Martin März[1,2] (1. Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany), 2. Fraunhofer Institute for Integrated Systems and Device Technology IISB (Germany))

[O13-2-05]
Study on Wireless Power Transfer System Integrating Cell Voltage Equalizer Using Series-Resonant Voltage Multiplier
*Shion Kubo[1], Satou Daiki[1] (1. Tokyo Denki University (Japan))

Technical Sessions: Oral Sessions 13

Room 101C (1F)

[Oral] Semiconductor Power Conversion

[O13-3] Industry Technology Session in Semiconductor Power Conversion 1
Chairs: Ryota Kondo (Mitsubishi Electric Corporation)
Sewan Choi (Seoul National Univ of Science and Technology)

[O13-3-01]
HVDC Valve Tower for the JEAG 5003 and the Nankai Trough Megathrust Earthquake Scenario
*Akihiro Mukai[1], Choji Yamazaki[1], Hitoshi Teramoto[2], Kenta Suzuki[2], Toru Kitamura[2], Hiroko Kuse[2], Masashi Shigemitsu[2] (1. TMEIC (Japan), 2. Mitsubishi Electric Corporation (Japan))

[O13-3-02]
Molded Interconnect Substrate (MIS)-Based GaN Power Module Enabling High-Efficiency and Compact System Integration
Qinghong Liu[1], *Ziying Li[1], Chang Huang[1], Qingyuan Tang[1] (1. Fenghua Semiconductor Technology Co., Ltd . (China))

[O13-3-03]
Compact and High-Efficiency Uninterruptible Power System for Medium-Capacity Applications
*Nobuyuki Momochi[1], Masamichi Kanoh[1], Ryo Murata[1] (1. TMEIC Corporation (Japan))

[O13-3-04]
Demonstration of Microgrid Stabilization with Virtual Synchronous Generator and Flywheel Energy Storage System
*Kenichi Sakimoto[1], Takaaki Matsuo[1], Toshiyuki Kawamoto[2], Akira Yagi[2], Jomar Balute[3], Xavier Broncano[3] (1. Kawasaki Heavy Industries, Ltd. (Japan), 2. IKS Co., Ltd. (Japan), 3. Amber Kinetics Philippines Inc. (Philippines))

[O13-3-05]
A Novel Feed-Forward Voltage-Injection Active EMI Filter for Two-Stage Grid-Connected PV Inverters
Sarayut Jitprasong[2], *Pawaret Ampai[1], Surapong Suwankawin[1] (1. Chulalongkorn University (Thailand), 2. A.P.Y. Engineering Co., Ltd. (Thailand))

Technical Sessions: Oral Sessions 13

Room 102 (1F)

[Oral] Rotating Electrical Machine

[O13-4] General Topics for Rotating Electrical Machines
Chairs: Hiroya Sugimoto (Tokyo Denki University)
Yujing Liu (Chalmers University of Technology)

[O13-4-01]
Applying a Magnetic Composite Material onto a Motor Rotor for the Reduction of AC Copper and Permanent Magnet Eddy Current Losses
*Ren Washioka[1], Takashi Nakamura[1], Kensuke Masuda[1], Jun Kitajima[1], Tsutomu Mizuno[1], Masami Nirei[2], Mitsuhide Sato[1] (1. Shinshu university (Japan), 2. National Institute of Technology Nagano College (Japan))

[O13-4-02]
Flux Linkage Estimation and Condition Monitoring of an IPMSM with Mechanically Adjustable Flux Linkage
*Matthew Bagnara[1], Gabriel Weissitsch[2], Behrooz Bahrani[1], Greg Heins[1], Edmund Marth[2], Gerd Bramerdorfer[2] (1. Monash University (Australia), 2. Johannes Kepler University Linz (Austria))

[O13-4-03]
Benchmarking of Traction Electric Machines Considering Sustainability and Performance
*Edoardo Lagorio[1], Simone Ferrari[1], Federica Graffeo[1], Chengyang Ye[1], Irving Sixto Aguilar Zamorate[3], Vittorio Ravello[2], Raffaele Bonavolontà[2], Andrea Tonoli[1], Silvio Vaschetto[1], Gianmario Pellegrino[1] (1. Politecnico di Torino (Italy), 2. CRF - Stellantis (Italy), 3. Tecnologico de Monterrey (Mexico))

[O13-4-04]
Reimagining Hairpin Windings: 3D Transposition through Additive Manufacturing
*Yitbarek Tedla Bekele[1], Olga Korolova[2], Andreas Biebighäuser[2], Amir Ebrahimi[3], Bernd Ponick[1] (1. Leibniz University Hannover (Germany), 2. ProFluxx GmbH (Germany), 3. University of Bremen (Germany))

[O13-4-05]
A High Performance Dry-Winding Cooling Technique for Electrical Machines
*David Gerada[1], Zeyuan Xu[1], Fengyu Zhang[1], Chris Gerada[1], Andrew Page[2], David Tate[2], Tadashi Sawata[2] (1. University of Nottingham (UK), 2. Collins Aerospace (UK))

Technical Sessions: Oral Sessions 13

Room 103 (1F)

[Oral] Power Electronics Applied to Home Appliance and V2X

[O13-5] Power Electronics Applied to Home and V2X using Machine Learning
Chairs: Toshiyuki Fujita (Shibaura institute of technology)
Chaoyu Dong (Nanyang Technological University)

[O13-5-02]
SOC Estimation for 1000V Energy Storage Systems: Implementation and Validation of an Extended Kalman Filter-Based Approach
Wei-Feng Chin[1], *TZU-WEI CHIANG[2], Kuan-Ting Lai[2] (1. Orient Technology (Singapore), 2. National Taipei University of Technology (Taiwan))

[O13-5-03]
A Study on Topological Analysis and Necessary Processing of Distribution Networks Simulation Data
*IN KWON PARK[1], Yi Zhang[1], Gilsung Byeon[2] (1. RTDS Technologies (Canada), 2. Korea Electrotechnology Research Institute (KERI) (Korea))

[O13-5-04]
Adaptive Synchronverter Algorithm with Q-learning for University Microgrid
Mohd Brado Frasetyo[1], *Fransisco Danang Wijaya[1], Husni Rois Ali[1] (1. Universitas Gadjah Mada (Indonesia))

Technical Sessions: Oral Sessions 13

Room 107 (1F)

[Oral] Motor Drive and Control

[O13-6] Practical Technique of Motor Drive Systems
Chairs: Ufot Ekong (TMEIC)
Wang Shuo (University of nottingham Ningbo China)

[O13-6-01]
Effects of Power Superposition on Motor Control Characteristics and Extracted Power in a Power Superposition System on PMSM Power Lines
*Taiga Fujii[1], Takeshi Kiribuchi[2], Yukinori Inoue[1], Masayuki Sanada[1] (1. Osaka Metropolitan University (Japan), 2. OMRON (Japan))

[O13-6-02]
Electric Motor Emulator for Variable-frequency-driven Induction Motor with Stator Interturn Fault
*Koroku Nishizawa[1], Ikuya Sato[1] (1. Fuji Electric Co., Ltd. (Japan))

[O13-6-03]
Four Switches Three Phase Inverter Space Vector Overmodulation Analysis
*Shuo Wang[1], Abraham M Alcaide[2], Giampaolo Buticchi[1], Alberto Castellazzi[3] (1. university of nottingham Ningbo China (China), 2. Universidad de Sevilla (Spain), 3. Kyoto university of advanced science (Japan))

[O13-6-04]
Encoder Power Supply Using Common-Mode Current with a Zero-Phase Inductor and Y-Capacitors
*Takumi Nakagaki[1], Kodai Nisikawa[1], Hiroki Watanabe[1], Jun-ichi Itoh[1], Takeshi Kiribuchi[2] (1. Nagaoka University of Technology (Japan), 2. Omron Coroperation (Japan))

[O13-6-05]
Direct Measurement and Analysis of Iron loss Using the H-coil Method During Low-order Harmonic Current Suppression in PMSMs
*Kaiki Akizuki[1], Toshiyuki Fujita[1], Sakahisa Nagai[1], Hiroshi Fujimoto[1], Michihiro Nakagawa[2], Naoya Yamashita[2], Takayuki Miyajima[2], Yoshiki Yasuda[2], Akio Yamagiwa[2] (1. The University of Tokyo (Japan), 2. DAIKIN INDUSTRIES, Ltd. (Japan))

Technical Sessions: Oral Sessions 13

Room 108 (1F)

[Oral] Semiconductor Power Conversion » Application-oriented power converter and control

[O13-7] Grid-forming Control of Power Converters and Systems
Chairs: Shan Jiang (UNSW Sydney)

[O13-7-01] Invited Paper
A Current-Limiting Strategy for Grid-Forming Converters under Varying Line Reactance-to-Resistance Ratios
*Yian Guo[1], Huizhong Wang[1], Yaohua Li[2], Yi Tang[2] (1. Energy Research Institute @ NTU, Interdisciplinary Graduate Programme, Nanyang Technological University, Singapore (Singapore), 2. School of Electrical and Electronic Engineering , Nanyang Technological University, Singapore (Singapore))

[O13-7-02] Invited Paper
A New Partitioning Method for Renewable Energy Systems in Black-Start Based on Graph Theory
*Lingjun Yao[1], Yi Xiao[1], Yongheng Yang[1], Frede Blaabjerg[2] (1. College of Electrical Engineering, Zhejiang University (China), 2. Department of Energy, Aalborg University (Denmark))

[O13-7-03] Invited Paper
An Improved Voltage Regulation Method for Grid-Forming Converter in Low Voltage Distribution Grids Considering Current Limiting
*Haoyuan Yu[1], Liang Huang[2], Hanwen Zhang[3], Junjie Xiao[1], Fan Yang[1], Hang Ren[2], Zian Qin[1] (1. Delft University of technology (Netherlands), 2. Aalborg University (Denmark), 3. University of Bath (UK))

[O13-7-04] Invited Paper
Power Reference Adjustment Using Current Saturation Ratio to Improve Synchronization Stability of Grid-Forming Converters
*Tianyi Xu[1], Shan Jiang[1], Georgios Konstantinou[1] (1. University of New South Wales (Australia))

[O13-7-05] Invited Paper
Dynamic Output Impedance of Grid-Forming Inverters under Current Limiting
Bowen Yang[1], *Yongheng Yang[2], Gab-Su Seo[1] (1. National Laboratory of the Rockies (USA), 2. Zhejiang University (China))

Hall 1 (2F)

[Oral] Semiconductor Power Conversion

[O13-8] Industry Technology Session in Semiconductor Power Conversion 2
Chairs: Yusuke Hayashi (Toshiba Corporation)
Ruben Inzunza (TMEIC)

[O13-8-01]
Design and Variation Analysis of Wireless PowerTransfer System
Kenichiro Hitosugi[1], *Yudai Funaki[1], Kimiyoshi Kobayashi[1] (1. Shindengen Electric Manufacturing Co., Ltd. (Japan))

[O13-8-02]
A Light Load Control Scheme for Three-Phase Isolated Buck Matrix-type Rectifier with Regenerative Active Snubber
*Tomotaka Nagai[1], Yuki Ishikura[1] (1. Murata Manufacturing Co., Ltd. (Japan))

[O13-8-03]
Evaluation and Efficiency Improvement Strategies of a 1-kV 500-kW Dual-Active-Bridge Converter Using SiC Modules
*Kenshi Nagumo[1], Akira Komuro[1], Yudai Ogata[1], Shuji Tanaka[1], Kei Matsumoto[1], Takushi Jimichi[1] (1. TMEIC Coporation (Japan))

[O13-8-04]
Over 1 MHz opeation Totem-Pole PFC ASIC with next generation Wide Bandgap device GaN
*Yasuo Tom Higuchi[1], Genki Tsuruyama[1], Yuhei Yamaguchi[1] (1. ROHM Co., Ltd. Marketing Headquarters (Japan))

[O13-8-05]
Switching-Node-to-Ground Short Protection Applicable to 48V GaN DC-DC Converters for AI Server Power Systems
*Yuhei Yamaguchi[1], Isao Takobe[2], Genki Tsuruyama[1] (1. ROHM Co., Ltd. Marketing Headquarters (Japan), 2. ROHM Co., Ltd. LSI Development Headquarters (Japan))

Online Session (Online)

[Oral] Semiconductor Power Conversion » Advanced Power conversion topology

[O13-9] Semiconductor Power Conversion
Chairs: Rui Wang (Hunan University)
Kansuke Fujii (Fuji Electric)

[O13-9-01]
Scalable Design and Control of Multiple-Parallel Grid-Forming Converter Static Var Generators
Muhammad Waqas Qaisar[1,2], Jingyang Fang[1,2], *Pengfeng Lin[3], Vladimir Terzija[4] (1. Shenzhen Research Institute of Shandong University, Shandong University (China), 2. School of Control Science and Engineering, Shandong University (China), 3. School of Electrical Engineering, Shanghai Jio Tong University (China), 4. School of Engineering, Newcastle University (UK))

[O13-9-02]
A Parallel Differential Power Processing Scheme with Mismatching Detection
*Xue Wang[1], Qinglei Bu[2], Guansong Shan[2], Liping Wang[1] (1. Suzhou City University (China), 2. Xi'an Jiaotong-Liverpool University (China))

[O13-9-03]
Resonance Characteristic Investigation and External Damping Strategy Analysis of APF System
*Zhilong Zhang[1], Hao Yi[1], Xin Jiang[1], Qiru Li[1], Zebing Yang[1], Fang Zhuo[1], Ruru Zheng[1,2] (1. Xi'an Jiaotong University (China), 2. Yandangshan Institute of Electrical Technology (China))

[O13-9-04]
Generalized Topology Derivation via Graph Theory for Switch-Minimized Hybrid Multilevel Inverters
*Jincheng Huang[1], Mi Dong[1], Liansheng Huang[2], Xiaojiao Chen[2], Xianyong Xu[3], Bokovi Yao[4], Xian Liu[5] (1. Central South University (China), 2. Institute of Plasma Physics, Chinese Academy of Sciences (China), 3. State Grid Hunan Electric Power Company (China), 4. University of Lomé (Togo), 5. Hunan Hangxin Intelligent Technology Co., Ltd. (China))

[O13-9-05]
Reverse Derivation Method for ANPC Inverter Topology Enabling Consistent Operating Modes
*Bohui Dong[1], Mi Dong[1], Jincheng Huang[1], Chenyao Xu[2], Liansheng Huang[3], Xiaojiao Chen[3], Xianyong Xu[4], Bokovi Yao[5], Xian Liu[6] (1. Central South University (China), 2. City University of Hong Kong (Hong Kong), 3. Institute Of Plasma Physics Chinese Academy Of Sciences (China), 4. STATE GRID HUNAN ELECTRIC POWER COMPANY LIMITED (China), 5. University of Lomé (Togo), 6. Hunan Hangxin Intelligent Technology Company Limited (China))

[O7-4-01]
A Low-cost Single-Stage Unidirectional Solid-state Transformer with Mixed-Frequency Conversion
*Zhifeng Deng[1], Jinjun Liu[1], Sixing Du[1], Ning Guo[1], Tong Wu[1] (1. Xi'an Jiaotong University (China))

Poster Sessions

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Poster 1-1 (Event & Exhibition Hall)

[P1-1] Advanced Power conversion topology 1
Chair: Ikuya Sato (Fuji Electric Co., Ltd.)

[P1-1-01] Assessment of Transformer Mismatch in LLC-Based Two-Stage Solid-State Transformers
*Samuel Soares Queiroz[1], João Victor Guimarães França[1], Levy Ferreira Costa[1] (1. Eindhoven University of Technology (Netherlands))

[P1-1-02] Transformerless Dual-Grounded Boost Inverter Featuring Multiplexed Switching and Reactive Grid Support for PV Systems
*hanlei tian tian[1], jie qiu[1], junyu fan[1], peisong han[2], yangyang chen[1], jinliang huang[1], wei han[1] (1. The Hong Kong University of Science and Technology (China), 2. Yanshan University (China))

[P1-1-03] Rapid Control Prototyping of Multi-Phase-Shift Modulation for Dual Active Bridge Converter using dSPACE MicroLabBox II
*Melinya Kamonlaksameekit[1], Satit Owatchaiphong[1], Narong Thumputi[1] (1. KING MONGKUT'S UNIVERSITY OF TECHNOLOGY NORTH BANGKOK (Thailand))

[P1-1-04] Single Input Multi Output Converter Design by Three-Port Network Analysis
*Junho Shin[1], Jung-Ik Ha[1], Jong-Won Shin[1] (1. Seoul National Univ. (Korea))

[P1-1-05] Asymmetric Switched-Capacitor Multilevel Inverter with Reduced Components and Common-Ground Connection
*Jinliang HUANG[1], Hanlei TIAN[1], Bowang ZHANG[1], Wei HAN[1] (1. The Hong Kong University of Science and Technology (Guangzhou) (China))

[P1-1-06] DC Voltage Control of Single-Stage Isolated AC-DC Converter based on Half-bridge DAB Converter with PFC capability
*Hayate Akiyama[1], Takashi Ohno[1], Hiroki Watanabe[1], Jun-ichi Itoh[1] (1. Nagaoka University of technology (Japan))

[P1-1-07] 67 W/cm^3 High Power Density DCX with Capacitive Isolation and Integrated Magnetics for Low-Voltage DC Power Supply
*Keigo Arita[1], Yusuke Hayashi[1] (1. Toshiba (Japan))

[P1-1-08] Voltage and Power Sharing Analysis of an ISOP DC/DC Stage With Fault-Tolerance Capability
*Samuel Soares Queiroz[1], Levy Ferreira Costa[1] (1. Eindhoven University of Technology (Netherlands))

[P1-1-09] A Modulation Strategy for Generating Sinusoidal Output Voltage Under Arbitrary Power Factor Conditions in Flying-Capacitor Linear Amplifiers
*Shunsaku Nomoto[1], Keisuke Kusaka[1] (1. Nagaoka University of Technology (Japan))

[P1-1-11] Synthesis of Hybrid Integrated Multi-Ouptut Converters with Inherent ZVS Operation
*Anubhav Sharma[1], Debjit Rana[1], Santanu Kumar Mishra[1] (1. Indian Institute of Technology, Delhi (India))

[P1-1-12] Virtual Reactance Circuit for Miniaturizing the Grid-Side Inductor Based on Four-Terminal Network Theory
Riki Yamazaki[1], Shunta Hayashi[1], *Keisuke Kusaka[1] (1. Nagaoka University of Technology (Japan))

[P1-1-13] Mixed-sensitivity Based Multi-variable ControllerDesign For Boost integrated Buck-Type Double-Input DC-DC Converter
*Veerachary Mummadi[1], Varun Mishra[1] (1. Indian Institute of Technology Delhi (India))

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Poster 1-1 (Event & Exhibition Hall)

[P1-1-14] Analysis of Neutral Point Clamped Dual Active Bridge Converter Over a Wide Output Voltage Range
*Shashank Santosh Panikkar[1], Florian Floh[1], Markus Makoschitz[1,2], Rupak Chakraborty[2] (1. Chair of Electrical Engineering, Technical University of Leoben (Austria), 2. Power and Renewable Gas Systems, Austrian Institute of Technology (Austria))

Poster 1-2 (Event & Exhibition Hall)

[P1-2] Advanced Power conversion topology 2
Chair: Yoshiya Ohnuma (Nagaoka power Electronics)

[P1-2-01] Multiphase Flyback Converter with Clamping Circuit for Multiple-Output Converter
*Narong Thumputi[1], Satit Owatchaiphong[1] (1. King Mongkut's University of Technology North Bangkok (Thailand))

[P1-2-02] A Half-Bridge Converter with Coupled Inductor for Electric Power Systems in Satellites
*Seongjun Kim[1], Dongmin Choi[1], Kahee Kim[1], Jaeil Baek[1], Gun-Woo Moon[1] (1. KAIST (Korea))

[P1-2-03] Benchmark of Conventional and Center-Tapped Dual Active Bridge Converter
*Suo Matsunaga[1], Queena Qurrota Ayun[1], Isitha Kapugamage[1], Alberto Castellazzi[1] (1. Kyoto University of Advanced Science (Japan))

[P1-2-04] Transient Response of Buck-Boost DC-DC Converter with Large Proportional Gain
Kazuhiro Kajiwara[1], *Koushi Aoki[1], Yudai Furukawa[1], Fujio Kurokawa[1] (1. Nagasaki Institute of Applied Science (Japan))

[P1-2-05] Toroidal Core Transformer based Multiport Power Combiner for RF Plasma Source
*Kuang Shi[1], Ming Liu[1], Shuang Li[1], Wei Liu[1], YongZhi Zhu[1] (1. Shanghai Jiao Tong University (China))

[P1-2-06] Implementation of Bidirectional Buck-Boost Converter using Gallium Nitride Technology
*Kaidsana Boonmepipit[1], Jedsada Jindahom[1], Satit Owatchaiphong[1], Narong Thumputi[1] (1. King Mongkut's University of Technology North Bangkok (Thailand))

[P1-2-07] Experimental Verification of Current Balancing in Parallel MHz WPT Systems Using a Coupled Inductor Pair
*Rintaro Kusui[1], Taiga Osada[1], Hiroki Watanabe[1], Jun-ichi Itoh[1] (1. Nagaoka University of Technology (Japan))

[P1-2-08] Fully Soft Switched Dual Active Bridge Converter for Wide Range of Voltage and Power Applications Using Variable Inductor and SPS Modulation
*Priya Priya[1], Baylon G. Fernandes[1] (1. Indian Institute of Technology, Bombay (India))

[P1-2-09] A Bootstrapped Gate Driver with Integrated LDO for GaN Power Devices
Pang-Jung Liu[1], *Yu-Jie Lin[1], Yu-Hui Hsiao[1], Chang-Jing Yang[2], Wei-Hsiang Chao[2] (1. National Taipei University of Technology (Taiwan), 2. Ancora Semiconductors Inc. (Taiwan))

[P1-2-10] Optimized Morphological Filter for Power Spike Detection
*Yevgen Biletskiy[2], Zhihao Yu[1], Liuchen Chang[2] (1. UNB graduate (Canada), 2. Professor UNB (Canada))

[P1-2-11] Fast Black Start of Grid-Forming Inverters in Multi-Transformer Feeders via Simultaneous Accelerated Soft-Magnetization
*Jiyu Lee[1], Jae-Jung Jung[2], Shenghui Cui[1] (1. Seoul National University (Korea), 2. Kyungpook National University (Korea))

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Poster 1-3 (Event & Exhibition Hall)

[P1-3] Application-oriented power converter and control 1
Chair: Atsushi Nakajima (PandaPower Co., Ltd. / Tokyo Denki Univ.)

[P1-3-01] A novel active compensation based low-frequency power supply for Remanent Flux Elimination
*Haohan Yang[1], Yunqing Pei[1], Lantian Shao[1], Wenhui Pei[1] (1. Xi'an Jiaotong University (China))

[P1-3-02] A Stackable, Industry-Aligned Pathway in Smart Electric Power: Renewable Generation Technology, Distributed Microgrids Engineering, and a Professional Master's in Intelligent Power Systems
*Fredy Martinez[1] (1. Universidad Distrital Francisco Jose de Caldas (Colombia))

[P1-3-03] Performance Evaluation of Low-Pass Filters for D-Σ Direct Digital Control with Capacitor Current Compensation in 3Φ3W Grid-Connected Inverters
Tsai-Fu Wu[1], *Chien-Chih Hung[1], Jui-Yang Chiu[1], Yu-Xian Li[1], Xi-Ming Duan[1] (1. National Tsing Hua University (Taiwan))

[P1-3-04] Analysis and suppression of low frequency circulating current for transformer-coupled parallel rectifiers with common DC bus
*Kaiwen Feng[1], Zipeng Liu[1], Min Wu[1], Jiazhi Wang[1], Jinjun Liu[1] (1. Xi'an Jiaotong University (China))

[P1-3-05] Compensation Method for Current Asymmetry Induced by a DC-link Capacitor at Active 3rd-order Harmonic Injection Rectifier
*Jin Yoo[1], Jisun Ham[1], Shenghui Cui[1] (1. Seoul National University (Korea))

[P2-1-07] Offset-Suppression-Based Current Control for Three-Phase Four-Wire Grid Connected Inverters under Current Measurement Offset Effects
*Yaow-Ming Chen[1], Irham Fadlika[1,2], Wen-Yen Li[1] (1. National Taiwan University, Dept. of Electrical Engineering (Taiwan), 2. State University of Malang (Indonesia))

Poster 1-4 (Event & Exhibition Hall)

[P1-4] Application-oriented power converter and control 2
Chair: Kenta Emori (Nissan Motor Co., Ltd.)

[P1-4-01] An Improved DPWM Method for Single-Phase 3L-NPC Converters in Solid-State Transformers Featuring Enhanced Efficiency and Current Quality
Haiguo Tang[1], Lei Ren[2], *Xing Fang[1], Junzhong Xu[1], Yong Wang[1] (1. Shanghai Jiao Tong University (China), 2. Xiang Dian Electric Manufacturing Group Co.,ltd. (China))

[P1-4-02] A Hybrid Control for Series Half Three-Level CLLC Converter With Minimized RMS Current in Solid State Transformer
Xiong Wang[2], Cheng Yang[2], Lu Bai[2], Xiaobo Zhang[2], Yuanzhen Xu[3], *Chaofan Cui[1], Wei Lv[1] (1. SHANGHAI JIAO TONG UNIVERSITY (China), 2. State Grid Yulin Electric Power Supply Company (China), 3. NR Electric Co., Ltd. (China))

[P1-4-03] Adaptive Voltage Restoration-Based Droop Control Strategy Enabling CC-CV Operation for IPOP xEV Auxiliary Converters
*Mu ho Lee[1], Taek Keun Jung[1], Jong Soo Kim[1] (1. Daejin Univ. (Korea))

[P1-4-04] Control of an Input-Series Output-Parallel Asymmetric Triple Active Bridge for Medium-Voltage DC Renewable Applications
Ahmed Eldistawy[1], Jun-Hyung Jung[1], Endalkachew Degarege Almawu[2], *Nadia Mei Lin Tan[2], Marco Liserre[1,2] (1. Fraunhofer ISIT (Germany), 2. Kiel university (Germany))

[P1-4-05] Interleaved LLC-Converter for a DC-Arc-Plasma Torch
*David Hirning[1], Jörg Haarer[1], Mattea Eckstein[1], Chris Hermann[1], André Haspel[1], Ingmar Kallfass[2], Jörg Roth-Stielow[1] (1. ILEA University of Stuttgart (Germany), 2. ILH University of Stuttgart (Germany))

[P1-4-06] Orthogonally Decoupled Integrated Inductor–Transformer for the DAB Converter
*Camilo Suarez[1], Diego Acevedo[1], Wilmar Martinez[1] (1. KU Leuven (Belgium))

Poster Sessions

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Poster 1-4 (Event & Exhibition Hall)

[P1-4-07] A Natural Power Factor Corrector and Soft Switching Design for AC-DC Single-Stage TAB Converters
Cheng Yang[1], *Mulinsen Zhang[3], Xiong Wang[1], Lu Bai[1], Xiaobo Zhang[1], Shaofei Liu[2], Wer Lyu[3] (1. State Grid Yulin Electric Power Company (China), 2. NR Electric Co., Ltd (China), 3. Shanghai Jiao Tong University (China))

[P1-4-08] Variable Inductor–Variable Capacitor (VIVC) Technique with Parameter Identification for Adaptive WPT Systems
*Po-Yi Chiang[1], Sangmin Lee[2], Ching-Ming Lai[1], Chunting Chris Mi[2] (1. National Chung Hsing University (Taiwan), 2. San Diego State University (USA))

[P1-4-09] Two-Port Network Design for a Double-Sided LC-Compensated Capacitive Wireless Power Transfer with Robustness to Coupling Variation
*Beomsoon Chung[1], Jongun Baek[1], Jong-Won Shin[1] (1. SEOUL NATIONAL UNIVERSITY (Korea))

[P1-4-10] Improving Transient Synchronization Stability and Voltage Support of Grid-Forming Converters Under Grid Faults
Wenlong Zhang[1], Lingling Tan[1], Haixiang Liu[1], *zhenzhen xie[2], Chao Wu[2], Yong Wang[2] (1. SHANDONG ELECTRIC POWER ENGINEERING CONSULTING INSTITUTE CORP.,LTD. (China), 2. Shanghai Jiao Tong University (China))

[P1-4-11] Analysis of Maximum Low-Voltage Ride-Through Support Capability of Grid-Forming Converters
Canyu Li[1], *Jia Liu[1], Jinjun Liu[1] (1. Xi'an Jiaotong University (China))

[P1-4-12] Interoperable Control Method of Three-Phase and Single-Phase Wireless Power Transfer Systems
*Jinwook Jung[1], Sunghyuk Choi[1], Juwon Lee[1], Won Hyo Jeong[1], Minsuk Seo[1], Jung-Ik Ha[1] (1. Seoul National University (Korea))

[P1-4-13] RIFT: Residual-based Iterative Fault Tolerance Algorithm for Reconfigurable Cascaded Multilevel Converters in BESS Applications
*Behrouz Mohammadzadeh[1], Giulia Tresca[1], Andrea Volpini[1], Pericle Zanchetta[1] (1. University of Pavia (Italy))

[P1-4-14] Arm Current Limiting of Grid-Forming Modular Multilevel Converters With Second-Order Harmonic Injection
Ye Zhu[1], *Shan Jiang[2], Georgios Konstantinou[2] (1. ShanghaiTech University (China), 2. UNSW Sydney (Australia))

[P1-4-15] Development of a Course on Resilient Electric Power Engineering
*Alexis Kwasinski[1] (1. University of Pittsburgh (USA))

Poster 1-5 (Event & Exhibition Hall)

[P1-5] Application-oriented power converter and control 3
Chair: Kazuyasu Takimoto (TOSHIBA CORPORATION)

[P1-5-01] LLC Resonant Converter Using Si-IGBT and SiC-MOSFET Hybrid Switches for Low Negawatt Cost Modular AC-DC Solid State Transformer
*Hiroki Nemoto[1], Keigo Arita[1], Yusuke Hayashi[1], Ryosuke Iijima[1] (1. Toshiba Corporation (Japan))

[P1-5-02] Robust Power Converter Health Monitoring via Domain-Specific Foundation Model
*Xinyuan Liao[1], Xinyue Zhang[1], Junwei Liu[1], Chao Wu[2], Yang Wu[3], Yi Zhang[1] (1. The Hong Kong Polytechnic University (Hong Kong), 2. Shanghai Jiaotong University (China), 3. Nanyang Technological University (Singapore))

[P1-5-03] Comparative Study of SiC MOSFETs and Si IGBTs for A Parallel Half-Bridge Modules Based Bidirectional SSCB
Yannal Nawafleh[1], Daixin Chen[1], Baher Abu Sba'[1], Ahmed Ismail[1], Yue Zhao[1], *Xiaoqing Song[1] (1. University of Arkansas (USA))

[P1-5-04] Online Estimation of Battery Resistances in a Battery Integrated Modular Multilevel Converter
*Lars Leister[1], Niklas Katzenburg[1], Phil Neugebauer[1], Lukas Stefanski[1], Marc Hiller[1] (1. Karlsruhe Institute of Technology (Germany))

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Poster 1-5 (Event & Exhibition Hall)

[P1-5-05] NSGA-II-Based Multi-Objective Optimization for Voltage Unbalance Mitigation Using PSDs and SVGs in Low-Voltage Distribution Networks
*Wei Feng[1], Hang Su[2], Zebin Yang[1,3], Zhixiong Li[2], Heng Du[2], Fang Zhuo[1,3], Weifeng Ge[2], Ruru Zheng[3] (1. Xi'an Jiaotong University (China), 2. Junlang Electric Co.,Ltd. (China), 3. Yandangshan Institute of Electrical Technology (China))

[P1-5-06] Design of a Receiving Bi-polar Pad with a Relay Coil for Enhanced Interoperability
*Chang-Su Shin[1], Dong-Hee Kim[1], Minyeong Choe[1] (1. Chonnam National University (Korea))

[P1-5-07] A Study on an Interoperable Wireless Power Transfer System Using a Bipolar Pad
*So Jeong Kang[1], Dong-Hee Kim[1], Seung Jin Jo[1] (1. Chonnam National University (Korea))

[P1-5-08] Parity-Time Symmetric WPT System with Receiver Equivalent Negative Resistance for Stabilizing Output Power Over Long Distances
*Yilin ZHANG[1], Bowang ZHANG[2], Weikang HU[1], Youhao HU[1], Wei HAN[1] (1. The Hong Kong University of Science and Technology (Guangzhou) (China), 2. The Hong Kong University of Science and Technology (Hong Kong))

[P1-5-09] Pareto Optimal DC-Link Capacitor Selection
*Nikolas Förster[1], Sebastian Schachten[2], Oliver Wallscheid[2], Jakub Kucka[1] (1. Paderborn University (Germany), 2. University of Siegen (Germany))

[P1-5-10] Automated Gate-Profile Optimization to Maximize the Potential of Active Gate Drivers
*Kai-Jimmy Shen[1], Clara Yue Feng[1], Laurids Schmitz[1], Rik W De Doncker[1] (1. ISEA - RWTH Aachen University (Germany))

[P1-5-11] Digital Modeling and Optimal Design of DAB Converter for Efficiency Improvement
*Chaochao Song[1], Ning Wang[1], Chen Liu[1], Frede Blaabjerg[1], Pooya Davari[1] (1. AAU Energy, Aalborg University, Denmark (Denmark))

[P1-5-12] Power Leveling Control of H-MMC with Energy Storage System for Variable Frequency Generator
*Hiroki Isoda[1], Hayato Takashima[1], Shin-ichi Hamasaki[1], Tetsuji Daido[1] (1. Nagasaki University (Japan))

[P1-5-13] Fault-Ride-Through Strategy of PEMFC-Based Grid-Forming Converter with Stable Stoichiometric Utilization
*Imbo Kong Kong[1], Euntaek Nam[1], Inchan Hwang[1], Suyong Chae[1] (1. POSTECH (Korea))

[P1-5-14] Ripple Current Mitigation in DC-Link Capacitor for Two-Stage Single-Phase DC-AC Inverters based on Clamping Modulation Scheme
*Geonhu Park[1], Juyeon Lee[1], June-Seok Lee[1] (1. Dankook University (Korea))

[P1-5-15] Enhanced Dead-Time Compensation Method for Reducing Impacts of Current Polarity Detection Inaccuracy in 3-Level Hybrid ANPC Inverter
*Joonhyung Kim[1], Juyeon Lee[1], June-Seok Lee[1] (1. Dankook University (Korea))

Poster 1-6 (Event & Exhibition Hall)

[P1-6] Industrial Instrumentation and Control
Chair: Wataru Ohnishi (The University of Tokyo)

[P1-6-01] Adaptive Positive/Negative Sequence Current Extraction Using an MPC-Cascaded Kalman Filter Under Unbalanced Three-Phase Conditions
*ZHENGWEI DONG[1], Zhi Chen[2], Yifan Shi, Liwei Zhou[1] (1. University of Texas at Arlington (USA), 2. Nanyang Technological University (Singapore))

[P1-6-02] Interface artificial intelligence models to tertiary controllers: A GoogleNet-Fuzzy logic framework
*Jingxuan Wu[1], Shuting Li[1], Saeed Peyghami[1], Frede Blaabjerg[1] (1. Aalborg University (Denmark))

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Poster 1-6 (Event & Exhibition Hall)

[P1-6-03] Online Fault Diagnosis and Fault-Tolerant Operation of Power-Electronic Converters Using a Multi-Scale Convolutional Neural Network With Model Predictive Control
*Ning Li[1], Stephen Finney[1], Paul D. Judge[1] (1. University of Edinburgh (UK))

[P1-6-04] Scalable Modelling and Optimisation Framework based on Common Potential for Lattice Modular Converters
*Xinyun Zhang[1], Michael Merlin[1] (1. The University of Edinburgh (UK))

[P1-6-05] Neural-Network-Based Predictive Control for LLC Converters
*Qingcheng SUI[1], Yu ZUO[1], Yang LI[1], Wilmar MARTINEZ[1] (1. EnergyVille - KU Leuven (Belgium))

[P1-6-06] Modeling of FRA-Based Loop Transfer Characteristic Measurement System for SMPSs' Stability Evaluation
*Hideaki Funaki[1], Yushi Miura[1] (1. Nagaoka University of Technology (Japan))

[P1-6-07] Inertia Measurement Using Active Power Reference Step for Grid-Supporting Inverters
*Shuhei Kadota[1], Hideaki Funaki[1], Yushi Miura[1] (1. Nagaoka University of Technology (Japan))

[P1-6-09] Dynamic Characteristics Improvement of PMD Battery Charger with Fuzzy Logic Control
*Gijeong Yoon[1], Sungjoon Cho[2], Yeongsu Bak[1] (1. Keimyung University (Korea), 2. Daegu University (Korea))

[P1-6-10] Design of 2-DOF controller using convolution-based data-driven simulation
*Teppei Yamada[1], Fujimoto Yasutaka[1] (1. Yokohama National Univ. (Japan))

[P1-6-11] Adaptive Differentiable Predictive Control for Parameter-Varying Power Electronic Systems
*YUAN LI[1], Shuai Zhao[1], Mateja Novak[1], Huai Wang[1], Frede Blaabjerg[1] (1. Aalborg University (Denmark))

[P1-6-12] Digital Twin-Based Quality Inspection of Starter Motor Power Transmission Modules
Qi-You Huang[1], Zhong-Han Tsai[2], *Wei-Che Lin[1], Mi-Ching Tsai[1,2] (1. Electric Motor Technology Research Center, National Cheng Kung University (Taiwan), 2. Department of Mechanical Engineering, National Cheng Kung University (Taiwan))

[P1-6-13] Application of Autonomous Mobile Robots with Visual Guidance, Energy-Saving Navigation, and Electric Lifting Devices in the Smart Industry
*Ming-Yen Wei[1], Po-Hsien Wu[1] (1. Department of Electrical Engineering, National Formosa University (Taiwan))

[P1-6-14] Adaptive Barrier Function-based Nonsingular Terminal Sliding Mode Control for Wireless Motor System
*YOUHAO HU[1], BOWANG ZHANG[2], WEIKANG HU[2], JUNRUI LIU[1], WEI HAN[1] (1. The Hong Kong University of Science and Technology (Guangzhou) (China), 2. The Hong Kong University of Science and Technology (Hong Kong))

[P1-6-15] Broadband Control for Virtual Impedance Circuits Based on a Model-Matching Approach
*Kazutada Yamashita[1], Keita Ohata[1], Keisuke Kusaka[1], Kodai Nishikawa[1], Hiroki Watanabe[1], Jun-ichi Itoh[1] (1. Nagaoka University of Technology (Japan))

[P1-6-16] Deadbeat Positioning Control Based on PWM Hold
*Tamon Miyauchi[1], Qige Chen[1], Jun Ishikawa[1] (1. Tokyo Denki Univercity (Japan))

[P1-6-17] A Novel Resonance Suppression method for LCL-Type Grid-Connected Inverters Based on Model Predictive Control
*Kaiwen Feng[1], Huilin Xu[2], Zipeng Liu[1], Jiazhi Wang[1], Jiang Liu[2], Jinjun Liu[1] (1. Xi'an Jiaotong University (China), 2. Xi'an University Of Science And Technology (China))

[P1-6-18] A High-Bandwidth Single-Turn Pickup Coil Current Sensor
*Haonan Jiang[1,2], Shuzhen You[1,2], Longyang Yu[1,2], Wei Mu[3], Shenglei Zhao[1,2], Yue Hao[1,2], Jincheng Zhang[1,2] (1. Xidian University (China), 2. Guangzhou institute of technology, Xidian Univerisity (China), 3. Department of Engineering, University of Cambridge (UK))

Poster Sessions

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Poster 1-7 (Event & Exhibition Hall)

[P1-7] Rotating Electrical Machines 1
Chair: Yasuhito Takahashi (Doshisha University)

[P1-7-01] Design and Optimization of High-Speed IPMSM Stators Using Fe-Co Electrical Steel for Enhanced Power Density in Aerospace Propulsion
*DAEYEONG JI[1], DONGWOO LEE[2], JAEHWAN LEE[2], HOJOON LEE[1] (1. Dankook University (Korea), 2. Cheongju University (Korea))

[P1-7-02] An Integrated Design Approach for Power Factor and Efficiency Enhancement in PM Vernier Machines Using Hybrid Stator with Magnetic End Caps
*Po-Wei Huang[1,2], Tsung-Wei Chang[3], Shen-Han Jian[2], I-Hua Jiang[2], Mi-Ching Tsai[1,2] (1. Department of Mechanical Engineering, National Cheng Kung University (Taiwan), 2. Electric Motor Technology Research Center, National Cheng Kung University (Taiwan), 3. Department of Vehicle Engineering, National Kaohsiung University of Science and Technology (Taiwan))

[P1-7-03] Comparative Study of PM Synchronous Machine and PM Vernier Machine for eVTOL Applications
*Ziang Wang[1,2], Dawei Li[1,2], Yu Zhao[1,2], Ronghai Qu[1,2] (1. State Key Laboratory of High-Density Electric Energy Conversion (China), 2. School of Electrical and Electronic Engineering Huazhong University of Science & Technology (China))

[P1-7-04] Data-Driven Bayesian Inference for High-Fidelity Material Property Characterization in Electrical Machines
*Marc Ramos Friedmann[1], Calina Ciuhu[1], Doga Ceylan[1], Marko Merdzan[1], Elena Lomonova[1] (1. Eindhoven University of Technology (Netherlands))

[P1-7-05] Study on Increasing Power Density of Motor for Large Drones
*Satoru Ota[1], Kazuma Hikida[1], Takashi Okitsu[1], Masatsugu Takemoto[2], Ren Tsunata[2] (1. Power Electronics & Drive Systems Research Dept., Advanced Technology Research Laboratories, Research & Development Group, MEIDENSHA CORPORATION (Japan), 2. Graduate School of Environmental, Life, Natural Science and Technology, Okayama University, Okayama (Japan))

[P1-7-06] Study on Magnet Eddy Current Loss Reduction by Applying Copper Foil around the Magnets in Interior Permanent Magnet Synchronous Motors
*Junji Kitao[1], Takahiro Mizuta[1] (1. Mitsubishi Electric Corporation (Japan))

[P1-7-07] Speed Oscillation Damping Algorithm for I-F Speed Control of Synchronous Motors
*Yerim Shim[1], Dongyeob Han[2], Jaeyong Kim[2], Sungmin Kim[2] (1. Hyundai Elevator (Korea), 2. Hanyang university ERICA campus (Korea))

[P1-7-08] Geometry Optimization of Brushless Permanent Magnet Synchronous Machines for Household Appliances
*Nejat Saed[1], Klaus Krischan[1], Annette Muetze[1] (1. Graz University of Technology (Austria))

[P1-7-09] Methods for Calculating and Reducing Surge Voltages Caused by Recovery Currents of Diodes Connected to Synchronous Generators
*Daisuke Kori[1], Takayuki Koyama[2], Hiroyuki Sato[2], Shuhei Sato[2] (1. Hitachi,Ltd Research Department (Japan), 2. Hitachi Industrial Products, Ltd (Japan))

[P1-7-10] Controllability-Oriented Design Method of Electrically-Excited Synchronous Machines in Pumped-Storage Hydropower Plants
*Seyedali Seyedbouzari[1], Annette Muetze[1], Johann Peter Bacher[1], Boštjan Polajžer[2] (1. Graz University of Technology (Austria), 2. University of Maribor (Slovenia))

[P1-7-11] Torque Ripple Reduction Mechanism of Flux Barrier in Synchronous Reluctance Motor
*Yuki Hidaka[1], Kazumasa Ide[2] (1. Ritsumeikan University (Japan), 2. Nagoya University (Japan))

[P1-7-12] Torque Ripple Optimized Design of a Synchronous Reluctance Machine with Concentrated Windings
*Mario Nikowitz[1], Manfred Schrödl[1] (1. TU Wien (Austria))

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[P1-7-13] Step-out Suppression using External Impedance for Motor-generator set Driven Synchronous Reluctance Motors in Equivalent Load Testing
*Yamamoto Shunsuke[1], Yuki Hidaka[2], Takumi Murakami[2], Fumiya Koga[3], Sunao Wakasugi[3], Masatsugu Oyamada[3] (1. Nagaoka University of Technology (Japan), 2. Ritsumeikan University (Japan), 3. TMEIC Corporation (Japan))

[P1-7-14] Comparative Evaluation of Rotor Segmentation Strategies for Eddy-Current Loss Reduction in Additively Manufactured Multi-Material Synchronous Reluctance Rotors
*Siddique Akbar[1], Amir Ebrahimi[3], Bernd Ponick[2] (1. Profluxx GmbH (Germany), 2. Institute for Drive Systems and Power Electronics (Germany), 3. Institute for Electrical Drives, Power Electronics and Components (Germany))

Poster 1-8 (Event & Exhibition Hall)

[P1-8] Controls and Drives of Electric Machines 1
Chair: Hiroki Ishikawa (Gifu University)

[P1-8-01] Impact of Inverter Nonlinearities and Stator Coupling on Flux Observation in Triple-Stator Induction Machine
Abdulrahman Ali M Alharbi[1], Shafiq Odhano[1], *Saleh Ali[1], Volker Pickert[1], Fajer Alelaj[2] (1. Newcastle University (UK), 2. Kuwait Institute for Scientific Research (UK))

[P1-8-02] Predefined-Time Adaptive Dynamic Programming and Fractional-Order Sliding Mode Control for Loss Optimization in Flywheel Energy Storage Systems
*Xue Wang[1], Yuting Gao[1], Takashi Kosaka[2] (1. Wuhan University (China), 2. Nagoya Institute of Technology (Japan))

[P1-8-03] Direct Instantaneous Torque Control of Switched Reluctance Motor Using T-Type Three-Phase Four-Leg Converter
*Dexu Lv[1], Wen Ding[1], Zhuobo Dong[1], Zhanyuan Su[1], Da Wang[1] (1. Xi'an Jiaotong University (China))

[P1-8-04] Quasi-adaptive speed control of a PMSM using the Gain Scheduling technique
*Tomasz Pajchrowski[1], Jerzy Zawieja[1] (1. Poznan University of Technology (Poland))

[P1-8-05] A Start-up Method for a Synchronous Reluctance Generator in Islanded Operation
*Tetsuji Daido[1], Yuya Kanda[1], Arashi Yoshioka[1], Shin-ichi Hamasaki[1] (1. Nagasaki University (Japan))

[P1-8-06] Sensorless Position Control for PMSMs at Low Speeds Using a Single-Shunt Current Sensor
*Hibiki Tamiya[1], Yoshitaka Iwaji[1] (1. Ibaraki University (Japan))

[P1-8-07] Controller-Hardware-in-the-Loop Investigations for a Partly Superconducting Medium-Speed Wind Turbine Generator Prototype
*Nick Thönelt[1], Benedikt Schmitz-Rode[1], Nils Rickertsen[1], Lukas Stefanski[1], Marc Hiller[1] (1. Karlsruhe Institute of Technology (Germany))

[P1-8-08] Capacitance Reduction Method for Smoothing Capacitors in Motor Drive Inverter Circuits
*Fuma Saruta[1], Yoshitaka Iwaji[2] (1. Graduate School of Science and Engineering, Ibaraki Univ. (Electrical & Electronic) (Japan), 2. Ibaraki University, Graduate School of Science and Engineering (Electrical & Electronic) (Japan))

[P1-8-09] A Novel Fault-Tolerant Control Approach for a Six-Phase Motor Drive Under Open-Circuit Faults
*Germán Fañanás-Puigjaner[1], Sergio Busquets-Monge[1], Gabriel Garcia-Rojas[1], Fabio Bernardi[2], Davide Barater[2], Àlber Filbà-Martínez[3] (1. Universitat Politècnica de Catalunya (Spain), 2. University of Modena and Reggio Emilia (Italy), 3. Catalonia Institute for Energy Research (Spain))

[P1-8-10] Admittance Shaping Control for Reduced DC-Link Capacitance IPMSM Drives
*Ko OUE[1], Nami FUNAMOTO[1], Nobuo HAYASHI[1], Masaki KONO[1], Takayuki MIYAJIMA[1], Kazuya TSUBOUCHI[1] (1. DAIKIN Industries (Japan))

[P1-8-11] MTPA Control between Different Pole Numbers during Pole Change in Multiphase IM Drive System
*Taito Matsumoto[1], Shinji Doki[1], Hirotaka Kato[2], Jun-ichi Itoh[2], Masashi Kobayashi[3] (1. Nagoya University (Japan), 2. Nagaoka University of Technology (Japan), 3. Toyota Motor Corporation (Japan))

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[P1-8-12] Real-Time DC-Link Capacitor Stress Reduction in Two-Level Three-Phase Inverters Using Adaptive Multi-Carrier PWM Method
*Enes Ayaz[1], Shahriar Sarmast Ghahfarokhi[1], Staffan Norrga[1], Hans-Peter Nee[1] (1. KTH royal institute of technology (Sweden))

[P1-8-13] Fault-Tolerant Control of a Nine-Phase Permanent Magnet Synchronous Machine Using an Adapted Vector Space Decomposition Matrix
*Michael Mangels[1], Michael Ebnicher[1], Jörg Kammermann[1], Hans-Georg Herzog[1] (1. Technical University of Munich, TUM School of Engineering and Design, Professorship of Energy Conversion Technology (Germany))

[P1-8-14] Comprehensive Analysis of Bearing Stress Reduction with Modulation and Output Filters
*Minchul Kim[1], Younghoon Cho[1] (1. Konkuk Univ. (Korea))

[P1-8-15] Design of the Voltage Feedback Flux Weakening Controller for PMSM Based on Small Signal Voltage Model
*Jaeyong Kim[1], Dongyeob Han[1], Yerim Shim[1], Sungmin Kim[1] (1. Hanyang University ERICA Campus (Korea))

[P1-8-16] MTPA Angle Search Method Using Virtual Signal Injection with Inductance Identification
*Taishi Arai[1], Sari Maekawa[1], Sho Shibata[2], Shizunori Hamada[2] (1. Meiji University (Japan), 2. MEIDENSHA CORPORATION (Japan))

Poster 1-9 (Event & Exhibition Hall)

[P1-9] Sensorless Control and Model Predictive Control
Chair: Motoki Sato (ToyodenkiSeizo K.K.)

[P1-9-01] Study of Initial Speed Estimation for Induction Motors with Speed Sensorless Control Utilizing Cross-Coupling between *d-q* Axes
*Yuto Suzuki[1], Yoshitaka Iwaji[1], Naoki Kunihiro[2], Takashi Kaneko[2] (1. Ibaraki Univ. (Japan), 2. Hitachi, Ltd. (Japan))

[P1-9-02] Impact of Speed and Position Estimation Errors on Sensorless PMSM Drive Dynamic Performance
*Rui Cai[1], Kaiyuan Lu[1], Shuai Zhao[1], Dong Wang[2] (1. Aalborg Univ. (Denmark), 2. Sichuan Univ. (China))

[P1-9-03] Sensorless Model Predictive Flux Control of a Five-Phase Induction Machine
Hammad Hasan[1], Omar Al Zaabi[1], *Abdul R. Beig[1] (1. Khalifa University (United Arab Emirates))

[P1-9-04] ANN-based Sensorless Control Method for Estimating Rotor Speed and Position of PMSM
*Gyuri Kim[1], Junhyeok Choi[1], Yeongsu Bak[1] (1. Keimyung University (Korea))

[P1-9-05] Sensorless Vector Control of a Concentrated-Winding SPMSM Using 1/3N Carrier Frequency Components
*KOTARO KYONO[1], Hisao Kubota[1] (1. Meiji university (Japan))

[P1-9-06] MPC-Based Direct Torque Control in the abc Frame for Induction Motors
Kaif Ahmed Lodi[1], Abdul R Beig[1], *Majid Poshtan[2], Apparao Dekka[3] (1. Khalifa University (United Arab Emirates), 2. California Polytechnic State University (USA), 3. Lakehead University (Canada))

[P1-9-07] Multistep Direct Model Predictive Control for Current Source Inverter fed Permanent Magnet Synchronous Motor Drives
*Andrés Carvajal[1], Annette Muetze[1] (1. Graz University of Technology (Austria))

[P1-9-08] Comparison of Position Sensorless IPMSM Drive Using RFVC DTC in Experiments
*Akimasa Kikunaga[1], Atsushi Shinohara[1], Kichiro Yamamoto[1] (1. Kagoshima University (Japan))

[P1-9-09] Sensorless Control of SPMSM at Low Speeds Using High-Frequency Voltage Injection Based on Magnetic Saturation Induced by d-Axis Current
*Kaito Kikuchi[1], Sari Maekawa[1], Yura Satoshi[2] (1. Meiji University (Japan), 2. TOYODA GOSEI CO., LTD. (Japan))

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Poster 1-9 (Event & Exhibition Hall)

[P1-9-10] MRAS-Based Speed Sensorless Control of PMSM Enhanced by Ultrasonic Cuttlefish Optimization
Jinlun Liu, Mianzhi Wu[1], *Zirui Zhuang (1. University of Pennsylvania (USA))

[P1-9-11] Effect of BPF Dynamics on Stability of High-Frequency Signal-Injection Sensorless Control
*Hyeonseok Shin[1], Jiwon Yoo[1] (1. Inha University (Korea))

[P1-9-12] Robust Simplified Sensorless Control for Synchronous Reluctance Motors Under Magnetic Saturation
*Hinako Teranishi[1], Sari Maekawa[1], Hiroaki Ueta[2], Koroku Nishizawa[2], Satoru Fujita[2], Ikuya Sato[2] (1. Meiji University (Japan), 2. FUJI ELECTRIC CO., LTD. (Japan))

Poster 1-10 (Event & Exhibition Hall)

[P1-10] Vehicle Electrification-related Technologies 1
Chair: Yuki Okuda

[P1-10-01] Solid-State Circuit Breaker Design for High-Available DC/DC Converters in Automated Electric Vehicles
*Shouzheng Wang[1,2], Christian Winter[3], David Cello[1] (1. Esslingen University (Germany), 2. University of Stuttgart (Germany), 3. Robert Bosch GmbH (Germany))

[P1-10-02] Acquisition of EIS Without DC-Side Sensors Based on Inverter and Current Reconstruction
*ding luo[1], dong jiang[1], min zhou[1], tao cai[1], yang cao[1] (1. Hust Univ (China))

[P1-10-03] Motor Performance Allocation Method for 2-in-1 Motor Drive System to Improve Electric Vehicle Driving Efficiency
*Yuki Nishimura[1], Yoshihiro Miyama[1], Kan Akatsu[2] (1. Mitsubishi Electric Corporation (Japan), 2. Yokohama National University (Japan))

[P1-10-04] Design and Experimental Validation of a 30kW Three-Level Vienna Recrifier for High-Efficiency EV Fast Charging
*Won-Jun Jung[2], Sang-Hyeok Lee[2], Young-Dal Lee[1], Yu-Jin Choi[1], Eun-Song Oh[1], Seo-Woo Yun[1] (1. Chonnam National University (Korea), 2. KETI (Korea))

[P1-10-05] Conceptualization and Evaluation of DC link Cooling for a 6-phase 500-kW Inverter with Respect to Life Time
*Artem Rodionov[1], Jedsada Yodwong[1], Sebastiaan De Boodt[2], Yujing Liu[1] (1. Chalmers University of Technology (Sweden), 2. Rogers Corporation (Belgium))

[P1-10-06] A Low-Cost Scalable Coupled Inductor Topology for High-Speed Active Balancing of Battery Modules
*Hourong Song[1], Branislav Hredzak[1], Hang Zhou[1], Yuxin Yang[1], John Fletcher[1], Rui Li[2] (1. The University of New South Wales (Australia), 2. Shanghai Jiao Tong University (China))

[P1-10-07] High-accuracy Lithium-ion Battery State of Health Estimation using Limited Data in Electric Vehicle Applications
*Shiv Shankar Sinha[1], Pinki Saini[1], Pallavi Bharadwaj[1] (1. Indian Institute of Technology Gandhinagar (India))

[P1-10-08] A Modular Multilevel Converter-based Inductive Coupler for High Voltage MW-scale Offshore Charging Applications
*Giuseppe Guidi[1], Jon Are Suul[1,2] (1. Sintef (Norway), 2. Dept. of Engineering Cybernetics, NTNU (Norway))

[P1-10-09] Robust Control Strategy for EV Charging Focusing on DC/DC Stage of Integrated Onboard Chargers
Nattapon Somboonpanya[1,3], Lotfi Baghli[3], Ehsan Jamshidpour[3], Matheepot Phattanasak[2], *Surin Khomfoi[1] (1. Department of Electrical Engineering, School of Engineering, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand (Thailand), 2. Department of Teacher Training in Electrical Engineering Faculty of Technical Education King Mongkut's University of Technology North Bangkok, Bangkok, Thailand (Thailand), 3. Université de Lorraine - GREEN, France (France))

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Poster 1-10 (Event & Exhibition Hall)

[P1-10-10] Comparison of V2L Dynamic Performance: Interleaved totem-pole based Single-stage vs. Two-Stage OBC
Quy Ngoc Do[1], *Thong Van Minh Ta[1], Sewan Choi[1] (1. Seoul National University of Science&Technology (Korea))

[P1-10-11] Development of a Lithium-Ion Battery Self-Heating System for Low-Temperature Operation Using a Multi-Software Simulation Platform
Sheng-Chieh Chang[1], Guan-Hao Su[1], *Yu-Shan Cheng[1], Zong-Zhen Yang[2], Yi-Hua Liu[2] (1. National Taiwan Ocean University (Taiwan), 2. National Taiwan University of Science and Technology (Taiwan))

[P1-10-12] Unified Current Limiter-Breaker for Medium-Voltage DC Buses in All-Electric Aircraft
Adil Ayub Sheikh[1], Dong-Choon Lee[1], *Saeed Peyghami[2], Frede Blaabjerg[2] (1. Yeungnam University, South Korea (Korea), 2. Aalborg University, Denmark (Denmark))

[P1-10-14] Revisiting Z-Score Analysis: A Simple yet Effective Approach for Cross-Chemistry Detection of Abnormal Cells in Lithium-Ion Batteries
*Shinichi Domae[1], Alberto Castellazzi[1] (1. Kyoto University of Advanced Science (Japan))

[P1-10-15] A Four-Quadrant Current-Fed DAB-based Partial Power Converter for EV Ultra-Fast Charging
*Aabid Ahmad Dar[1], Vishnu Mahadeva Iyer[1], Vinod John[1] (1. Indian Institute of Science (India))

Poster 1-11 (Event & Exhibition Hall)

[P1-11] Application of Power Electronics in Electric Railway and Related Public Transportation 4
Chair: Ken Kunomura

[P1-11-01] Modeling and Suppression of Circulating Currents in Parallel Inverters Considering Switching Frequency Discrepancies
*Genglun Song[1], Shubao Li[1], Yufei Liang[2], Zinan Lou[1], Yaozhi Zhao[3], Yongda Wu[3], Lei Xie[3], Yaoqin Jia[1], Yan Zhang[1] (1. Xi'an Jiaotong University (China), 2. Xi'an University of Technology (China), 3. Nanjing Electronic Devices Institute (China))

[P1-11-02] Expanding the Capabilities of Electric Railway DC Systems Using the Modular Bridge Rectifier
*Sebastian Rivera[1], Julian Rojas[1], Felipe Calderon-Rivera[1], Pavol Bauer[1] (1. Delft University of Technology (Netherlands))

[P1-11-03] Installation and Evaluation of a Real-Time Condition Monitoring System for Propulsion Inverters in Commercial Rolling Stock
*Kazuki Fujimoto[1], Kazunori Hasegawa[3], Shoichiro Watanabe[2] (1. TOYO DENKI SEIZO K.K. (Japan), 2. Tokyo Denki University (Japan), 3. Kyushu Institute of Technology (Japan))

Poster 1-12 (Event & Exhibition Hall)

[P1-12] Advanced Power conversion topology 3
Chair: Ruben Inzunza (TMEIC)

[P1-12-01] A Five-Level Switched-Midpoint Boost Inverter with Extended Voltage Gain
*Sze Sing Lee[1], Andy Chua[1], Anurag Sharma[1], Mohamed Dahidah[2], Kuan Tak Tan[3] (1. Newcastle University in Singapore (Singapore), 2. Newcastle University (UK), 3. Singapore Institute of Technology (Singapore))

[P1-12-02] Highly Integrated DC-DC Converter Eliminating Output Current Ripple for Green Hydrogen Production
*Daniel Baggen[1], Niklas Fritz[1], Tianlong B. Albert[1], Rik W. De Doncker[1] (1. ISEA RWTH Aachen University (Germany))

[P1-12-03] Gate Driver for Multi-Level Power Converter
*Hideo Pratama[1], Cheng-Syun Lee[1], Yao-Ching Hsieh[1] (1. National Sun Yat-sen University (Taiwan))

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Poster 1-12 (Event & Exhibition Hall)

[P1-12-04] Interleaved Hybrid Flyback-Forward Converter with Double Step-down Voltage and Natural Current Sharing
*Van Dai Bui[1], Jonas Andresen[1], Andreas Stybe Petersen[1], Bima Nugraha Sanusi[1], Ziwei Ouyang[1] (1. Technical University of Denmark (Denmark))

[P1-12-05] Multi-objective Optimization Framework for DC–DC Converters Using Genetic Algorithms
*Minsung Kang[1], Itsuki Masuda[1], Sihoon Choi[2], Koichi Shigematsu[2], Jun Imaoka[2], Masayoshi Yamamoto[2] (1. Nagoya University (Japan), 2. Institute of Materials and Systems for Sustainability (IMass), Nagoya University (Japan))

[P1-12-06] Control and Loss Optimization of the HiLEM Topology - a PV Partial Power Converter
*Marcus Becker[1], Lukas Stefanski[1], Marc Hiller[1] (1. Karlsruhe Institute of Technology (Germany))

[P1-12-07] Switching Performance and Loss Analysis of SiC/Si-Hybrid Sparse NPC Inverters
*Simon Quergfelder[1], Julian Sax[1], Thomas Heckel[1], Thomas Menrath[1], Bernd Eckardt[1], Martin März[2,1] (1. Fraunhofer Institute for Integrated Systems and Device Technology (Germany), 2. Chair of Power Electronics, Friedrich-Alexander University (Germany))

[P1-12-08] Control System Development of Medium-Voltage Modularized-Bridge-Rectifier Solid-State Transformer with RT-HIL Validation
*Zhenchao Li[1], Drazen Dujic[1] (1. EPFL (Switzerland))

[P1-12-09] Experimental Verification of a Single-Stage Isolated AC–DC Converter with Bidirectional GaN Switches
*Naoto Izumoto[1], Takahiro Ohori[1] (1. Panasonic Electric Works Co., Ltd. (Japan))

[P1-12-11] A ZVS-PWM Resonant Step Up/Down DC/AC Converter
Chien-Ming Wang[1], Yu-Zhe Lee[1], Tzu-Yuan Lan[1], *Sheng-Feng Lee[1], Chen-Hsiang Fan[1] (1. National Ilan University (Taiwan))

[P1-12-12] A New DC-DC Converter with Enhanced CM Noise Characteristics and Capacitive Isolation
*Minseok Park[1], Jong-Won Shin[1] (1. Seoul National University (Korea))

[P1-12-13] Design of Active-Clamp Push-Pull Converter with Decoupled Transformer for Low Conduction Loss
*Youngrok An[1], Junho Shin[1], Donghan Seo[1], Jong-Won Shin[1] (1. Seoul Nationl Univ. (Korea))

[P1-12-14] Operating Characteristics of Primary Side Two Phase Active Clamp Forward Converter for Wide Input Voltage Range
Atsushi Fujii[1], *Motoki Sumii[1], Seiya Abe[1] (1. Kyusyu Institute of Technology (Japan))

[P1-12-15] Design and Implementation of Bidirectional Three-Level Neutral-Point-Clamped Full-Bridge CLLLC Resonant Converter
Yu-Sheng Wu[1], Tsorng-Juu Liang[1], Kai-Hui Chen[1], Wei-Chiang Kuo[1], *Ching-Feng Liu[1], Yi-Shin Chen[1] (1. National Cheng Kung University (Taiwan))

[P1-12-16] A Nonredundant Topology Derivation Method Based on Graph and Number Theory for Quadratic DC-DC Converters
*Xinghao Zhao[1], Mi Dong[1], Hongsheng He[1], Yunhao Sui[1], Liansheng Huang[2], Xiaojiao Chen[2], Xianyong Xu[3], Bokovi Yao[4], Xian Liu[5] (1. Central South University (China), 2. Institute of Plasma Physics, Chinese Academy of Sciences (China), 3. State Grid Hunan Electric Power Company (China), 4. University of Lomé (Togo), 5. Hunan Hangxin Intelligent Technology Co.. Ltd. (China))

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Poster 1-13 (Event & Exhibition Hall)

[P1-13] Application-oriented power converter and control 4
Chair: Shin-ichi Hamasaki (Nagasaki University)

[P1-13-02] A General and Efficient Method of Filter Structure Selection and Parameter Optimization Design for Grid-Connected Inverters
*Yuxi Cai[1], Haoran Ling[1], Wei Zhang[1], Zhigao Cui[1], Aihua Li[1], Ronghui An[2] (1. Rocket Force University of Engineering (China), 2. Xi'an Jiaotong University (China))

[P1-13-03] Underwater Wireless Power Transfer Using Cylindrical Spiral Coils with LLC-S Resonant Topology
*Yong-Dong Chang[1], Hao Kai Chang[1] (1. National Penghu University of Science and Technology (Taiwan))

[P1-13-04] An Improved Modulation Strategy for Full ZVS of Single-Stage Magnetically Integrated Interleaved Totem-Pole AC-DC Converter
*Wenjie Du[1], Wenjie Chen[1], Chufan Zhou[1], Jianxiang Chen[1], Hanjie Qi[1], Xu Yang[1] (1. School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, China (China))

[P1-13-05] An Improved Inductor-Transformer Magnetic Integration Structure for a Single-Stage Bidirectional AC-DC Converter
*Chufan Zhou[1], Wenjie Chen[1], Wenjie Du[1], Hanjie Qi[1], Jianxiang Chen[1], Xu Yang[1] (1. Xi'an Jiaotong University (China))

[P1-13-06] Enhancing Stability of Multiple Parallel-Connected MMCs through Reactive Power Circulation
Mandy Shi[1], Ye Zhu[2], *Georgios Konstantinou[1] (1. UNSW Sydney (Australia), 2. ShanghaiTech University (China))

[P1-13-07] Secure FSK-Based Talkative Power Conversion in DC-DC Converters with Embedded AES
Hwa-Pyeong Park[1], *Geun-Ho Yoon[1], Wan Kim[1] (1. Korea Institute of Energy Technology (Korea))

[P1-13-08] High Resolution Online Battery Impedance Measurement via ILP-Optimized Switching Frequency Selection
Hwa-Pyeong Park[1], *Jia Hong[1], Wan Kim[1] (1. Korea Institute of Energy Technology (Korea))

[P1-13-09] Application of Parity–Time Symmetry to Dynamic Wireless Power Transfer for Constant Voltage Load
*Yuya Deguchi[1], Aoi Oyane[1], Hiroshi Fujimoto[1] (1. The University of Tokyo (Japan))

[P1-13-10] A Unified Voltage Loop with Neutral-Point Auxiliary Control for Three-Level Buck Converter
*Jun-Hyeong Kwon[1], Hyeon-Uk Go[1], Min-Seong Kim[1], Sang-Kil Lim[2], Seong-Mi Park[3], Yipei Wang[4], Sung-Jun Park[1] (1. Department of Electrical Engineering Chonnam National University Gwangju, South Korea (Korea), 2. Department of Electronic Engineering, Chosun University Gwangju, South Korea (Korea), 3. Department of Lift Engineering, Korea Lift College, Gyeongsangnam-do, South Korea (Korea), 4. Institute of Automation, Qilu University of Technology (Shandong Academy of Sciences), Jinan 250014, China (China))

[P1-13-11] Revisiting Grid-Forming and Grid-Following Converter Stability via Subsystem Interaction
*Jin Wang[1], Mebtu Bihonegn Beza[1], Anant Narula[1], Massimo Bongiorno[1], Jan R. Svensson[2] (1. Department of Electrical Engineering, Chalmers University of Technology (Sweden), 2. Hitachi Energy Research (Sweden))

[P1-13-12] Burst-Mode Operation of ZVS GaN Half-Bridge for Low-Current Capacitor-Charging and Increased Electrocaloric Heat Pump System Efficiency
*Adrian Söllner[1], Sakyo Hirose[2], Stefan Mönch[1] (1. University Stuttgart (Germany), 2. Murata Manufacturing Co., Ltd. (Japan))

[P1-13-13] Design and Optimization of a 1500-V, 150-kHz All Silicon Carbide Modular Power Stage for Solid-State Transformer Applications
Baher Abu Sba[1], Ahmed Ismail[1], Eric Allee[1], Hui Cao[1], Taehyun Kim[1], *Yue Zhao[1] (1. University of Arkansas (USA))

[P1-13-14] Study on Real-Time Reinforced Learnig for Wide-Range Operation of Buck Converter
*Ayumu Endo[1], Ryo Echigoya[1], Hirokazu Matsumoto[1], Yuki Sato[1] (1. Aoyama Gakuin University (Japan))

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[P1-13-15] Comparative Study of Rigid and Flexible PCBs for Power Converter Implementation in Portable Power Solutions
*Richard Angsetya[1], F. Selin Bagci[1], Katherine A. Kim[1] (1. National Taiwan University (Taiwan))

[P1-13-16] A Cell-Selection PWM with Phase-Shifted Variable-Frequency Carriers for Modular Multilevel Converters
*Kei Sekiguchi[1], Takahiro Ishiguro[1], Shogo Kurita[2], Ryuichi Morikawa[2] (1. Toshiba Corporation (Japan), 2. TMEIC Corporation (Japan))

Poster 1-14 (Event & Exhibition Hall)

[P1-14] Application-oriented power converter and control 5
Chair: kenichi sakimoto (Kawasaki Heavy Industries, Ltd.)

[P1-14-01] High-Efficiency Synchronous Rectification Method Using Analog Phase Detection for EV Chargers
*Jisoo Kim[1], Seul Lee[1], Junyeong Oh[1], Eunsoo Lee[1] (1. Department of Electrical Engineering, Hanyang University (Korea))

[P1-14-02] Experimental Demonstration of Rebar Loss Reduction Using Sendust Magnetic Concrete for Wireless Power Transfer
*Norika Miura[1], Shuntaro Inoue[1], Yuko Kano[1], Koji Shigeuchi[1], Shin Tajima[1] (1. Toyota Central R&D Labs., Inc. (Japan))

[P1-14-03] A Maximum Power Point Tracking Method for Stabilizing Power Output of Perovskite Solar Cells
*Makito Nakahira[1], Haruto Miyata[1], Juan Padron[1], Toshimasa Miyazaki[1], Yushi Miura[1], Kiyoshi Ohishi[1], Yousuke Ibusuki[1] (1. Nagaoka University of Technology (Japan))

[P1-14-04] Modulation and Capacity Analysis of Active-Filtering Grid-Forming Energy Storage in DRU-HVDC Systems
*Haonan Li[1], Xu Yang[1], Min Wu[1], Jiaxuan Niu[1], Hongyi Zhou[1], Wenjie Chen[1] (1. School of Electrical Engineering Xi'an Jiaotong University (China))

[P1-14-05] Power Angle Constrained Large-Signal Modeling and Stability Analysis of Grid-Connected Inverter
*Boyuan Cui[1], Liang Huang[2], Poh Chiang Loh[1], Frede Blaabjerg[2] (1. The Chinese University of Hong Kong (Hong Kong), 2. Aalborg University (Denmark))

[P1-14-06] Two-Step Load Voltage Identification for Inductive Power Transfer Systems Using Linear Kalman Filtering
ANDREW NGINI MWANGI[1], *SUNG-JIN CHOI[1] (1. University of Ulsan (Korea))

[P1-14-07] Derivation and Validation of the Critical ZVS Boundary in Parity-Time Symmetric Wireless Power Transfer Systems
*Zhen Huang[1,2], Bowang Zhang[3], Youhao Hu[2], Hanlei Tian[2], Jinliang Huang[2], Wei Han[2] (1. Sun Yat-sen University (China), 2. The Hong Kong University of Science and Technology (Guangzhou) (China), 3. The Hong Kong University of Science and Technology (Hong Kong))

[P1-14-08] Design of a 20 kW SiC Current Source Inverter System for Machine Drives
*Patrick Cujic[1], Tobias Blaich[1], Lorenz Hahn[1], Benjamin Bachowsky[1], Tobias Zeller[1], Dennis Bank, Rüdiger Schwendemann[1], Marc Hiller[1] (1. Karlsruhe Institute of Technology (Germany))

[P1-14-09] Experimental Investigation of Continuous Switching Operation of Solid-State Circuit Breaker for Engine Protection on Electric Hybrid Aircraft
*Ryuji Iijima[1], Shunsuke Noguchi[1], Yuichi Tsuboi[1] (1. Japan Aerospace Exploration Agency (Japan))

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Poster 1-14 (Event & Exhibition Hall)

[P1-14-10] A Wireless Power Transfer Based Impedance Matching Method for Inductively Coupled Plasma RF Sources
*SiYu Feng[1], Shuang Li[2], Chengbin Ma[2], Ming Liu[1] (1. The school of Electrical Engineering, Shanghai Jiao Tong University (China), 2. The Global College, Shanghai Jiao Tong University (China))

[P1-14-11] Analysis and Design of Inertia Measurement Methods for Grid-Forming Converters in Power-Electronized Power Systems
*Yifan Yang[1], Jiaqi Niu[1], Yuehang Zhao[1], Chunyu Xu[1], Zhaoyu Guo[1], Yonghui Liu[1] (1. Xi'an Jiaotong University (China))

[P1-14-12] Low-Switch Count, Single-Stage, 3-Φ/1-Φ DC-AC Bidirectional Converter Employing Y-Δ Transformer Configurations
*Dharani Deepika Pidiyar[1], Shiladri Chakraborty[1] (1. INDIAN INSTITUTE OF TECHNOLOGY BOMBAY (India))

[P1-14-13] Small Signal Stability Analysis of Multi-Inverter Dominated Power Systems
*Kang Wang[1], Sijia Li[1], Xiangchen Zhu[1], Hang Ren[1], Kuangpu Liu[1], Zhe Chen[1] (1. Aalborg University (Denmark))

[P1-14-14] H-type Multilevel Inverter with Common-Ground Concept for Grid-Connected Transformerless PV Applications
*Junyu FAN[1], Zhishen LUO[1], Hanlei TIAN[1], Wei HAN[1] (1. HKUST (China))

[P1-14-15] Impact of Current Limiters on the Transient Stability of Grid-Forming Inverters Employing the Virtual-Power Method
*ANTONIS MAKRIGIORGIS[1], Antonios Antonopoulos[1] (1. NTUA (Greece))

[P1-14-16] Auxiliary-Less Precharge Strategy for Flying-Capacitor Current-Fed DAB Converters
*Takashi Ohno[1], Hiroki Watanabe[1], Jun-ichi Itoh[1] (1. Nagaoka University of Technology (Japan))

[P1-14-17] A Soft Mode Transition Method for Dual-Active-Bridge Microinverters with Adaptive Mode Boundary Conditions
*Minseok Kim[1], Suyong Chae[1] (1. Pohang University of Science and Technology (Korea))

[P1-14-18] Physics-Informed Neural Network for Voltage Gain Modeling of LLC Resonant Converters with Wide Voltage Range
Yuqian Zhang[1], *Yu Zuo[2], Yang Li[2], Jiaze Kong[2], Fanghao Tian[2], Wilmar Martinez[2] (1. The Australian National University, School of Computing (Australia), 2. KU Leuven, Power Electronics (Belgium))

[P1-14-19] CVCF Control of a Matrix Converter-Based Single-Phase Three-Wire Isolated AC-DC Converter under Standalone Operation with Unbalanced Loads
*Ryoki Onodera[1], Hiroki Watanabe[1], Junichi Itoh[1], Naoto Izumoto[2], Takahiro Ohori[2] (1. Nagaoka University of Technology (Japan), 2. Panasonic Electric Works Co., Ltd. (Japan))

Poster Sessions

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Poster 2-1 (Event & Exhibition Hall)

[P2-1] Application-oriented power converter and control 6
Chair: Koji Kato (GS Yuasa International Ltd.)

[P2-1-01] Adaptive Droop of Distributed Generators for Inertia Emulation in a Cascaded Series Microgrid
Jayvie Gabriel Templonuevo[1], *Inam Nutkani[1], Richardt Wilkinson[1], Carlos Teixeira[1], Brendan McGrath[1] (1. RMIT University, Melbourne, Australia (Australia))

[P2-1-02] Placement of Grid Forming Inverters and Synchronous Condensers in the Grid
Md Zahir Hossain[1], *Inam Nutkani[1], Lasantha Meegahapola[1] (1. RMIT University, Melbourne, Australia (Australia))

[P2-1-03] A High Performance Model Training Framework for Large-scale BOM Classification in Automated Power Electronics Schematics Design
Jiahua Ying[1], Bowen Su[1], Ran Ou[1], Huan Chen[1], *Kai Sun[1] (1. Department of Electrical Engineering, State Key Laboratory of Power System Operation and Control, Tsinghua University, Beijing, China (China))

[P2-1-04] Techno-Economic Analysis of Pulsed Power Electrolysis
*Muhammad Yousuf[1], Andre Chambers[2], Glen Farivar[1], Mengran Li[1], Dragan Nesic[1], Michael John Brear[1] (1. The University of Melbourne (Australia), 2. The University of British Columbia (Canada))

[P2-1-05] Explainable and Non-Invasive Ultrasound-based Capacitor Condition Monitoring in Power Converters
*Youssof Fassi[1], Vincent Heiries[2], Jérôme Boutet[2], Clément Chambon[2], Sébastien Boisseau[2] (1. Univ. Grenoble Alpes, CEA-Liten (France), 2. Univ. Grenoble Alpes, CEA-Leti (France))

[P2-1-06] AC Impedance Measurement: Cell-Balancing Circuit Based on a Median–Gaussian Filter
*Seongjong Kim[1], Hwa pyeong Park[2], Yu Bi[1], Hyunjoon Choi[1], SangHeon Chae[3] (1. Kumoh National Institute of Technology (kit) (Korea), 2. Korea Institute of Energy Technology (Korea), 3. Korea Electronics Technology Institute (Korea))

[P2-1-08] Voltage Vector-Generalized Variable Switching Frequency DPWM for Overvoltage Mitigation
*Min-Gi Kim[1], Kyo-Beum Lee[1], Heon su Lee[2] (1. Ajou University (Korea), 2. LS Electric (Korea))

[P2-1-09] Power-Response Matrix Framework: Intuitive Frequency-Domain Analysis of an Offshore Wind Farm
*Lazar Stojanović[2], Anant Narula[1], Massimo Bongiorno[1], Paolo Mattavelli[2] (1. Chalmers University of Technology (Sweden), 2. University of Padova (Italy))

[P2-1-10] Accurate and Tailor-Made Semiconductor Device Models forSystem Simulations Across Diverse Circuit Topologies and Operating Conditions
*Paul Sochor[1], Andreas Huerner[2], Jaime Zapata-Amores[2] (1. Infineon Technologies (Japan), 2. Infineon Technologies AG (Germany))

[P2-1-11] Operating Characteristics of a Non-Resonant AC–AC Converter for Induction Heaters with Buck–Boost Operation Using Work Coil
*Takuo Kawarabayashi[1], Shohei Komeda[1] (1. Tokyo University of Marine Science and Technology (Japan))

[P2-1-12] Designing efficient coils for a 500 W Inductive Wireless Power Transfer (WPT) system using Finite Element Method Magnetics (FEMM)
Suwatchari Phuangchaosuan[1], Uthen Kamnarn[1], Accarat Chaoumead[2], Kittisak Srisawas[2], Noureddine Takorabet[3], *Duanraem Phaengkieo[2] (1. Department of Electrical Engineering, Rajamangala University of Technology Lanna (Thailand), 2. Department of Electrical Engineering, Rajamangala University of Technology Lanna Phitsanulok (Thailand), 3. Université de Lorraine-GREEN (France))

[P2-1-13] Robust controller design for series-series compensation based WPT system
*Veerachary Mummadi[1], Ayush Bhaskar[1] (1. Indian Institute of Technology Delhi (India))

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Poster 2-2 (Event & Exhibition Hall)

[P2-2] Emerging technologies in Packaging, thermal management, system integration and reliability 1
Chair: Kenchi Nagayoshi (Electronics Division, Toyota Industries Corporation)

[P2-2-01] 200 MHz PCB Rogowski Coil Current Sensor for WBG Switching Applications
*Julian Sax[1], Simon Quergfelder[1], Thomas Heckel[1], Bernd Eckardt[1], Martin März[1,2] (1. Fraunhofer Institute for Integrated Systems and Device Technology (Germany), 2. Chair of Power Electronics, Friedrich-Alexander-University Erlangen-Nuremberg (Germany))

[P2-2-02] High-Speed Short-Circuit Protection with Parasitic Inductance in 3.3 kV SiC-MOSFET Power Modules
*Yusuke Takada[1], Takashi Hirao[1], Hiroshi Suzuki[1], Yusuke Kanno[2], Yasuhiko Kouno[2] (1. Research & Development Group, Hitachi, Ltd. (Japan), 2. Railway System Business Unit, Hitachi, Ltd. (Japan))

[P2-2-03] Electroluminescence-Based Online Condition Monitoring of Gate Switching Instability in SiC MOSFETs
*Lukas A. Ruppert[1], Nikita Huber[1], Christian Schmitz[1], Rik W. De Doncker[1] (1. Institute for Power Electronics and Electrical Drives, RWTH Aachen University (Germany))

[P2-2-04] Discontinuous Pulse Width Modulation for Simultaneous Thermal Stress Reduction in Power Devices and DC-link Capacitors of NPC Inverter
*Dong-Jin Lee[1], Ui-Min Choi[1] (1. Seoul National University of Science and Technology (Korea))

[P2-2-05] Asymmetric PWM for Reliability Enhancement of Multi-Chip IGBT Module in Motor Drive Inverters
*Junseong Hwang[1], Ui-Min Choi[1] (1. Seoul National University of Science and Technology (Korea))

[P2-2-06] Current Balance Improvement in a Multi-Chip Power Module Using a Slitted Conductor Structure
*Shota Tashiro[1], Yuta Ichikura[1], Kazuyasu Takimoto[1], Takahiro Ishiguro[1] (1. Toshiba Corporation (Japan))

[P2-2-07] Investigation of the Impact of Active Short Circuit on Traction Inverter
*Linhua Lai[1], Maciej Brzycki[1], Nimananda Sharma[2], Artem Rodionov[1], Yujing Liu[1] (1. Department of Electrical Engineering, Chalmers University of Technology (Sweden), 2. Volvo group (Sweden))

[P2-2-08] Thermal Fault Diagnosis of Power Modules Using Digital Twins
*Zhongchao Sun[1], Stefan Meyer[1], Asger Bjørn Jørgensen[1] (1. Aalborg Univ. (Denmark))

[P2-2-09] Online Parameter Estimation Based Digital Twin and EKF for Health Indicators of Buck Converters
*Boyang Jin[1], Chunlin Lv[1], Jinjun Liu[1], Pingjunjin Tan[1] (1. Xi'an Jiaotong University (China))

[P2-2-10] Dynamic Maintenance Scheduling of PV Inverters through Condition Monitoring
*Seyed Amir Hosseini[1], Muhammad Usman Tahir[1], Pooya Davari[1], Saeed Peyghami[1] (1. AAU Energy, Aalborg University (Denmark))

[P2-2-11] Effect of Redundant Leg Topology on the Reliability of PV Inverters
*Muhammad Usman Tahir[1], Seyed Amir Hosseini[1], Pooya Davari[1], Saeed Peyghami[1] (1. AAU Energy, Aalborg University (Denmark))

[P2-2-12] Physics-Integrated PDE-Constrained Deep Learning for Lifetime Prediction of Power Semiconductor Modules
*Yichi Zhang[1], Yi Zhang[2], Bo Yao[1], Frede Blaabjerg[1], Huai Wang[1] (1. Aalborg University (Denmark), 2. Hong Kong Polytechnic University (Hong Kong))

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Poster 2-2 (Event & Exhibition Hall)

[P2-2-13] Thermal Optimization of 75kW Phase-Shift Dual Active Bridge LLC Resonant Converters Through Variable Inductance for Electric Vehicle Applications by Finite Element Solution
*Wai Keung Mo[1], Kasper Mayntz Paasch[1], Thomas Ebel[1] (1. The university of Southern Denmark (Denmark))

[P2-2-14] Optimal Operation Parameter Determination for Enhancing Overcurrent Capability in Grid-connected Converters
*Zhenhong Lai[1], Zebin Yang[1], Xiaobin Mu[2], Weiwei Xu[3], Xin Ning[3], Hao Yi[1], Lei Chen[3], Fang Zhuo[1] (1. School of Electric Engineering, Xi'an Jiaotong University (China), 2. State Key Laboratory of Advanced Power Transmission Technology, State Grid Smart Grid Research Institute co. Ltd. (China), 3. State Grid Zhejiang Electric Power Research Institute, State Grid Zhejiang Electric Power Co., Ltd. (China))

[P2-2-15] Experimental Validation of Driving Force for a Temperature-Sensitive Magnetic Fluid Heat Transport System Utilizing an Electromagnet
*Masataka Anazawa[1], Keisuke Kusaka[1] (1. Nagaoka University of Technology (Japan))

Poster 2-3 (Event & Exhibition Hall)

[P2-3] Emerging technologies in Packaging, thermal management, system integration and reliability 2
Chair: Takaya Sekiguchi (Hitachi, Ltd.)

[P2-3-01] Modular Accelerated Lifetime Testing Platform for Autonomous Testing of Multiple Proximal SiC MOSFETs to Inform Data-Driven RUL Estimation
Paul Bradford[1], *Hongjie Wang[1] (1. Utah State University (USA))

[P2-3-02] Condition Monitoring of Power Electronic Devices Using Modulation-Based Thermal Impedance Spectroscopy
Alireza Aghdaei[1], *Rattapon Wayamanon[2], Sven Kalker[1], Lukas A. Ruppert[1], Rik W. De Doncker[1] (1. RWTH Univ. (Germany), 2. TGGS Univ. (Thailand))

[P2-3-03] Design of a Full Bridge Power Module for a Dual Active Bridge Converter
Weiping Fu[1], Xiaoling Li[1], Yuxiang Chen[1], Liyang Du[1], Saroj Majakoti[1], *Alan Mantooth, David Huitink[1], David Underwood[2] (1. University of Arkansas (USA), 2. Micro Cooling Concepts, Inc (USA))

[P2-3-04] Improved Noise Source Modeling for BCM Single-Phase Grid-Connected Inverters With Zero Current Detection Delay
*Chen Liu[1], Chao Chao Song[1], Frede Blaabjerg[1], Pooya Davari[1] (1. Aalborg University (Denmark))

[P2-3-05] A Design Procedure for Current-Injection Active EMI Filter by Taking Load-Pulling Effect into Consideration
Jakrapong Wongsasulux[2], *Surapong Suwankawin[1], Thattam Narksook[1], Achirawat Kaitkansiri[1], Pawaret Ampai[1] (1. Chulalongkorn University (Thailand), 2. Delta Electronics (Thailand) (Thailand))

[P2-3-06] Wireless Power Transmission Method using Superimposed PWM signal
*Atsushi YOSHIDA[1], Kosuke MORIYA[1], Hiyang SUNG[1], Kyungmin SUNG[1] (1. National Institute of Technology, Ibaraki College (Japan))

[P2-3-07] Impact of Core Segmentation on Eddy Current Loss in Mn-Zn Ferrite Cores at High Frequencies
*Naoya Miyata[1], Itsuki Masuda[1], Jun Imaoka[2], Masayoshi Yamamoto[2] (1. Department of Electrical Engineering, Nagoya University (Japan), 2. Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University (Japan))

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Poster 2-3 (Event & Exhibition Hall)

[P2-3-08] Electro-thermal Stability of Planar and Trench Gate SiC Power MOSFETs in Linear Mode Operation
*Yisi Liu[1], Olayiwola Alatise[2], Asad Mahmood[2], Jose Ortiz Gonzalez[2], Ian Laird[1], Phil Meller[1], Saeed Jahdi[1] (1. University of Bristol (UK), 2. University of Warwick (UK))

[P2-3-09] Comparative Analysis of Flatwise and Edgewise Windings for Improved Thermal Management in Transformers
*Karl Raymond Dela Cruz Roque[1], Itsuki Masuda[1], Sihoon Choi[2], Jun Imaoka[1,2], Masayoshi Yamamoto[1,2], Matti Kauhanen[3], Kengo Tashiro[4] (1. Department of Electrical Engineering, Nagoya University (Japan), 2. Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University (Japan), 3. ABB Drives Oy (Finland), 4. HighQ Power Oy (Finland))

[P2-3-10] Geometrically Constrained Optimization of Planar Transformers for DCM Flyback Converters
*Tianming Luo[1], Kamran Kamran[1,2], Ziwei Ouyang[1] (1. Technical University of Denmark (Denmark), 2. STMicroelectronics S.R.L. (Italy))

[P2-3-11] Parameter Estimation Techniques for DC-link Capacitors in Three-level NPC Inverters
*Diana Lopez-Caiza[1], Ariya Sangwongwanich[1], Mateja Novak[1], Frede Blaabjerg[1] (1. Aalborg University (Denmark))

[P2-3-12] Prediction and Mitigation of EMI from Near-Field Coupling Effects in Interleaved PFC Converters
Tyler McGrew[1], *Che-An Cheng[1], Qiang Li[1] (1. Center for Power Electronic Systems, Virginia Tech (USA))

[P2-3-13] Reliability Evaluation of 650 V E-Mode GaN Devices Under HTRB and H3TRB Stress
*Mateja Novak[1], Kaichen Zhang[1], Senyu Du[1], Arlene Rementeria[1], Shuai Zhao[1], Dao Zhou[1], Francesco Iannuzzo[2] (1. Aalborg University (Denmark), 2. Politecnico di Torino (Italy))

[P2-3-14] Link between Black Box and Physical EMC Models of Power Electronics Converters
Bayan Hamami[2,1], Yandry Alexander Jacome Montero[1], Genevieve Frantz[1], *Jean-Luc SCHANEN[1] (1. Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab (France), 2. Industrial Automation Schneider Electric Grenoble (France))

Poster 2-4 (Event & Exhibition Hall)

[P2-4] Device-related technologies, Passive components and materials 2
Chair: Yasuo Higuchi (Rohm Co., Ltd.)

[P2-4-01] Investigation of AC Resistance in Carbon Nanotube Ribbon Conductors for Planar Magnetics
*Tianming Luo[1], Bima Nugraha Sanusi[1], Ziwei Ouyang[1] (1. Technical University of Denmark (Denmark))

[P2-4-02] A Comparison of Transformer Copper Loss for Different Winding Configurations in a 200-kW, 16-kHz Dual Active Bridge Converter
*Ryohta Shimamoto[1], Qichen Wang[1], Toshihisa Tajyuta[1], Koji Maruyama[1] (1. Fuji Electric Co. Ltd. (Japan))

[P2-4-03] Design and Comparative Evaluation of Three-Phase Coupled Inductors
*Yunni Li[1], Thomas Gradinger[1] (1. Hitachi Energy Research (Switzerland))

[P2-4-04] Bayesian Inference-based Multi-Fidelity Surrogate Modeling for Circuit-Level Inductor-Optimization
*Nobuto Misono[1], Yuki Sato[1], Hirokazu Matsumoto[1] (1. Aoyama Gakuin University (Japan))

[P2-4-05] Utilization of Multi-Winding Transformers with Single Active Bridge Converter for Power Quality Enhancement in Multiple-Output Power Supply
*Satit Owatchaiphong[1], Kitsada Poonsawad[1], Wiranya Mungtorbua[1], Athiphat Kanavittaya[1], Narong Thumputi[1] (1. King Mongkut's University of Technology North Bangkok (Thailand))

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Poster 2-4 (Event & Exhibition Hall)

[P2-4-06] Minimal Implementation Method of Active Gate Driver for Improving Performance of DC-DC Converters
*Shuhei Fukunaga[1], Hajime Takayama[2], Takashi Hikihara[3] (1. The University of Osaka (Japan), 2. Kyoto Institute of Technology (Japan), 3. Kyoto University (Japan))

[P2-4-07] A Fractional-Turn Transformer for Hybrid Switched Capacitor Converters
*Tongrui Sun[1], Xu Yang[1], Panming Li[1], Wei Zhou[1], Xingwei Huang[1], Keliang Chen[1], Wenjie Chen[1] (1. School of Electrical Engineering, Xi 'an Jiaotong University (China))

[P2-4-08] Small-Signal Measurements for Fringing Effects of Air Gaps on Winding Losses in Magnetic Components
Shaokang Luan[1], *Henrik Hansen[1], Hongbo Zhao[1] (1. Aalborg University (Denmark))

[P2-4-09] Flip Chip SiC Power Module for Common-Mode Noise Reduction with an Integrated Shunt Resistor
*Thiyu Sansika Warnakulasooriya[1], Sihoon Choi[2], Yu Yonezawa[2], Jun Imaoka[2], Masayoshi Yamamoto[2] (1. Department of Electrical Engineering, Nagoya University (Japan), 2. Institute of Materials and Systems for Sustainability, Nagoya University (Japan))

[P2-4-10] A Modular Test Bench for Real-Time Characterization of DC-Link Capacitors under Pulsed Load Conditions
*Mario Wasner[1], Martin Hübner[1], Peer Orzelek[1], Ulrich Unterhinninghofen[1], Marek Galek[1] (1. Munich University of Applied Sciences (Germany))

[P2-4-11] MOSFET Package with Integrated Si-Capacitor-Based RC Snubber for Reduced Switching Surge and Loss
*Takenori Yasuzumi[1], Susumu Obata[1], Kazuhito Higuchi[1], Tatsuya Ohguro[2] (1. Toshiba Corp. (Japan), 2. Toshiba Electric Devices & Storage Corp. (Japan))

[P2-4-12] Development of a Compact Auxiliary Inductance Employing Mn-Zn Ferrite for a 200-kHz DAB Converter
*Hiroaki Kakigano[1] (1. RItsumeikan University (Japan))

[P2-4-13] Flexible Multi-Layer Foil Based Self-Resonant Transformer for High-Density LLC Converter
*Sajib Ahmed[1], Dylan Lu[1], Saad Mekhilef[2], Yam Siwakoti[1] (1. School of Electrical and Data Engineering, Faculty of Engineering and IT, University of Technology Sydney (Australia), 2. School of Engineering, Swinburne University of Technology (Australia))

[P2-4-14] Magnetic Core Selection in High-Frequency DAB and LLC Transformer Design Considering Both Core Loss and Saturation Flux Density Constraints
*Ryohei Okada[2], Keiji Wada[1] (1. Tokyo Metropolitan University (Japan), 2. Takushoku University (Japan))

[P2-4-15] Parallel Operation of GaN-based Monolithic Bidirectional Switches for Energy Storage Systems
Shuwei He[1], Yuzhou Yao[1], Zhining Zhang[1], *Jin Wang[1], Jacob Mueller[2], Luciano A. Garcia Rodriguez[2], Stanley Atcitty[2] (1. The Ohio State University (USA), 2. Sandia National Laboratories (USA))

[P2-4-16] Empirical and Analytical Modelling of Capacitance Induced Dissipation Losses in Power Semiconductors
*Kaushik Mirdoddi[1,3], Roberto Petrella[2,3] (1. System-Level Integration Technologies, Power Electronics Division, Silicon Austria Labs GmbH, Villach, Austria (Austria), 2. Power Electronics Division, Silicon Austria Labs GmbH, Villach, Austria (Austria), 3. PEMD Laboratory, Polytechnic Department of Engineering and Architecture, University of Udine, Udine, Italy (Italy))

[P2-4-17] Development of a Current Overshoot Detection Circuit for Power Semiconductor Switches
Satoshi Sugahara[2], *Takashi Toriyabe[1], Takato Sugawara[1] (1. Fuji Electric Co., Ltd. (Japan), 2. Fukuyama University (Japan))

[O6-10-04]
Demostration of A 1700V Enhancement Mode pGaN Gate HEMT Power Device on Sapphire Substrate
*Ju Gao[1], Ziheng Liu[1], Jiayin He[1], Wenbo Xia[1], Chengkang Ao[1], Hongjie Peng[1], Lanlan Wang[1], Yimeng Cai[2], Yi Sun[2], Zhaohui Cheng[3], Yong Xie[3], Jin Wei[1], Jinyan Wang[1] (1. Peking University (China), 2. ZhiCheng Semiconductor (Anhui) Co., Ltd (China), 3. Dongke Semiconductor (Anhui) Co., Ltd (China))

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Poster 2-5 (Event & Exhibition Hall)

[P2-5] Sophisticated Power Conversion 1
Chair: Motoki Sato (ToyodenkiSeizo K.K.)

[P2-5-01] Carrier-Based PWM for Circulating Current Suppression in Dual-Parallel NPC Inverters
*Tae-Hyeon Kim[1], Ui-Min Choi[1] (1. Seoul National University of Science and Technology (Korea))

[P2-5-02] On the Use of Online Adaptive Space Vector Modulation for Constrained Active Thermal Control
*Ignacio Acosta[1], Chengmin Li[1], Petros Karamanakos[2], Georgios Papafotiou[1] (1. Eindhoven University of Technology (Netherlands), 2. Tampere University (Finland))

[P2-5-03] A Carrier-Based Discontinuous PWM Method for Mitigating Neutral-Point Voltage Fluctuation in Two-Parallel Interleaved Vienna Rectifier
*Juyeon Lee[1], June-Seok Lee[1] (1. Dankook University (Korea))

[P2-5-04] Voltage Error Compensation Method for PS-PWM in Single-Phase Seven-Level CHB Inverters
*Yisoo Park[1], Eunwoo Lee[1], Hyewon Kang[1], June-Seok Lee[1] (1. Dankook University (Korea))

[P2-5-05] High-Accuracy Synchronization Method for Wireless Control of Power Modules with Built-in Gate Drive Circuits
*Satoshi Mikami[1], Keiji Wada[1], Shigeyoshi Goka[1] (1. Tokyo Metropolitan University (Japan))

[P2-5-06] Modulation Technique for Dual-Transformer Series-Resonant Converters to Balance Switch Currents and Limit Switching Frequency Variation
*SangHyeon Lee[1], Lukas Antonio Budiwicaksana[1], Dong-Choon Lee[1] (1. Yeungnam University (Korea))

[P2-5-07] Zero Voltage Switching Technique Using Synchronous Rectifier Control of PWM LLC Resonant Converter for Light Load Efficiency
*Yeonghun Jeong[1], Dongmin Choi[1], Taewoo Kim[2], Jaeil Baek[1], Gun-woo Moon[1] (1. KAIST (Korea), 2. IMEC USA (USA))

[P2-5-08] Reduction in Capacitor of Flying-Capacitor for a 3+1-Level Converter
*Akihide Mizukawa[1], Keisuke Kusaka[1] (1. Nagaoka University of Technology (Japan))

[P2-5-09] Carrier-based PWM for Current Source Inverters with Overlap-Time Compensation and Switching-Loss Minimization
*takanobu ohno[1], Predrag Pejovic[2], Spasoje Miric[3] (1. Innsbruck Univ. (Austria), 2. Belgrade Univ. (Serbia), 3. TUWien (Austria))

[P2-5-10] Investigation of Control Quantization in Decentralized Modular Active Cell Control for Multi-Active Bridge Converters
*Niklas Stöcklein[1], Raffael Schwanninger[1], Martin Lindner[1], Martin März[1] (1. Institute for Power Electronics, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany))

[P2-5-11] Boosted Gate Driving with Active Damping to Reduce Turn-Off Losses in High-Power SiC MOSFETs
*Max J. Watson[1], Sebastian Neira[1], Stephen Finney[1], Paul D. Judge[1] (1. University of Edinburgh (UK))

[P2-5-12] Propagation–Coupling Factorization Model for 2-D Waveguide Wireless Power Transfer
Naoya Takahashi[1], *Yuichi Masuda[2], Katsuhiro Hata[1] (1. Shibaura Institute of Technology (Japan), 2. The University of Tokyo (Japan))

[P2-5-13] A Virtual SVM Strategy with Simultaneous Capacitor Voltages Balancing and Common-Mode Voltage Reduction for Three-Level Neutral-Point-Clamped Inverters
Yuttana Kumsuwan[1], *Sutthimat Mueangngoen[1] (1. Chiang Mai University (Thailand))

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Poster 2-5 (Event & Exhibition Hall)

[P2-5-14] State-Space-Bilinear SOGI Digital Filter Design for Spread Spectrum Modulation of a Single-Phase PWM Rectifier
*Chang Min Lee[1], Jee Hoon Jung[1] (1. Ulsan National Institute of Science and Technology (UNIST) (Korea))

[P2-5-15] Improved Current Regulation in CRM-Operated Totem-Pole PFC by Replacing the Blank Interval with a Modified DCM at the Zero Crossing
*Sota Sasaki[1], Cheng Huang[1], Takanori Isobe[1] (1. University of Tsukuba (Japan))

[P2-5-16] Optimizing ZVS-Capable DCM for High-Efficiency Grid-Tied Inverters: Can It Be Better than BCM?
*Cheng Huang[1], Sota Sasaki[1], Takanori Isobe[1] (1. University of Tsukuba (Japan))

[P2-5-17] Passive Common-Noise Canceller using Edgewise Winding for SiC Traction Inverters
*Takashi Sawada[1,2], Satoshi Ogasawara[1], Kazumasa Ide[1], Koji Shiozaki[1] (1. Nagoya University (Japan), 2. Power Design Laboratory Co., Ltd. (Japan))

Poster 2-6 (Event & Exhibition Hall)

[P2-6] Rotating Electrical Machines 2
Chair: Takahiro Sato (Muroran institute of technology)

[P2-6-01] Reluctance Torque Characteristics of PM-assisted Half-Wave Rectified Variable Field Flux Motor
*Taiga Yamaguchi[1], Tong Wang[1], Takashi Abe[1], Yoshitsugu Otomo[1] (1. Nagasaki University (Japan))

[P2-6-02] Rare-Earth-Free Variable Magnetization PM Reluctance Motor
*TAKAHIRO MORIOKA[1], Kazuto Sakai[1], Sari Maekawa[1] (1. Meiji University (Japan))

[P2-6-03] Propagation of Pulsed Voltage With a Rise Time of Shorter Than 100 ns Driven by SiC Pulsar Within Random Wound Motor
*Takafumi Okuda[1,2], Yuki Nomura[1,2], Hirotaku Ishikawa[3], Takahiro Umemoto[4], Yusuke Kikuchi[5], Takashi Nakamura[1,2] (1. The University of Osaka (Japan), 2. NexFi Technology Inc., (Japan), 3. Mitsubishi Electric Corp. (Japan), 4. The University of Tokyo (Japan), 5. University of Hyogo (Japan))

[P2-6-04] A Design Consideration of the Dual-three Phase Type Multiphase Induction Motor Drive System (IMTS) for Electric Vehicle Tractions
*Kyohei Kiyota[1], Keigo Matsuzaki[1], Akira Chiba[1], Masashi Kobayashi[2] (1. Institute of Science Tokyo (Japan), 2. Toyota Motor Corporation (Japan))

[P2-6-05] Measurement and Uncertainty Analysis of Asynchronous Machines Using Dual Test Benches and Complementary Software Tools
*Nijan Yogal[1] (1. VEM Motors GmbH (Germany))

[P2-6-06] A Simple Online Method to Estimate the Operating Characteristics of Inverter-Fed Induction Motors
*Hideaki Hirahara[1], Shu Yamamoto[1] (1. The Polytechnic University of Japan (Japan))

[P2-6-07] Evaluation of the Acoustic Noise Influenced by Current Waveform and Current Control Method in the Low-Speed Range of SRMs
*Muhammad Fabio[1], Shou Qiu[1], Kyohei Kiyota[1] (1. Institute of Science Tokyo (Japan))

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Poster 2-6 (Event & Exhibition Hall)

[P2-6-08] Torque Estimation of Switched Reluctance Motors Using Magnetic Circuit Model
Hiroki Ishikawa[1], *Hirokazu Yoshino[1], Kohei Budo[1] (1. Gifu University (Japan))

[P2-6-09] Analytical Modeling of Back Electromotive Force in Surface Permanent Magnet Vernier Motor
*Yasuhiro Kataoka[1] (1. Akita Prefectural University (Japan))

[P2-6-10] Application of Parameter Topology Simultaneous Optimization to a 42 Pole 36 Slot Outer Rotor Permanent Magnet Synchronous Motor
Wataru Sekiyama[1], *Hidenori Sasaki[1] (1. Hosei University (Japan))

[P2-6-11] Proposal and Validation of a Ringing Loss Analysis Model for PWM Inverter-Driven Motor Systems
*Masakazu Akahane[1], Kazunobu Hayashi[1], Kan Akatsu[2] (1. HIOKI E.E. CORPORATION (Japan), 2. Yokohama National University (Japan))

[P2-6-12] Insights to Spectral Based Acoustic Emissions Detection of Partial Discharge
*Colin Sim[1], Stephen Pierson[1], Han Hu[1], Alan Mantooth[1] (1. University of Arkansas (USA))

[P2-6-13] Contactless Permanent Magnet Temperature Detection of PMSM based on the Input DC Power of the Auxiliary Inverter
*Ryo Hamba[1], Keisuke Kusaka[1], Yoshihisa Hojo[2] (1. Nagaoka University of Technology (Japan), 2. Toyo Denki Seizo K.K. (Japan))

[P2-6-14] Estimation of Winding Loss by measureing Temperature Rises at End-winding and Active-winding for High Slot Fill Winding
*Shoichi Oaku[1], Jun Ebinuma[1], Yuto Yamada[1], Hiroya Sugimoto[1] (1. Tokyo Denki University (Japan))

[P2-6-15] Quantification of Manufacturing-Induced Degradation in stator cores of electric machines and the restorative Role of annealing
*Sima Soltanipour[1], Douglas Jutsell Nilsson[2], Torbj ¨ orn Thiringer[2], Joachim Lindstr ¨ om[1] (1. Volvo Cars Corporation (Sweden), 2. Chalmers University of Technology (Sweden))

[P2-6-16] AC Loss Asymmetry in Fractional-Slot PM Machines with Form-Wound Double-Layer Flat-Wire Windings
*Wenting Wang[1], Linnan Sun[1], Tianjie Zou[1], Gaurang Vakil[1], Zeyuan Xu[1], Zhaokai Li[2], David Gerada[1], Chris Gerada[1] (1. University of Nottingham (UK), 2. Politecnico di Milano (Italy))

Poster 2-7 (Event & Exhibition Hall)

[P2-7] Controls and Drives of Electric Machines 2
Chair: Kazuhiro Ohyama (Fukuoka Institute of Technology)

[P2-7-01] Voltage-Error-Based Angular Compensation for Torque Accuracy Improvement in IPMSM Drives
*Hye-Won Kang[1], Joon-Seok Kim[1], June-Seok Lee[1] (1. Dankook University (Korea))

[P2-7-02] Implementation of Field-Oriented Control with a Multi-Loop Control Structure for LC-Filtered Motor Inverters
Chih-Chung Tseng[1], Chi-Yang Chang[1], Ho-An Chen[2], *Wei-Che Lin[2], Mi-Ching Tsai[2,3] (1. Department of Electrical Engineering, National Cheng Kung University (Taiwan), 2. Electric Motor Technology Research Center, National Cheng Kung University (Taiwan), 3. Department of Mechanical Engineering, National Taiwan University (Taiwan))

[P2-7-03] Energy Saving Optimal Trajectories for Induction Motor Drive System Considering Inverter Loss
*Kaoru Inoue[1], Kinya Manabe[1], Toshiji Kato[1] (1. Doshisha University (Japan))

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Poster 2-7 (Event & Exhibition Hall)

[P2-7-04] Mitigation of Current Steady-State Error in PMLSM via Multi-Sampling Deadbeat Current Control with Extended State Observer
*Hozumi Kurotaki[1], Akira Takakura[1], Tomoki Yokoyama[2], Toshiyuki Murakami[1], Takahiro Nozaki[1] (1. Keio Univ. (Japan), 2. Tokyo Denki Univ. (Japan))

[P2-7-05] Enhanced Disturbance Rejection With Discrete Virtual-Impedance-Based complex vector control for High-Speed PMSMs
*Syed Mohammad Maaz[1], Lukas Antonio Budiwicaksana[1], Dong-Choon Lee[1] (1. Yeungnam University (Korea))

[P2-7-06] Operation and Control of High-Power Medium-Voltage Traction Motor Drive at All Integer Pulse Numbers Through Carrier Interleaved Parallel VSI
*Ashish Kumar Panda[1], Sourav Ghimirey[1], Avanish Tripathi[2] (1. Phd Research Scholar at IIT Delhi (India), 2. Associate Professor at IIT Delhi (India))

[P2-7-07] Technique for Passenger Entrapment Prevention in Elevators using Sensorless Control
*KYEONG JUN KWON[1], JUN HYEOK LEE[2], CHAN HWI KANG[2], YOUNG DOO YOON[1] (1. Hanyang University Department of Automotive Engineering (Korea), 2. Hanyang University Department of Automotive Engineering(Automotive-Computer Convergence) (Korea))

[P2-7-08] Reinforcement Learning-based Torque Control of Synchronous Machines
*Lara Broghammer[1,2], Dennis Hufnagel[1], Tobias Schindler[1], Armin Dietz[1], Oliver Wallscheid[2] (1. Technische Hochschule Nürnberg Georg Simon Ohm (Germany), 2. Univ. Siegen (Germany))

[P2-7-09] A Hybrid Flux-Weakening Control Method for Maximum-Speed Operation of a Wound Field Synchronous Motor
*Han-Vit Kim[1], Do-Hyeon Kim[1], June-Seok Lee[1] (1. Dankook University (Korea))

[P2-7-10] Oversampling based High-Speed Sensorless Control for PMSM
*Yuto Fukasawa[1], Sari Maekawa[1] (1. Meiji University (Japan))

[P2-7-11] Zero-Sequence Current Suppression Control Considering Interference Inductance in Open-End Concentrated Winding SynRM
*Ryo Kokubu[1], Shou Qiu[1], Kyohei Kiyota[1] (1. Institute of Science Tokyo (Japan))

[P2-7-12] Frequency Estimation for Three-Phase Power Grid With Modified Cost Function Recursive Least Squares
*Tuomo Matias Pälvilä[1], Aleksi Mattsson[1], Pasi Peltoniemi[1] (1. LUT University (Finland))

[P2-7-13] New Parallel Drive System of an Induction Motor and a Permanent Magnet Synchronous Motor with a Single Inverter
*Natsuki Yamamoto[1], Kohei Kamada[1], Yoshitaka Kawabata[1] (1. Ritsumeikan University (Japan))

[P2-7-14] Interleaved Multilevel Inverter for Power Hardware-in-the-Loop Machine Emulation Considering Harmonics
*André Haspel[1], Chirs Hermann[1], David Hirning[1], Mattea Eckstein[1], Ingmar Kallfass[2], Jörg Roth-Stielow[1] (1. University of Stuttgart, Institute for Power Electronics and Electrical Drives (Germany), 2. University of Stuttgart, Institute of Robust Power Semiconductor Systems (Germany))

[P2-7-16] Feasibility Verification of Reinforcement Learning–Based Compensation for Inverter Nonlinearities
Hyunuk Seo[1], Hyunyong Choi[2], Jongjun Won[2], *JAEHOOON SHIM[2] (1. Korea Institute of Machinery and Materials (KIMM) (Korea), 2. Myongji University (Korea))

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Poster 2-8 (Event & Exhibition Hall)

[P2-8] Motor Drives, Condition Monitoring and Diagnostics
Chair: Takahiro Noguchi (University of Minnesota)

[P2-8-01] Uncertainty-Aware IGBT Aging State Classification for Traction Inverters Using Bayesian Residual Networks
*Jiahong Liu[2], Subham Sahoo[1], Xing Wei[1], Bo Yao[1], Yichi Zhang[1], Yongjie Liu[1], Frede Blaabjerg[1], Huai Wang[1] (1. Aalborg University (Denmark), 2. State Grid Jiangsu Electric Power Company Ltd. (China))

[P2-8-02] Event-triggered exponentially robust state estimation for nonlinear systems via generalized estimator
Muhammad Binyamin[2], Muhammad Tufail[2], Muhammad Rehan[1], *Sadeq Ali Qasem Mohammed[1], Ijaz Ahmed[1], Muhammad Khalid[1] (1. King Fahd University of Petroleum and Minerals (Saudi Arabia), 2. Pakistan Institute of Engineering & Applied Sciences (PIEAS) (Pakistan))

[P2-8-03] Precise Initial Rotor Position Estimation and Encoder Alignment Using Interpolation of Limited Data for PMSMs
*Bijen Mali[1], Dong-Choon Lee[1] (1. Yeungnam University (Korea))

[P2-8-04] An Indirect Tool Condition Monitoring Method on Embedded Systems for Spindle Motors
Damian Vilchis-rodriguez[1], *Cheng Zhang[1], Sinisa Durovic[1], Graham Fick[2], Sanket Gore[2], Phil Bates[2], Judith Apsley[1] (1. The University of Manchester (UK), 2. Round Bank Engineering Ltd (UK))

[P2-8-05] 10 MHz oversampling based Online estimating insulation degradation in motor windings
*Tomoki Hara[1], Sari Maekawa[1] (1. Meiji University (Japan))

[P2-8-06] Differentiable Predictive Current Control for PMSM Drives
*YUAN LI[1], Mateja Novak[1], Shuai Zhao[1], Huai Wang[1], Frede Blaabjerg[1] (1. Aalborg University (Denmark))

[P2-8-07] Real-Time DC-Link Capacitance Identification for Motor Drive Systems With Torque Ripple Mitigation
*Taewon Park[1], Younghoon Cho[1] (1. konkuk university (Korea))

Poster 2-9 (Event & Exhibition Hall)

[P2-9] Linear Drives
Chair: TAKAFUMI KOSEKI (The University of Tokyo)

[P2-9-01] Robust Fractional-Order PI-PD Controller Design for Unstable Magnetic Levitation System
*Akanksha Dwivedi[1], Ahmad Ali[1], Lalit Singh[2] (1. Indian Institute of Technology Patna (India), 2. Department of Atomic Energy, NPCIL-BARC, India (India))

[P2-9-02] Online-Trained Dead-Time Compensator for PMLSM Considering End Effect
*Zhi Chen[1], You Zhou[2], Christopher H. T. Lee[1] (1. Nanyang Technological University (Singapore), 2. Huazhong University of Science and Technology (China))

[P2-9-03] Model Predictive Control of Nonlinear Wave Energy Converter for Broadening Operational Frequency Range
*Hidetoshi Miyazaki[1], Takahiro Sato[1] (1. Muroran Institute of Technology (Japan))

[P2-9-04] Verification of Online Winding Resistance Identification Method for Linear Switched Reluctance Motor under PWM Drive
*Sakuya Ebashi[1], Seiya Tashiro[1], Ryo Takagi[1], Tadashi Hirayama[1] (1. Kogakuin University (Japan))

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Poster 2-10 (Event & Exhibition Hall)

[P2-10] Vehicle Electrification-related Technologies 2
Chair: Nobukazu HOSHI (Tokyo University of Science)

[P2-10-01] Comparison of Electric Vehicle Battery Chemistries: Lithium-Ion and Solid-State
*Jesse Thornburg[1] (1. Grid Fruit, LLC (USA))

[P2-10-02] Grid-BESS Hybrid Strategy for Partial Power EV Charging
*Di Wu[1], Yue Cao[1], Liangcai Shu[1], Krzysztof Puczko[3], Reza Davoodnezhad[2], Michael Golombok[2], Dongsheng Yang[1] (1. Eindhoven University of Technology (Netherlands), 2. Shell (Netherlands), 3. Delta Electronics (Poland))

[P2-10-03] Deep Reinforcement Learning Based Fast-Charging Strategy for Lithium-Ion Batteries Using Twin Delayed DDPG
Ying-Ting Huang[1], *Guan-Hao Lu[1] (1. National Taipei University of Technology (Taiwan))

[P2-10-04] A Novel Blockchain-Assisted V2V Energy Trading System Design Addressing Charging Difficulties in Emergencies or in Remote Areas
Zaixin Song[1], *Yuan Gao[1], Yongtao Liang[1], Zhijian Zhang[1] (1. The Hong Kong Polytechnic University (Hong Kong))

[P2-10-05] Design and Implementation of a Non-Isolated 11 kW On-board Charger for Three-Phase and Single-Phase Operation
Konstantinos Theodosiou[1], *Michael Hartmann[1] (1. Technical University of Graz (Austria))

[P2-10-06] Physics-Informed State of Charge Estimation for LiFePO4 Cells
*Hoda Sorouri[1], Arman Oshnoei[1], Monica Marinescu[2], Remus Teodorescu[1] (1. Department of Energy, Aalborg University, 9220 Aalborg East, Denmark (Denmark), 2. Department of Mechanical Engineering, Imperial College London, London SW7 2AZ, UK. (UK))

[P2-10-07] Impact of Triple-Phase-Shift Modulation on the Efficiency–Cost Optimization of Single-Stage Dual Active Bridge Converters for Wide-Voltage DC Fast Charging
*Sadik Cinik[1,2], Tomislav Turscak[1], Khan Reyyan Ahmad[1], Asim Ibrahim[1,2], Giuseppe De Falco[1], Xiongfei Wang[3], Ariya Sangwongwanich[2] (1. Infineon Technologies Austria AG (Austria), 2. Aalborg University (Denmark), 3. Tsinghua University (China))

[P2-10-08] Study on Machine Learning Modeling Methods for Capacitance Estimation of LC Series Circuit Type Cell Voltage Equalizer
*Yuya Sekiguchi[1], Daiki Satou[1] (1. Tokyo Denki University (Japan))

[P2-10-09] Calorimetric-Based Condition Monitoring and Reliability Assessment of Power Semiconductor Devices in Electric Vehicle Inverters
*Shahriar Sarmast Ghahfarokhi[1], Enes Ayaz[1], Stanisław Oliszewski[2], Staffan Norrga[1], Hans Peter Nee[1] (1. KTH Royal Institute of Technology (Sweden), 2. Wrocław University of Science and Technology (Poland))

[P2-10-10] Single-Stage Integrated OBC-APM Topology with Reduced Device Count for EV Application
*Anmol Arun Meshram[1], Siva Prabhakar[1], Sandeep Anand[1] (1. Indian Institute of Technology Bombay (India))

[P2-10-11] Optimal Primary Coil Placement in a Dual-Field Dynamic Wireless Power Transfer System
*HARUTAKA SUZUKI[1], Ryosuke Ota[1], Cristian Giovanni Colombo[2], Michela Longo[2] (1. Tokyo Metropolitan University (Japan), 2. Politecnico di Milano (Italy))

[P2-10-12] EMI and Loss Reduction via DC Link Optimization for Battery Based Automotive Multilevel Converters
*Wolfgang Grupp[1], Tobias Manfred Högerl[1], Johannes Buberger[1], Andreas Wiedenmann[1], Julian Estaller[1], Kevin Krakow[2], Thomas Weyh[1] (1. Universität der Bundeswehr München (Germany), 2. Helmut Schmidt Universität Hamburg (Germany))

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Poster 2-10 (Event & Exhibition Hall)

[P2-10-13] Comparison of Unfolder and Pseudo-DC linkSingle-stage Topologies for Phase-Modular 3-phase Off-Board LEV Chargers
*Biswajit Sahoo[1], Shiladri Chakraborty[1] (1. IIT Bombay (India))

[P2-10-14] Design and Implementation of a Multi-Stage Constant Current Charging Strategy for LFP Battery Chargers
Anh-Tuan Le-Nguyen[1], *Chang-Hua Lin[1], Hwa-Dong Liu[2], Jenn-Jong Shieh[3] (1. National Taiwan University of Science and Technology (Taiwan), 2. National Taiwan Normal University (Taiwan), 3. Feng Chia University (Taiwan))

[P2-10-15] Energy Control Strategy with Compact Flywheel Battery for Grid Support and Fast EV Bus Charging
*Atsushi Nakajima[1], Jahangir Hossain[2], Biplob hossain[2], Kiyoharu Nakao[4], Yoichi Ito[3], Kazuo Rokkaku[4], Morihiro Saito[6], Yoshifumi Shimogaki[7], Koji Shibasaki[8], Hiroya Sugimoto[5], Daiki Satou[5] (1. PandaPower Co., Ltd. / Tokyo Denki University (Japan), 2. University of Technology Sydney (Australia), 3. GS Yuasa Corporation (Japan), 4. PandaPower Co., Ltd. (Japan), 5. Tokyo Denki University (Japan), 6. Motion System Tech, Inc. (Japan), 7. Exedy Corporation (Japan), 8. Maruwa Electronic Inc. (Japan))

Poster 2-11 (Event & Exhibition Hall)

[P2-11] Home and Consumer Appliances
Chair: Motoshi Matsushita (DAIKIN INDUSTRIES, LTD.)

[P2-11-01] Normalized Quadruple Sine Phase-Locked Loop for Three-Phase Distorted and Unbalanced Power Grids
Hao-Min Zhang[1], Yi-Hung Liao[1], *Jian-Chun Huang[1] (1. NATIONAL CENTRAL UNIVERSITY (Taiwan))

[P2-11-02] High-Efficiency Active-Clamp Flyback DC to DC Converter with Dual Transformers for 1.2 kW Power Applications
Chihchiang Hua[1], *JunYou Wang[1] (1. Department of Electrical Engineering, National Yunlin University of Science and Technology Address : No. 123, Section 3, University Road, Douliu City, Yunlin County (Taiwan))

[P2-11-03] Efficient Voltage Harmonic Control of DC–AC Inverters With Low Computational Burden
*Shih-Gang Chen[1], Shih-Sian Lee[1], Jun-Ming Hsu[1] (1. National Taipei University of Technology (Taiwan))

[P2-11-04] Inrush Current in an Inverter-Equipped Refrigerator Connected to a Power Outlet at Various Source-Voltage Phase-Angles and Its Suppressor
*Fuka Ikeda[2], Toshihiko Tanaka[1], Hidetoshi Kanazawa[3] (1. Hiroshima Institute of Technology (Japan), 2. Fukuoka Institute of Technology (Japan), 3. Kanazawa Fellowship Laboratory (Japan))

[P2-11-05] A Scalable Infrastructure for Distributed Energy Resources Based on MEC-RM Architecture
*Koki SAITO[1], Yuta HASUHARA[1], Teruo KOBAYASHI[2], Shigehide FUWA[2], Midori SUGAYA[1] (1. Shibaura Institute of Technology (Japan), 2. ENERES Co.,Ltd. (Japan))

[P2-11-06] Input Current Harmonics Reduction in Non-isolated Buck-boost ZVS AC-DC LED Driver using Triangular Current Mode
*Hiroki Watanabe[1], Daisuke Ueda[2], Jun-ichi Itoh[1] (1. Nagaoka University of Technology (Japan), 2. Panasonic Electric Works Co. Ltd (Japan))

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Poster 2-12 (Event & Exhibition Hall)

[P2-12] Human Factor and Image Recognition
Chair: Sho Yokota (Toyo University), Kaoru Mitsuhashi (Teikyo University)

[P2-12-01] Deep Learning Block-Set: A Simulink Native Deep Learning Framework
*Alexander Oerder[1], Tim Kappler[1], Johnny Abu Akdeh, Marc Hiller[1], Andreas Liske[1] (1. Karlsruhe Institute of Technology (Germany))

[P2-12-02] YOLOv8-Based Image Recognition Framework for Disease Detection in Agricultural Systems
*Cheng-Chi Yu[1], Da Cheng Peng[1], Jia Hong Lyu[1], Po Chen Liu[1], Ching Chun Chuan[1] (1. Department of Electrical Engineering, National Kaohsiung University of Science and Technology (NKUST) (Taiwan))

Poster 2-13 (Event & Exhibition Hall)

[P2-13] Sophisticated Power Conversion 2
Chair: Rintaro Kusui (Nagaoka University of Technology)

[P2-13-01] A Hybrid-bridge Resonant Converter with WideZVS and Minimum Current Operation for Wide Gain Range Applications
Yinan Li[1], *Xiaodong LI[1], Chuan Sun[1], Akshay Rathore[2] (1. Macau University of Science and Technology (Macau), 2. National University of Singapore (Singapore))

[P2-13-02] Optimization of TPS Modulation for LCL Resonant DAB Converters
Rui Wang[1], Chuan Sun[1], *Xiaodong LI[1], Akshay Rathore[2] (1. Macau University of Science and Technology (Macau), 2. National University of Singaporee (Singapore))

[P2-13-03] A Unipolar PWM to Reduce Common-Mode Voltage in Three-Level Inverters Based on Neutral-Point Voltage Balancing
*Paiboon Kiatsookkanatorn[1], Somboon Sangwongwanich[2], Phongsathorn Sangsuwan[1], Surapong Suwankawin[2] (1. Rajamangala University of Technology Suvarnabhumi(RUS), Suphanburi (Thailand), 2. Chulalongkorn University Bangkok (Thailand))

[P2-13-04] Volt-Second Balance Control with Magnetizing Current Estimation for Primary-side Regulation Double-Clamp ZVS Flyback Converter
*Song Ding[1], Yaoqing Wang[1], Qinsong Qian[1], Weifeng Sun[1] (1. Southeast University (China))

[P2-13-05] Multi-mode Control for an Asymmetric Half-bridge Flyback Converter
*Younghoon Cho[1], Paul Jang[2], Jong-Won Shin[1] (1. Seoul National University (Korea), 2. Tech University of Korea (Korea))

[P2-13-06] Relative Impact of Dead Time in Medium Voltage SiC MOSFET-Based Converters
*Morten Rahr Nielsen[1], Gao Liu[1], Narendra Shankar Walawalkar[1], Michael Møller Bech[1], Stig Munk-Nielsen[1] (1. Aalborg University (Denmark))

[P2-13-07] Switching Loss Optimization for Three-Phase Hybrid NPC Inverter with Flying-Capacitor Leg
*chengjun li[1], dong jiang[1], yikang mao[1], hui liu[1] (1. Huazhong University of Science and Technology (China))

[P2-13-08] Coordinated Control of DC-link Capacitor Voltages of NPC Converters for Doubly Fed Machines in Adjustable-Speed Pumped-Storage Hydropower Systems
*Jiantao Zhang[1], Takuro Arai[1], Yushi Koyama[1], Hironari Kaneda[1], Teruyuki Ishizuki[1], Junji Mori[1] (1. Toshiba Corporation (Japan))

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Poster 2-13 (Event & Exhibition Hall)

[P2-13-09] Stability Analysis of Grid-Following Inverter with Digital Symmetric Component Separator
*Shota Tanaka[1], Toshiji Kato[1], Kaoru Inoue[1] (1. Doshisha University (Japan))

[P2-13-10] A Novel Integral Sliding Mode Controller Applied for Grid-connected Modular Multilevel Converter
*Hieu Chi Pham[1], Long Van Pham[1], Phuong Viet Pham[1] (1. Hanoi University of Science and Technology (Viet Nam))

[P2-13-11] Detection and Localization for Subsequent Sub-Module Fault in a Cascaded Multilevel Converter Based on Line-to-Line Voltage Waveforms
*Yosuke Aoki[1], Yushi Miura[1] (1. Nagaoka University of Technology (Japan))

[P2-13-12]Novel Current Modulation Method for Active Temperature Control in Parallel Operated Half-Bridge Power Stages
*Chris Hermann[1], Julian Tomsik[1], David Hirning[1], André Haspel[1], Ingmar Kallfass[2], Jörg Roth-Stielow[1] (1. ILEA - University of Stuttgart (Germany), 2. ILH - University of Stuttgart (Germany))

[P2-13-13] Active Power Decoupling with Capacitor Voltage Utilization Factor Design for Single-phase and Three-phase Compatible T-type Converter in EV On-board Chargers
*Ryohei Higashide[1], Hiroki Watanabe[1], Jun-ichi Itoh[1] (1. Nagaoka University of Technology (Japan))

[P2-13-14] Common-Mode Voltage Reduction Pulse-Width Modulation for Three-Phase Converters
*Shinji Sato[1], Daiki Yamaguchi[1], Fumiki Kato[1] (1. National Institute of Advanced Industrial Science and Technology (AIST) (Japan))

[P2-13-15] Simplified Soft-Switching Constraints for High-Power Multi-Active Bridge Converters
*Jonghun Yun[1], Jaekeun Lee[2], Giovanni De Carne[1], Shenghui Cui[2] (1. Karlsruhe Institute of Technology (Germany), 2. Seoul National University (Korea))

[P2-13-16] Hybrid Thermal Digital Twin for Power Modules with Data-Driven Residual Correction
Martin Votava[1], Oke Olayinka Adebayo[3], Riccardo Sancio[1], *Marco Liserre[2] (1. Kiel University (Germany), 2. Kiel University; Fraunhofer ISIT (Germany), 3. Department of Mechanical and Aerospace Engineering, Missouri University of Science and Technology (USA))

[P2-13-17] Analysis of Parallel Operation Effects in Grid-Connected Inverters with LCL Filters
*Chhaya Seng[1], Dongmin Kim[1], Jinlei Sun[1], Hanju Cha[1] (1. Chungnam National University (Korea))

Poster Sessions

Wednesday, June 3 12:40 – 14:00

Poster 2-14 (Event & Exhibition Hall)

[P2-14] Device-related technologies, Passive components and materials 1
Chair: Noriyuki Nosaka (OMRON Corporation)

[P2-14-01] Magnetic-Field-Based Switching Stage Detection for Closed-Loop Active Gate Driving to Suppress Overshoot and Oscillatory Switching Behaviour in SiC Power Modules
*Yuxiao Bai[1], Mason Parker[1], Ilker Sahin[2], Sebastian Neira Castillo[1], Paul Judge[1], Stephen Finney[1] (1. University of Edinburgh (UK), 2. ASELSAN (Turkey))

[P2-14-02] Toward Direct Aging Detection of SiC MOSFETs Using Switching-Delay Measurements
*Laurids Schmitz[1], Xin Yen Woon[1], Franz Hendrik Groote[1], Kai-Jimmy Shen[1], Rik W. De Doncker[1] (1. ISEA - RWTH Aachen University (Germany))

[P2-14-03] Online Junction-Temperature Sensing of GaN GITs Utilizing the Gate Diode Forward Voltage
*Tianlong Albert[1], Tudor Sechel[1], Daniel Baggen[1], Rik W. De Doncker[1] (1. RWTH Aachen University (Germany))

[P2-14-04] Optimized Short-Circuit Turn-Off Performance in IGBTs with High Desaturation Current
*Michael Walter[1], Mark-M. Bakran[1] (1. Universität Bayreuth (Germany))

[P2-14-05] A SiC MOSFET double-side cooled press packutilising liquid metal for die connections
*Stefan Meyer[1], Asger Bjørn Jørgensen[1], Szymon Michael Beczkowski[1], Kaichen Zhang, Nicholas Baker[2] (1. Aalborg University (Denmark), 2. University of Alabama (USA))

[P2-14-06]Comparative Evaluation of Gate Driving Schemes for Paralleled 2.3 kV SiC MOSFET Power Modules
*Nianzun Qi[1], Gao Liu[1], Hongbo Zhao[1], Asger Bjørn Jørgensen[1], Stig Munk-Nielsen[1] (1. Aalborg University (Denmark))

[P2-14-07] Monolithic GaN Gate Driver with Adaptive Gate Driving Control
*Ching-Yu Ou Yang[1], Ching-Jan Chen[1], Yen-Ming Chen[1] (1. National Taiwan University (Taiwan))

[P2-14-08] Self-Driven Active Gate Driver Employing Gate–Drain Capacitive Coupling for Overshoot Reduction in SiC MOSFETs
*Niklas Falkenberg[1], Martin Pfost[1] (1. TU Dortmund Univ. (Germany))

[P2-14-09] Trade-off between Avalanche and Short Circuit Ruggedness in Different SiC MOSFET Technologies
Layi Alatise[1], Arkadeep Deb[2], Heaklig Ayala[1], Jose Ortiz Gonzalez[1], Abdul-Haleem Malik[1], *Saeed Jahdi[3] (1. University of Warwick (UK), 2. GE Vernova, Stafford, UK, ST17 4FL (UK), 3. University of Bristol (UK))

[P2-14-10] Modeling GaN HEMT Devices: Physical Insights into Intrinsic and Extrinsic Circuit Components of the SPICE model
*Pengpeng Sun[1], Torbjörn Thiringer[2], Adamantia Logotheti[1] (1. Volvo Cars (Sweden), 2. Chalmers Univ. (Sweden))

[P2-14-11] Reconstruction of Output Characteristics of Wide-Bandgap Devices Based on Double-Pulse Tests
*Tianxu Cao[1], Christos Leontaris[1], Gean Maia de Sousa[1], Marcelo Lobo Heldwein[1] (1. Technical University of Munich (Germany))

[P2-14-12] Double-Pulse Characterization of GaN Monolithic Bidirectional Switches in Single-Stage OBC
*Guanjiang Liu[1], Qishan Pan[1], Xinxu Cui[1], Haoyu Wang[1,2] (1. School of Information Science and Technology, ShanghaiTech University (China), 2. Shanghai Engineering Research Center of Energy Efficient and Custom AI IC (China))

[P2-14-13] Comprehensive Modeling and Evaluation of Cascode GaN HEMT Power Modules
*Ruijie Song[1], Fang Zhuo[1], Feng Wang[1], Hao Yi[1], Jiachen Tian[1], Ruru Zheng[2] (1. Xi'an Jiaotong University (China), 2. Yandangshan Institute of Electrical Technology (China))

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