



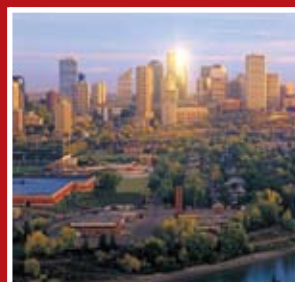
# 2008 IEEE Industry Applications Society Annual Meeting

OCTOBER 5-9, 2008

WESTIN HOTEL

EDMONTON, ALBERTA

CANADA





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CANADA





# President's Welcome

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## Welcome to the 43rd IAS Annual Meeting!

I would like to extend my personal welcome to you at this 43rd Industry Applications Society Annual Meeting in Edmonton. The city of Edmonton is considered by many to be a gateway into northern Canada and the numerous heavy industry activities which are underway. It is truly appropriate to hold our Society's flagship conference here this week. You will find numerous activities spanning the scope of the IAS and I hope that you have the chance to participate in all of them that are of interest to you.

At this year's meeting, we have more than 60 technical sessions covering technical topics ranging from industrial power systems to power electronic devices and virtually all applications found in industry. You will find a healthy mix of application, development, and research papers throughout the well-planned technical program. You can attend any paper in any session, and you may move freely between sessions as you like to listen to any paper presentation that is of interest to you.

A major activity at the Annual Meeting is the standards work which takes place, typically on Sunday and Monday during the meeting week. The IAS is a major developer of IEEE Standards and many are created and discussed at the Annual Meeting. Perhaps the most recognizable of the standards which are being developed here are the IEEE Color Books which deal with industrial and commercial power systems. All of the standards development activities are open to conference attendees and your involvement would be most welcome. These meetings are listed in the program for your convenience.

In addition to the technical aspects, there are numerous social activities in which I encourage you to participate. Foremost among these are the Awards Luncheon and the President's Banquet. At these two events, we recognize the achievements of some of our most distinguished members as well as our outstanding chapters. Prize paper awards for some of our technical committees are also presented in these venues. There is also the Myron Zucker Student Luncheon which provides a great opportunity for students to meet and interact with each other and other IAS members.

As always, the Annual Meeting is the culmination of the year's activities. I hope you enjoy the conference and your stay in Edmonton. On behalf of all of the IAS volunteers who have put so much effort into insuring a successful event, I thank you for your participation this year.

Mark Halpin  
President, IEEE Industry Applications Society



# Conference Local Chair's Welcome

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## Welcome to Edmonton and to the 2008 IEEE IAS Annual Meeting!

It is my pleasure to warmly welcome you to Edmonton, the province capital of Alberta, Canada's second most populous provincial capital (after Toronto). We are honoured that you accepted the invitation to be our IAS guest and the guest of my home city: the northernmost North American city with a metropolitan population of over one million. Edmonton covers an area larger than Chicago, Philadelphia, Toronto or Montreal, while offering all the services of a major urban center.

Edmonton, the "Festival City", has also been named Canada's Cultural Capital for 2007 for its thriving arts and cultural community. A number of cultural events are anchored just steps from your hotel, in the modern architectural downtown Arts District, and around the newly renovated Churchill Square. The Edmonton outdoors is most generous in our sunny city. Our river valley is the largest stretch of urban parkland in Canada.

Oil production and refining remain the basis for Alberta's economy. But Edmonton's economy is now the second most diverse in Canada and is known for its strong life-science sector and burgeoning high-tech industry. Much of the growth in technology sectors is due to Edmonton's reputation as one of Canada's premiere research and education centers. Research initiatives are anchored by educational institutions such as the University of Alberta, home to Canada's second largest research library, which ranks first in volumes per student. Many of the research programs benefit from proactive Provincial Government initiatives such as Informatics Circle of Excellence (iCORE), Alberta Ingenuity Fund (AIF), National Institute for Nanotechnology (NINT), Edmonton Research Park, etc.

In this context, it just feels right that the 2008 IEEE Industry Application Society Conference is here, a feeling that I am hoping you share. As with any event of this magnitude, the joint effort of many people is required. I am expressing my thanks to the IEEE IAS and its Officers, especially to Dr. Mark Nelms, for their support in the process. Our tireless and generous Conference Chair, Tom Nondahl was a pleasure to work with. Lynda, thank you! I am grateful to all of you for your participation and for striving to make this conference a success. You deserve to enjoy the fruits of your hard work and I am truly hoping that you will have a very pleasant, exciting stay in Edmonton, with a lot of great stories to tell when you get back home.

Angela Antoniu  
Local Committee Chair



# IEES - IAS Leadership

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# Contents

President's Welcome .....	2
Conference Local Chair's Welcome .....	3
IEEE-IAS Leadership .....	4
Registration Hours .....	7
Conference Daily Amenities & Special Events .....	8
Westin Hotel Floorplan.....	9
Committee Meetings .....	10
Technical Program .....	12
Conferences & Workshops .....	26

## Registration Hours

IEEE IAS Conference Registration Desk will be located near the escalators on the Banquet Level in the Westin Edmonton Hotel.

**Sunday, October 5, 2008**

7:00am-7:00pm

**Monday, October 6, 2008**

7:00am-6:00pm

**Tuesday, October 7, 2008**

7:00am-6:00pm

**Wednesday, October 8, 2008**

7:00am-6:30pm

**Thursday, October 9, 2008**

7:00am-12:00pm





# Conference Daily Amenities & Special Events

## Authors Breakfast

An Authors' Breakfast will be held each morning for the authors presenting that particular day. This breakfast is meant to provide that day's presenting authors with a chance to meet with their moderators and colleagues.

Monday, Oct. 6, 2008  
7:00 am – 8:00 am  
Centennial (Lobby Level)

Tuesday, Oct. 7, 2008  
7:00 am – 8:00 am  
Manitoba (Banquet Level)

Wednesday, Oct. 8, 2008  
7:00 am – 8:00 am  
Manitoba (Banquet Level)

Thursday, Oct. 9, 2008  
7:00 am – 8:00 am  
Turner Valley (Banquet Level)

## Guest Hospitality Suite

There will be a hospitality suite available to all registered guests for refreshments and networking during these hours:

- Monday, 8:00 am – 6:00 pm
- Tuesday, 8:00 am – 6:00 pm
- Wednesday, 8:00 am – 6:00 pm
- Thursday, 8:00 am – 12:00 pm

The Guest Hospitality Suite will be located in the Parlour Suite.

## Daily Conference Breaks

AM Breaks 10:00am-10:30am  
PM Breaks 3:30pm-4:00pm  
(Foyer on Banquet Level)

## Special Events

### **Guide to the IAS Annual Meeting for First Time Attendees**

*Please come learn how to take advantage of all the IAS Annual Meeting has to offer if this is your first time in attendance!*

Sunday, October 5, 2008  
5:30 pm – 7:00 pm  
Chairman (Banquet Level)

### **Welcome Reception** *(tickets required)*

Sunday, October 5, 2008  
6:30 pm – 10:00 pm  
Saskatchewan/Manitoba (Banquet Level)  
Cocktails and light fare.  
Dinner will not be provided.

### **Myron Zucker Student Luncheon** *(By invitation only)*

Monday, October 6, 2008  
12:00 pm – 2:00 pm  
Centennial (Lobby Level)

### **IEEE IAS Awards Luncheon** *(By invitation only)*

Tuesday, October 7, 2008  
12:00 pm – 2:00 pm  
Saskatchewan/Manitoba (Banquet Level)

### **IEEE IAS President's Special Reception** *(By invitation only)*

Wednesday, October 8, 2008  
6:30 pm – 7:30 pm  
Manitoba/Saskatchewan (Banquet Level)

### **IEEE IAS President's Reception & Banquet** *(tickets required)*

Wednesday, October 8, 2008

#### **Reception**

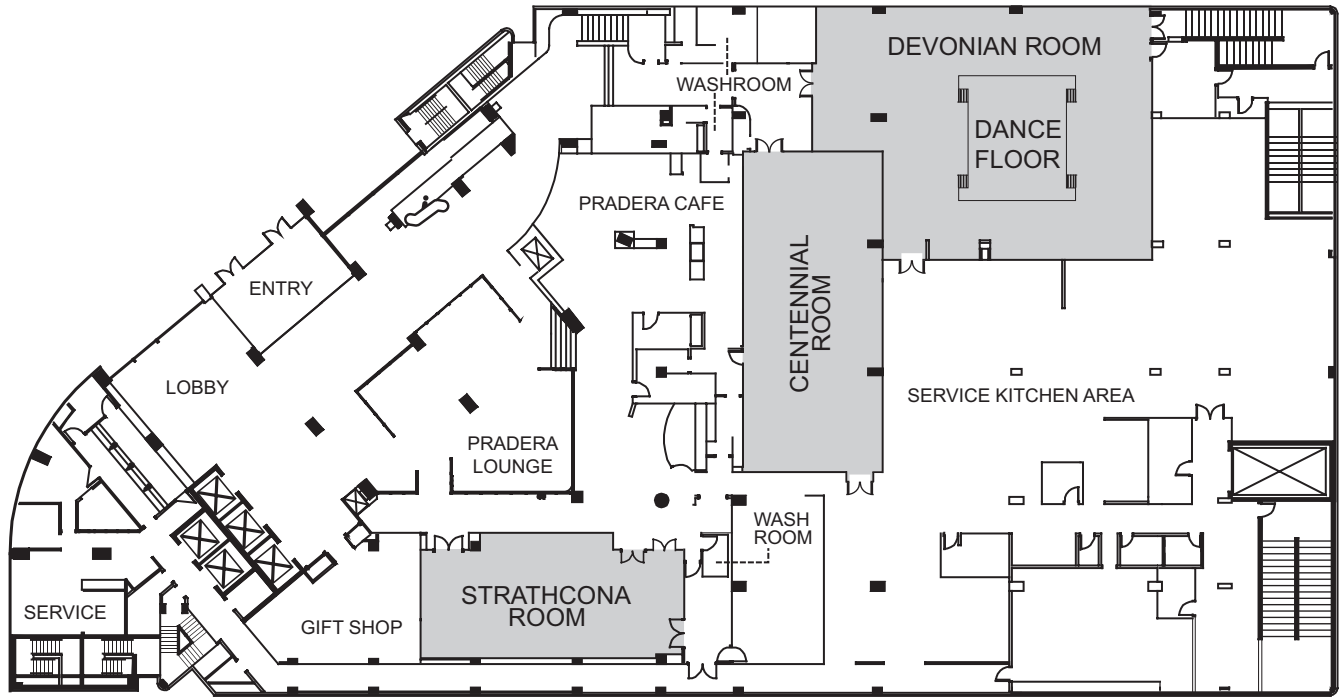
6:30 pm – 7:30 pm  
Saskatchewan/Manitoba Foyer  
(Banquet Level)

#### **Banquet**

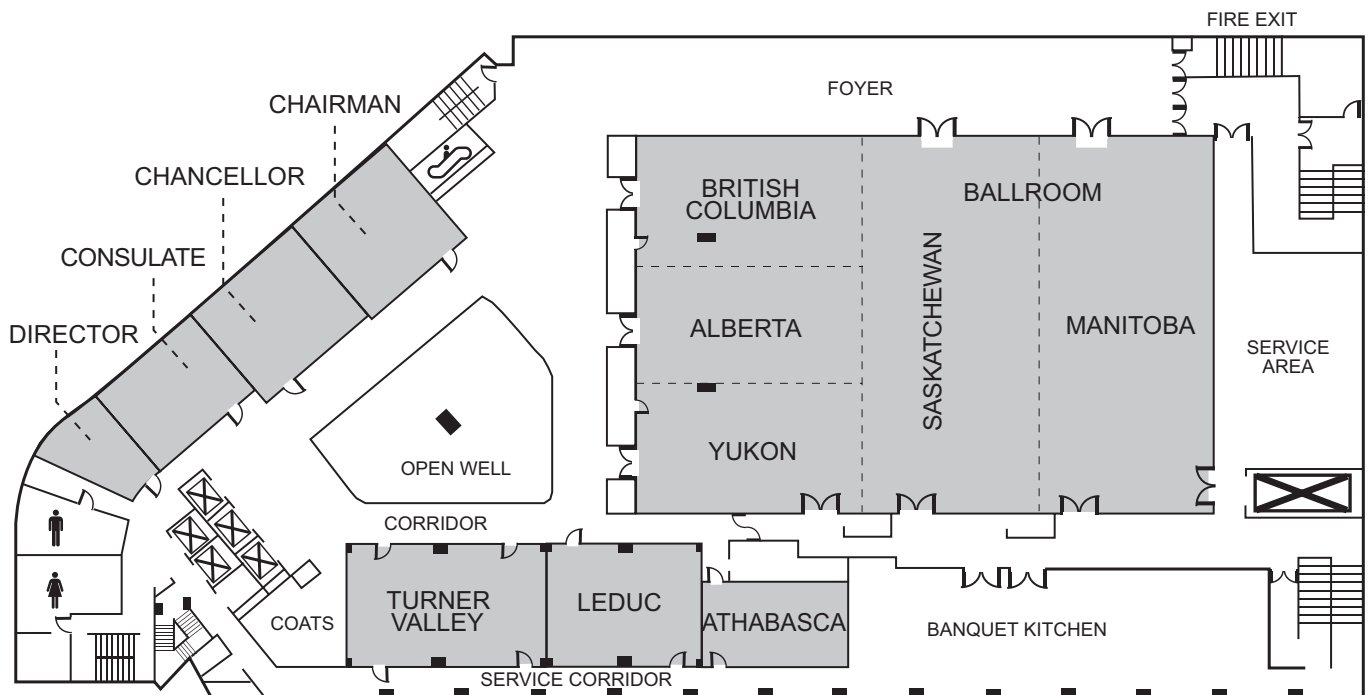
7:30 pm – 9:30 pm  
Saskatchewan/Manitoba/Yukon  
(Banquet Level)



# Westin Hotel Floorplan



**LOBBY LEVEL**



**BANQUET LEVEL**



# Committee Meetings

## **Sunday - October 5**

PELS Board Meeting	8:00 am - 6:00 pm	Turner Valley	Westin
IAS Board Meeting	1:00 pm - 5:00 pm	Alberta	Westin
Annual Meeting Planning	11:00 am - 1:00 pm	Director	Westin
I&CPS General Session - Color Book Re-Organizational Meeting	1:00 pm - 2:00 pm	Chancellor	Westin
I&CPS Standards Training -			
Technical Books Coordinating Committee (TBCC)	2:00 pm - 3:00 pm	Chancellor	Westin
Base Book - TBCC	3:00 pm - 4:00 pm	Chancellor	Westin
Power System Engineering Executive Committee	4:00 pm - 5:00 pm	Chancellor	Westin
Power Systems Protection Executive Committee	5:00 pm - 6:00 pm	British Columbia	Westin
Industrial Power Conversion Systems Department Meeting	5:00 pm - 7:00 pm	Chancellor	Westin

## **Monday - October 6**

Technical Books Coordinating Committee (TBCC)	8:00 am - 9:00 am	Maligne Suite	Courtyard Marriott
Power Systems Design TBCC	9:00 am - 10:00 am	Maligne Suite	Courtyard Marriott
Power Systems Analysis TBCC	10:00 am - 11:00 am	Maligne Suite	Courtyard Marriott
Grounding TBCC	11:00 am - 12:00 am	Maligne Suite	Courtyard Marriott
Emergency / Stand-By Power Systems TBCC	9:00 am - 10:00 am	Fraser Suite	Courtyard Marriott
Protection and Coordination TBCC	10:00 am - 11:00 am	Fraser Suite	Courtyard Marriott
Maintenance, Operations, and Safety TBCC	11:00 am - 12:00 pm	Fraser Suite	Courtyard Marriott
Reliability TBCC	9:00 am - 10:00 am	Riverside	Courtyard Marriott
I&CPS Technical Program Meeting	3:00 pm - 4:00 pm	Chairman	Westin
I&CPS Meetings Committee Meeting	4:00 pm - 5:00 pm	Chairman	Westin
I&CPS Department OpCom Meeting	6:00 pm - 8:00 pm	Chairman	Westin
Power System Engineering Reliability Subcommittee	10:30 am - 12:30 pm	Riverside	Courtyard Marriott
Power System Engineering Emergency & Standby Systems Subcommittee	1:00 pm - 1:30 pm	Fraser Suite	Courtyard Marriott
Power System Engineering Power System Design Subcommittee	1:30 pm - 2:00 pm	Fraser Suite	Courtyard Marriott
Power System Engineering Forensics Working Group	1:00 pm - 2:00 pm	Maligne Suite	Courtyard Marriott
Power System Engineering Safety, Operations, & Maintenance Subcommittee	2:00 pm - 3:00 pm	Maligne Suite	Courtyard Marriott
Power System Engineering Power System Analysis Subcommittee	2:00 pm - 2:30 pm	Fraser Suite	Courtyard Marriott
Power System Engineering Grounding Subcommittee	2:30 pm - 3:30 pm	Fraser Suite	Courtyard Marriott
Power System Engineering Power Quality Subcommittee	3:30 pm - 4:00 pm	Fraser Suite	Courtyard Marriott
Power System Engineering Main Committee	4:00 pm - 5:00 pm	Fraser Suite	Courtyard Marriott
Codes & Standards Committee	5:00 pm - 6:00 pm	Fraser Suite	Courtyard Marriott

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Power System Protection Generator Grounding Working Group	1:00 pm - 3:00 pm	Riverside	Courtyard Marriott
Power System Protection Medium Voltage Protection Subcommittee	3:00 pm - 4:00 pm	Maligne Suite	Courtyard Marriott
Power System Protection Low Voltage Protection Subcommittee	3:00 pm - 4:00 pm	Riverside	Courtyard Marriott
Power System Protection Surge Protection Subcommittee	4:00 pm - 5:00 pm	Riverside	Courtyard Marriott
Power System Protection Molded Case Circuit Breaker Working Group	4:00 pm - 4:30 pm	Maligne Suite	Courtyard Marriott
Power System Protection Main Committee	5:00 pm - 6:00pm	Riverside	Courtyard Marriott
Energy Systems Utility Deregulation Subcommittee	4:30 pm - 5:00 pm	Maligne Suite	Courtyard Marriott
Energy Systems Main Committee	5:00 pm - 6:00 pm	Maligne Suite	Courtyard Marriott
Appliance Industry Committee	6:00 pm - 7:30 pm	Consulate	Westin
Power Electronics Devices and Components Committee	6:00 pm - 8:00 pm	Leduc	Westin
Metals Industry Committee	6:00 pm - 8:00 pm	Turner Valley	Westin
Industrial Drives Committee	6:00 pm - 8:00 pm	British Columbia	Westin

## **Tuesday - October 7**

Electrostatic Processes Committee	6:00 pm - 7:30 pm	Leduc	Westin
Electric Machines Committee	6:00 pm - 8:00 pm	Alberta	Westin
Industrial Power Converter Committee	6:00 pm - 8:00 pm	Strathcona	Westin
Industrial Light and Displays Committee	6:00 pm - 7:30 pm	Chancellor	Westin
Mining Industry Committee	6:00 pm - 8:00 pm	Consulate	Westin
Industrial Automation & Control Committee	6:00 pm - 8:00 pm	Turner Valley	Westin
Transactions Editorial Board Meeting	8:00 am - 10:00 am	Director	Westin
Magazine Editorial Board Meeting	10:00 am - 12:00 pm	Director	Westin
IAS Board Meeting	2:00 pm - 8:00 pm	Director	Westin
MSDAD Meeting	5:00 pm - 6:30 pm	Manitoba	Westin
Chapters Workshop	8:00 am - 5:30 pm	Chairman	Westin

## **Wednesday - October 8**

IAS Executive Board Meeting	8:00 am - 12:00 pm	Manitoba	Westin
IEEE Energy Conversion Congress & Expo (ECCE 2009)	2:00 pm - 6:00 pm	Chairman	Westin
Organization Meeting	2:00 pm - 6:00 pm	Strathcona	Westin



# Technical Program

Room	Turner Valley	Leduc	Chancellor	Devonian	Alberta
<b>Com- mittee</b>	Metal Industry	Electrostatic Processes	Industrial Lighting & Displays	Electric Machines	Industrial Drives
	Session 1 - Power System Analysis, Arc Flash	Session 2 - Electrostatic Precipitators and Separators	Session 3 - LED	Session 4 - Renewable Energy and Synchronous Machines	Session 5 - Drives III
	Session Chair and Organizer: S. Douglas Cromey, Novelis Inc., Canada	Session Chair: Akira Mizuno, Toyohashi University of Technology, Japan	Session Chair and Organizer: Joep Jacobs, Philips Research Laboratories, Germany	Session Chair and Organizer: David Dorrell, University of Glasgow, UK	Session Chair and Organizer: Behrooz Mirafzal, Rockwell Automation, USA
		Session Organizer: Petru Notingher, University of Montpellier 2, France			
<b>8:00 AM</b>	IAS1p1 Voltage Sag in Highly Automated Factories	IAS2p1 Electrostatic Precipitators for Cleaning Diesel Exhaust	IAS3p1 Suitable Switching Converter Topologies for Automotive Signal Lamps and Headlamps Using Power LEDs	IAS4p1 Design of a Lightweight Transverse Flux Permanent Magnet Machine for Direct-Drive Wind Turbines	IAS5p2 A Decoupling Control Scheme of Combined Levitation-and-Propulsion SLIM for Maglev Vehicle
	A. Moreno-Muñoz, Universidad de Córdoba, Spain;	Hiroshi Umemoto, Toyohashi University of Technology, Japan; Hideaki Hayashi, Toyohashi University of Technology, Japan; Kazunori Takashima, Toyohashi University of Technology, Japan; and Akira Mizuno, Toyohashi University of Technology, Japan	D. Gacio, University of Oviedo, Spain; A. J. Calleja, University of Oviedo, Spain; J. Garcia, University of Oviedo, Spain; J. Ribas, University of Oviedo, Spain; M. Rico-Secades, University of Oviedo, Spain	Deok-je Bang, Delft University of Technology, The Netherlands; Henk Polinder, Delft University of Technology, The Netherlands; Ghanshyam Shrestha, Delft University of Technology, The Netherlands; Jan Abraham Ferreira, Delft University of Technology, The Netherlands	Ke Wang, Chinese Academy of Sciences, China; Liming Shi, Chinese Academy of Sciences, China; Yaohua Li, Chinese Academy of Sciences, China; Jinwei He, Chinese Academy of Sciences, China
	J. J. G. de la Rosa, Universidad de Cádiz, Spain				
<b>8:30 AM</b>	IAS1p2 Harmonic Analysis of a Mid-Frequency Welder Application for a Metal Working Facility	IAS2p2 Electrohydrodynamically-Assisted Electrostatic Precipitator for Collection of Low Resistive Dust	IAS3p2 Comparison Among Power LEDs for Automotive Lighting Applications	IAS4p2 A Methodology to Design Linear Generators for Energy Conversion of Ambient Vibrations	IAS5p1 On the Contribution of PWM Methods to the Common Mode (Leakage) Current in Conventional Three-Phase Two-Level Inverters as Applied to AC Motor Drives
	Thomas J. Dionise, Eaton Corporation, USA;	T. Yamamoto, Musashi Institute of Technology, Japan; T. Abe, Musashi Institute of Technology, Japan; T. Mimura, Musashi Institute of Technology, Japan; N. Otsuka, Musashi Institute of Technology, Japan; Y. Ito, (affiliation not cited); Y. Ehara, Musashi Institute of Technology, Japan; A. Zukeran, Fuji Electric Systems Co., Japan	D. Gacio, University of Oviedo, Spain; J. Cardesin, University of Oviedo, Spain; E. L. Corominas, University of Oviedo, Spain; J. M. Alonso, University of Oviedo, Spain; M. Dalla-Costa, University of Oviedo, Spain; A. J. Calleja, University of Oviedo, Spain	Haodong Li, Clarkson University, USA; and Pragasen Pillay, Concordia University, Canada	Ahmet M. Hava, Middle East Technical University, Turkey; N. Onur Çetin, Middle East Technical University, Turkey; Emre Ün, Middle East Technical University, Turkey
	Visuth Lorch, Eaton Corporation, USA				
<b>9:00 AM</b>	IAS1p3 Protective Relay Settings of Tie Line Tripping and Load Shedding for an Integrated Steel-Making Cogeneration System	IAS2p3 Collection of Fine Particles by Novel Wet Electrostatic Precipitator	IAS3p3 Compact Lamp Using High-Brightness LEDs	IAS4p3 On the Possibilities of Using a Brushless Doubly-Fed Reluctance Generator in a 2 MW Wind Turbine	IAS5p3 Design of Speed Control Loop of A Variable Speed Diesel Engine Generator by Electric Governor
	Chao-Shun Chen, I-Shou University, Taiwan; Cheng-Ting Hsu, Southern Taiwan University, Taiwan; Yih-Der Lee, National Sun Yat-sen University, Taiwan; D. S. Ting and C. C. Shen,, China Steel Corporation, Taiwan;	Andrei Bologa, Forschungszentrum Karlsruhe, Germany; Hanns-Rudolf Paur, Forschungszentrum Karlsruhe, Germany; Markus Lehner, Rauschert Verfahrenstechnik GmbH, Germany; Helmut Seifert, Forschungszentrum Karlsruhe, Germany; Thomas Wäscher, Ingenieurbüro für Energie- und Verfahrenstechnik, Germany; Klaus Woletz, Forschungszentrum Karlsruhe, Germany	Rafael A. Pinto, Marcelo R. Cosetin, Tiago B. Marchesan, Murilo Cevi, Alexandre Campos, Ricardo N. do Prado, Federal University of Santa Maria, Brazil	David G. Dorrell, University of Glasgow, UK; and Milutin Jovanovic, Northumbria University, UK	Seung-Hwan Lee, Seoul National University, Korea; Jung-Sik Yim, Seoul National University, Korea; Joon-Hwan Lee, Seoul National University, Korea; Seung-Ki Sul, Seoul National University, Korea
<b>9:30 AM</b>	IAS1p4 A New Field-Data Based EAF Model for Power Quality Studies	IAS2p4 Enhanced Performance for Electrostatic Precipitators by Means of Conventional and Fuzzy Logic Control	IAS3p4 Dynamic Control Point Simulation of OLEDs	IAS4p4 Synchronous Reference Frame Grid Current Control for Single-Phase Photovoltaic Converters	IAS5p4 Modeling of Torsional Resonances for Multi-Megawatt Drives Design
	Murat Göl, TUBITAK-UZAY, Turkey; Özgül Salor, TUBITAK-UZAY, Turkey; Bora Albayaci, Middle East Technical University, Turkey; Bilge Mutluer, TUBITAK-UZAY, Turkey; I ik Çadirci, TUBITAK-UZAY, Turkey; and Muammer Ermi , Middle East Technical University, Turkey	Norbert Grass, Ohm University, Germany; Andreas Zintl, Siemens AG, Germany; and Enrico Hoffmann, Siemens AG, Germany	Joep Jacobs, Philips, Germany; Carsten Singer, Philips, Germany; Dirk Hente, Philips, Germany; Hans-Peter Loebl, Philips, Germany	G. Franceschini, University of Parma, Italy; E. Lorenzani, University of Parma, Italy; C. Tassoni, University of Parma, Italy; and A. Bellini, University of Modena and Reggio Emilia, Italy	Joseph Song-Manguelle, Baldor Drives Center, Canada; Christof Sihler, GE Global Research Center, Germany; Jean Maurice Nyobe-Yome, University of Douala, Cameroon
<b>10:00 AM</b>	Break	Break	Break	Break	Break
<b>10:30 AM</b>	IAS1p5 Design of an Ultra-Capacitor Energy Storage System (UESS) for Power Quality Improvement of Electric Arc Furnaces	IAS2p5 Premises for the Electrostatic Separation of Wheat Bran Tissues		IAS4p5 Brushless DC Motor for a Solar Airplane Application: Comparison between Simulations and Measurements	IAS5p5 Regenerative Operation of DC-Series Machines in Pitchsystems for Multimegawatt Windturbines
	Chong Han, ABB Inc., USA; Alex Q. Huang, Subhashish Bhattacharya, Leonard W. White, North Carolina State University, USA; Michael Ingram, Tennessee Valley Authority, USA; Stanley Atcity, Sandia National Laboratory, USA; and Willie Wong, ABB Inc., USA	L. Dascalescu, University of Poitiers, France; C. Dragan, University of Poitiers, France; M. Bilici, University of Poitiers, France; R. Beleca, University of Poitiers, France; Y. Hemery, University of Montpellier II, France; X. Rouau, University of Montpellier II, France		Patrick Ragot, Paolo Germano, Miroslav Markovic, Yves Perriard, Ecole Polytechnique Fédérale de Lausanne, Switzerland.	Tobias Rösmann, LF-i REEnergy GmbH, Germany; Stefan Soter, Retostronik GmbH, Germany

# Monday, October 6, Morning Sessions

Strathconia	Yukon	British Columbia	Consulate	Manitoba
Industrial Power Converter	Industrial Power Converter	Industrial Drives	Appliance Industry	Power Electronics Devices & Components
Session 6 - Active Power Filters	Session 7 - AC-AC and current source converter	Session 8 - Sensorless Drives	Session 9 - Emerging Appliance Technologies	Session 10 - SiC Devices and Other Power Semiconductor Devices
Session Chair: Grahame Holmes, Monash University, Australia	Session Chair: Geza Joos, McGill University, Canada	Session Chair and Organizer: Michael Harke, Hamilton Sundstrand, USA	Session Chair and Organizer: Zheng Zhang, Whirlpool Corporation, USA	Session Chair: Jerry Hudgins, University of Nebraska, USA
Session Organizer: Kevin Lee, Eaton Corporation, USA	Session Organizer: Bingsen Wang, Arizona State University, USA			Session Organizer: Enrico Santi, University of South Carolina, USA
IAS6p1 High Performance Harmonic Isolation and Load Voltage Regulation of the Three-Phase Series Active Filter Utilizing the Waveform Reconstruction Method	IAS7p1 Design and Performance of a 200 kHz All-SiC JFET Current Source Converter	IAS8p1 Standstill Parameter Identification of Vector-Controlled Induction Motor Using Frequency Characteristics of Rotor Bars	IAS9p1 Performance Comparison of Permanent Magnet Synchronous Motors and Controlled Induction Motors in Washing Machine Applications Using Sensorless Field Oriented Control	IAS10p1 10 kV SiC MOSFET Based Boost Converter
Osman S. entürk, Middle East Technical University, Turkey; Ahmet M. Hava, Middle East Technical University, Turkey	Thomas Friedli, ETH Zurich, Switzerland; Simon D. Round, ETH Zurich, Switzerland; Dominik Hassler, ETH Zurich, Switzerland; Johann W. Kolar, ETH Zurich, Switzerland	Young-Su Kwon, Yeungnam University, Korea; Jeong-Hum Lee, Sang-Ho Moon, Byung-Ki Kwon, POSCON Corporation, Korea; Chang-Ho Choi, POSCON, Korea; Jul-Ki Seok, Yeungnam University, Korea	Aengus Murray, International Rectifier, USA; Marco Palma, International Rectifier, USA; Ali Husain, International Rectifier, USA	Jun Wang, North Carolina State University, USA; Jun Li, North Carolina State University, USA; Xiaohu Zhou, North Carolina State University, USA; Tiefu Zhao, North Carolina State University, USA; Alex Q. Huang, North Carolina State University, USA; Robert Callanan, Cree Inc., USA; Fatima Husna, Cree Inc., USA; Anant Agarwal, Cree Inc., USA
IAS6p2 A Harmonic Damping Method for a Loop Power System	IAS7p2 Unsymmetric Control of a Matrix Converter for Two-Phase Inductive Melting Furnaces	IAS8p2 Zero Speed Sensorless Control of Induction Machines Using Rotor Saliencies	IAS9p2 Large Package Transfer Molded DIP-IPM	IAS10p2 A Physics-Based Model for a SiC JFET Device Accounting for the Mobility Dependence on Temperature and Electric Field
Tzung-Lin Lee, Chang Gung University, Taiwan; Po-Tai Cheng, National Tsing Hua University, Taiwan	Stephan Thomas, RWTH Aachen University, Germany; Rik W. De Doncker, RWTH Aachen University, Germany	T. M. Wolbank, Vienna University of Technology, Austria; M. K. Metwally, Vienna University of Technology, Austria	E. Motto, Powerex Incorporated, USA; J. Donlon, Powerex Incorporated, USA; Ming Shang, Mitsubishi Electric Corporation, Japan; Kazuhiro Kuriaki, Mitsubishi Electric Corporation, Japan; Toru Iwagami, Mitsubishi Electric Corporation, Japan; Hisashi Kawafuji, Mitsubishi Electric Corporation, Japan; Toshiya Nakano, Mitsubishi Electric Corporation	E. Platania, University of Catania, Italy; Z. Chen, University of South Carolina, USA; F. Chimento, University of Catania, Italy; L. Lu, E. Santi, University of South Carolina, USA; A. Raciti, University of Catania, Italy; J. Hudgins, University of Nebraska, USA; A. Mantooth, University of Arkansas, USA; D. Sheridan, SemiSouth Laboratories, Inc., USA; J. Cassidy, SemiSouth Laboratories, Inc., USA
IAS6p3 An Enhanced Shunt Active Filter with Energy Storage for Microgrids	IAS7p3 A Single- to Three-Phase Matrix Converter for a Vector-Controlled Induction Motor	IAS8p3 Self-Commissioning Algorithm for Inverter Non-Linearity Compensation in Sensorless Induction Motor Drives	IAS9p3 Lower-Cost Sensorless Vector Control Method for Three-Phase PMSMs That Uses One-Shunt Current Detection	IAS10p3 High-Voltage Isolated Gate Drive Circuit for 10 kV, 100 A SiC MOS-FET/JBS Power Modules
Fabio Carastro, University of Nottingham, UK; Mark Sumner, University of Nottingham, UK; Pericle Zanchetta, University of Nottingham, UK	Makoto Saito, Shibaura Institute of Technology, Japan; Nobuyuki Matsui, Nagoya Institute of Technology, Japan	Gianmario Pellegrino, Politecnico di Torino, Italy; Paolo Guglielmi, Politecnico di Torino, Italy; Eric Armando, Politecnico di Torino, Italy; Iustin Radu Bojoi, Politecnico di Torino, Italy	Huangsheng Xu, Renesas Technology America, Inc., USA	David W. Berning, Tam H. Duong, José M. Ortiz-Rodríguez, Angel Rivera-López, Allen R. Hefner Jr., National Institute of Standards and Technology, USA
IAS6p4 Dynamic Var/Harmonic Compensation with Inverter-Less Active Filters	IAS7p4 Analysis of Power Cycling Capability of IGBT Modules in a Conventional Matrix Converter	IAS8p4 Sensorless Control of Induction Machines by Using PWM Harmonics for Rotor Bar Slotting Detection	IAS9p4 Smart Home Appliance Control	IAS10p4 Impact of SiC Devices on Hybrid Electric and Plug-in Hybrid Electric Vehicles
Anish Prasai, Georgia Institute of Technology, USA; Jyoti Sastry, Georgia Institute of Technology, USA; and Deepak Divan, Georgia Institute of Technology, USA	Lixiang Wei, Rockwell Automation—Allen Bradley, USA; Richard A. Lukaszewski, Rockwell Automation—Allen Bradley, USA; Thomas A. Lipo, University of Wisconsin—Madison, USA	Reiko Raute, University of Malta, Malta; Cedric Caruana, University of Malta, Malta; Cyril Spiteri Staines, University of Malta, Malta; Joseph Cilia, University of Malta, Malta; Mark Sumner, University of Nottingham, UK; Greg Asher, University of Nottingham, UK	Jianwen Shao, STMicroelectronics, Inc., USA; Cliff Ortmeier, STMicroelectronics, Inc., USA; David Finch, STMicroelectronics, Inc., USA	Hui Zhang, The University of Tennessee, USA; Leon M. Tolbert, The University of Tennessee, USA; Burak Ozpineci, Oak Ridge National Laboratory, USA
Break	Break	Break	Break	Break
IAS6p5 Harmonic Identification Methods Based on Moving Average Filters for Active Power Filters	IAS7p5 Experimental Verification of Current Source Inverter with ZVS Commutation Circuit	IAS8p5 A Robust Sensorless Control Algorithm for Induction Generator Operating in Deep Flux Weakening Region	IAS9p5 Integrating System Functions Using a Single DSP Controller	IAS10p5 A Circuit-Level Analytical Study on Switching Behaviors of SiC Diode at Basic Cell for Power Converters
Francisco D. Freijedo, University of Vigo, Spain; Jesus Doval-Gandoy, University of Vigo, Spain; Oscar Lopez, University of Vigo, Spain; Jacobo Cabaleiro, University of Vigo, Spain	Akihisa Matsushita, Kazuyasu Takimoto, Kentaro Suzuki, Hiromichi Tai, Toshiba Corporation, Japan; Ryoichi Kurosawa, Toshiba Mitsubishi-Electric Industrial Systems Corporation, Japan; Isao Kamiyama, Toshiba Mitsubishi-Electric Industrial Systems Corporation, Japan	Longya Xu, The Ohio State University, USA; Bo Guan, The Ohio State University, USA; Jiangang Hu, The Ohio State University, USA	Jeff Stafford, Texas Instruments Inc., USA; Arefeen Mohammed, Texas Instruments Inc., USA	Carl N. M. Ho, ABB Switzerland Ltd, Switzerland; Francisco Canales, ABB Switzerland Ltd, Switzerland; Antonio Coccia, ABB Switzerland Ltd, Switzerland; Matti Laitinen, ABB Oy, Finland



# Technical Program

Room	Turner Valley	Leduc	Chancellor	Devonian	Alberta
Com- mittee	Metal Industry	Electrostatic Processes	Industrial Lighting & Displays	Electric Machines	Electric Machines
	Session 11 - Casting, Rolling, Fabrication, Power	Session 12 - Non-thermal Plasma Processes	Session 13 - Displays	Session 14 - Material, Thermal and Losses Analysis	Session 15 - Special Machines and Actuators
	Session Chair: Thomas J. Dionise, Eaton Corporation, USA	Session Chair: Tetsuji Oda, University of Tokyo, Japan	Session Chair: Masayuki Nakamoto, Shizuoka University, Japan	Session Chair and Organizer: Mircea Popescu, University of Glasgow, UK	Session Chair: Uday Deshpande, Maxwell Technologies, USA
	Session Organizer: S. Douglas Cromey, Novelis Inc., Canada	Session Organizer: Masaaki Okubo, Osaka Prefecture University	Session Organizer: Horoaki Ikeda, IKEDA Technologies, Japan		Session Organizer: Fabrizio Marignetti, University Degli Studi, Italy
2:00 PM	IAS11p1 Development of a Camber Measurement System in a Hot Rolling Mill	IAS12p1 Non-Thermal Plasma Process for Dilute Trichloroethylene Decomposition Combined with Catalyst Position Effect of Plasma Reactor and Catalyst	IAS13p1 Acoustic Resonance Characteristics in a High Pressure Sodium Lamp	IAS14p1 A General Model of the Laminated Steel Losses in Electric Motors with PWM Voltage Supply	IAS15p1 High-Strength Undiffused Brushless (HSUB) Machine
	Yung-Yi Yang, China Steel Corporation, Taiwan; Chung-Mei Chen, China Steel Corporation, Taiwan; Chiu-Yi Ho, China Steel Corporation, Taiwan; Wen-Chieh Li, China Steel Corporation, Taiwan; Jung-Huei Wu, China Steel Corporation, Taiwan	Tetsuji Oda, The University of Tokyo, Japan; Hikaru Kuramochi, The University of Tokyo, Japan; Ryo Ono, The University of Tokyo, Japan	P. Maussion, Université de Toulouse, France; L. Chhun, Université de Toulouse, France; S. Bhosle, Université de Toulouse, France; G. Zissis, Université de Toulouse, France	Dan Ionel, AO Smith CTC, USA; Mircea Popescu, University of Glasgow, UK; C. Cossar, University of Glasgow, UK; M. I. McGilp, University of Glasgow, UK; Aldo Boglietti, Politecnico di Torino, Italy; Andrea Cavagnino, Politecnico di Torino, Italy	John S. Hsu, Oak Ridge National Laboratory, USA; Seong-Taek Lee, Oak Ridge National Laboratory, USA; and Leon M. Tolbert, Oak Ridge National Laboratory, USA
2:30 PM	IAS11p2 Performance Improvements of an In-Mold Electromagnetic Stirrer with Minimum Hardware Adjustments	IAS12p2 Decomposition of Adsorbed Xylene on Adsorbent Using Nonthermal Plasma and Gas Circulation	IAS13p2 Nanoimprint Applications for Liquid Crystal Displays	IAS14p2 On Liquid-Nitrogen-Cooled Copper-Wound Machines with Soft Magnetic Composite Core	IAS15p2 Development of Planar Microcoils for an Electromagnetic Linear Actuator Fabricated in Batch-Type Wafer Technology
	Cheng-Tsung Liu, National Sun Yat-Sen University, Taiwan	Tomoyuki Kuroki, Kiyoyuki Hirai, Ryouhei Kawabata, Masaaki Okubo, Osaka Prefecture University, Japan; Toshiaki Yamamoto, Musashi Institute of Technology, Japan	Hiroshi Kikuchi, National Institute of Information and Communications Technology, Japan; Hiroto Sato, Japan Broadcasting Corporation, Japan; Hideo Fujiyake, Japan Broadcasting Corporation, Japan; Fumio Sato, Japan Broadcasting Corporation, Japan	Fabrizio Marignetti, University of Cassino, Italy	Sebastiano Merzaghi, Pascal Meyer, Yves Perriard, Ecole Polytechnique Fédérale de Lausanne, Switzerland
3:00 PM	IAS11p3 Model for Control of a Tandem Hot Metal Strip Rolling Process	IAS12p3 Additive Effect of Water on the Decomposition of VOCs in Nonthermal Plasma	IAS13p3 Current Trends in Field Emission Displays	IAS14p3 A Remote and Sensorless Thermal Protection Scheme for Soft-Start-Connected Induction Motors	IAS15p3 Development of a Wound Rotor Brushless Doubly Fed Machine Based on Slot MMF Harmonics
	John Pittner, University of Pittsburgh, USA; Marwan A. Simaan, University of Pittsburgh, USA	Masami Sugawara, National Institute of Advanced Industrial Science and Technology, Japan; Tomoyuki Terasawa, National Institute of Advanced Industrial Science and Technology, Japan; Shigeru Futamura, National Institute of Advanced Industrial Science and Technology, Japan	Masayuki Nakamoto, Shizuoka University, Japan	Pinjia Zhang, Georgia Institute of Technology, USA; Yi Du, Georgia Institute of Technology, USA; Bin Lu, Eaton Corporation, USA; Thomas G. Habetler, Georgia Institute of Technology, USA	Youguang Guo, University of Technology—Sydney, Australia; Xuefan Wang, Huazhong University of Science and Technology, China; Jianguo Zhu, University of Technology—Sydney, Australia; Haiyan Lu, University of Technology—Sydney, Australia
3:30 PM	Break	Break	Break	Break	Break
4:00 PM		IAS12p4 Performance Characteristics of Pilot-Scale Plasma-Chemical NOx Removal System from Boiler Emission	IAS13p4 Human Factors of 3-D Displays for Virtual Reality	IAS14p4 End Space Heat Transfer Coefficient Determination for Different Induction Motor Enclosure Types	IAS15p4 A Non-Intrusive Load and Efficiency Evaluation Method for In-Service Motors Using Vibration Tests with an Accelerometer
		Hidekatsu Fujishima, Tomoyuki Kuroki, Tomohiro Ito, Masaaki Okubo, Osaka Prefecture University, Japan; Keiichi Otsuka, Takao Iron Works Co., Ltd., Japan; Toshiaki Yamamoto, Musashi Institute of Technology, Japan; Keiichiro Yoshida, Japan Science and Technology Agency, Japan	Tetsuri Inoue, Kanagawa Institute of Technology, Japan; Kazutake Uehira, Kanagawa Institute of Technology, Japan; Kazumi Komiya, Kanagawa Institute of Technology, Japan; Masahiro Suzuki, Kanagawa Institute of Technology, Japan	A. Boglietti, Politecnico di Torino, Italy; A. Cavagnino, Politecnico di Torino, Italy; D. A. Staton, Motor Design Ltd, UK; M. Popescu, University of Glasgow, UK; C. Cossar, University of Glasgow, UK; M. I. McGilp, University of Glasgow, UK	He Zhang, University of Nottingham, UK; Keith Bradley, University of Nottingham, UK; Pericle Zanchetta, University of Nottingham, UK
4:30 PM		IAS12p5 Automatic Control Method of NO Removal by a Combination of Ozone Injection and Exhaust Gas Recirculation	IAS13p5 High-Power EUV Source for Lithography Using Tin Target	IAS14p5 Isolating the Impact of PWM Modulation on Motor Iron Losses	IAS15p5 An Analytical-Numeric Method for Stator End-Coil Leakage Inductance Computation in Multi-Phase Electric Machines
		Yoshio Yoshioka, Hiroaki Kondo, Yasuharu Tabata, Hayato Hatakenaka, Katsushi Nakada, Kanazawa Institute of Technology, Japan	C.H. Zhang, Harbin Institute of Technology/ University of Shanghai for Science and Technology, China; S. Katsuki, H. Horta, H. Imamura, H. Akiyama, University of Shanghai for Science and Technology, China.	A. Boglietti, Politecnico di Torino, Italy; A. Cavagnino, Politecnico di Torino, Italy; and A. M. Knight, University of Alberta, Canada	Alberto Tassarolo, University of Trieste, Italy; Fabio Luise, Ansaldo Sistemi Industriali, Italy
5:00 PM		IAS12p6 Continuous Regeneration of Ceramics Particulate Filter in Stationary Diesel Engine Using Nonthermal Plasma-Induced Ozone Injection		IAS14p6 New Epstein Frame for Core Loss Measurements at High Frequencies and High Flux Densities	IAS15p6 Development of a Spirally-Shaped Linear Actuator
		Masaaki Okubo, Tomoyuki Kuroki, JapanShinpei Kawasaki, Osaka Prefecture University, Japan; Keiichiro Yoshida, Japan Science and Technology Agency, Japan; Toshiaki Yamamoto, Musashi Institute of Technology, Japan		Marubini J. Manyage, University of Cape Town, South Africa; Pragasen Pillay, Concordia University, Canada	Yasutaka Fujimoto, Yokohama National University, Japan; Tsutomu Kominami, Yokohama National University, Japan; Hiroshi Hamada, Yokohama National University, Japan
5:30 PM		IAS12p7 Observation of N <sub>2</sub> (A <sup>3</sup> +u) Metastable in Pulsed Positive Corona Discharge Using Laser-Induced Fluorescence		IAS14p7 Impact of Rotor Losses in a 12-Slot 10-Pole Axial Flux PM Machine	IAS15p7 On a New Type of Inverter-Induced Bearing Current in Large Drives with Oil-Lubricated Bearings
		Ryo Ono, The University of Tokyo, Japan; Chihiro Tobaru, The University of Tokyo, Japan; Yoshiyuki Teramoto, The University of Tokyo, Japan; Tetsuji Oda, The University of Tokyo, Japan		Luigi Alberti, University of Padova, Italy; Emanuele Fornasiero, University of Padova, Italy; Nicola Bianchi, University of Padova, Italy; Silverio Bolognani, University of Padova, Italy	Annette Muetze, University of Warwick, UK

# Monday, October 6, Afternoon Sessions

Strathconia	Yukon	British Columbia	Consulate	Manitoba
Industrial Power Converter	Industrial Power Converter	Industrial Drives	Appliance Industry	Power Electronics Devices & Components
Session 16 - Utility Interface and Power Quality	Session 17 - Converter Applications and Issues (includes Drives and EMI)	Session 18 - Drives II	Session 19 - Motor Drives for Appliances	Session 20 Advancements, Innovations and Applications of Power Device Components
Session Chair: Thomas Jahns, University of Wisconsin-Madison, USA	Session Chair: William Peterson, E & M Power, USA	Session Chair: Fernando Briz, University Oviedo, Spain	Session Chair and Organizer: Radu Bojoi, Politecnico di Torino, Italy	Session Chair: Richard Lukaszewski, Rockwell Automation, USA
Session Organizer: Radu Bojoi, Politecnico DI Torino, Italy	Session Organizer: Mahesh Swamy, Yaskawa Electric America, USA	Session Organizer: Gui-Ja Su, Oak Ridge National Laboratory, USA		Session Organizer: Richard Schmerda, DRS Technologies, USA
IAS16p1 Unbalanced Voltage Sag Ride-Through of a Doubly Fed Induction Generator Wind Turbine with Series Grid Side Converter	IAS17p1 Intelligent Modularized Emitter Turn-Off Thyristor (ETO)-Based High Power Converter	IAS18p1 Power Control Algorithm for Hybrid Excavator with Super Capacitor	IAS19p1 A DSP-Based Switching Motor Controller	Presentation 1. Reliability of the Chip Surface Solder Joint
Patrick Flannery, University of Wisconsin-Madison, USA; Giri Venkataraman, University of Wisconsin-Madison, USA	Wenchao Song, North Carolina State University, USA; Bin Chen, North Carolina State University, USA; Qian Chen, North Carolina State University, USA; Alex Q. Huang, North Carolina State University, USA	Tae-suk Kwon, Seon-woo Lee, Seung-Ki Sul, Seoul National University, Korea; Byoung-il Kang, Doosan Infracore Co., Ltd., Korea; Min-seok Hong, Doosan Infracore Co., Ltd., Korea; Cheol-gyu Park, Doosan Infracore Co., Ltd., Korea; Nag-in Kim, Doosan Infracore Co., Ltd., Korea	Ahmed Rubaai, Howard University, USA	Yoshinari Ikeda, Fuji Electric Company, Japan
IAS16p2 Outline of the Control Design for a Cascaded H-Bridge STATCOM	IAS17p2 Fault Detection and Protection of Three-Level Neutral-Point-Clamped PWM Voltage Source Converters	IAS18p2 Analysis for Unstable Problem of PMSM Current Control System in Overmodulation Range	IAS19p2 Comparison of Starting Method for Position Sensorless BLDC Motor Driven Reciprocating Compressor	Presentation 2. Extending the Power Capacity of IGBT Modules - Integration of Chip and Package Technologies
R. E. Betz, University of Newcastle, Australia; T. J. Summers, University of Newcastle, Australia; B. J. Cook, ResTech Pty Ltd, Australia	Fred Wang, Rixin Lai, Xibo Yuan, Fang Luo, Rolando Burgos, Dushan Boroyevich, Virginia Polytechnic Institute and State University, USA	Smith Lerdudomsak, Nagoya University, Japan; Shinji Doki, Nagoya University, Japan; and Shigeru Okuma, Nagoya University, Japan	Dae-kyong Kim, Se-hyun Rhyu, Korea Electronics Technology Institute, Korea; Kwang-woon Lee, Mokpo National Maritime University, Korea; Byung-taek Kim, Kunsan National University, Korea; Dong-hwa Chung, Sunchon National University, Korea; Byung-il Kwon, Hanyang University	Masahito Otsuki, Fuji Electric Company, Japan
IAS16p3 An Inrush Current Mitigation Technique for the Line-Interactive Uninterruptible Power Supply Systems	IAS17p3 Active Fault Protection for an AC Zonal Marine Power System Architecture	IAS18p3 Space-Shifted Split-Phase High-Speed Motor/Converter Topology with Fault-Tolerance Capability	IAS19p3 Sensorless Stator Field-Oriented Control for Low Cost Induction Motor Drives with Wide Field Weakening Range	Presentation 3. State of the Art Power Modules with Ultrasonic Welding Technology
Yu-Hsing Chen, National Tsing Hua University, Taiwan; Po-Tai Cheng, National Tsing Hua University, Taiwan	J. Wang, University of Nottingham, UK; P. Kadanak, University of Nottingham, UK; M. Sumner, University of Nottingham, UK; D. W. P. Thomas, University of Nottingham, UK; R. D. Geertsma, Ministry of Defence, UK	Zach Pan, Direct Drive Systems, Inc., USA; Raed Ahmad, Direct Drive Systems, Inc., USA; Daniel M. Saban, Direct Drive Systems, Inc., USA	R. Bojoi, Politecnico di Torino, Italy; P. Guglielmi, Politecnico di Torino, Italy; G. Pellegrino, Politecnico di Torino, Italy	Wilhelm Rusche, Infineon Technologies AG, Germany
Break	Break	Break	Break	Break
IAS16p4 A Single-Phase Utility-Interface Circuit without any AC Inductor nor EMI Filter	IAS17p4 Control Strategy Improving Fault Ride-Through Capability of Cascade Multilevel Inverter Based STATCOM	IAS18p4 High Efficiency Single-Pulse Controlled Switched Reluctance Motor Drive for High Speed (48k RPM) Application: Analysis, Design, and Experimental Verification	IAS19p4 Performance of IPM-PMASR Motors with Ferrite Injection for Home Appliance Washing Machine	Presentation 4. Inverter Design Options Using New Intelligent and Integrated Power Modules
Hideaki Fujita, Tokyo Institute of Technology, Japan	Yu Liu, North Carolina State University, USA; Alex Q. Huang, North Carolina State University, USA; Guojun Tan, China University of Mining and Technology, China; Subhashish Bhattacharya, North Carolina State University, USA	Jaehyuck Kim, Virginia Polytechnic Institute and State University, USA; R. Krishnan, Virginia Polytechnic Institute and State University, USA	Eric Armando, Gianmario Pellegrino, Politecnico di Torino, Italy; Alfredo Vagati, Politecnico di Torino, Italy	Eric Motto, Powerex, USA
IAS16p5 Design and Control for LCL-Based Inverters with Both Grid-Tie and Standalone Parallel Operations	IAS17p5 An Active Common Mode EMI Filter for Switching Converters	IAS18p5 A Failure Mode for PWM Inverter-Fed AC Motors Due to the Anti-Resonance Phenomenon	IAS19p5 Design and Manufacturing of a Linear Transverse Flux Permanent Magnet Machines	
Chien-Liang Chen, Jih-Sheng Lai, Yu-Bin Wang, Sung-Yeul Park, Hide Miwa, Virginia Polytechnic Institute and State University, USA	Nicolai Mortensen, University of Wisconsin-Madison, USA; Giri Venkataraman, University of Wisconsin-Madison, USA	Behrooz Mirafzal, Rockwell Automation-Allen Bradley, USA; Gary L. Skibinski, Rockwell Automation-Allen Bradley, USA; Rangarajan M. Tallam, Rockwell Automation-Allen Bradley, USA	Alija Cosic, Chandur Sadarangani, Royal Institute of Technology, Sweden; and Jan Timmerman, Nynas AB, Sweden Politecnico di Torino, Italy; Paolo Guglielmi, Politecnico di Torino, Italy; Michele Pastorelli, Politecnico di Torino, Italy;	
IAS16p6 Power System Stabilisation Using STATCOM with Supercapacitors	IAS17p6 Compensation of Switch Faults in a Three-Level Inverter	IAS18p6 Reliability Improvement of Industrial Drives Using Multi-Objective Optimization		
Phinit Srithorn, University of Nottingham, UK.; Mark Sumner, University of Nottingham, UK.; Liangzhong Yao, AREVA T&D Technology Centre, UK.; Ram Parashar, AREVA T&D Technology Centre, UK	Edison R. C. da Silva, Antonio S. de O. Jr., Cursino B. Jacobina, Universidade Federal de Campina Grande, Brazil; Ricardo L. Ribeiro, Universidade Federal do Rio Grande do Norte, Brazil; Liviane C. A. Melo, Universidade Federal do Rio Grande do Norte, Brazil	Shahriyar Kaboli, Sharif University of Technology, Iran; Mohammad Reza Zolghadri, Sharif University of Technology, Iran; Alireza Khaligh, Illinois Institute of Technology, USA		
IAS16p7 Direct Power Control of a Doubly Fed Induction Generator with a Fixed Switching Frequency		IAS18p7 Contactless Planar Actuator with Manipulator: a Motion System without Cables and Physical Contact between the Mover and the Fixed World		
Won-Sang Kim, Ajou University, Korea; Sung-Tak Jou, Ajou University, Korea; Kyo-Beum Lee, Ajou University, Korea; Steve Watkins, Fleadh Electronics Ltd, UK		Jeroen de Boeij, Eindhoven University of Technology, The Netherlands; Elena Lomonova, Eindhoven University of Technology, The Netherlands; Jorge Duarte, Eindhoven University of Technology, The Netherlands		





# Technical Program

Room	Devonian	Leduc	Chancellor	Consulate	Alberta
<b>Com- mittee</b>	Power Electronics Devices & Components	Electrostatic Processes	Industrial Lighting & Displays	Power System Protection	Electric Machines
	Session 21 - Applications, Protection and EMI for Power Electronics	Session 22 - ESD, Corona and Related Phenomena	Session 23 - Fluorescent Lighting	Session 24 - Power System Protection I	Session 25 - Faults and Diagnostics
	Session Chair: Adam Konopka, Baldor Electric, USA	Session Chair: William D. Greason, University of Western Ontario, Canada	Session Chair: Sounil Bhosle, Université Paul Sabatier-Toulouse 3, France	Session Chair and Organizer: Rasheek Rifaat, Jacobs Canada, Canada	Session Chair: Gerard-Andre Capolino, University of Picardie, France
	Session Organizer: Charles Sullivan, Dartmouth College, USA	Session Organizer: Maciej A. Noras, University of North Carolina at Charlotte, USA	Session Organizer: Jo Olsen, Sylvania, USA		Session Organizer: Alberto Bellini, University of Modena, Italy
<b>8:00 AM</b>	IAS21p1 A Literature Review of IGBT Fault Diagnostic and Protection Methods for Power Inverters	IAS22p1 Analysis of the Effect of ESD on the Operation of MEMs	IAS23p1 Mercury Dosing in Fluorescent Lamps	IAS24p1 The Status of DC Micro-Grid Protection	IAS25p1 A Stator Core Quality Assessment Technique for Inverter-Fed Induction Machines
	Bin Lu, Eaton Corporation, USA; and Santosh Sharma, Eaton Corporation, India	William D. Greason, The University of Western Ontario, Canada	Alessio Corazza, SAES Getters S.p.A., Italy; Stefano Giorgi, SAES Getters S.p.A., Italy; Vincenzo Massaro, SAES Getters S.p.A., Italy	Robert M. Cuzner, DRS Power and Control Technologies, USA; Giri Venkataramanan, University of Wisconsin-Madison, USA	Kwanghwan Lee, Korea University, Korea; Jongman Hong, Korea University, Korea; Kwangwoon Lee, Korea University, Korea; Sang Bin Lee, Korea University, Korea; Ernesto Wiedenbrug, Baker Instrument Company, USA
<b>8:30 AM</b>	IAS21p2 A Novel Short-Circuit Detecting Scheme Using Turn-On Switching Characteristic of IGBT	IAS22p2 A Study on Discharge Current and Radiation Noise of ESD from Charged Metal and Charged Human Body	IAS23p2 Investigation of Moving Striations in a 50Hz AC Low-Pressure Ar-Hg Discharge	IAS24p2 Traveling Wave Based Distribution Lines Fault Location Using Hilbert-Huang Transform	IAS25p2 A New Robust Method To Detect Rotor Faults in Salient-Pole Synchronous Machines Using Structural Asymmetries
	Byoung-Gun Park, Hanyang University, Korea; Jun-Bae Lee, Infineon Technologies, Korea; Dong-Seok Hyun, Hanyang University, Korea	Takahiro Yoshida, Tokyo University of Science, Japan; Noriaki Masui, Tokyo University of Science, Japan	Yang Liu, Fudan University, China; Sounil Bhosle, Université de Toulouse, France; David Buso, Université de Toulouse, France; Georges Zissis, Université de Toulouse, France; Dahua Chen, Fudan University, China	Xiao'an Qin, Changsha University of ScienceTechnology, China; Xiangjun Zeng, Changsha University of Science and Technology, China; Xiaoli Zhang, Changsha University of Science and Technology, China; Zewen Li, Changsha University of Science and Technology, China	Prabhakar Neti, General Electric-Global Research Center, USA; A. B. Dehkordi, University of Manitoba, Canada; A. M. Gole, University of Manitoba, Canada
<b>9:00 AM</b>	IAS21p3 Physical Layout of High Current Rectifiers: Modern Methods for an Old Challenge	IAS22p3 Experimental Study of Corona Discharge Generated in a Modified Wire-Plate Electrode Configuration for Electrostatic Processes Applications	IAS23p3 Energy Saver F32T8 Lamps and Dimming Ballasts for Sustainable Lighting	IAS24p3 An Approach to Improve Measurement Accuracy for Electric Power Fault Recorder	IAS25p3 Application of Piezoelectric Sensors to Rotor Fault Diagnostics in Squirrel-Cage Induction Machines
	J. L. Schanen, Grenoble Institute of Technology, France; J. M. Guichon, Grenoble Institute of Technology, France; C. Domenech, Schneider Electric, France; L. Meysenc, Schneider Electric, France	A. Bendaoud, A. Tilmatine, K. Medles, M. Younes, University Djillali Liabès, Algeria; O. Blejan, University of Poitiers, France; L. Dascalescu, University of Poitiers, France	Veeravach Jamjureeruk, Philips Lighting Company, USA; Thomas O. Leyh, Philips Lighting Company, USA	Renfei Che, Shandong University, China; Jun Liang, Shandong University, China; Wei-Jen Lee, The University of Texas at Arlington, USA	Gennadi Y. Sizov, Marquette University, USA; Chia-Chou Yeh, General Motors Corporation, USA; Nabeel A. O. Demerdash, Marquette University, USA
<b>9:30 AM</b>	IAS21p4 Analysis of Current Distribution in Parallel Semiconductors of High Current Rectifiers in Electro-Intensive Plants	IAS22p4 Basic Research on Low Voltage Electrostatic Discharge Phenomena	IAS23p4 A Novel Driver Circuit for Multiple Cold-Cathode Fluorescent Lamps of LCD Backlight Modules	IAS24p4 A Mal-Trip of Bus Relay Due to Visible Light	IAS25p4 Experimentally Validated Dynamic Fault Model for PMSM with Stator Winding Inter-Turn Fault
	Edison Pires de Moraes, Abb Ltda, Brazil; Walter Kaiser, University of Sao Paulo, Brazil	Tetsuji Oda, The University of Tokyo, Japan; Hiraku Miyasaka, The University of Tokyo, Japan; and Ryo Ono, The University of Tokyo, Japan	Yi-Cyun Cheng, I-Shou University, Taiwan; Chun-An Cheng, I-Shou University, Taiwan	Li-Cheng Wu, National Taiwan University, Taiwan; Chih-Wen Liu, National Taiwan University, Taiwan	B. Vaseghi, Institut National Polytechnique de Lorraine, France; B. Nahid-Mobarakeh, Institut National Polytechnique de Lorraine, France; N. Takorabet, Institut National Polytechnique de Lorraine, France; F. Meibody-Tabar, Institut National Polytechnique de Lorraine, France
<b>10:00 AM</b>	Break	Break	Break	Break	Break
<b>10:30 AM</b>	IAS21p5 The Application of FRD with Avalanche Capability for Improvement of Power Conversion Efficiency in Output Rectifier and PFC	IAS22p5 Evaluation of Surface Charge Density with Electrostatic Voltmeter - Measurement Geometry Considerations	IAS23p5 Fixed Frequency Self-Oscillating Electronic Ballast Design Procedure		IAS25p6 Diagnosis of Bearing Faults of Induction Machines by Vibration or Current Signals: A Critical Comparison
	Saburo Okumura, Hirofumi Yamamoto, Yoshikazu Nishimura, Hironori Hiraoka, Kenzo Danjo, Hiroki Morimoto, Sansha Electric Mfg. Co., Ltd., Japan	Maciej A. Noras, University of North Carolina at Charlotte, USA; Apra Pandey, Trek, Inc., USA	Lucas B. Oliveira, University of Santa Maria, Brazil; Guilherme S. Oliveira, University of Santa Maria, Brazil; Jackson Piazza, University of Santa Maria, Brazil; Murilo Cervi, University of Santa Maria, Brazil; Ricardo N. Prado, University of Santa Maria, Brazil; Alysson R. Seidel, University of Santa Maria, Brazil		Alberto Bellini, University of Modena and Reggio Emilia, Italy; Fabio Immovilli, University of Modena and Reggio Emilia, Italy; Riccardo Rubini, University of Modena and Reggio Emilia, Italy; Carla Tassoni, University of Parma, Italy
<b>11:00 AM</b>	IAS21p6 Analysis and Control of Soft-Commutation of Inverter at Small Residual Voltage with Benign DV/DT and Integrated Converter Module	IAS22p6 Corona Charging and Charge Decay Characteristics of Non-Woven Filter Media	IAS23p6 Comparison of Self-Oscillating Electrode and Electrode-Less Compact Fluorescent Lamps from Loss Perspective		IAS25p5 Fast Single-Turn Sensitive Stator Inter-Turn Fault Detection of Induction Machines Based on Positive and Negative Sequence Third Harmonic Components of Line Currents
	Jie Chang, Eaton Aerospace, USA; Jun Hu, Eaton Aerospace, USA	B. Tabti, University of Bejaia, Algeria; R. Mekideche, University of Bejaia, Algeria; M. Plopeanu, University Politehnica, Romania; L. M. Dumitran, University Politehnica, Romania; L. Herous, University of Poitiers, France; L. Dascalescu, University of Poitiers, France	M. A. Shafi, University of Cambridge, UK; R. A. McMahon, University of Cambridge, UK; Sven Weier, University of Cambridge, UK		Qing Wu, University of Victoria, Canada; Subhasis Nandi, University of Victoria, Canada
<b>11:30 AM</b>	IAS21p7 EMI Terminal Modeling		IAS23p7 Comparison between Different Discharge Lamp Models Based on Lamp Dynamic Conductance		IAS25p7 Study of Different Architectures of Fault Tolerant Actuator Using a Double-Star PM Motor
	A. C. Baisden, Virginia Polytechnic Institute and State University, USA; D. Boroyevich, Virginia Polytechnic Institute and State University, USA; F. Wang, Virginia Polytechnic Institute and State University, USA		C. Blanco, University of Oviedo, Spain; J. C. Anton, University of Oviedo, Spain; A. Robles, University of Oviedo, Spain; F. Ferrero, University of Oviedo, Spain; J. C. Viera, University of Oviedo, Spain; S. Blosse, Université de Toulouse, France; G. Zissis, Université de Toulouse, France		N. Takorabet, J. P. Caron, B. Vaseghi, B. Nahid-Mobarakeh, F. Meibody-Tabar, Institut National Polytechnique de Lorraine, France; G. Humbert, Safran Group, France

# Tuesday, October 7, Morning Sessions

Strathcona	Centennial	British Columbia	Yukon	Turner Valley
Industrial Power Converter	Industrial Power Converter	Industrial Drives	Appliance Industry	Industrial Automation & Control
Session 26 - Multilevel Converters	Session 27 (34) - Industrial Power Conversion Committee (IPCC) Product and Service Session	Session 28 - Sensorless and Permanent Magnet Drives	Session 29 - Appliance Energy Management and Conversion	Session 30 - Industrial Controls
Session Chair: Burak Ozpineci, Oak Ridge National Laboratory, USA	Session Chair and Organizer: Hui Li, Florida State University, USA	Session Chair: Fabio Giulii Capponi, University of Rome—La Sapienza, Italy	Session Chair and Organizer: Roy McCann, University of Arkansas, USA	Session Chair and Organizer: A. Rubaai, Howard University, USA
Session Organizer: Zhiguo Pan, Direct Drive Systems, USA		Session Organizer: Bingsen Wang, Arizona State University, USA		
IAS26p1 An Effective SPWM Control Technique for 1MVA 6000V Cascaded Neutral Point Clamped Inverter	Presentation 1. Sic Power Devices and Application Outlook	IAS28p1 Shaft Position Correction Scheme Comparison for Sensorless Control of a PMSM Based on State-Space Estimation between Variance Adjustment and Angle PI Regulation	IAS29p1 Model Predictive Control for Time-Delay Compensation of a Switched Reluctance Motor Drive in Smart Building Applications	IAS30p1 Study on Dynamic Production Planning System Oriented to Shipbuilding Process
Ge Baoming, Beijing Jiaotong University, China; Fang Zheng Peng, Michigan State University, USA	Dave Grider.Cree Inc, USA	Ming Chuan Huang, A. J. Moses, F. J. Anayi, Cardiff University, UK	Roy McCann, University of Arkansas, USA; Anh T. Le, University of Arkansas, USA; David Traore, University of Arkansas, USA	Xiaobing Liu, Dalian University of Technology, China; Zhongkai Li, Dalian University of Technology, China; Xiao Wang, Dalian University of Technology, China; Wenliang Zhao, Dalian Shipbuilding Industry Co., Ltd., China
IAS26p2 High-Performance Control Strategies and Applications of a New Hybrid Cascaded Multilevel Inverter	Presentation 2. Advanced Inverter Features for Utility Scale Renewables	IAS28p2 Design of Flux Observer Robust to Parameter Variation of Interior Permanent Magnet Synchronous Motor	IAS29p2 New Built-In Induction Heating Cooker Using High-Frequency ZVS-PWM Converter with Single Stage Circuit Topology	IAS30p2 Implementation of an Automatic Counting and Control Production System for Metal-Mechanics Industries
Jianye Rao, Tsinghua University, China; Yongdong Li, Tsinghua University, China	Leo F. Casey, SatCon Technology Corporation, USA	Anno Yoo, Seoul National University, Korea; Seung-Ki Sul, Seoul National University, Korea	Hisayuki Sugimura, Bishwajit Saha, Kyungnam University, Korea; Shinichiro Sumiyoshi, Hideki Omori, Matsushita Electric Industrial, Japan; Sang-Pil Mun, Kyungnam University, Korea; Soon-Kurl Kwon, Kyungnam University, Korea; Eiji Hiraki, Mutsuo Nakaoka, Yamaguchi University, Japan	Estela Perez, Instituto Tecnológico de Queretaro, Mexico; Raul Ramirez, Instituto Tecnológico de Queretaro, Mexico; Salome Perez, Instituto Tecnológico de Queretaro, Mexico
IAS26p3 Converter Topologies and Power Semiconductors for Industrial Medium Voltage Converters	Presentation 3. Power Components: From Bricks to VI Chips	IAS28p3 Sliding Mode Control with Double Boundary Layer for Robust Compensation of Payload Mass and Friction in Linear Motors	IAS29p3 Modeling and Analysis of a Tubular Oscillating Permanent Magnet Actuator	IAS30p3 Modeling and Control of Large Shovel Converter Systems Integrated with Supercapacitor
Marc Hiller, Siemens AG, Germany; Rainer Sommer, Siemens AG, Germany; Max Beuermann, Siemens AG, Germany	Vinciarelli, Patrizio.Vicor Corporation, USA	Francesco Cupertino, Politecnico di Bari, Italy; David Naso, Politecnico di Bari, Italy; Ernesto Mininno, Politecnico di Bari, Italy; Biagio Turchiano, Politecnico di Bari, Italy	X. Chen, University of Sheffield, UK; Z. Q. Zhu, University of Sheffield, UK; D. Howe, University of Sheffield, UK	Babak Parkhideh, North Carolina State University, USA; Subhashish Bhattacharya, North Carolina State University, USA; Joy Mazumdar, Siemens Energy and Automation, USA; Walter Koellner, Siemens Energy and Automation, USA
IAS26p4 A New Modulation Method for Hexagram Inverter	Presentation 5. High power electronics and future trends	IAS28p4 Modeling and Adaptive Decoupling of Transient Resistance and Temperature Effects in Carrier-Based Sensorless Control of PM Synchronous Machines	IAS29p4 Stochastic Sliding Mode Arbitration for Energy Management in Smart Building Systems	IAS30p4 Hardware Implementation of an AIS-Based Optimal Excitation Controller for an Electric Ship
Jun Wen, University of California—Irvine, USA; Keyue Ma Smedley, University of California—Irvine, USA	Yongsug Suh.ABB-Switzerland Ltd. Switzerland	David Reigosa, Pablo García, Fernando Briz, University of Oviedo, Spain; Dejan Raca, Magnetek Inc. Power Control Systems, USA; Robert D. Lorenz, University of Wisconsin—Madison, USA	Roy McCann, University of Arkansas, USA; Anh T. Le, University of Arkansas, USA; David Traore, University of Arkansas, USA	Chuan Yan, Missouri University of Science and Technology, USA; Ganesh K. Venayagamoorthy, Missouri University of Science and Technology, USA; Keith Corzine, Missouri University of Science and Technology, USA
Break	Break	Break	Break	Break
IAS26p5 A New Balancing Algorithm of Neutral-Point Potential in the Three-Level NPC Converters	Presentation 7. Power electronics technologies for adjustable speed drive during optimization	IAS28p5 Sensorless Control of Linear Tubular Permanent Magnet Synchronous Motors Using Pulsating Signal Injection	IAS29p5 Lebesgue Sampling with a Kalman Filter in Wireless Sensors for Smart Appliance Networks	IAS30p5 Security System for Die Cutting Press
Chenchen Wang, Tsinghua University, China, and Jiaotong University, China; Yongdong Li, Tsinghua University, China	Lixiang Wei, Rockwell Automation, USA	Francesco Cupertino, Politecnico di Bari, Italy; Paolo Giangrande, Politecnico di Bari, Italy; Maurizio Scaringi, Politecnico di Bari, Italy; Silvio Stasi, Politecnico di Bari, Italy; Luigi Salvatore, Politecnico di Bari, Italy	Roy McCann, University of Arkansas, USA; Anh T. Le, University of Arkansas, USA	Ismael Perez, Instituto Tecnológico de Queretaro, Mexico; Raul Ramirez, Instituto Tecnológico de Queretaro, Mexico; Salome Perez, Instituto Tecnológico de Queretaro, Mexico
		IAS28p6 Carrier Signal Selection for Sensorless Control of PM Synchronous Machines at Zero and Very Low Speeds	IAS29p6 Arc Linear Motors for Direct Drive Robots: Galileo Sphere	IAS30p6 Design and Development of a Flexible Multi-Purpose Controller Hardware System for Power Electronics and Other Industrial Applications
		Dejan Raca, Magnetek Inc., USA; Pablo García, University of Oviedo, Spain; David Reigosa, University of Oviedo, Spain; Fernando Briz, University of Oviedo, Spain; Robert D. Lorenz, University of Wisconsin—Madison, USA	Claudio Bianchini, University of Modena and Reggio Emilia, Italy; Fabio Immovilli, University of Modena and Reggio Emilia, Italy; Alberto Bellini, University of Modena and Reggio Emilia, Italy; Paolo Mignano, Mechatronic System Company, Italy	Rahul Godbole, North Carolina State University, USA; Subhashish Bhattacharya, North Carolina State University, USA
		IAS28p7 Loss Minimizing Control of PMSM with the Use of Polynomial Approximations		IAS30p7 A Hand-Held Programmable-Logic-Device Based Temperature and Relative-Humidity Sensor, Processor and Display System Platform for Automation and Control of Industry Processes
		Junggi Lee, Pohang University of Science and Technology, Korea; Kwanghee Nam, Pohang University of Science and Technology, Korea; Seoho Choi, Hyundai Motor Company, Korea; Soonwoo Kwon, Hyundai Motor Company, Korea		Phani Tangirala, University of Kentucky, USA; J. Robert Heath, University of Kentucky, USA; Arthur Radun, University of Kentucky, USA; Terry Connors, University of Kentucky, USA



# Technical Program

Room	Devonian	Leduc	Chancellor	Alberta	Strathcona
<b>Com- mittee</b>	Power Electronics Devices & Components	Electrostatic Processes	Industrial Lighting & Displays	Electric Machines	Industrial Power Converter
	Session 31 - Software Tools for Power Electronics	Session 32 - Material Properties and Measurement Techniques	Session 33 - HID Lighting I	Session 35 - Reluctance Machines	Session 36 - Inverters
	Session Chair: Richard Lukaszewski, Rockwell Automation, USA.	Session Chair: Kelly Robinson, Electrostatic Answers, USA	Session Chair: Georges Zissis, Université Paul Sabatier-Toulouse 3, France	Session Chair: Philippe Wendling, Magsoft Corporation, USA	Session Chair: PoTai Cheng, National Tsing Hua University, Taiwan
	Session Organizer: Adam Konopka, Baldor Electric, USA	Session Organizer: Rajesh Sharma, University of Arkansas at Little Rock, USA	Session Organizer: Jo Olsen, Sylvania, USA	Session Organizer: Mohammad S. Islam, Delphi Corporation, USA	Session Organizer: Gui Jia Su, Oak Ridge National Laboratory, USA
<b>2:00 PM</b>	Presentation 1. Integrated Simulation Environment for Power Electronics, Drives, and Electrical Machine Design	IAS32p1 Non Contacting Measurement of Surface Resistivity Using Phi Type Electrodes	IAS33p1 Analysis of the Output Capacitor and Lamp Voltage Inversion for the Bidirectional Flyback Converter	IAS35p1 New Designs of a Two-Phase E-Core Switched Reluctance Machine by Optimizing the Magnetic Structure for a Specific Application: Concept, Design, and Analysis	IAS36p1 PWM Inverters Using Split-Wound Coupled Inductors
	Scott Stanton, ANSOFT, USA	Toshiyuki Sugimoto, Yamagata University, Japan; Hiromu Ishii, Yamagata University, Japan; and Yoshio Higashiyama, Yamagata University, Japan	Tiago B. Marchesan, Murilo Cervi, Andre L. Kirsten, Alexandre Campos, Ricardo N. do Prado, Federal University of Santa Maria, Brazil	Cheewoo Lee, Virginia Polytechnic Institute and State University, USA; R. Krishnan, Virginia Polytechnic Institute and State University, USA	J. Salmon, University of Alberta, Canada; J. Ewanchuk, University of Alberta, Canada; A. Knight, University of Alberta, Canada
<b>2:30 PM</b>	Presentation 2. Design Support for Complex Technical Systems using Web Based Technologies	IAS32p2 Analysis of Data Obtained Using the Thermal Step Method on a MOS Structure - An Electrostatic Approach	IAS33p2 Envelope Analysis of a Phase-Controlled Triple LCpCs Resonant Inverter for Electronic Ballast Applications	IAS35p2 A Novel High Power Density Segmented Switched Reluctance Machine	IAS36p2 Embedded EZ-Source Inverters
	Uwe Knorr, TRANSIM, USA	L. Boyer, O. Fruchier, P. Notingher Jr., S. Agnel, A. Toureille, Université Montpellier 2, France; B. Rousset, CNRS, France; J. L. Sanchez, CNRS, France	Christian Brañas, University of Cantabria, Spain; Francisco J. Azcondo, University of Cantabria, Spain; Rosario Casanueva, University of Cantabria, Spain	R. Vandana, Indian Institute of Technology-Bombay, India; Naresh Vattikuti, Indian Institute of Technology-Bombay, India; B. G. Fernandes, Indian Institute of Technology-Bombay, India	P. C. Loh, Nanyang Technological University, Singapore; F. Gao, Nanyang Technological University, Singapore; F. Blaabjerg, Aalborg University, Denmark
<b>3:00 PM</b>	Presentation 3. Automatic Code Generation of Control Algorithms for Electronic Applications - Part I	IAS32p3 Electro-Chemical Preparation of Fine Needles for Field Ion Microscopy to Observe Biomolecules	IAS33p3 Self-Oscillating Full-Bridge Electronic Ballast with Constant-Lamp-Current Control and No-Lamp-Protection Circuit	IAS35p3 16,000-RPM Interior Permanent Magnet Reluctance Machine with Brushless Field Excitation	IAS36p3 A Class of Quasi-Z-Source Inverters
	Tony Lennon, Math Works, USA	Kei Kakuta, Toyohashi University of Technology, Japan; Kazunori Takashima, Toyohashi University of Technology, Japan; Akira Mizuno, Toyohashi University of Technology, Japan	Ray-Lee Lin, National Cheng Kung University, Taiwan; Jung-Pei Cheng, National Cheng Kung University, Taiwan; Feng-Yin Chen, National Cheng Kung University, Taiwan	J. S. Hsu, A. Burress, S. T. Lee, R. H. Wiles, C. L. Coomer, J. W. McKeever, D. J. Adams, Oak Ridge National Laboratory, USA	Joel Anderson, Michigan State University, USA; and F. Z. Peng, Michigan State University, USA
<b>3:30 PM</b>	Break	Break	Break	Break	Break
<b>4:00 PM</b>	Presentation 4. Automatic Code Generation of Control Algorithms for Electronic Applications - Part II	IAS32p4 Application of Atmospheric-Pressure Plasma for Enhancing Photoelectrochemical Properties of TiO <sub>2</sub> Electrodes	IAS33p4 Two-Stage High Power Factor Electronic Ballast for Metal-Halide Lamps	IAS35p4 Calculation of Flux Linkages of a 12/8 Dual-Channel SRM Including Mutual Coupling and Saturation: From Magnetic Circuit Model to FEM Analysis	IAS36p4 Design and Implementation of Photovoltaic Power Conditioning System Using a Current Based Maximum Power Point Tracking
	Tony Lennon, Math Works, USA	R. Sharma, J. Bock, A. S. Biris, M. K. Mazumder, University of Arkansas at Little Rock, USA; P. P. Das, University of Nevada, USA; M. Misra, University of Nevada, USA; V. Mahajan, University of Nevada, USA	T. J. Liang, National Cheng Kung University, Taiwan; C. M. Huang, National Cheng Kung University, Taiwan; J. F. Chen, National Cheng Kung University, Taiwan	Wen Ding, Xi'an Jiaotong University, China; Deliang Liang, Xi'an Jiaotong University, China	Hanju Cha, Chungnam National University, Korea; Sanghoey Lee, Chungnam National University, Korea
<b>4:30 PM</b>	Presentation 5. Rapid Virtual Prototyping in an Integrated Multi-Disciplinary Environment using VTB Pro	IAS32p5 Pt-Doped Al <sub>2</sub> O <sub>3</sub> as Dissipative Gap-Material in Tape Heads	IAS33p5 An Optimal LCC Design Method for Dimmable Electronic Ballasts of the HID lamp	IAS35p5 M-Phase N-Segment Flux-Reversal-Free Stator Switched Reluctance Machines	IAS36p5 A Novel Soft-Switching Scheme for an Isolated DC/DC Converter with Pulsating DC Output for a Three-Phase High-Frequency-Link PWM Converter
	Enrico Santi, University of South Carolina, USA	Yutaka Soda, Sony Corporation, Japan; Masaaki Sekine, Sony Corporation, Japan	Moksoon Jang, Alltelife Co. Ltd, South Korea; Byoung Lim, Kangwon National University, South Korea; Chongyeun Park, Kangwon National University, South Korea	N. S. Lobo, Virginia Polytechnic Institute and State University, USA; E. Swint, Virginia Polytechnic Institute and State University, USA; R. Krishnan, Virginia Polytechnic Institute and State University, USA	Rongjun Huang, University of Illinois at Chicago, USA; Sudip Mazumder, University of Illinois at Chicago, USA
<b>5:00 PM</b>	Presentation 6. Fast Inductance Computation Based on the PEEC Method Associated to System Simulations	IAS32p6 Multifunctional Coatings with Carbon Nanotubes for Electrostatic Charge Mitigation	IAS33p6 A Novel Low-Cost Electronic Ballast for Automotive HID Lamps	IAS35p6 Two-Phase SR Drive with Flux-Reversal Free Stator and Balanced Normal Forces	IAS36p6 Optimal Control of a Dual Three-Level Inverter System for Medium-Voltage Drives
	Philippe Wendling, Magsoft, France	E. Dervishi, Z. Li, V. Saini, R. Sharma, Y. Xu, M. K. Mazumder, A. S. Biris, University of Arkansas at Little Rock, USA; S. Trigwell, NASA/ASRC, USA; A. R. Biris, National Institute for Research Development of Isotopic Molecular Technologies, Romania; D. Lupu, National Institute for Research Development of Isotopic Molecular Technologies, Romania; D. Saini, Saint Louis University, USA	Chun-An Cheng, I-Shou University, Taiwan; Kun-Jheng Lin, I-Shou University, Taiwan	E. Swint, Virginia Polytechnic Institute and State University, USA; R. Krishnan, Virginia Polytechnic Institute and State University, USA	Joachim Holtz, University of Wuppertal, Germany; Nikolaos Oikonomou, University of Wuppertal, Germany
<b>5:30 PM</b>		IAS32p7 Molecular Dynamics of Poly 3-Hexyl Thiophene by Broadband Dielectric Spectroscopy	IAS33p7 A Novel Single-Stage Low-Frequency Square-Wave Driven Electronic Ballast for HID Lamps		IAS36p7 Design of Power Supply for Driving High Power Piezoelectric Actuators
		Anca Petre, Sombel Diahm, Paul Sabatier University, France; Edgar Reyes-Melo, Universidad autónoma de Nuevo Leon, Mexico; Viney Saini, Zhongrui Li, Alexandru S. Biris, University of Arkansas at Little Rock, USA; Adrian Samuila, Lucian Dascalescu, University of Poitiers, France	Chun-An Cheng, I-Shou University, Taiwan; Yung-Chine Wu, I-Shou University, Taiwan		Rongyuan Li, Paderborn University, Germany; Michael Loenneker, Paderborn University, Germany; Norbert Froehleke, Paderborn University, Germany; Joachim Boecker, Paderborn University, Germany

# Tuesday, October 7, Afternoon Sessions

Consulate	British Columbia	Yukon	Turner Valley
Energy Systems	Industrial Drives	Industrial Power Converter	Industrial Automation & Control
Session 37 - Energy Systems I	Session 38 - Drives I	Session 39 - Design, Modeling and Analysis of Power Converters	Session 40 - Motion Control Systems
Session Chair and Organizer: Kodjo Agbossou, Université du Québec à Trois-Rivières, Canada	Session Chair: Robert Betz, University of Newcastle, Australia	Session Chair: Sudip K. Mazumder, University of Illinois at Chicago, USA	Session Chair and Organizer: G. Venayagamoorthy, Missouri University of Science and Technology, USA
	Session Organizer: Gao Zhi, Schneider Electric / Square D, USA	Session Organizer: Poh Chiang Loh, Nanyang Technological University, Singapore	
IAS37p1 Hydrogen Production from a Large Digester Gas Plant - Plant Layout, Modeling, and Evaluation	IAS38p1 Power Factor Control for High Power Current Source Drive with Active Front End	IAS39p1 Interleaving Impact on AC Passive Components of Paralleled Three-Phase Voltage-Source Converters	IAS40p1 Analysis and Development of a Resolution-Level Vector-Controlled WM Inverter-Fed IPM Motor Drive
Sinclair Gair, Consultant, Scotland; André Martins de Martini, Promon, Brazil; Neil Finlayson, Lewis Castle College, Scotland; Rauri D. MacIver, Comhairle nan Eilean Siar, Scotland	Yun Wei Li, University of Alberta, Canada; Manish Pande, Rockwell Automation, Canada; Navid Zargari, Rockwell Automation, Canada; Bin Wu, Ryerson University, Canada	Di Zhang, Fred Wang, Rolo Burgos, Rixin Lai, Dushan Boroyevich, Virginia Polytechnic Institute and State University, USA	S. A. Saleh, Memorial University of Newfoundland, Canada; M. A. Rahman, Memorial University of Newfoundland, Canada
IAS37p2 Experimental Validation of a State Model for PEMFC Auxiliaries Control	IAS38p2 A Series Connected Three-Level Inverter Topology For Medium Voltage Squirrel Cage Motor Drive Applications	IAS39p2 Analysis and Implementation of a Power Switch for Telecommunication Applications	IAS40p2 A Novel Overmodulation and Field Weakening Strategy for Direct Torque Control of Induction Machines
K. P. Adzakpa, J. Ramousse, K. Agbossou, Y. Dubé, N. Hasanally, F. Zemmam, Université du Québec à Trois-Rivières, Canada	Suvajit Mukherjee, Indian Institute of Technology-Kharagpur, India; Gautam Poddar, Indian Institute of Technology-Kharagpur, India	Majid Pahlevaninezhad, Queen's University, Canada; S. Ali Khajehoddin, Queen's University, Canada; Alireza Bakhshai, Queen's University, Canada; Praveen Jain, Queen's University, Canada	A. Jidin, Universiti of Teknologi, Malaysia; N. R. N. Idris, Universiti of Teknologi, Malaysia; A. H. M. Yatim, University of Teknologi, Malaysia; M. Elbuluk, University of Akron, USA
IAS37p3 Optimal Design Analysis of a Stand-Alone Photovoltaic Hybrid System	IAS38p3 Evaluation of the Auto-Associative Neural Network Based Sensor Compensation in Drive Systems	IAS39p3 Fault-Tolerant Transformerless Power Flow Controller Based-On ETO Light Converter	IAS40p3 On-Line Identification of PMSM Parameters: Model-Reference vs EKF
Jérémy Lagorse, Stefan Giurgea, Damien Paire, Maurizio Cirrione, University of Technology of Belfort Montbéliard, France; Marcelo G. Simões, Colorado School of Mines, USA; Abdellatif Miraoui, University of Technology of Belfort Montbéliard, France	Luigi Galotto Jr., João Onofre Pereira Pinto, Luciana C. Leite, Federal University of Mato Grosso do Sul, Brazil; Luiz Eduardo Borges da Silva, Federal University of Itajubá, Brazil; Bimal K. Bose, The University of Tennessee, USA	Wenchao Song, North Carolina State University, USA; Subhashish Bhattacharya, North Carolina State University, USA; Alex. Q. Huang, North Carolina State University, USA	Thierry Boileau, Institut National Polytechnique de Lorraine, France; Babak Nahid-Mobarakeh, Institut National Polytechnique de Lorraine, France; Farid Meibody-Tabar, Institut National Polytechnique de Lorraine, France
Break	Break	Break	Break
IAS37p4 Implementation of Fuel Cell Emulation on DSP and dSPACE Controllers in the Design of Power Electronic Converters	IAS38p4 A New Walking Pattern SVM Technique for Five-Phase Motor Drives	IAS39p4 Modeling and Stability Analysis of Cascaded Multi-Converter Systems Including Feedforward and Feedback Control	IAS40p4 Direct Tuning Strategy for PMSM Drives
Abraham Gebregergis, Delphi Steering Saginaw, USA; Pragasen Pillay, Concordia University, Canada	Jing Huang, Missouri University of Science & Technology, USA; Keith A. Corzine, Missouri University of Science & Technology, USA	Hyoung Y. Cho, Swearingen Engineering Center, USA; Enrico Santi, Swearingen Engineering Center, USA	A. Lidozzi, University ROMA TRE, Italy; V. Serrao, University ROMA TRE, Italy; L. Solero, University ROMA TRE, Italy; F. Crescimbin, University ROMA TRE, Italy; A. Di Napoli, University ROMA TRE, Italy
IAS37p5 PEMFC Fault Diagnosis, Modeling, and Mitigation	IAS38p5 Loss Comparison between an SPWM and Harmonic Elimination Excited Small, (<1kW) Induction Motor Drive Using Pspice Simulation and Calorimetry	IAS39p5 High-Quality Single Phase Power Conversion by Reconsidering the Magnetic Components in the Output Stage - Building a Better Half Bridge	IAS40p5 Modeling and Minimization of Speed Ripple of a Faulty Induction Motor with Broken Rotor Bars
Abraham Gebregergis, Delphi Steering Saginaw, USA; Pragasen Pillay, Concordia University, Canada; Raghunathan Rengaswamy, Clarkson University, USA	C. Y. Leong, University of Oxford, UK; N-A. Parker-Allotey, University of Cambridge, UK; R. A. McMahon, University of Cambridge, UK	C. Chapelsky, University of Alberta, Canada; J. Salmon, University of Alberta, Canada; A. Knight, University of Alberta, Canada	M. Nasir Uddin, Lakehead University, Canada; W. Wang, Lakehead University, Canada; and Z. R. Huang, Lakehead University, Canada
	IAS38p6 Reversible AC Drive Systems Based on Parallel AC-AC DC-Link Converters	IAS39p6 Dynamic Control of a 20kW Interleaved Boost Converter for Traction Applications	IAS40p6 CORDIC Implementation of Space Vector Modulation
	C. B. Jacobina, Federal University of Campina Grande, Brazil; E. C. dos Santos Jr., Federal Center of Technological Education of Paraiba, Brazil; B. de S. Gouveia, Federal University of Campina Grande, Brazil; E. R. C. da Silva, Federal University of Campina Grande, Brazil	Grahame Holmes, Monash University, Australia; B. P. McGrath, Monash University, Australia; D. Segaran, Monash University, Australia; W. Y. Kong, Monash University, Australia	Prashanth Reddy Kambalappally, Northern Illinois University, USA; Donald S. Zinger, Northern Illinois University, USA
	IAS38p7 Performance of a High Speed Motor Drive System Using a Novel Multi-Level Inverter Topology	IAS39p7 The Impact of Voltage Generation on Harmonic Spectra of Current and Flux Density in the Welding Transformer for a Middle Frequency Resistance Spot Welding System - Gorazd Stumberger, Klemen Deželak, Boštjan Polajžer, Drago Dolinar, University of Maribor, Slovenia; Beno Klopčič, Indramat elektromotorji, Slovenia	
	J. Ewanchuk, University of Alberta, Canada; J. Salmon, University of Alberta, Canada; A. Knight, University of Alberta, Canada		



# Technical Program

Room	Devonian	Leduc	Chancellor	Alberta	Centennial
<b>Com- mittee</b>	Power Electronics Devices & Components	Electrostatic Processes	Industrial Lighting & Displays	Electric Machines	Mining
	Session 41 - Magnetics and Thermal Issues for Power Electronics	Session 42 - Bio-electrostatic Engineering	Session 43 - HID Lighting II	Session 44 - Interior PM Machines	Session 45 - Advanced Technologies in Mining I
	Session Chair: Jean-Luc Schanen, LEG ENSIEG, France	Session Chair: Ed Law, University of Georgia, USA	Session Chair: Francis Dawson, University of Toronto, Canada	Session Chair: Z.Q. Zhu, University of Sheffield, UK	Session Chair and Organizer: Jorge Pontt, Technical University Federico Santa Maria, Chile
	Session Organizer: Angus Bryant, University of Warwick, UK	Session Organizer: Lucian Dascalescu, University of Poitiers France	Session Organizer: Jo Olsen, Sylvania, USA	Session Organizer: Edward C. Lovelace, SatCon Technology Corporation, USA	
<b>8:00 AM</b>	IAS41p1 Improved Configuration of the Inductive Core-Saturation Fault Current Limiter with the Magnetic Decoupling	IAS42p1 Computation of Electrical Conditions Inside a Wire-Plate Electrostatic Precipitator Using an Unstructured Finite Volume Method	IAS43p1 A Dynamic Model of a High Temperature Arc Lamp	IAS44p1 Combination of Finite Element and Analytical Models in the Optimal Multi-Domain Design of Machines : Application to an Interior Permanent Magnet Starter Generator	IAS45p1 Evaluation of Peripheral Visual Performance When Using Incandescent and LED Miner Cap Lamps
	Dalibor Cvoric, Technische Universiteit Delft, The Netherlands; Sjoerd W. H. de Haan, Technische Universiteit Delft, The Netherlands; J. A. Ferreira, Technische Universiteit Delft, The Netherlands	Zhengwei Long, Tsinghua University, China; Qiang Yao, Tsinghua University, China; Qiang Song, Tsinghua University, China; Li Shuqing, Tsinghua University, China; Amar Tilmatine, Djillali Liabes University, Algeria	B. Halliop, University of Toronto, Canada; F. P. Dawson, University of Toronto, Canada; M. C. Pugh, University of Toronto, Canada	Jérôme Legranger, Valeo Electrical System, France; Guy Friedric, Université de Technologie de Compiègne, France; Stéphane Vivier, Université de Technologie de Compiègne, France; Jean Claude Mipo, Valeo Electrical System, France	John J. Sammarco, Miguel Reyes, John Bartels, Sean Gallagher, National Institute for Occupational Safety and Health, USA
<b>8:30 AM</b>	IAS41p2 Multi-Layer Barrel-Wound Foil Winding Design	IAS42p2 Graphitic Materials for RF Thermal Ablation of Tumors	IAS43p2 Characterization of Non-Stable States of Lamp Operation of High Power Lamps	IAS44p2 Analysis of Rotor Core Eddy-Current Losses in Interior Permanent Magnet Synchronous Machines	IAS45p2 Full Measuring System for Copper Electro-winning Processes Using Optibar® Inter-Cell Bârs
	Mitushi Nigam, Thayer School of Engineering at Dartmouth, USA; Charles R. Sullivan, Thayer School of Engineering at Dartmouth, USA	Meena Mahmood, Yang Xu, Zhongrui Li, Enkeleda Dervishi, Nawab Ali, Viney Saini, Alexru S. Biris, University of Arkansas at Little Rock, USA; Steve Trigwell, NASA/ASRC, USA; Vladimir P. Zharov, University of Arkansas for Medical Sciences, USA; Alexandru R. Biris, National Institute for Research and Development of Isotopic and Molecular Technologies, Romania; Dan Lupu, National Institute for Research and Development of Isotopic and Molecular Technologies, Romania	M. Kettlitz, neoplas GmbH, Germany; J. Zalach, neoplas GmbH, Germany; J. Rarbach, Diez Elektromaschinenbau, Germany	Seok-Hee Han, University of Wisconsin-Madison, USA; T. M. Jahns, University of Wisconsin-Madison, USA; Z. Q. Zhu, University of Sheffield, UK	Eduardo P. Wiechmann, University of Concepcion, Chile; Anibal S. Morales, University of Concepcion, Chile; Pablo E. Aqueveque, University of Concepcion, Chile
<b>9:00 AM</b>	IAS41p3 Analytical and Numerical Contributions for Winding Losses Estimation in an Integrated Magnetic Component	IAS42p3 Basic Study of Sterilization at Low Discharge Voltage by Using Microplasma	IAS43p3 Observer Based Ceramic HID Lamp Control	IAS44p3 Design Tradeoffs between Stator Core Loss and Torque Ripple in IPM Machines	IAS45p3 High Power Synchronous Machine fed by a Cascaded Regenerative Inverter
	Ajman Kerim, Grenoble Institute of Technology, France; Jean-Paul Ferrieux, Grenoble Institute of Technology, France; James Roudet, Grenoble Institute of Technology, France; Gérard Meunier, Grenoble Institute of Technology, France	Kazuo Shimizu, Shizuoka University, Japan; Masahiro Yamada, Shizuoka University, Japan; Masaki Kanamori, Shizuoka University, Japan; Marius Blajan, Shizuoka University, Japan	D. H. J. van Casteren, Technical University of Eindhoven, The Netherlands; M. A. M. Hendrix, Technical University of Eindhoven, The Netherlands; J. L. Duarte, Technical University of Eindhoven, The Netherlands	Seok-Hee Han, University of Wisconsin-Madison, USA; T. M. Jahns, University of Wisconsin-Madison, USA; Z. Q. Zhu, University of Sheffield, UK	José R. Rodriguez, Technical University Federico Santa Maria, Chile; Jorge Pontt, Technical University Federico Santa Maria, Chile; Marcelo Pérez, Technical University Federico Santa Maria, Chile; Pablo Lezana, Technical University Federico Santa Maria, Chile; Peter W. Hammond, Siemens Energy & Automation, Inc., USA
<b>9:30 AM</b>	IAS41p4 Fast Thermal Models for Power Device Packaging	IAS42p4 Pulsed Power Applied to Process Industry	IAS43p4 Warm-Up and Steady-State Control of High-Pressure Sodium Lamps Applied to Public Lighting Systems	IAS44p4 A Study on the Acoustic Noise Reduction of Interior Permanent Magnet Motor with Concentrated Winding	IAS45p4 Utilization of Supplementary Energy Storage Systems in High Power Mining Converters
	I. R. Swan, University of Warwick, UK; A. T. Bryant, University of Warwick, UK; P. A. Mawby, University of Warwick, UK	Shesha H. Jayaram, University of Waterloo, Canada	Rafael E. da Costa, Jeferson S. da Silveira, Fabio L. Tomm, Tiago B. Marchesan, Alexandre Campos Ricardo N. do Prado, University of Santa Maria, Brazil	Sang-Ho Lee, Hanyang University, Korea; Jung-Pyo Hong, Hanyang University, Korea	Babak Parkhideh, North Carolina State University, USA; Subhashish Bhattacharya, North Carolina State University, USA; Joy Mazumdar, Siemens Energy and Automation, USA; Walter Koellner, Siemens Energy and Automation, USA
<b>10:00 AM</b>	Break	Break	Break	Break	Break
<b>10:30 AM</b>	IAS41p5 Analysis and In-Situ Measurement of Thermal-Mechanical Strain in Active Silicon Power Semiconductors	IAS42p5 Survivability of Inoculated Versus Naturally Grown Bacteria in Liquid Foods under Pulsed Electric Fields	IAS43p5 Integration Methodology of DC/DC Converters to Supply HPS Lamps: An Experimental Approach	IAS44p5 Design of Saliency-Based Sensorless Drive IPM Motors for General Industrial Applications	IAS45p5 Design and Evaluation Criteria for High Power Drives
	Matthew L. Spencer, John Deere Technology Center, USA; Robert D. Lorenz, University of Wisconsin-Madison, USA	A. H. El-Hag, American University of Sharjah, United Arab Emirates; S. H. Jayaram, University of Waterloo, Canada; M. W. Griffiths, Guelph University, Canada; R. Dadarwal, Guelph University, Canada	Tiago B. Marchesan, Northwest University of RGS, Brazil; Jeferson S. da Silveira, Federal University of Santa Maria, Brazil; Munilo Cervi, Federal University of Santa Maria, Brazil; Marco A. Dalla Costa, Universidad de Oviedo, Spain; J. Marcos Alonso, Universidad de Oviedo, Spain; Alexandre Campos, Federal University of Santa Maria, Brazil; Ricardo N. do Prado, Federal University of Santa Maria, Brazil	Yoshiaki Kano, Nagoya Institute of Technology, Japan; Takashi Kosaka, Nagoya Institute of Technology, Japan; Nobuyuki Matsui, Nagoya Institute of Technology, Japan; Toshihito Nakanishi, Toyo Denki Seizo K.K., Japan	Jose Rodriguez, Technical University Federico Santa Maria, Chile; Bin Wu, Ryerson University, Canada; Steffen Bernet, Dresden University, Germany; Navid Zargari, Rockwell Automation, Canada; Jaime Rebolledo, Technical University Federico Santa Maria, Chile; Jorge Pontt, Technical University Federico Santa Maria, Chile; Peter Steimer, ABB Industrie AG., Switzerland
<b>11:00 AM</b>	IAS41p6 Precision Calorimetry for the Accurate Measurement of Losses in Power Electronic Devices	IAS42p6 Detection of Discharge Activities During Food Processing by Pulsed Electric Field	IAS43p6 Design of Resonant Igniters for Metal Halide Lamps Supplied with High Frequency Square Waveform Inverters	IAS44p6 A Study on Reduction of Vibration Based on Decreased Cogging Torque for Interior Type Permanent Magnet Motor	IAS45p6 Feasibility of Using Intelligent Video for Machine Safety Applications
	S. D. J. Weier, University of Cambridge, England; M. A. Shafi, University of Cambridge, England; R. A. McMahon, University of Cambridge, England	A. M. Gaouda, United Arab Emirates University, United Arab Emirates; A. H. El-Hag, American University of Sharjah, United Arab Emirates; S. H. Jayaram, University of Waterloo, Canada	J. Garcia, University of Oviedo, Spain; E. L. Corominas, University of Oviedo, Spain; A. J. Calleja, University of Oviedo, Spain; M. A. Dalla-Costa, University of Oviedo, Spain; J. Ribas, University of Oviedo, Spain; M. Rico-Secades, University of Oviedo, Spain	Seung-Hoon Lee, Kwang-Kyu Han, Ho-Jin Ahn, Changwon National University, Korea; Gyu-Hong Kang, GEM-TECH Co., LTD, Korea; Young-Dae Son, Dongseo University, Korea; Gyu-Tak Kim, Changwon National University, Korea	Todd M. Ruff, National Institute for Occupational Safety and Health, USA
<b>11:30 AM</b>	IAS41p7 Evaluation of Power Semiconductors Power Cycling Capabilities for Adjustable Speed Drive		IAS43p7 A Simple Electronic Ballast to Supply HID Lamps		
	Lixiang Wei, Rockwell Automation-Allen Bradley, USA; Russ J. Kerkman, Rockwell Automation-Allen Bradley, USA; Richard A. Lukaszewski, Rockwell Automation-Allen Bradley, USA		Fabio Luis Tomm, Universidade Federal de Santa Maria, Brazil; Jacson Hansen, Universidade Federal de Santa Maria, Brazil; Ricardo Nederson do Prado, Universidade Federal de Santa Maria, Brazil; Alexandre Campos, Universidade Federal de Santa Maria, Brazil		

# Wednesday, October 8, Morning Sessions

Strathcona	Consulate	British Columbia	Turner Valley	Yukon
Industrial Power Converter	Energy Systems	Industrial Drives	Power Systems Engineering	Industrial Automation & Control
Session 46 - Rectifiers	Session 47 - Energy Systems II	Session 48 - Permanent Magnet Drives	Session 49 - Power Quality	Session 50 - Intelligent Controls
Session Chair and Organizer: Jim Galloway, J. H. Galloway & Associates, USA	Session Chair and Organizer: Wei-Jen Lee, University of Texas at Arlington, USA	Session Chair: Semyon Royak, Rockwell Automation, USA	Session Chair: Chris Melhorn, Electric Power Research Institute, USA	Session Chair and Organizer: A. Skorek, University of Quebec, Canada
		Session Organizer: Zach Pan, Direct Drive Systems, Inc., USA	Session Organizer: Peter Sutherland, GE, USA	
IAS46p1 Sensorless Nonlinear Control of a Three-Phase/ Switch/ Level Vienna Rectifier Based on a Numerical Reconstruction of DC and AC Voltages	IAS47p1 A Multi-Agent Fuzzy Logic Based Energy Management of Hybrid Systems	IAS48p1 Examination and Linearization of Torque Control System for Direct Torque Controlled IPMSM	IAS49p1 Resonance Excited by Transformer Inrush Current in Inter-Connected Offshore Power Systems	IAS50p1 Improving the Torque Ripple in DTC of PMSM Using Fuzzy Logic
Nesrine Belhadj Youssef, École de Technologie Supérieure, Canada; Kamal Al-Haddad, École de Technologie Supérieure, Canada; Hadi-Y. Kanaan, Saint-Joseph University, Lebanon	Jérémy Lagorse, University of Technology of Belfort Montbéliard, France; Marcelo G. Simões, Colorado School of Mines, USA; Abdellatif Miraoui, University of Technology of Belfort Montbéliard, France	Yukinori Inoue, Osaka Prefecture University, Japan; Shigeo Morimoto, Osaka Prefecture University, Japan; Masayuki Sanada, Osaka Prefecture University, Japan	R. A. Turner, Mott MacDonald Transmission and Distribution, UK; K. S. Smith, Mott MacDonald Transmission and Distribution, UK	Hussein F. E. Soliman, Ain Shams University, Egypt; Malik E. Elbuluk, University of Akron, USA
IAS46p2 Power Quality Conditioning Using Bridged-T Filters for Passive Rectifiers	IAS47p2 An AMI System for the Deregulated Electricity Markets	IAS48p2 Novel Voltage Trajectory Control for Flux Weakening Operation of Surface Mounted PMSM Drives	IAS49p2 Generalization of Methods for Voltage Sag Source Detection Using Vector Space Approach	IAS50p2 A Novel Neuro-Wavelet Based Self-Tuned Wavelet Controller for IPM Motor Drives
Steven Fredette, UTC Power, USA; and Giri Venkataramanan, University of Wisconsin-Madison, USA	Huibin Sui, Shandong University, China; Honghong Wang, Qingdao University, China; Ming-Shun Lu, Taiwan Power Company, Taiwan; Wei-Jen Lee, The University of Texas at Arlington, USA	Ping-Yi Lin, National Taipei University of Technology, Taiwan; Yen-Shin Lai, National Taipei University of Technology, Taiwan	Boštjan Polajžer, University of Maribor, Slovenia; Gorazd Štumberger, University of Maribor, Slovenia; Sebastijan Seme, University of Maribor, Slovenia; Drago Dolinar, University of Maribor, Slovenia	M. Abdes S. K. Khan, Memorial University of Newfoundland, Canada; M. A. Rahman, Memorial University of Newfoundland, Canada
IAS46p3 Comparison of LCL-Filter-Based PWM Rectifier with Different Current Sensor Positions	IAS47p3 Artificial Neural Network Based Adaptive Load Shedding for an Industrial Cogeneration Facility	IAS48p3 Precise Torque Control in Flux-Weakening Operation of Surface-Mounted PM Motor with Magnetic Saliencies	IAS49p3 Power Quality Investigation of Surge Protective Device Failures During Open-Transition for a Waste Water Treatment Facility	IAS50p3 Real-Time Implementation of Intelligent Modeling and Control Techniques on a PLC Platform
Bing Gong, Ryerson University, Canada; Dewei Xu, Ryerson University, Canada	Cheng-Ting Hsu, Southern Taiwan University, Taiwan; Hui-Jen Chuang, Kao-Yuan University, Taiwan; Chao-Shun Chen, I-Shou University, Taiwan	Ju-Young Jang, Yeungnam University, Korea; Chan-Hee Choi, Yeungnam University, Korea; Jul-Ki Seok, Yeungnam University, Korea	Thomas Dionise, Eaton Coporation, USA; Rakan El-Mahayni, Eaton Coporation, USA	Curtis Parrot, Missouri University of Science Technology, USA; Ganesh K. Venayagamoorthy, Missouri University of Science and Technology, USA
IAS46p4 New Stationary Frame Control Scheme for Three Phase PWM Rectifiers under Unbalanced Voltage Dips Conditions	IAS47p4 Influence of Wind Energy Converter Control Methods on the Output Frequency Components	IAS48p4 Investigation and Implementation of Control Strategies for Flux-Switching Permanent Magnet Motor Drives	IAS49p4 Architecture of Electrical Installations: The Node Double Two	IAS50p4 Identification of Induction Machine Electrical Parameters Using Genetic Algorithms Optimization
D. Roiu, Politecnico di Torino, Italy; R. Bojoi, Politecnico di Torino, Italy; L. R. Limongi, Politecnico di Torino, Italy; A. Tenconi, Politecnico di Torino, Italy	Bingchang Ni, Ruhr-University Bochum, Germany; Constantinos Sourkounis, Ruhr-University Bochum, Germany	Hongyun Jia, Southeast University, China; Ming Cheng, Southeast University, China; Wei Hua, Southeast University, China; Wei Lu, Southeast University, China; Xiaofan Fu, Southeast University, China	Giuseppe Parise, University of Roma "La Sapienza", Italy; Aldo Gabelli, Italian Parliament, Italy; E. Berenato, Schneider-Electric SpA, Italy; D. Brambilla, Schneider-Electric SpA, Italy; L. Signorelli, Schneider-Electric SpA, Italy	Konstantinos Kampisios, University of Nottingham, UK; Pericle Zanchetta, University of Nottingham, UK; Chris Gerada, University of Nottingham, UK; Andrew Trentin, University of Nottingham, UK
Break	Break	Break	Break	Break
IAS46p5 Application of IGCT in High Power Rectifiers	IAS47p5 Combining the Wind Power Generation System with Energy Storage Equipments	IAS48p5 IPM Machine Drive Design and Tests for an Integrated Starter-Alternator Application	IAS49p5 Prospected Evolution for Low Voltage Customers: Ecodesign of the Electrical Distribution System	IAS50p5 Development and Testing of Hybrid Fuzzy Logic Controller for Car Suspension System Using Magneto-Rheological Damper
Yongsung Suh, Chonbuk National University, Korea; Peter Steimer, ABB Switzerland, Switzerland	Ming-Shun Lu, Taiwan Power Company, Taiwan; Chung-Liang Chang, Taiwan Power Company, Taiwan; Wei-Jen Lee, The University of Texas at Arlington, USA; Li Wang, National Cheng Kung University, Taiwan	M. Barcaro, University of Padova, Italy; L. Alberti, University of Padova, Italy; A. Faggion, University of Padova, Italy; L. Sgarbossa, University of Padova, Italy; M. Dai Prè, University of Padova, Italy; N. Bianchi, University of Padova, Italy; S. Bolognani, University of Padova, Italy	Giuseppe Parise, University of Roma "La Sapienza", Italy; Luigi Martirano, University of Roma "La Sapienza", Italy	M. M. Rashid, International Islamic University of Malaysia, Malaysia; N. A. Rahim, University of Malaya, Malaysia; M. A. Hussain, University of Malaya, Malaysia; M. A. Hussain, University of Malaya, Malaysia; F. Mohamed, University of Malaya, Malaysia; M. A. Rahman, Memorial University of Newfoundland, Canada
	IAS47p6 Variable Speed Engine Generator with Super-Capacitor; Isolated Power Generation System and Fuel Efficiency	IAS48p6 Steady-State and Transient Analysis of Maximum Torque per Ampere Control for IPMSMs		IAS50p6 On the Fuzzy-Based Control Strategy Design and Implementation of a Non-Contacting Steel Plate Conveyance System
	Joon-Hwan LEE, Seoul National University, Korea; Seung Hwan Lee, Seoul National University, Korea; Seung-Ki Sul, Seoul National University, Korea	A. Consoli, University of Catania, Italy; G. Scarcella, University of Catania, Italy; G. Scelba, University of Catania, Italy; S. Sindoni, University of Catania, Italy; A. Testa, University of Messina, Italy		Cheng-Tsung Liu, National Sun Yat-Sen University, Taiwan; Sheng-Yang Lin, National Sun Yat-Sen University, Taiwan; Yung-Yi Yang, China Steel Corporation, Taiwan
	IAS47p7 A Effort to Optimize Similar Days Parameters for ANN Based Electricity Price Forecasting	IAS48p7 Fault Tolerant Permanent Magnet Motor Drive Topologies for Automotive X-By-Wire Systems		
	Paras Mandal, University of Tasmania, Australia; Anurag K. Srivastava, Mississippi State University, USA; Michael Negnevitsky, University of Tasmania, Australia; Jung-Wook Park, Yonsei University, Korea	Malakondaiah Naidu, Moog Inc., USA; Suresh Gopalakrishnan, General Motors R&D Center, USA; Thomas Nehl, Delphi Chassis, USA		



# Technical Program

Room	Devonian	Leduc	Consulate	Alberta	Centennial
<b>Com- mittee</b>	Power Electronics Devices & Components	Electrostatic Processes	Energy Systems	Electric Machines	Mining
	Session 51 – EMC Filters and Magnetics for Power Electronics	Session 52 - EHD and Microfluidics	Session 53 - Energy Systems III	Session 54 - PM Machines I	Session 55 - Advanced Technologies in Mining II
	Session Chair: Richard Lukaszewski, Rockwell Automation, USA.	Session Chair: Shesha Jayaram, University of Waterloo, Canada	Session Chair and Organizer: Wei-Jen Lee, University of Texas at Arlington, USA	Session Chair: William Cai, Remy Inc, USA	Session Chair and Organizer: Galina Mirzaeva, University of Newcastle, Australia
	Session Organizer: Adam Konopka, Baldor Electric, USA	Session Organizer: Jamal Seyed-Yagooobi, Illinois Institute of Technology, USA		Session Organizer: M. El-Refaei, GE Global Research, USA	
<b>2:00 PM</b>	Presentation 1. How to improve EMI Filters with Nanocrystalline Cores	IAS52p1 Capillary/Narrow Flow Channel Driven EHD Gas Pump for an Advanced Thermal Management of Micro-Electronics	IAS53p1 Solar Trigenation for Residential Applications, a Feasible Alternative to Traditional Micro-Cogeneration and Trigenation Plants	IAS54p1 Influence of PWM on the Proximity Loss in Permanent Magnet Brushless AC Machines	IAS55p1 Requirements and Evaluation of an Active Harmonic Filter Application in an Actual Industrial Installation
	Rodney Rodgers, Vacuumschmelze, USA; Dirk Heumann, Vacuumschmelze, USA; Sean Rainsford, Vacuumschmelze, USA	Jen-Shih Chang, McMaster University, Canada; H. Tsubone, Ariake National College of Technology, Japan; G. D. Harvel, University of Ontario Institute of Technology, Canada; K. Urashima, McMaster University, Canada	Fabio Immovilli, Alberto Bellini, Claudio Bianchini, University of Modena and Reggio Emilia, Italy; Giovanni Franceschini, University of Parma, Italy	S. Iwasaki, IMRA UK Research Centre, UK; R. Deodhar, IMRA UK Research Centre, UK; Y. Liu, IMRA UK Research Centre, UK; A. Pride, IMRA UK Research Centre, UK; Z. Q. Zhu, University of Sheffield, UK; J. Bremner, Elektro Magnetix Ltd., UK	José Ignacio Simpson, University Federico Santa María, Chile; Jorge Pontt, University Federico Santa María, Chile; Adolfo Paredes Palacios, University Federico Santa María, Chile; Guillermo Figueroa, Schneider-Electric, Chile
<b>2:30 PM</b>	Presentation 2. Design of CMC's simplified by VAC simulation program.	IAS52p2 An Electrically Driven Impinging Liquid Jet for Direct Cooling of Heated Surfaces	IAS53p2 Effects of Voltage Unbalance and System Harmonics on the Performance of Doubly Fed Induction Wind Generators	IAS54p2 Multi-Phase Flux-Switching Permanent Magnet Brushless Machine for Aerospace Application	IAS55p2 Technological Aspects of Solid-State and Incandescent Sources for Miner Cap Lamps
	Rodney Rodgers, Vacuumschmelze, USA; Dirk Heumann, Vacuumschmelze, USA; Sean Rainsford, Vacuumschmelze, USA	Miad Yazdani, Illinois Institute of Technology, USA; Jamal Seyed-Yagooobi, Illinois Institute of Technology, USA	M. Kiani, The University of Texas at Arlington, USA; W. J. Lee, The University of Texas at Arlington, USA	A. S. Thomas, University of Sheffield, UK; Z. Q. Zhu, University of Sheffield, UK; R. L. Owen, University of Sheffield, UK; G. W. Jewell, University of Sheffield, UK; D. Howe, University of Sheffield, UK	J. J. Sammarco, M. A. Reyes, National Institute for Occupational Safety and Health, USA; J. P. Freyssiener, Rensselaer Polytechnic Institute, USA; J. D. Bullough, Rensselaer Polytechnic Institute, USA; X. Zhang, Rensselaer Polytechnic Institute, USA
<b>3:00 PM</b>	Presentation 3. Practical Considerations for the Efficient Application of Harmonic Filters.	IAS52p3 Numerical Models for AC Electro-Osmotic Micropumps	IAS53p3 Design of Optimal Coasting Speed for MRT Systems Using ANN Models	IAS54p3 Loss Analysis of Permanent Magnet Motors with Concentrated Windings - Variation of Magnet Eddy Current Loss Due to Stator and Rotor Shapes	IAS55p3 Interharmonics Power Losses Estimation in Power Transformer fed High Power Cycloconverter Drive
	Stefan Melly, Schaffner, Germany	Michal Pribyl, Institute of Chemical Technology, Czech Republic; Kazimierz Adamiak, The University of Western Ontario, Canada	Hui-Jen Chuang, Kao Yuan University, Taiwan; Chao-Shun Chen, I Shou University, Taiwan; Chia-Hung Lin, National Kaohsiung University of Applied Sciences, Taiwan; Ching-Ho Hsieh, National Sun Yat-Sen University, Taiwan; Chin-Yin Ho, Kao Yuan University, Taiwan	Katsumi Yamazaki, Chiba Institute of Technology, Japan; Yu Fukushima, Chiba Institute of Technology, Japan; Makoto Sato, Chiba Institute of Technology, Japan	J. San Martin, Technical University Federico Santa María, Chile; J. Pontt, Technical University Federico Santa María, Chile; F. Bello, Technical University Federico Santa María, Chile; R. Aguilera, Technical University Federico Santa María, Chile
<b>3:30 PM</b>	Break	Break	Break	Break	Break
<b>4:00 PM</b>	Presentation 4. Improved Power Factor Performance of Harmonic Mitigation Filters	IAS52p4 Innovative Electrode Arrangement for Electrohydrodynamic Pumping	IAS53p4 A Converter Topology Suitable for Interfacing Energy Storage with the DC Link of a StatCom	IAS54p4 Fault-Tolerant Flux-Switching Permanent Magnet Brushless AC Machines	IAS55p4 Improving Efficiency in Iron Ore Mining Facilities
	Eric Ruckstadter, MTE, USA	Ichiro Kano, Yamagata University, Japan; Yoshio Kano, KENEK Co. Ltd, Japan; Tatsuo Nishina, Yamagata University, Japan	Hailian Xie, Royal Institute of Technology, Sweden; Lennart Angquist, ABB Power Systems, Sweden; Hans-Peter Nee, Royal Institute of Technology, Sweden	R. L. Owen, University of Sheffield, UK; Z. Q. Zhu, University of Sheffield, UK; A. S. Thomas, University of Sheffield, UK; G. W. Jewell, University of Sheffield, UK; D. Howe, University of Sheffield, UK	Eduardo P. Wiechmann, University of Concepcion, Chile; Pablo E. Aqueveque, University of Concepcion, Chile; Anibal S. Morales, University of Concepcion, Chile
<b>4:30 PM</b>	Presentation 5. Innovation in EMC Filter - SineFormer™ Filter Solves Motor Bearing Current Problems.	IAS52p5 Verifying Solution Component Concentration by Measuring Frequency Dependent Conduction of Electrically Charged Species	IAS53p5 Optimization of Reactive Power Compensation in Wind Farms Using Sensitivity Analysis and Tabu Algorithm	IAS54p5 Impact of Winding Layer Number and Slot/Pole Combination on AC Armature Losses of Synchronous Surface PM Machines Designed for Wide Constant-Power Speed Range Operation	IAS55p5 Highland Valley Copper Control Systems Upgrade - Technology, Design, Simulation, and Installation
	Suresh Chandran, EPCOS, USA	Kelly Robinson, Electrostatic Answers LLC, USA	Ling Li, Xiangjun Zeng, Ping Zhang, Yunfeng Xia, Changsha University of Science and Technology, China; Guopin Liu, China Hydropower Engineering Consulting Group Co., China	Patel B. Reddy, University of Wisconsin-Madison, USA; T. M. Jahns, University of Wisconsin-Madison, USA; Ayman M. El-Refaei, General Electric Global Research Center, USA	Kevin S. Borthwick, Fransen Engineering Ltd., Canada; Jamie R. Hargreaves, Fransen Engineering Ltd., Canada; Greg L. Yorke, Fransen Engineering Ltd., Canada
<b>5:00 PM</b>	Presentation 6. Power Line Filter Product Technology Present and Future	IAS52p6 Analysis of the Effects of Solution Conductivity on Electro-Spinning Process and Fiber Morphology	IAS53p6 PV-Microgrid Operational Cost Minimization by Neural Forecasting and Heuristic Optimization	IAS54p6 Comparative Study of Flux-Switching and Doubly-Salient PM Machines Particularly on Torque Capabilit	IAS55p6 A Novel Measuring Method of Capacitive Current for Ungrounded Distribution Systems
	Ken Ogden, Radius Power, USA; Tim Opalewski, L&W Power	C. J. Angamma, University of Waterloo, Canada; S. H. Jayaram, University of Waterloo, Canada	Sudipta Chakraborty, National Renewable Energy Laboratory, USA; Marcelo G. Simoes, Colorado School of Mines, USA	Wei Hua, Southeast University, China; Ming Cheng, Southeast University, China; Hongyun Jia, Southeast University, China; Xiaofan Fu, Southeast University, China	Wangyi Jin, Changsha University of Science and Technology, China; Xiangjun Zeng, Changsha University of Science and Technology, China; Bo Chen, Changsha University of Science and Technology, China; Yao Xu, Changsha University of Science and Technology, China
<b>5:30 PM</b>	Presentation 7. Operational Tolerance Study of Electromagnetic Component by Using Local and Global Deterministic Algorithms.		IAS53p7 Distributed Energy Resources and Renewable Energy in Distribution Systems: Protection Considerations and Penetration Levels		
	Jean-Luc Schanen, Grenoble Electrical Engineering Laboratory (G2Elab), France; B. Cogitore, Microspire, France; F. Wurtz, L. Gerbaud, Grenoble Electrical Engineering Laboratory (G2Elab), France		Keith Malmedal, NEI Electric Power Engineering, USA; Ben Kroposki, National Renewable Energy Laboratory, USA; P. K. Sen, Colorado School of Mines, USA		

# Wednesday, October 8, Afternoon Sessions

Strathcona	Chancellor	British Columbia	Turner Valley	Yukon
Industrial Power Converter	Electric Machines	Industrial Drives	Power Systems Engineering	Industrial Automation and Control
Session 56 - PWM and Control Techniques	Session 57 - PM Machines II	Session 58 - Induction Machine Drives	Session 59 - Power System Analysis	Session 60 - Advanced Controls
Session Chair: Bingsen Wang, Arizona State University, USA	Session Chair: Mohammad S. Islam, Delphi Corporation, USA	Session Chair: Bin Lu, Eaton Innovation Center, USA	Session Chair: J. J. Dai, ETAP, USA	Session Chair and Organizer: Joy Mazundar, Siemens, USA
Session Organizer: PoTai Cheng, National Tsing Hua University, Taiwan	Session Organizer: Nicola Bianchi, University of Padova, Italy	Session Organizer: Ranga Tallam, Rockwell Automation, USA	Session Organizer: Peter Sutherland, GE, USA	Session Organizer: Joy Mazundar, Siemens, USA
IAS56p1 A Dynamic Boost Converter Input Stage for a Double 120° Flattop Modulation Based Three-Phase Inverter	IAS57p1 Analysis of Axial Leakage in High-Speed Slotless PM Motors for Industrial Hand Tools	IAS58p1 Advanced Control Strategies for Stability Improvement of Natural Field Orientation	IAS59p1 A Novel Control Strategy for a Variable Speed Wind Turbine with a Permanent Magnet Synchronous Generator	IAS60p1 Voltage and Current Programmed Modes in Control of the Z-Source Converter
Jie Shen, RWTH Aachen University, Germany; Klaus Rigbers, RWTH Aachen University, Germany; Christian P. Dick, RWTH Aachen University, Germany; Rik W. De Doncker, RWTH Aachen University, Germany	Oskar Wallmark, Royal Institute of Technology, Sweden; Peter Kjellqvist, Atlas Copco Tools AB, Sweden; Florence Meier, Royal Institute of Technology, Sweden	G. Mirzaeva, University of Newcastle, Australia; A. Rojas, University of Newcastle, Australia	M. E. Haque, University of Tasmania, Australia; M. Negnevitsky, University of Tasmania, Australia; K. M. Muttaqi, University of Wollongong, Australia	Gokhan Sen, University of Akron, USA; Malik Elbuluk, University of Akron, USA
IAS56p2 A General Analytical Method for Calculating Inverter DC-Link Current Harmonics	IAS57p2 Optimal Skew Angle for Improving of Start-Up Performance of a Single-Phase Line-Start Permanent Magnet Motor	IAS58p2 Induction Motor Temperature Estimation Based on High-Frequency Model of Rotor Bar	IAS59p2 Induced Voltages and Power Losses in Single-Conductor Armored Cables	IAS60p2 Experimental Performance Evaluation of a Nonlinear Controller Based IM Drive Incorporating Iron Loss in the Motor Model
B. P. McGrath, Monash University, Australia; Grahame Holmes, Monash University, Australia	Byung-taek Kim, Kunsan National University, S. Korea; Dae-kyong Kim, Korean Electronics Technology Institute, S. Korea; Byung-il Kwon, Hanyang University, S. Korea; Thomas A. Lipo, University of Wisconsin-Madison, USA	Kyung-Rae Cho, Yeungnam University, Korea; Jul-Ki Seok, Yeungnam University, Korea	Y. Du, The Hong Kong Polytechnic University, PRChina; X. H. Wang, The Hong Kong Polytechnic University, PRChina; and Z. H. Huan, The Hong Kong Polytechnic University, PRChina	M. Nasir Uddin, Lakehead University, Canada; Sang Woo Nam, Rockwell Automation Canada, Canada
IAS56p3 Complex-Vector Time-Delay Control of Power Converters	IAS57p3 Winding Inductances of Fractional Slot Surface-Mounted Permanent Magnet Brushless Machines	IAS58p3 Diagnostics of Induction Machines Operated from Inverters and Soft-Starters Using High Frequency Negative Sequence Currents	IAS59p3 A Better Understanding of Load and Loss Factors	IAS60p3 Real Time Implementation of an Artificial Immune System Based Controller for a DSTATCOM in an Electric Ship Power System
P. C. Loh, Nanyang Technological University, Singapore; Y. Tang, Nanyang Technological University, Singapore; P. Wang, Nanyang Technological University, Singapore; F. Blaabjerg, Aalborg University, Denmark	Ayman M. EL-Refaie, GE Global Research Center, USA; Z. Q. Zhu, University of Sheffield, UK; Thomas M. Jahns, University of Wisconsin-Madison, USA; David Howe, University of Sheffield, UK	Fernando Briz, University of Oviedo, Spain; Michael W. Degner, Ford Motor Company, USA; Juan M. Guerrero, University of Oviedo, Spain; Pablo Garcia, University of Oviedo, Spain	Keith Malmedal, NEI Electric Power Engineering, USA; P. K. Sen, Colorado School of Mines, USA	Pinaki Mitra, Missouri University of Science and Technology, USA; Ganesh K. Venayagamoorthy, Missouri University of Science and Technology, USA
Break	Break	Break	Break	Break
IAS56p4 Variable-Frequency Pulse-Width Modulation for an Improved Grid-Connected Converter Efficiency	IAS57p4 Analysis of Flux Measurements on a PMSM With Non-Overlapping Concentrated Windings	IAS58p4 Model-Based Stator Fault Detection in Induction Motors	IAS59p4 Influence of Subsea Cables on Offshore Power Distribution Systems	IAS60p4 New Power Quality Index in a Distribution Power System by Using RMP Model
Christian P. Dick, RWTH Aachen University, Germany; Matthias Biskoping, RWTH Aachen University, Germany; Sebastian A. Richter, RWTH Aachen University, Germany; Rik W. De Doncker, RWTH Aachen University, Germany	Florence Meier, Royal Institute of Technology, Sweden; Juliette Soulard, Royal Institute of Technology, Sweden	Carsten Skovmose Kalløse, Grundfos Management A/S, Denmark	Xiaodong Liang, Schlumberger, Canada; William Jackson, Schlumberger, Canada	Soon Lee, Hyundai Heavy Industries Co., Ltd., Korea; Jung-Wook Park, Yonsei University, Korea; Ganesh K. Venayagamoorthy, Missouri University of Science and Technology, USA
IAS56p5 Modulation Error Control for Medium Voltage Drives with LC-Filters and Synchronous Optimal Pulse Width Modulation	IAS57p5 Unbalanced Magnetic Pull in Fractional-Slot Brushless PM Motors	IAS58p5 Pulsating Torques in PWM Multi-Megawatt Drives for Torsional Analysis of Large Shafts		IAS60p5 Improved Control of DFIG Wind Turbines for Operation with Unbalanced Network Voltages
T. Laczynski, Leibniz University of Hannover, Germany; T. Werner, Leibniz University of Hannover, Germany; A. Mertens, Leibniz University of Hannover, Germany	David G. Dorrell, University of Glasgow, UK; Mircea Popescu, University of Glasgow, UK; Calum Cossar, University of Glasgow, UK; Dan Ionel, AO Smith Corp., USA	Joseph Song-Manguelle, Baldor Drives Center, Canada; Jean Maurice Nyobeyome, University of Douala, Cameroon		Wei Qiao, Georgia Institute of Technology, USA; Ronald G. Harley, Georgia Institute of Technology, USA
IAS56p6 Simplified Space Vector PWM Algorithm for Multilevel Inverters Using Non-Orthogonal Moving Reference Frame	IAS57p6 Flat Magnets in Surface-Mounted Permanent Magnet Machines	IAS58p6 Soft Starting of Induction Motor with Torque Control		IAS60p6 A Neural Inverse Control of a PEM-FC System by the Generalized Mapping Regressor (GMR)
Nicolau Pereira Filho, Federal University of Mato Grosso do Sul, Brazil; Luiz Eduardo Borges da Silva, Federal University of Itajubá, Brazil; João Onofre Pereira Pinto, Federal University of Mato Grosso do Sul, Brazil; Bimal K. Bose, The University of Tennessee, USA	I. Egaña, A. Garcia Rico, University of Navarra, Spain; I. Elosegui, J. M. Echeverria, M. Martinez-Iturralde, Centre for Studies and Research Techniques Gipuzkoa, Spain	Ademir Nied, State University of Santa Catarina, Brazil; José de Oliveira, State University of Santa Catarina, Brazil; Rafael de F. Campos, State University of Santa Catarina, Brazil; Rogério P. Dias, WEG Equipamentos Elétricos, Brazil; Luiz C. de Souza Marques, Federal University of Santa Maria, Brazil		G. Marsala, D. Bouquin, J. T. Pukrushpan, Université de Technologie de Belfort-Montbéliard, France; M. Pucci, Institute on Intelligent Systems for the Automation, Italy; G. Cirrincione, University of Picardie-Jules Verne, France; G. Vitale, Institute on Intelligent Systems for the Automation, Italy; A. Miraoui, Université de Technologie de Belfort-Montbéliard, France





# Technical Program

Room	Chancellor	Saskatchewan	Alberta	Manitoba
<b>Com- mittee</b>	Electrostatic Processes	Electric Machines	Electric Machines	Industrial Power Converter
	Session 61 - Particles, Aerosols and Droplets	Session 62 - Linear Machines	Session 63 - Induction Machines	Session 64 - Alternative Energy
	Session Chair: Wamadeva Balachandran, Brunel University, UK	Session Chair: Keith Klontz, Advanced MotorTech, USA	Session Chair: Longya Xu, The Ohio State University, USA	Session Chair: Leon Tolbert, University of Tennessee, USA
	Session Organizer: Kaz Adamiak, University of Western Ontario, Canada	Session Organizer: Wen Xuhui, China Academy of Sciences, China	Session Organizer: Emmanuel Agamloh, Advanced Energy, USA	Session Organizer: Burak Ozpineci, Oak Ridge National Laboratory, USA
<b>8:00 AM</b>	IAS61p1 Electrostatic and Gravitational Transport of Lunar Dust in the Airless Atmosphere of the Moon	IAS62p1 Analytical Study of Special Linear Motor-Transformer for Wireless Tram	IAS63p1 Investigation and Comparison of Inverter-Fed Induction Machine Loss	IAS64p1 Fuel Cell Based Battery-Less UPS System
	M. K. Mazumder, R. Sharma, A. S. Biris, University of Arkansas at Little Rock, USA; M. N. Horenstein, Boston University, USA; S. Trigwell, ASRC Aerospace, USA; M. M. Abbas, NASA Marshall Space Flight Center, USA	Nobuo Fujii, Kyushu University, Japan; and Takeshi Mizuma, National Traffic Safety & Environment Laboratory, Japan	Y. Zhan, University of Alberta, Canada; A. M. Knight, University of Alberta, Canada; Y. Wu, University of Cambridge, UK; and R. A. McMahon, University of Cambridge, UK	Mirunalini V. Chellappan, Texas A&M University, USA; Maja Harfman Todorovic, Texas A&M University, USA; Prasad N. Enjeti, Texas A&M University, USA
<b>8:30 AM</b>	IAS61p2 Electrodynamic Suspension and Stability of a Charged Droplet in Quadrupole Electrode	IAS62p2 Development and Test of a High Force Tubular Linear Drive Concept with Discrete Wound Coils for Industrial Applications	IAS63p2 Synchronous Torques in Split Phase Induction Motors	IAS64p2 Transformer-Less Converter Concept for a Grid-Connection of Thin-Film Photovoltaic Modules
	Takashi Sato, Hokkaido Institute of Technology, Japan	Ralf Wegener, Technical University Dortmund, Germany; Sebastian Gruber, University of Wuppertal, Germany; Kilian Nötzold, University of Wuppertal, Germany; Florian Senicar, LTI DRIVES GmbH, Germany; Christian Junge, Retostronik GmbH, Germany; Stefan Soter, Technical University Dortmund, Germany	Peter Scavenius Andersen, Danfoss Compressors GmbH, Germany; David G. Dorrell, University of Glasgow, UK; Niels Christian Weihrauch, Danfoss Compressors GmbH, Germany; Poul Erik Hansen, Danfoss Compressors GmbH, Germany	Ulrich Boeke, Philips Technologie GmbH, Germany; Heinz van der Broeck, University of Applied Science, Germany
<b>9:00 AM</b>	IAS61p3 Nebulised Aerosol Electrostatic Charge Explored Using Bipolar Electrical Mobility Profiles	IAS62p3 Power Supply of Long Stator Linear Motors - Application to Multi Mobile System	IAS63p3 Comparison of Induction Machine Performance with Distributed and Fractional-Slot Concentrated Windings	IAS64p3 Hybrid Modulation for Dual Active Bridge Bi-Directional Converter With Extended Power Range For Ultracapacitor Application
	M. O'Leary, Brunel University, UK; W. Balachandran, Brunel University, UK; F. Chambers, AstraZeneca, UK	A. Cassat, B. Kawkabani, Y. Perriard, J.-J. Simond, Ecole Polytechnique Fédérale de Lausanne, Switzerland	Ayman M. EL-Refaei, GE Global Research Center, USA; Manoj R. Shah, GE Global Research Center, USA	Haihua Zhou, National University of Singapore, Singapore; Ashwin M. Khambadkone, National University of Singapore, Singapore
<b>9:30 AM</b>	IAS61p4 Standards for Industrial Electrostatic Processes	IAS62p4 A Study on the Characteristics of PMLSM According to Permanent Magnet Arrangement	IAS63p4 A Modeling Approach for Gearbox Monitoring Using Stator Current Signature in Induction Machines	IAS64p4 Control and Protection of a DFIG-Based Wind Turbine under Unbalanced Grid Voltage Dips
	Charles G. Noll, XiPro Technologies LLC, USA	Ho-Jin Ahn, Changwon National University, Korea; Seung-Hoon Lee, Changwon National University, Korea; Dong-Yeup Lee, Changwon National University, Korea; Ki-Bong Jang, Changwon National University, Korea; Gyu-Tak Kim, Changwon National University, Korea	Shahin Hedayati Kia, University of Picardie "Jules Verne", France; Humberto Henao, University of Picardie "Jules Verne", France; Gérard-André Capolino, University of Picardie "Jules Verne", France	Peng Zhou, Zhejiang University, China; Yikang He, Zhejiang University, China; Dan Sun, Zhejiang University, China; Jianguo Zhu, University of Technology-Sydney, Australia
<b>10:00 AM</b>	Break	Break	Break	Break
<b>10:30 AM</b>	IAS61p5 Dynamic Induction Charging of Particles with Finite Conductivity	IAS62p5 Linear Motors for Astronomical Mirrors	IAS63p5 Modeling of Mutual Saturation in Induction Machines	IAS64p5 Power Converters and Controllers for UPS Applications with Backup PEM Fuel Cell
	Deying Yu, The University of Western Ontario, Canada; G. S. Peter Castle, The University of Western Ontario, Canada; Kazimierz Adamiak, The University of Western Ontario, Canada	Ciro Del Vecchio, National Institute for Astrophysics, Italy; Armando Riccardi, National Institute for Astrophysics, Italy; Fabrizio Marignetti, Università di Cassino, Italy; Roberto Biasi, Microgate Srl, Italy; Daniele Gallieni, ADS International Srl, Italy; Roberto Spairani, Solaria Engineering, Italy	Toni Tuovinen, Helsinki University of Technology, Finland; Marko Hinkkanen, Helsinki University of Technology, Finland; Jorma Luomi, Helsinki University of Technology, Finland	Yuedong Zhan, Kunming University of Science and Technology, China; Youguang Guo, University of Technology-Sydney, Australia; Jianguo Zhu, University of Technology-Sydney, Australia; Hua Wang, Kunming University of Science and Technology, China
<b>11:00 AM</b>	IAS61p6 Factors that Influence the Fluidized-Bed Tribo-Electrostatic Separation of Plastic Granular Mixtures		IAS63p6 Comparison of Test Methods for Characterisation of a Doubly-Fed Induction Machine	IAS64p6 Maximum Power Control of Grid-Connected Solid Oxide Fuel Cell System Using Adaptive Fuzzy Logic Controller
	L. Calin, Technical University of Cluj, Romania; A. Iuga, Technical University of Cluj, Romania; A. Samuila, Technical University of Cluj, Romania; C. Dragan, University of Poitiers, France; L. Dascalescu, University of Poitiers, France		David P. Cashman, University College Cork, Ireland; John G. Hayes, University College Cork, Ireland; Micheal G. Egan, University College Cork, Ireland	Nawapan Chanasut, Chiang Mai University, Thailand; Suttichai Premrudeeprachacharn, Chiang Mai University, Thailand
<b>11:30 AM</b>			IAS63p7 Change of Mechanical Natural Frequencies of Induction Motor	IAS64p7 A Novel Reactive Power Control Scheme for CSC Based PMSG Wind Energy System
			Fuminori Ishibashi, Shibaura Institute of Technology, Japan; Makoto Matsushita, Toshiba Corporation, Japan; Kenzo Tonoki, Toshiba Corporation, Japan; Shinichi Noda, Toshiba Corporation, Japan	Yongqiang Lang, Ryerson University, Canada; Bin Wu, Ryerson University, Canada; Navid Zargari, Rockwell Automation, Canada

# Thursday, October 9, Morning Sessions

Centennial	British Columbia	Chairman	Yukon
Industrial Power Converter	Industrial Drives	Power System Engineering	Industrial Automation & Controls
Session 65 - DC/DC Converters	Session 66 - Automotive	Session 67 - Power System Reliability/ Power System Analysis	Session 68 - Monitoring and Sensors
Session Chair: Faisal Khan, Electric Power Research Institute, USA	Session Chair: Galina Mirzaeva, University of Newcastle, Australia	Session Chair: Bill Braun, Owens Corning, USA	Session Chair and Organizer: Jung-Wook Park, Yonsei University, Korea
Session Organizer: William Peterson, E & M Power, USA	Session Organizer: Long Wu, John Deere Phoenix Intl., USA	Session Organizer: Peter Sutherland, GE, USA	
IAS65p1 A Three-Phase Bidirectional DC-DC Converter for Automotive Applications	IAS66p1 BEGA Starter/Alternator - Vector Control Implementation and Performance for Wide Speed Range at Unity Power Factor Operation	IAS67p1 Stability Requirements for Implementation of Grid Separation Scheme in a Steel Mill with Internal Generation	IAS68p1 Current Sharing and Sensing in N-Paralleled Converters Using Single Current Sensor
Gui-Jia Su, Oak Ridge National Laboratory, USA; and Lixin Tang, Oak Ridge Associated Universities, USA	Ion Boldea, Vasile Coroban-Schramel, University Politehnica of Timisoara, Romania; Gheorge-Daniel Andreescu, University Politehnica of Timisoara, Romania; Sever Scridon, University Politehnica of Timisoara, Romania; Frede Blaabjerg, Aalborg University, Denmark	Peter E. Sutherland, GE Energy, USA; Vinicius Roubach, ArcelorMittal Tubarão, Brazil; Leandro Matos Riani, ArcelorMittal Tubarão, Brazil	Ravinder Pal Singh, National University of Singapore, Singapore; and Ashwin M. Khambadkone, National University of Singapore, Singapore
IAS65p2 A New Soft-Switching PWM High Frequency Half-Bridge Inverter Linked DC-DC Converter with Diode-Clamped Active Edge Resonant Snubbers	IAS66p2 Design Aspects of an Active Electromagnetic Suspension System for Automotive Applications	IAS67p2 Evaluation of the Prospective Joule Integral to Assess the Limit Short Circuit Capability of Cables and Busways	IAS68p2 A Low Cost Linear Position Measurement System for Magnetically Levitated Rotor in Axial Flow Pump
Hisayuki Sugimura, Kyungnam University, Korea; Tetsuya Etoh, Daihen Corporation, Japan; Toshimitsu Doi, Daihen Corporation, Japan; Keiki Morimoto, Daihen Corporation, Japan; Bishwajit Saha, Kyungnam University, Korea; Sang Pil Mun, Kyungnam University, Korea; Eiji Hiraki, Yamaguchi University, Japan; Mutsuo Nakaoka, Yamaguchi University, Japan	Bart L. J. Gysen, Eindhoven University of Technology, The Netherlands; Jeroen L. G. Janssen, Eindhoven University of Technology, The Netherlands; Johannes J. H. Paulides, Eindhoven University of Technology, The Netherlands; Elena A. Lomonova, Eindhoven University of Technology, The Netherlands	Michele Tartaglia, Politecnico di Torino, Italy; Massimo Mitolo, Chu & Gassman, USA	Sheng-Ming Yang, National Taipei University of Technology, Taiwan; and Chien-Lung Huang, National Taipei University of Technology, Taiwan
IAS65p3 Closed Loop Control Design of Two Inductor Current-Fed Isolated DC-DC Converter for Fuel Cells to Utility Interface Application	IAS66p3 Design and Analysis of a New Drive-Integrated Auxiliary Dc-Dc Converter for Hybrid Vehicles	IAS67p3 Dynamic Simulator for Thyristor Controlled Series Capacitor	IAS68p3 Position Acquisition for Long Primary Linear Drives with Passive Vehicles
A. K. Rathore, University of Victoria, Canada; A. K. S. Bhat, University of Victoria, Canada; S. Nandi, University of Victoria, Canada; Ramseh Oruganti, National University of Singapore, Singapore	H. Plesko, ETH Zurich, Switzerland; J. Biela, ETH Zurich, Switzerland; J. W. Kolar, ETH Zurich, Switzerland	Kejun Li, Shandong University, China; Jianguo Zhao, Shandong University, China; Wei-Jen Lee, The University of Texas at Arlington, USA	M. Mihalachi, Darmstadt University of Technology, Germany; and P. Mutschler, Darmstadt University of Technology, Germany
IAS65p4 Analysis and Control of Chaos in SEPIC DC-DC Converter Using Sliding Mode Control	IAS66p4 Design and Optimization of a Hybrid-Electric Vehicle for Advanced Urban Mobility	IAS67p4 Robust Optimization in HTS Cable Based on DEPSO and Design for Six Sigma	IAS68p4 A Real Time Predictive Maintenance System of Aluminium Electrolytic Capacitors Used in Uninterrupted Power Supplies
A. Kavitha, Anna University, India; G. Indira, Anna University, India; G. Uma, Anna University, India	Carlo Concari, University of Parma, Italy; Giovanni Franceschini, University of Parma, Italy; Andrea Toscani, University of Parma, Italy	Shuhong Wang, Xi'an Jiaotong University, China; Xinying Liu, Xi'an Jiaotong University, China; Jie Qiu, Xi'an Jiaotong University, China; Jianguo Guo Zhu, University of Technology-Sydney, Australia; Youguang Guo, University of Technology-Sydney, Australia; Zhi Wei Lin, University of Technology-Sydney, Australia	Karim Abdennadher, Schneider Electric, France; Pascal Venet, Université Lyon 1, France; Gérard Rojat, Université Lyon 1, France; Jean-Marie Retif, INSA de Lyon, France; and Christophe Rosset, Schneider Electric, France
Break	Break	Break	Break
IAS65p5 Digital Compensator Design to Reduce Phase Lag for Multi-Sampling Controlled DC-DC Converters	IAS66p5 Design and Comparison of Power Systems for a Fuel Cell Hybrid Electric Vehicle		IAS68p5 Automated Monitoring of High-Resistance Connections in the Electrical Distribution System of Industrial Facilities
Ye-Then Chang, National Taipei University of Technology, Taiwan; Yen-Shin Lai, National Taipei University of Technology, Taiwan	Erik Schaltz, Aalborg University, Denmark; Peter Omand Rasmussen, Aalborg University, Denmark		Jangho Yoon, Jangho Yun, Sang Bin Lee, Korea University, Korea; and Ernesto J. Wiedenbrug, Baker Instrument Company, USA
IAS65p6 Interleaved Bidirectional DC-DC Converter for Automotive Electric Systems	IAS66p6 Monolithic Systems Using Standard Three-Leg Inverter Supplying Independently Two Motors		IAS68p6 Bearing Fault Diagnostics Based on Reconstructed Features
Dong-hyun Ha, Hanyang University, Korea; Nam-Ju Park, Hanyang University, Korea; Kui-Jun Lee, Hanyang University, Korea; Dong-Gyu Lee, Hanyang University, Korea; Dong-Seok Hyun, Hanyang University, Korea	Euzeli C. dos Santos Jr., Federal Center of Technological Education of Paraíba, Brazil; Cursino B. Jacobina, Federal University of Campina Grande, Brazil; Edison R. C. da Silva, Federal University of Campina Grande, Brazil; Hamid Toliyat, Texas A&M University, USA		J. Liu, University of Waterloo, Canada; S. Ghafari, University of Waterloo, Canada; W. Wang, Lakehead University, Canada; F. Golnaraghi, Simon Fraser University, Canada; and F. Ismail, University of Waterloo, Canada



# Conferences & Workshops

## 2008 Conferences & Workshops

Date and Location		Conference Name	Sponsors
October 12-15 New Delhi, India	POWERCON	IEEE Power India Conference	IAS Technical Co-Sponsor
October 17-20 Wuhan, China	ICEMS	11th International Conference on Electrical Machines and Systems	IAS Technical Co-Sponsor
November 18-20 Edmonton, Alberta Canada	ESTMP	IEEE-IAS Electrical Safety, Technical & MegProject Workshop	IAS Co-Sponsor
November 18-21 Hyderabad, India	TENCON	Region 10 Conference	IAS Technical Co-Sponsor
November 24-27 Singapore	ICSET	IEEE International Conference on Sustainable Energy Technologies	IAS Technical Co-Sponsor

## 2009 Conferences & Workshops

Date and Location		Conference Name	Sponsors
February 2-6 St. Louis, MO USA	ESW	Electrical Safety Workshop	IAS Co-sponsor
February 15-19 Washington D.C. USA	APEC	Applied Power Electronics Conference	IAS Co-Sponsor
April 26-28 Fort Collins, CO USA	REPC	Rural Electric Power Conference	IAS
May 3-7 Calgary, Alberta Canada	I&CPS	Industrial & Commercial Power Systems Technical Conference	IAS Co-Sponsor
May 29 - June 5 Palm Springs, CA USA	CIC	Cement Industry Conference	IAS Co-Sponsor
June 21-26 Birmingham, AL USA	PPIC	IEEE Pulp and Paper Industry Conference	IAS
September 14-16 Anaheim, CA USA	PCIC	Petroleum and Chemical Industry Technical Conference	IAS Co-Sponsor
September 20-24 San Jose, CA USA	ECCE	IEEE Energy Conversion Congress and Exposition	IAS Co-Sponsor
October 4-8 Houston, TX, USA	IAS	Industry Applications Society Annual Meeting	IAS