

IAS 2007 TECHNICAL PROGRAM

MONDAY MORNING SESSIONS

METAL INDUSTRY COMMITTEE

Monday, 24 September 8:00 AM – 12:00 PM Napoleon A1
Session 01—Power Quality, Casting, Precision Electric Cutting

Session Chair and Organizer: S. Douglas Cromey, Novelis Inc., Canada

IAS01p1 Power Quality Investigation of Back-to-Back Harmonic Filters for a High-Voltage Anode Foil Manufacturing Facility

Thomas J. Dionise, Eaton Electrical, USA

Visuth Lorch, Eaton Electrical, USA

Brandon J. Brazil, Eaton Electrical, USA

IAS01p2 Power Quality Assessment of a Hot Strip Mill with Cycloconverter Drive Systems

C. S. Chen, National Sun Yat-Sen University, ROC

Y. D. Lee, National Sun Yat-Sen University, ROC

C. T. Hsu, Southern Taiwan University, ROC

D. S. Ting, China Steel Corporation, ROC

C. C. Shen, China Steel Corporation, ROC

IAS01p3 Advanced Cutting Experiences for a Nuclear Power Plant Application

Rosario Casanueva, University of Cantabria, Spain

Francisco J. Azcondo, University of Cantabria, Spain

Lidia Alcedo, ENWESA Operaciones, S.A., Spain

Jorge Jiménez, ENWESA Operaciones, S.A., Spain

IAS 01p4 Three-dimensional Design and Performance Assessments of a Linear Induction-type Electromagnetic Stirrer

Cheng-Tsung Liu, National Sun Yat-Sen University, ROC

Yen-Ming Chen, National Sun Yat-Sen University, ROC

Jen-Hsin Chen, China Steel Corporation, ROC

Muh-Jung Lu, China Steel Corporation, ROC

ELECTROSTATIC PROCESSES COMMITTEE

Monday, 24 September 8:00 AM – 12:00 PM Napoleon A2
Session 02—Micro-, Nano-, and Molecular Electrostatics

Session Chair: Wamadeva Balachandran, Brunel University, UK

Session Organizer: Jamal Seyed-Yagoobi, Illinois Institute of Technology, USA

IAS 02p1 Electrohydrodynamic Dispersion of Dry Fine Powders

M. K. Mazumder, University of Arkansas at Little Rock, USA

J. Robison, University of Arkansas at Little Rock, USA

C. Wyatt, University of Arkansas at Little Rock, USA

P. K. Srirama, University of Arkansas at Little Rock, USA

R. Sharma, University of Arkansas at Little Rock, USA

J. Zhang, University of Arkansas at Little Rock, USA

A. S. Biris, University of Arkansas at Little Rock, USA

IAS 02p2 Electrohydrodynamic Flow in Optoelectrostatic Micropump: Experiment Versus Numerical Simulation

K. Adamiak, University of Western Ontario, Canada

A. Mizuno, Toyohashi University of Technology, Japan

M. Nakano, Toyohashi University of Technology, Japan

IAS 02p3 Development of an Electrohydrodynamic Micropump

Ichiro Kano, Yamagata University, Japan

Yosuke Shii, Yamagata University, Japan

Tatsuo Nishina, Yamagata University, Japan

IAS 02p4 Fluid Circulation Within a Spherical Reservoir With EHD Conduction Pumping

Miad Yazdani, Illinois Institute of Technology, USA

Jamal Seyed-Yagoobi, Illinois Institute of Technology, USA

IAS 02p5 Carbon Nanotubes Grown by RF Heating and Their Morphological and Structural Properties

Viney Saini, University of Arkansas at Little Rock, USA

Alexandru S. Biris, University of Arkansas at Little Rock, USA

Enkeleda Dervishi, University of Arkansas at Little Rock, USA

Zhongrui Li, University of Arkansas at Little Rock, USA

Steve Trigwell, University of Arkansas at Little Rock, 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

Zia Rahman, University of Central Florida, USA

Reginald Little, Florida State University, USA

Divey Saini, Saint Louis University, USA

IAS 02p6 Bone Tissue: A Relationship Between Micro and Nano Structural Composition and Its Corresponding Electrostatic Properties With Applications in Tissue Engineering

Drew B. Jensen, University of Arkansas at Little Rock, USA

Zhongrui Li, University of Arkansas at Little Rock, USA

Ioana Pavel, University of Arkansas at Little Rock, USA

Enkeleda Dervishi, University of Arkansas at Little Rock, USA

Alexandru S. Biris, University of Arkansas at Little Rock, 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
Peder J. Jensen, USA

ELECTRIC MACHINES COMMITTEE

Monday, 24 September 8:00 AM – 12:00 PM Napoleon B1
Session 04—Material and Thermal Analysis

Session Chair: Dave Dorrell, University of Glasgow, UK
Session Organizer: Mircea Popescu, University of Glasgow, UK

IAS 04p1 On the Physical Basis of Power Losses in Laminated Steel and Minimum-Effort Modeling in an Industrial Design Environment
Mircea Popescu, University of Glasgow, UK
T. J. E. Miller, University of Glasgow, UK
Malcolm McGilp, University of Glasgow, UK
Dan M. Ionel, A.O. Smith Corporation, USA
Stephen Dellinger, A.O. Smith Electrical Products, USA
R. J. Heidemann, A.O. Smith Electrical Products, USA

IAS 04p2 Comparative Study of High-speed PM Motors With Laminated Steel and Soft Magnetic Composite Cores
Yunkai Huang, Southeast University, PRC
Qiansheng Hu, Southeast University, PRC
Jianfeng Zhao, Southeast University, PRC
Jianguo Zhu, University of Technology, Australia
Youguang Guo, University of Technology, Australia

IAS 04p3 Determination of Critical Parameters in Electrical Machine Thermal Models
A. Boglietti, Politecnico di Torino, Italy
A. Cavagnino, Politecnico di Torino, Italy
D. Staton, Motor Design Ltd., UK

IAS 04p4 Iron Loss Prediction with PWM Supply: An Overview of Proposed Methods From an Engineering Application Point of View
A. Boglietti, Politecnico di Torino, Italy
A. Cavagnino, Politecnico di Torino, Italy

IAS 04p5 Aluminium Multi-wire for High-frequency Electric Machines
Luca Del Ferraro, Mc Quay Italia, Italy
Fabio Giulii, Capponi University of Rome “La Sapienza”, Italy

IAS 04p6 Incorporating Lamination Processing and Component Manufacturing in Electric Machine Design Tools

Waqas M. Arshad, ABB Corporate Research, Sweden
Thomas Ryckebusch, ABB Corporate Research, Sweden
Freddy Magnussen, ABB Corporate Research, Sweden
Heinz Lendenmann, ABB Corporate Research, Sweden
Bengt Eriksson, ABB Automation Products, Sweden
Juliette Soulard, Royal Institute of Technology, Sweden
Bo Malmros, ABB Automation Products, Sweden

ELECTRIC MACHINES COMMITTEE

Monday, 24 September 8:00 AM – 12:00 PM Napoleon B2
Session 05—Interior Permanent Magnet Machines

Session Chair: Mustafa Guven, Caterpillar Inc., USA
Session Organizer: Edward Lovelace, SatCon, USA

IAS 05p1 An Analytical Design Approach for Reducing Stator Iron Losses in Interior PM Synchronous Machines during Flux-weakening Operation

Seok-Hee Han, University of Wisconsin–Madison, USA
Wen L. Soong, University of Adelaide, Australia
Thomas M. Jahns, University of Wisconsin–Madison, USA

IAS 05p2 Reducing Iron Loss in Interior PM Machines Under Field-weakening Conditions

W. L. Soong, University of Adelaide, Australia
S. H. Han, University of Wisconsin–Madison, USA
T.M. Jahns, University of Wisconsin–Madison, USA
N. Ertugrul, University of Adelaide, Australia

IAS 05p3 A Novel Cogging Torque Reduction Method for Interior Type Permanent Magnet Motor

Gyu-Hong Kang, Gem-Tech Co., Ltd., Korea
Young-Dae Son, Dongseo University, Korea
Gyu-Tak Kim, Changwon National University, Korea

IAS 05p4 A Novel Approach for Circuit-field-coupled Time Stepping Electromagnetic Analysis of Saturated Interior PM Motors

Y. Kano, Nagoya Institute of Technology, Japan
K. Watanabe, Nagoya Institute of Technology, Japan
T. Kosaka, Nagoya Institute of Technology, Japan
N. Matsui, Nagoya Institute of Technology, Japan

IAS 05p5 Accurate Magnetic Modelling and Performance Analysis of IPM-PMASR Motors

Eric Armando, Politecnico di Torino, Italy
Paolo Guglielmi, Politecnico di Torino, Italy
Gianmario Pellegrino, Politecnico di Torino, Italy

Michele Pastorelli, Politecnico di Torino, Italy
Alfredo Vagati, Politecnico di Torino, Italy

IAS 05p6 Design and Performance Characteristics of IPM Machines with Single Layer
Non-overlapping Concentrated Windings
Johannes Germishuizen, Siemens A&D LD, Germany
Maarten Kamper, Stellenbosch University, South Africa

IAS 05p7 A Unified Approach to the Synchronous Performance Analysis of Single and
Poly-phase Line-fed Interior Permanent Magnet Motors
Mircea Popescu, University of Glasgow, UK
T. J. E. Miller, University of Glasgow, UK
Malcolm McGilp, University of Glasgow, UK
Dan M. Ionel, A.O. Smith Corporate Technology Centre, USA
Stephen J. Dellinger, A.O. Smith Electrical Products, USA

INDUSTRIAL POWER CONVERTER COMMITTEE

Monday, 24 September 8:00 AM – 12:00 PM Napoleon B3
Session 06—Power Conversion Interfaces to Alternative Energy Sources

Session Chair: Paolo Mattavelli, University of Padova, Italy
Session Organizer: Morten Lindholm, Vestas Wind Systems A/s, Denmark

IAS 06p1 Unbalanced Grid Fault Ride-through Control for a Wind Turbine Inverter
Chong Ng, Durham University, UK
Li Ran, Durham University, UK
Jim Bumby, Durham University, UK

IAS 06p2 Study and Design of Grid Connected Inverter for 2 MW Wind Turbine
Zhiling Qiu, Zhejiang University, PRC
Guozhu Chen, Zhejiang University, PRC

IAS 06p3 Voltage Sags Ride-through of Motion Sensorless Controlled PMSG for Wind
Turbines
Marius Fatu, University “Politehnica” of Timisoara, Romania
Cristian Lascu, University “Politehnica” of Timisoara, Romania
Gheorghe-Daniel, Andreescu University “Politehnica” of Timisoara, Romania
Remus Teodorescu, Aalborg University, Denmark
Frede Blaabjerg, Aalborg University, Denmark
Ion Boldea, University “Politehnica” of Timisoara, Romania

IAS 06p4 A Parallel Bidirectional DC/DC Converter Topology for Energy Storage Systems
in Wind Applications
Wei Li, McGill University, Canada
Géza Joós, McGill University, Canada
Chad Abbey, McGill University, Canada

INDUSTRIAL POWER CONVERTER COMMITTEE

Monday, 24 September 8:00 AM – 12:00 PM Napoleon C1

Session 07—AC Source Bidirectional Applications

Session Chair: William A. Peterson, E & M Power, USA

Session Organizer: Po-Tai Cheng, National Tsing Hua University, Taiwan

IAS 07p1 A New Three-level Indirect Matrix Converter with Reduced Number of Switches

Christian Klumpner, University of Nottingham, UK

Meng Lee, University of Nottingham, UK

Cristian Pitic, University of Nottingham, UK

Pat Wheeler, University of Nottingham, UK

Pericle Zanchetta, University of Nottingham, UK

IAS 07p2 Pulse-width-modulation of Neutral-point-clamped Sparse Matrix Converter

P. C. Loh, Nanyang Technological University, Singapore

F. Blaabjerg, Aalborg University, Denmark

F. Gao, Nanyang Technological University, Singapore

A. Baby, Nanyang Technological University, Singapore

A. C. Tan, Nanyang Technological University, Singapore

IAS 07p3 Behavior of the Predictive DTC based Matrix Converter under Unbalanced AC Supply

Marco E. Rivera, Universidad de Concepción, Chile

René E. Vargas, Universidad Federico Santa María, Chile

José R. Espinoza, Universidad de Concepción, Chile

José R. Rodríguez, Universidad Federico Santa María, Chile

IAS 07p4 Dynamic Voltage Restorer Utilizing a Matrix Converter and Flywheel Energy Storage

Bingsen Wang, General Electric Global Research Center, USA

Giri Venkataramanan, University of Wisconsin–Madison, USA

IAS 07p5 Design of a Three-phase Series Resonant Converter for Offshore DC Grids

Christopher Meyer, RWTH Aachen University, Germany

Rik W. De Doncker, RWTH Aachen University, Germany

IAS 07p6 A Sparse Multilevel Matrix Converter Based on Diode-clamped Topology

S. Ali Khajehoddin, Queen's University, Canada

Alireza Bakhshai, Queen's University, Canada

Praveen Jain, Queen's University, Canada

INDUSTRIAL DRIVES COMMITTEE

Monday, 24 September 8:00 AM – 12:00 PM Napoleon C2

Session 08—Drives I

Session Chair: Vladimir Blasko, Otis Elevator Co., USA

Session Organizer: Robert Betz, University of Newcastle, Australia

IAS 08p1 Design Aspects of Conductive Microfiber Rings for Shaft Grounding Purposes

Annette Muetze, University of Warwick, UK

H. William Oh, Electro Static Technology, USA

IAS 08p2 Condition Monitoring of DC Link Electrolytic Capacitors in Adjustable Speed Drives

Myungchul Kim, Korea University, Korea

Kwangwoon Lee, Korea University, Korea

Jangho Yoon, Korea University, Korea

Sang Bin Lee, Korea University, Korea

Jiyeon Yoo, Korea University, Korea

IAS 08p3 A Novel Control for Dual Cascaded Inverters

C. Attaianesi, University of Cassino, Italy

V. Nardi, University of Cassino, Italy

G. Tomasso, University of Cassino, Italy

IAS 08p4 Flux Weakening Control of an Open Winding Machine with Isolated Dual Inverters

Mu-Shin Kwak, Hyundai Motor Company, Korea

Seung-Ki Sul, Seoul National University, Korea

IAS 08p5 Dual Observers for the Disturbance Rejection of a Motion Control System

Young-Doo Yoon, Seoul National University, Korea

Eunsoo Jung, Seoul National University, Korea

Anno Yoo, Seoul National University, Korea

Seung-Ki Sul, Seoul National University, Korea

IAS 08p6 Operation of Adjustable-speed Drives under Non-standard Supply Conditions

Miroslav Chomat, Academy of Sciences of the Czech Republic, Czech Republic

Ludek Schreier, Academy of Sciences of the Czech Republic, Czech Republic

Jiri Bendl, Academy of Sciences of the Czech Republic, Czech Republic

IAS 08p7 Efficiency Comparison of PWM-controlled and PAM-Controlled Sensorless BLDCM Drives for Refrigerator Applications

Yen-Shin Lai, National Taipei University of Technology, ROC

Ko-Yen Lee, National Taipei University of Technology, ROC

Jing-Hong Tseng, National Taipei University of Technology, ROC

Yen-Chang Chen, Delta Electronics, ROC

Tse-Liang Hsiao, Industrial Technology Research Institute, ROC

APPLIANCE INDUSTRY COMMITTEE

Monday, 24 September

8:00 AM – 12:00 PM

Napoleon D1

Session 09—Low-cost Motor Drive Systems for Appliances

Session Chair and Organizer: Radu Bojoi, Politecnico di Torino, Italy

IAS 09p1 A Hybrid Current Controller for Linear Reciprocating Vapor Compressors
Zhengyu Lin, Control Techniques Ltd., UK
Jiabin Wang, University of Sheffield, UK
David Howe, University of Sheffield, UK

IAS 09p2 Performance Comparison of Sensorless Field Oriented Control Techniques for
Low Cost Three-phase Induction Motor Drives
G. Pellegrino, Politecnico di Torino, Italy
R. Bojoi, Politecnico di Torino, Italy
P. Guglielmi, Politecnico di Torino, Italy

IAS 09p3 Position Sensorless Control of Non-salient PMSM from Very Low Speed to High
Speed for Low Cost Applications
Ludovic Chretien, The University of Akron, USA
Iqbal Husain, The University of Akron, USA

IAS 09p4 Power Factor Correction of Direct Torque Controlled Brushless DC Motor Drive
Salih Baris Ozturk, Texas A&M University, USA
Oh Yang, Cheong Ju University, Korea
Hamid A. Toliyat, Texas A&M University, USA

IAS 09p5 Design of a Variable Speed Compressor Drive System for Air Conditioner
without Electrolytic Capacitor
Hyunjae Yoo, Seoul National University, Korea
Seung-Ki Sul, Seoul National University, Korea
Hoyong Jang, LG Electronics, Korea
Youngho Hong, LG Electronics, Korea

IAS 09p6 Comparative Study of Winding Configurations of Short-stroke, Single Phase
Tubular Permanent Magnet Motor for Refrigerator Applications
Jiabin Wang, University of Sheffield, UK
David Howe, University of Sheffield, UK
Zhengyu Lin, Control Techniques Ltd., UK

IAS 09p7 A 4/6-pole PSC Motor with Shared Windings
Renyan W. Fei, Emerson Motor Company, USA

POWER ELECTRONICS DEVICES & COMPONENTS COMMITTEE

Monday, 24 September 8:00 AM – 12:00 PM Napoleon D2
Session 10—Semiconductor Device Modeling

Session Chair: Jerry Hudgins, University of Nebraska, USA

Session Organizer: Enrico Santi, University of South Carolina, USA

IAS 10p1 Strategic Considerations for Unipolar SiC Switch Options: JFET vs. MOSFET

M. Treu, Infineon Technologies AG, Austria

R. Rupp, Infineon Technologies AG, Austria

P. Blaschitz, Infineon Technologies AG, Austria

K. Rüschemschmidt, Infineon Technologies AG, Austria

Th. Sekinger, Infineon Technologies AG, Austria

P. Friedrichs, SiCED GmbH & Co.KG, Germany

R. Elpelt, SiCED GmbH & Co.KG, Germany

D. Peters, SiCED GmbH & Co.KG, Germany

IAS 10p2 Comparisons of SiC MOSFET and Si IGBT based Motor Drive Systems

Tiefu Zhao, North Carolina State University, USA

Jun Wang, North Carolina State University, USA

Alex Q. Huang, North Carolina State University, USA

Anant Agarwal, Cree Inc., USA

IAS 10p3 Assessing the Impact of SiC MOSFETs on Converter Interfaces for Distributed Energy Resources

Joe Carr, University of Arkansas, USA

Daniel Hotz, University of Arkansas, USA

Juan Carlos Balda, University of Arkansas, USA

H. Alan Mantooth, University of Arkansas, USA

Alvin Ong, University of Arkansas, USA

IAS 10p4 Modeling of MOS-side Carrier Injection in Trench-gate IGBTs

L. Lu, University of South Carolina, USA

Z. Chen, University of South Carolina, USA

A. Bryant, University of Warwick, UK

E. Santi, University of South Carolina, USA

J. L. Hudgins, University of Nebraska–Lincoln, USA

P. R. Palmer, Cambridge University, UK

IAS 10p5 Robustness Evaluation of MOSFETs by Equivalent Cell Behavioral Model of the Gate Parasitic Resistance

F. Chimento, University of Catania, Italy

S. Musumeci, University of Catania, Italy

A. Raciti, University of Catania, Italy

S. Sannino, University of Catania, Italy

A. Magrì, STMicroelectronics, Italy

M. Melito, STMicroelectronics, Italy

F. Zara, STMicroelectronics, Italy

IAS 10p6 The Dual GCT—A New High-power Device using Optimized GCT Technology

Peter Köllensperger, RWTH Aachen University, Germany

Michael Bragard, RWTH Aachen University, Germany
Thomas Plum, RWTH Aachen University, Germany
Rik W. De Doncker, RWTH Aachen University, Germany

IAS 10p7 Experimental Investigation of Monolithic Cascode Devices in Inverter Leg Applications

F. Chimento, University of Catania, Italy
V. Crisafulli, University of Catania, Italy
S. Musumeci, University of Catania, Italy
A. Raciti, University of Catania, Italy
S. Buonomo, STMicroelectronics, Italy
R. Scollo, STMicroelectronics, Italy

MONDAY AFTERNOON SESSIONS

METAL INDUSTRY COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon A1
Session 11—Tandem Cold Mill, Strip Reliability, Power Quality

Session Chair: Thomas J. Dionise, Eaton Electrical, USA
Session Organizer: S. Douglas Cromey, Novelis Inc., Canada

IAS 11p1 A Novel Approach for Optimal Control of Continuous Tandem Cold Metal Rolling

John Pittner, University of Pittsburgh, USA
Marwan A. Simaan, University of Pittsburgh, USA
Nicholas S. Samaras, Larissa Institute of Technology, Greece

IAS 11p2 An Optimal Control Method for Improvement in Tandem Cold Metal Rolling

John Pittner, University of Pittsburgh, USA
Marwan A. Simaan, University of Pittsburgh, USA

IAS 11p3 Real-time Assessment of the Reliability of Welds in Steel Strips

Rubén Usamentiaga, University of Oviedo, Spain
Julio Molleda, University of Oviedo, Spain
Daniel F. García, University of Oviedo, Spain

IAS 11p4 A Study on Taper Tension Control Considering Telescoping in the Winding System

Chang-Woo Lee, Konkuk University, Korea
Kee-Hyun Shin, Konkuk University, Korea

IAS 11p5 Electrical Power Quality of Iron and Steel Industry in Turkey

Ö. Salor, TUBITAK-UZAY, Turkey
B. Gültekin, TUBITAK-UZAY, Turkey
S. Buhan, TUBITAK-UZAY, Turkey

B. Boyrazoğlu, TUBITAK-UZAY, Turkey
T. İnan, TUBITAK-UZAY, Turkey
T. Atalik, TUBITAK-UZAY, Turkey
A. Açık, TUBITAK-UZAY, Turkey
A. Terciyanlı, TUBITAK-UZAY, Turkey
Ö. Ünsar, Turkish Electricity Transmission Corporation, Turkey
E. Altıntaş, Turkish Electricity Transmission Corporation, Turkey
Y. Akkaya, Turkish Electricity Transmission Corporation, Turkey
E. Özdemirci, Turkish Electricity Transmission Corporation, Turkey
I. Çadircı, TUBITAK-UZAY, Turkey; Hacettepe University, Turkey
M. Ermiş, Middle East Technical University, Turkey

ELECTROSTATIC PROCESSES COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon A2
Session 12—Electrostatic Measurements and Materials

Session Chair: Edward S. Law, University of Georgia, USA
Session Organizer: Petru Notingher, University of Montpellier, France

IAS 12p1 Non-contact Measurements of Size and Charge Distributions of Submicron Particles using an ESPART Analyzer

P. K. Srirama, University of Arkansas at Little Rock, USA
J. W. Stark, University of Arkansas at Little Rock, USA
J. Zhang, University of Arkansas at Little Rock, USA
M. K. Mazumder, University of Arkansas at Little Rock, USA

IAS 12p2 In-situ Measurements of Particle Size and Charge Distributions for Mars and Lunar Missions

J. Zhang, University of Arkansas at Little Rock, USA
P. K. Srirama, University of Arkansas at Little Rock, USA
R. Sharma, University of Arkansas at Little Rock, USA
M. K. Mazumder, University of Arkansas at Little Rock, USA

IAS 12p3 Performance Analysis of Electrodynamic Self-cleaning Transparent Films for Its Applications to Mars and Lunar Missions

R. Sharma, University of Arkansas at Little Rock, USA
C. Wyatt, University of Arkansas at Little Rock, USA
J. Zhang, University of Arkansas at Little Rock, USA
M. K. Mazumder, University of Arkansas at Little Rock, USA
C. I. Calle, NASA Kennedy Space Center, USA
N. Mardesich, Jet Propulsion Laboratory, USA

IAS 12p4 Surface Potential of Insulating Plate Coated by Metallic Paint Spray

Toshiyuki Sugimoto, Yamagata University, Japan
Noriyuki Shirahata, Yamagata University, Japan
Yoshio Higashiyama, Yamagata University, Japan

Koichi Takeda, Alpha-Techotool. Co. Ltd., Japan

IAS 12p5 Applications of the Thermal Step Method to the Characterization of Electric Charge in MOS Components

O. Fruchier, University of Montpellier 2, France

P. Notingher Jr., University of Montpellier 2, France

S. Agnel, University of Montpellier 2, France

A. Toureille, University of Montpellier 2, France

F. Forest, University of Montpellier 2, France

S. Cunningham, University of Montpellier 2, France

B. Rousset, Centre National de la Recherche Scientifique, France

J. L. Sanchez, Centre National de la Recherche Scientifique, France

IAS 12p6 Electrocoalescence Criterion for Two Close Water Drops

Pierre Atten, Institute National Polytechnique Grenoble, France

Frédéric Aitken, Institute National Polytechnique Grenoble, France

INDUSTRIAL LIGHTING AND DISPLAYS COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon A3

Session 13—HID Lamps and Ballasts

Session Chair: Georges Zissis, Université Paul Sabatier - Toulouse 3, France

Session Organizer: Jo Olsen, Sylvania, USA

IAS 13p1 A Comparative Analysis of HID Lamp Electronic Ballasts Based on Differential Connection of Two DC/DC Converters

Murilo Cervi, Federal University of Santa Maria, Brazil

Tiago Bandeira Marchesan, Federal University of Santa Maria, Brazil

Alexandre Campos, Federal University of Santa Maria, Brazil

Ricardo Nederson do Prado, Federal University of Santa Maria, Brazil

IAS 13p2 Two Flyback-based Integrated Converters for the Implementation of LFSW Electronic Ballasts

Tiago B. Marchesan, Universidade Federal de Santa Maria, Brazil

Marco A. Dalla Costa, Universidad de Oviedo, Spain

Marina Perdigão, Universidade de Coimbra, Portugal

J. Marcos Alonso, Universidad de Oviedo, Spain

Ricardo N. Prado, Universidade Federal de Santa Maria, Brazil

IAS 13p3 Performance of “Ultra-high” Efficient Electronic Ballast for HID Lamps Using SiC Devices

Lakshmi R. Gopi Reddy, The University of Tennessee, USA

Leon M. Tolbert, The University of Tennessee, USA

Hui Zhang, The University of Tennessee, USA

Tom F. Cheek Jr., EPIC Systems, Inc., USA

IAS 13p4 Modeling of Acoustic Resonances in HID Lamps—Coupling between Standing Waves and Arc Bending

Sounil Bhosle, Université de Toulouse, France
Jean-Baptiste Rouffet, Université de Toulouse, France
David Buso, Université de Toulouse, France
Michel Aubès, Université de Toulouse, France
Georges Zissis, Université de Toulouse, France

IAS 13p5 Acoustic Resonance Effects in High Pressure Sodium Lamps

J.C. Antón, Universidad de Oviedo, Spain
C. Blanco, Universidad de Oviedo, Spain
F. Ferrero, Universidad de Oviedo, Spain
A. Martín, Universidad de Oviedo, Spain
N. Bordel, Universidad de Oviedo, Spain
G. Zissis, Université de Toulouse, France
S. Bhosle, Université de Toulouse, France

IAS 13p6 Generalized Analysis and Comparison of High-power-factor Integrated Topologies to Supply Metal Halide Lamps with Low Frequency Square Waveform

Marco A. Dalla, Universidad de Oviedo, Spain
J. Marcos Alonso, Universidad de Oviedo, Spain
Tiago B. Marchesan, Universidade Federal de Santa Maria, Brazil
Murilo Cervi, Universidade Federal de Santa Maria, Brazil
Ricardo N. Prado, Universidade Federal de Santa Maria, Brazil

ELECTRIC MACHINES COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon B1
Session 14—Special Machines and Actuators

Session Chair and Organizer: Elena Lomonova, Eindhoven University of Technology, The Netherlands

IAS 14p1 Experimental Verification of Thrust Improvement in Voice Coil Linear Actuator using Combined Wire of Copper and Iron

Masayuki Sanada, Osaka Prefecture University, Japan
Shigeo Morimoto,

IAS 14p2 Stability Analysis of an Ultrasonic Motor for a New Wave Amplitude Control

Frédéric Giraud, Laboratory of Electrotechnics and Power Electronics of Lille, France
Betty Lemaire-Semail, Laboratory of Electrotechnics and Power Electronics of Lille, France
Julien Aragues, SAGEM SA Defence and Security, France
Jacques Robineau, SAGEM SA Defence and Security, France
Jean-Thierry Audren, SAGEM SA Defence and Security, France

IAS 14p3 Analysis of a Variable Reluctance Permanent Magnet Actuator

J. L. G. Janssen, Eindhoven University of Technology, The Netherlands

J. J. H. Paulides, Eindhoven University of Technology, The Netherlands
E. A. Lomonova, Eindhoven University of Technology, The Netherlands
A. J. A. Vandenput, Eindhoven University of Technology, The Netherlands

IAS 14p4 Analysis of a Flexible Cylindrical Structure for a Harmonic Motor Drive
S. Filiz, The University of Akron, USA
R. Veillette, The University of Akron, USA
I. Husain, The University of Akron, USA
N. Ida, The University of Akron, USA
H. Klode, Delphi, USA
T. Baudendistel, Delphi, USA

IAS 14p5 Design and Control of a Micro Linear Motor with Integrated Magnetic Guidance
S. Demmig, Leibniz Universität Hannover, Germany
R. Gehrking, Leibniz Universität Hannover, Germany
K. Wiedmann, Leibniz Universität Hannover, Germany
A. Mertens, Leibniz Universität Hannover, Germany
B. Ponick, Leibniz Universität Hannover, Germany

IAS 14p6 A Linear Generator Powered from Bridge Vibrations for Wireless Sensors
Haodong Li, Clarkson University, USA
Pragasen Pillay, Clarkson University, USA

IAS 14p7 Analytical Formulation of Radial Magnetic Forces in PM Linear Tubular
Machines with Translator Eccentricity
F. Marignetti, University of Cassino, Italy
P. Cancelliere, University of Cassino, Italy
V. Delli Colli, University of Cassino, Italy
R. Di Stefano, University of Cassino, Italy
M. Scarano, University of Cassino, Italy

ELECTRIC MACHINES COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon B2

Session 15—Permanent Magnet Machines II

Session Chair: Willian Cai, Remy Inc., USA

Session Organizer: Wensen Wang, GE Global Research, USA

IAS 15p1 Rotor Eddy Current Loss in Single-phase Permanent Magnet Brushless DC Motor
Y. Chen, University of Sheffield, UK
Z. Q. Zhu, University of Sheffield, UK
D. Howe, University of Sheffield, UK
J. H. Gliemann, Grundfos Management A/S, Denmark

IAS 15p2 Eddy Current Loss Minimization in Conducting Sleeves of High Speed Machine
Rotors by Optimal Axial Segmentation and Copper Cladding

Manoj R. Shah, GE Global Research Center, USA
Ayman M. EL-Refaie, GE Global Research Center, USA

IAS 15p3 Winding Design and Characteristic of a Consequent-pole Type Bearingless Motor with 4-axis Active Magnetic Suspension

Miya Amada, Tokyo University of Science, Japan
Akira Mizuguchi, Tokyo University of Science, Japan
Yoshihiro Asano, Tokyo University of Science, Japan
Junichi Asama, Tokyo University of Science, Japan
Akira Chiba, Tokyo University of Science, Japan
Masatsugu Takemoto, Musashi Institute of Technology, Japan
Tadashi Fukao, Musashi Institute of Technology, Japan

IAS 15p4 Torque Ripple Reduction in Interior Permanent Magnet Synchronous Machines Using the Principle of Mutual Harmonics Exclusion

Seok-Hee Han, University of Wisconsin–Madison, USA
Thomas M. Jahns, University of Wisconsin–Madison, USA
Wen L. Soong, University of Adelaide, Australia

IAS 15p5 Performance Comparison and Winding Fault Detection of Duplex 2-phase and 3-phase Fault-tolerant Permanent Magnet Brushless Machines

Jie Chai, University of Sheffield, UK
Jiabin Wang, University of Sheffield, UK
Kais Atallah, University of Sheffield, UK
David Howe, University of Sheffield, UK

IAS 15p6 A Magnetic-geared Outer-rotor Permanent-magnet Brushless Machine for Wind Power Generation

L. N. Jian, The University of Hong Kong, PRC
K. T. Chau, The University of Hong Kong, PRC
Dong Zhang, Shanghai University, PRC
J. Z. Jiang, Shanghai University, PRC
Zheng Wang, The University of Hong Kong, PRC

INDUSTRIAL POWER CONVERTER COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon B3

Session 16—Multilevel Converters

Session Chair: Geza Joos, Concordia University, Canada

Session Organizer: Ashwin M. Khambadkone, National University of Singapore, Singapore

IAS 16p1 A General Modulation Strategy for a Five-level Three-phase Current Source Inverter with Regulated Intermediate DC Link Currents

Yakov L. Familiant, U.S. Naval Research Laboratory, USA
D. G. Holmes, Monash University, Australia
T. A. Lipo, University of Wisconsin–Madison, USA
B. P. McGrath, Monash University, Australia

IAS 16p2 A Multi-level Inverter Structure with Cascaded Two-level and Three-level Inverters for IM Drive with CMV Elimination and DC-link Capacitor Voltage Balancing Gopal Mondal, Indian Institute of Science–Bangalore, India
K. Gopakumar, Indian Institute of Science–Bangalore, India
P. N. Tekwani, Indian Institute of Science–Bangalore, India
Emil Levi, Liverpool John Moores University, UK

IAS 16p3 DC Link Voltage Unbalance Control in Three-phase UPQCs Based on NPC Topologies
Iván A. Rubilar, Concepción University, Chile
José R. Espinoza, Concepción University, Chile
Javier A. Muñoz, Concepción University, Chile
Luis A. Morán, Concepción University, Chile

IAS 16p4 Inductorless DC–AC Cascaded H-bridge Multilevel Boost Inverter for Electric/Hybrid Electric Vehicle Applications
Zhong Du, Oak Ridge National Laboratory, USA
Burak Ozpineci, Oak Ridge National Laboratory, USA
Leon M. Tolbert, Oak Ridge National Laboratory, USA
John N. Chiasson, Boise State University, USA

IAS 16p5 Asymmetrical PWM Technique for a Three-level Hybrid Inverter
Liviu Mihalache, Power Conversion Technologies Inc., USA

INDUSTRIAL POWER CONVERTER COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon C1

Session 17—Fuel Cell Applications

Session Chair: Remus Teodorescu, Aalborg University, Denmark

Session Organizer: Gui-Jia Su, Oak Ridge National Laboratory, USA

IAS 17p1 An Interleaved, Reduced Component Count, Multi-voltage Bus DC/DC Converter for Fuel Cell Powered Electric Vehicle Applications
Lixin Tang, Oak Ridge Associated Universities, USA
Gui-Jia Su, Oak Ridge National Laboratory, USA

IAS 17p2 A Family of Novel Zero-voltage and Zero-current Switching Full Bridge Converters Using Output Voltage Reset for Fuel Cell Application
Wensong Yu, Virginia Polytechnic Institute and State University, USA
Jih-Sheng Lai, Virginia Polytechnic Institute and State University, USA
Hao Qian, Virginia Polytechnic Institute and State University, USA

IAS 17p3 5 kW Multilevel DC–DC Converter for Hybrid Electric and Fuel Cell Automotive Applications
Faisal H. Khan, Electric Power Research Institute, USA

Leon M. Tolbert, The University of Tennessee, USA

IAS 17p4 Power Distribution Strategy of Fuel Cell Vehicle System with Hybrid Energy Storage Elements Using Triple Half Bridge (THB) Bidirectional DC–DC Converter

Hui Li, Florida State University, USA

Danwei Liu, Florida State University, USA

IAS 17p5 A Passivity based Control with Augmented Integration for an Interleaved Current Fed Full Bridge Converter as a Front End for Fuel Cell Source

Haihua Zhou, National University of Singapore, Singapore

Ashwin M. Khambadkone, National University of Singapore, Singapore

Xin Kong, National University of Singapore, Singapore

IAS 17p6 Dynamic Integration of a Grid Connected DFIG Wind Turbine with a Fuel Cell Bhaskara Palle, Colorado School of Mines, USA

Marcelo G. Simões, Colorado School of Mines, USA

INDUSTRIAL DRIVES COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon C2

Session 18—Sensorless Drives I

Session Chair: Annette Muetze, University of Warwick, UK

Session Organizer: Fabio Giulii Capponi, University of Rome "La Sapienza", Italy

IAS 18p1 Voltage Sag Ride-through of Super High-speed Turbo Compressor

Jung-Sik Yim, Seoul National University, Korea

Seung-Ki Sul, Seoul National University, Korea

Ji-seop Byeon Samsung, Techwin Co., Ltd., Korea

Sung-Il Lim, Samsung Techwin Co., Ltd., Korea

IAS 18p2 Sensorless Control of Surface Mounted Permanent Magnet Machine Using the Standard Space Vector PWM

Yahan Hua University of Nottingham, UK

G. M. Asher, University of Nottingham, UK

M. Sumner, University of Nottingham, UK

Qiang Gao, University of Nottingham, UK

IAS 18p3 Sensorless-oriented Design of PM Motors

Nicola Bianchi, University of Padova, Italy

Silverio Bolognani, University of Padova, Italy

IAS 18p4 Position Sensorless PMSM Drive System Including Square-wave Operation at High-speed

Shigeo Morimoto, Osaka Prefecture University, Japan

Yukinori Inoue, Osaka Prefecture University, Japan

Ting-Fei Weng, Osaka Prefecture University, Japan

Masayuki Sanada, Osaka Prefecture University, Japan

IAS 18p5 A Direct Torque Controlled Surface Mounted PMSM Drive with Initial Rotor Position Estimation Based on Structural and Saturation Saliencies

Ying Yan, University of Technology, Australia

Jianguo Zhu, University of Technology, Australia

Yanguang Guo, University of Technology, Australia

IAS 18p6 Implementation and Evaluation of a Stator and Rotor Flux Linkage-based Dead-beat, Direct Torque Control of Induction Machines at the Operational Voltage Limits

N. T. West, Trane Company, USA

R. D. Lorenz, University of Wisconsin–Madison, USA

APPLIANCE INDUSTRY COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon D1

Session 19—Energy Management and Conversion in Connected Homes

Session Chair and Organizer: Roy McCann, University of Arkansas, USA

IAS 19p1 Novel AC Driver and Protection Circuits with Dimming Control for Light Emitting Diodes

His Chang, ASUS Tek Computer Inc., Taiwan

Yen-Shin Lai, National Taipei University of Technology, Taiwan

IAS 19p2 High Performance DC Chopper Speed and Current Control of Universal Motors Using a Microcontroller

Huangsheng Xu, Renesas Technology America, Inc., USA

Kevin King Renesas, Technology America, Inc., USA

Yashvant Jani Renesas, Technology America, Inc., USA

IAS 19p3 Study of High Efficiency Small Diameter Annular Wind Turbines by Means of CAE Techniques

Francesco Pitzalis, Centro Ricerche Fiat, Italy

Nicola Corino, Centro Ricerche Fiat, Italy

Marco Ottella, Centro Ricerche Fiat, Italy

Pietro Perlo, Centro Ricerche Fiat, Italy

Paolo Guglielmi, Politecnico di Torino, Italy

POWER ELECTRONICS DEVICES & COMPONENTS COMMITTEE

Monday, 24 September 2:00 PM – 6:00 PM Napoleon D2

Session 20—Semiconductor Applications, Capacitors and Batteries

Session Chair: Alper Akdag, ABB Switzerland Ltd., Switzerland

Session Organizer: Angelo Raciti, DIEES-ARIEL, University of Catania, Italy

IAS 20p1 Energetical Modeling of Lithium-ion Batteries

M. Urbain, Ecole Nationale Supérieure d'Electricité et de Mécanique, France

S. Raël, Ecole Nationale Supérieure d'Electricité et de Mécanique, France

B. Davat, Ecole Nationale Supérieure d'Electricité et de Mécanique, France

IAS 20p2 Supercapacitor Thermal Characterization in Transient State
H. Gualous, Université de technologie de Belfort-Montbéliard, France
H. Louahlia-Gualous, Université de technologie de Belfort-Montbéliard, France
R. Gallay, Maxwell Technologies, Switzerland
A. Miraoui, Université de technologie de Belfort-Montbéliard, France

IAS 20p3 Electrolytic Capacitor Failure Mechanism Due to In-rush Current
Afroz M. Imam, Georgia Institute of Technology, USA
Deepak M. Divan, Georgia Institute of Technology, USA
Ronald G. Harley, Georgia Institute of Technology, USA
Thomas G. Habetler, Georgia Institute of Technology, USA

IAS 20p4 A Robust Reverse Blocking Switching Device for High Power Direct AC/AC and
Current Source Converters
Alper Akdag, ABB Switzerland Ltd. Semiconductors, Switzerland
Thomas Stiasny, ABB Switzerland Ltd. Semiconductors, Switzerland
Thomas Setz, ABB Switzerland Ltd. Semiconductors, Switzerland
Tobias Wikstroem, ABB Switzerland Ltd. Semiconductors, Switzerland
Bjoern Backlund, ABB Switzerland Ltd. Semiconductors, Switzerland

IAS 20p5 Design and Development of new Robust 3.3 kV IGBT and FWD Module Chips
John F. Donlon, Powerex, Inc., USA
Eric R. Motto, Powerex, Inc., USA
Shinichi Iura, Mitsubishi Electric Corporation, Japan

TUESDAY MORNING SESSIONS

ENERGY SYSTEMS COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon A1

Session 21—Energy Systems I

Session Chair and Organizer: Wei-Jen Lee, University of Texas at Arlington, USA

IAS 21p1 Governmental Regulation of Ocean Wave Energy Converter Installations
J. G. Vining, University of Wisconsin–Madison, USA
A. Muetze, University of Warwick, UK

IAS 21p2 Economic Factors and Incentives for Ocean Wave Energy Conversion
J. G. Vining, University of Wisconsin–Madison, USA
A. Muetze, University of Warwick, UK

IAS 21p3 Applied Grey System Theory to Power Quality of Utility Center in Campus
Chin-Kuei Lin, National Changhua University of Education, ROC
Jong-Bi Wei, National Changhua University of Education, ROC
Yuan-Piao Lee, Chienkuo Technology University, ROC
Cheng-Kai Yeh, Chienkuo Technology University, ROC

IAS 21p4 The Operation of 200 W Ultra-high Performance Lamp
Yuan-Piao Lee, Chienkuo Technology University, ROC
Chin-Kuei Lin, National Changhua University of Education, ROC
Kun-Li Wen, Chienkuo Technology University, ROC
Mei-Chi Lee, National Chiao Tung University, ROC

IAS 21p5 Apply Rough Set to the Study of Major Influence Factor in Gas Breakdown
Kun-Li Wen, Chienkuo Technology University, ROC
Hsiao-Hsian Nien, Chienkuo Technology University, ROC
Yuan-Piao Lee, Chienkuo Technology University, ROC
Chien-Wen Wang, Chienkuo Technology University, ROC

ELECTROSTATIC PROCESSES COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon A2
Session 22—Industrial Electrostatics

Session Chair: Kelly Robinson, Electrostatic Answers, Rochester, USA
Session Organizer: Norbert Grass, University of Applied Science Nuernberg, Germany

IAS 22p1 Electrostatic Issues in Roll-to-Roll Manufacturing Operations
Kelly Robinson, Electrostatic Answers, LLC., USA

IAS 22p2 Multivariate Statistical Process Control of Electrostatic Separation Processes
Khouira Senouci, University Djillali Liabès, Algeria
Abdelber Bendaoud, University Djillali Liabès, Algeria
Amar Tilmatine, University Djillali Liabès, Algeria
Karim Medles, University of Poitiers, France
Subhankar Das, University of Poitiers, France
Lucian Dascalescu, University of Poitiers, France

IAS 22p3 Corona Separation of Fly Ash
Subhankar Das, Hamos GmbH, Germany
Rainer Köhnlechner, Hamos GmbH, Germany
Florian Aman, Hamos GmbH, Germany
Lucian Dascalescu, University Institute of Technology, France

IAS 22p4 Electrostatic Separation Methods for Metal Removal from ABS Wastes
Alexandru Iuga, Technical University of Cluj-Napoca, Romania
Adrian Samuila, Technical University of Cluj-Napoca, Romania
Vasile Neamtu, Technical University of Cluj-Napoca, Romania
Roman Morar, Technical University of Cluj-Napoca, Romania
Radu Beleca, University of Poitiers, France
Subhankar Das, University of Poitiers, France
Lucian Dascalescu, University of Poitiers, France

IAS 22p5 150 kV / 300 kW High Voltage Supply with IGBT Inverter for Large Industrial Electrostatic Precipitators
Norbert Grass, University of Applied Science Nuernberg, Germany

INDUSTRIAL LIGHTING AND DISPLAYS COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon A3

Session 23—Lamps, Ballasts, and Applications

Session Chair: Francis Dawson, University of Toronto, Canada

Session Organizer: Jo Olsen, Sylvania, USA

IAS 23p1 A Family of Piezoelectric Transformer-based Bridgeless Continuous-conduction-mode Charge-pump Power-factor-correction Electronic Ballasts

Ray-Lee Lin, National Cheng Kung University, Taiwan

Hsu-Ming Shih, National Cheng Kung University, Taiwan

IAS 23p2 Single Switch Electronic Ballast with Unity Power Factor for Compact Fluorescent Lightings Based on a Single-stage Current Fed Resonant Inverter

John Lam, Queen's University, Canada

Praveen K. Jain, Queen's University, Canada

IAS 23p3 Digitally Controlled Low Frequency Square Wave Electronic Ballast with Resonant Ignition and Power Loop

F. J. Díaz, University of Cantabria, Spain

F. J. Azcondo, University of Cantabria, Spain

C. Brañas, University of Cantabria, Spain

R. Casanueva, University of Cantabria, Spain

R. Zane, University of Colorado–Boulder, USA

IAS 23p4 Effects of Flicker on Different Types of 150-W High-pressure Sodium Lamps and Ballasts

F. J. Azcondo, University of Cantabria, Spain

A. Ortiz, University of Cantabria, Spain

M. Mañana, University of Cantabria, Spain

F. J. Díaz, University of Cantabria, Spain

C. Brañas, University of Cantabria, Spain

C. Renedo, University of Cantabria, Spain

S. Pérez, University of Cantabria, Spain

F. Delgado, University of Cantabria, Spain

R. Casanueva, University of Cantabria, Spain

IAS 23p5 Penta-phase Series-parallel LCsCp Resonant Inverter to Drive 1 kW HPS Lamps

Christian Brañas, University of Cantabria, Spain

Francisco J. Azcondo, University of Cantabria, Spain

Rosario Casanueva, University of Cantabria, Spain

Francisco J. Díaz, University of Cantabria, Spain

ELECTRIC MACHINES COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon B1

Session 24—PM Design and Optimization

Session Chair and Organizer: Yves Perriard, Swiss Federal Institute of Technology, Switzerland

IAS 24p1 A Three-phase Permanent Magnet Brushless DC Motor for Low-power Low-speed Fan Applications—Optimizing Cost and Efficiency
Ranjan Kumar Gupta, University of Minnesota, USA
Ned Mohan, University of Minnesota, USA

IAS 24p2 Modelisation and Optimization of Clutch Magnet Actuator Topologies
V. Pauvert, Université de Nantes, France
N. Bernard, Université de Nantes, France
M. E. Zaïm, Université de Nantes, France
J. Bonnefous, Defontaine S.A, France

IAS 24p3 Efficiency Optimization of a 100-W, 500,000-rpm Permanent-magnet Machine Including Air Friction Losses
J. Luomi, Helsinki University of Technology, Finland
C. Zwyssig, ETH Zurich, Switzerland
A. Looser, ETH Zurich, Switzerland
J. W. Kolar, ETH Zurich, Switzerland

IAS 24p4 Optimization of a Biomedical Actuator for Implantable Continuous Glucose Monitoring
Sebastiano Merzaghi, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Igor Stefanini, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Miroslav Markovic, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Yves Perriard, Ecole Polytechnique Fédérale de Lausanne, Switzerland

IAS 24p5 Torque-maximizing Design of Double-stator, Axial-flux, PM Machines Using Simple Non-linear Magnetic Analysis
Y. Kano, Nagoya Institute of Technology, Japan
K. Tonogi, Nagoya Institute of Technology, Japan
T. Kosaka, Nagoya Institute of Technology, Japan
N. Matsui, Nagoya Institute of Technology, Japan

IAS 24p6 Surface PM Machine Parameter Selection for Wide Field-weakening Range Applications
W. L. Soong, University of Adelaide, Australia
P. B. Reddy, University of Wisconsin–Madison, USA
A. M. El-Refaie, GE Global Research Center, USA
T. M. Jahns, University of Wisconsin–Madison, USA
N. Ertugrul, University of Adelaide, Australia

POWER SYSTEM PROTECTION COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon B2

Session 25—Power System Protection I

Session Chair and Organizer: Rasheek Rifaat, Jacobs Engineering, Canada

IAS 25p1 Bus and Breaker Fail Protection for Industrial and Commercial Power Systems

Part I: Introduction and Bus Protection Summary—Working Group Report

Rasheek Rifaat, IEEE IAS Industrial and Commercial Power System Department

Bruce Baily, IEEE IAS Industrial and Commercial Power System Department

Gerald Dalke, IEEE IAS Industrial and Commercial Power System Department

Brent Duncan, IEEE IAS Industrial and Commercial Power System Department

Charles J. Mozina, IEEE IAS Industrial and Commercial Power System Department

Louie J. Powell, IEEE IAS Industrial and Commercial Power System Department

Jay Fischer, IEEE IAS Industrial and Commercial Power System Department

Alex Y. Wu, IEEE IAS Industrial and Commercial Power System Department

Joe Weber, IEEE IAS Industrial and Commercial Power System Department

James Daley, IEEE IAS Industrial and Commercial Power System Department

IAS 25p2 Bus and Breaker Fail Protection for Industrial and Commercial Power Systems

Part II: Breaker Fail Protection and Conclusion—Working Group Report

Rasheek Rifaat, IEEE IAS Industrial and Commercial Power System Department

Bruce Baily, IEEE IAS Industrial and Commercial Power System Department

Gerald Dalke, IEEE IAS Industrial and Commercial Power System Department

Brent Duncan, IEEE IAS Industrial and Commercial Power System Department

Charles J. Mozina, IEEE IAS Industrial and Commercial Power System Department

Louie J. Powell, IEEE IAS Industrial and Commercial Power System Department

Jay Fischer, IEEE IAS Industrial and Commercial Power System Department

Alex Y. Wu, IEEE IAS Industrial and Commercial Power System Department

Joe Weber, IEEE IAS Industrial and Commercial Power System Department

James Daley, IEEE IAS Industrial and Commercial Power System Department

IAS 25p3 High Speed Protection Scheme for Traction OHE of 25 kV AC Indian Railway System

Bhavesh Bhalja, Indian Institute of Technology–Roorkee, India

R. P. Maheshwari, Indian Institute of Technology–Roorkee, India

IAS 25p4 Ballast Survival When Exposed to Commonly Found Transient Voltages Gary

H. Fox, GE Consumer & Industrial, USA

Johnny Whitehead, GE Consumer & Industrial, USA

IAS 25p5 Safe Installation of Metal Light Poles per NEC or NESC

Paul G. Cardinal, Shell Exploration and Production, USA

INDUSTRIAL POWER CONVERTER COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon B3

Session 26—Utility Interface and Power Quality I

Session Chair: Edison R.C. da Silva, University of Campina Grande, Brazil

Session Organizer: Subhashish Bhattacharya, University of North Carolina, USA

IAS 26p1 Implementation of a Four Pole Neutral-point Clamped Three Phase Inverter with Zero Common Mode Voltage Output

Robert M. Cuzner, DRS Power and Control Technologies, USA

Ashish R. Bendre, DRS Power and Control Technologies, USA

Peter J. Faill, DRS Power Systems, USA

Boris Semenov, DRS Power Systems, USA

IAS 26p2 Control Method of a Doubly-fed Induction Generator with a Grid Synchronization against Parameter Variation and Encoder Position

Jung-Woo Park, Korea Electrotechnology Research Institute, Korea

Ki-Wook Lee, Korea Electrotechnology Research Institute, Korea

Dong-Wook Kim, Korea Electrotechnology Research Institute, Korea

Kwang-Soo Lee, Korea Ocean Research & Development Institute, Korea

Jin-Soon Park, Korea Ocean Research & Development Institute, Korea

IAS 26p3 VSC based D-Statcom with Selective Harmonic Elimination

A. Çetin, Middle East Technical University, Turkey

M. Ermiş, TUBITAK Space Technologies Research Institute, Turkey

IAS 26p4 Grid Impedance Identification Based on Active Power Variations and Grid Voltage Control

Adrian V. Timbus, Aalborg University, Denmark

Remus Teodorescu, Aalborg University, Denmark

Pedro Rodriguez, Technical University of Catalonia, Spain

IAS 26p5 Z-source Inverter based Power Quality Compensator with Enhanced Ride-through Capability

C. J. Gajanayake, Nanyang Technological University, Singapore

D. M. Vilathgamuwa, Nanyang Technological University, Singapore

P. C. Loh, Nanyang Technological University, Singapore

F. Blaabjerg, Aalborg University, Denmark

R. Teodorescu, Aalborg University, Denmark

INDUSTRIAL AUTOMATION & CONTROL COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon C1

Session 27—Industrial Controls

Session Chair: A. Rubaai, Howard University, USA

Session Organizer: M. N. Uddin, Lake Head University, Canada

IAS 27p1 Performance of a Single-Axis Controlled Magnetic Bearing for Axial Blood Pump

Gabriel Gallegos-López, General Motors Corporation, USA

Silva Hiti, General Motors Corporation, USA

IAS 27p2 A Scroll Compressor with a High Performance Induction Motor Drive for the Air Management of a PEMFC System for Automotive Applications
Benjamin Blunier, Université de Technologie de Belfort-Montbéliard, France
Marcello Pucci, ISSIA-CNR, Italy
Giansalvo Cirrincione, Politecnico di Torino, Italy
Abdellatif Miraoui, Université de Technologie de Belfort-Montbéliard, France

IAS 27p3 A Seamless Mode Transfer Maximum Power Point Tracking controller for Thermoelectric Generator Applications
Rae-Young Kim, Virginia Polytechnic Institute and State University, USA
Jih-Sheng Lai, Virginia Polytechnic Institute and State University, USA

IAS 27p4 Parallel CFD Analysis of Conjugate Heat Transfer in a Dry Type Transformer
Carlos Ortiz, École Polytechnique de Montréal, Canada
Adam Skorek, Université du Québec à Trois-Rivieres, Canada
Michel Lavoie, École de Technologie Supérieure de Montréal, Canada
Pierre Bénard, Université du Québec à Trois-Rivieres, Canada

IAS 27p5 Dynamic Coupling Force Compensation for Direct-driven Machine Tools
Oliver Zirn, University of Applied Sciences, Germany
Jacek Nowak, University of Applied Sciences, Germany
Bernhard Hiller, Hübner Elektromaschinen GmbH, Germany

INDUSTRIAL DRIVES COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon C2
Session 28—Induction Drives

Session Chair and Organizer: Rangarajan Tallam, Rockwell Automation, USA

IAS 28p1 Estimation of the Fundamental Current in Low Switching Frequency High-dynamic Medium Voltage Drives
Joachim Holtz, University of Wuppertal, Germany
Nikolaos Oikonomou, University of Wuppertal, Germany

IAS 28p2 Digital Implementation of Both a Stator and Rotor Flux Linkage Observer and Stator Current Observer
N. T. West, Trane Company, USA
R. D. Lorenz, University of Wisconsin–Madison, USA

IAS 28p3 Fuzzy Self-tuning Speed Control of an Indirect Field-oriented Control Induction Motor Drive
M. Masiala, University of Alberta, Canada
B. Vafakhah, University of Alberta, Canada
J. Salmon, University of Alberta, Canada
A. Knight, University of Alberta, Canada

IAS 28p4 Parameter Sensitivity Analysis of Flux Observers for Induction Motors

Zhenhuan Yuan, Rockwell Automation, China
Haihui Lu, Rockwell Automation, China
Russel J. Kerkman, Rockwell Automation, USA
Thomas A. Nondahl, Rockwell Automation, USA
Richard A. Lukaszewski, Rockwell Automation, USA

IAS 28p5 Two Different Approaches for Robust Adaptive Stator Current Control Strategies for Induction Motor Drives

R. L. A. Ribeiro, Universidade Federal do Rio Grande do Norte, Brazil
M. B. Santos, Universidade Federal do Rio Grande do Norte, Brazil
A. D. Araújo, Universidade Federal do Rio Grande do Norte, Brazil
A. C. Oliveira, Universidade Federal de Campina Grande, Brazil
C. B. Jacobina, Universidade Federal de Campina Grande, Brazil

IAS 28p6 Performance Assessment of SVM Modulation Techniques for Losses Reduction in Induction Motor Drives

Andrew Trentin, University of Nottingham, UK
Pericle Zanchetta, University of Nottingham, UK
Patrick Wheeler, University of Nottingham, UK
Jon Clare, University of Nottingham, UK
Robert Wood, AMSRD-ARL-SEDP, USA
Wes Typton, AMSRD-ARL-SEDP, USA

APPLIANCE INDUSTRY COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 P.M. Napoleon D1

Session 29—Appliance Electronic Control Solutions

Session Chair and Organizer: Zheng Zhang, Whirlpool Corporation, USA

IAS 29p1 New IGBT Concepts for Consumer Power Application

S. Voss, Infineon Technologies AG, Germany
O. Hellmund, Infineon Technologies AG, Germany
W. Frank, Infineon Technologies AG, Germany

IAS 29p2 Safety Regulations and Their Impact on Microcontrollers in Home Appliances

Steve Redpath, NEC Electronics (Europe) GmbH, UK
John Pocs, NEC Electronics America, USA

IAS 29p3 A Monolithic 500 V, 1 A Three Phase Motor Driver with Small Outline Surface Mount Package

E. Motto, Powerex Incorporated, USA
J. Donlon, Powerex Incorporated, USA
K. Watabe, Mitsubishi Electric Corporation, Japan
H. Kazunari, Mitsubishi Electric Corporation, Japan
T. Araki, Mitsubishi Electric Corporation, Japan

IAS 29p4 DSP-based versus Microcontroller-based Variable Frequency Drives for Domestic Washing Machines
Andrea Bianchi, Power One Italy, Italy
Massimo Valiani, Power One Italy, Italy

IAS 29p5 Combining Vector Control and User Interface/Machine Functions into a Single Microcontroller for White Goods Applications
Yashvant Jani, Renesas Technology America, Inc., USA

IAS 29p6 Integration of Hardware and Software for an Optimized Appliance Drive
Jeff Stafford, Texas Instruments Inc., USA
Arefeen Mohammed, Texas Instruments Inc., USA

POWER ELECTRONICS DEVICES & COMPONENTS COMMITTEE

Tuesday, 25 September 8:00 AM – 12:00 PM Napoleon D2
Session 30—Advancements, Innovations and Applications of Power Device Components

Session Chair: Richard Lukaszewski, Rockwell Automation, USA
Session Organizer: Adam Konopka, Baldor, USA

Predicting Aluminum Electrolytic Capacitor Performance and Expected Lifetime
Laird L Macomber, Cornell Dubilier, USA
Ultracapacitors in Energy Storage Systems: State of the Technology, Products and Trends
John Miller, Maxwell Technologies, Inc., USA
Compact Power Capacitor Meets The Challenge of Heavy Duty Converters
Suresh Chandran, EPCOS, Inc., USA
Harald Vetter, EPCOS, Inc., USA
An Indirect Method of Measuring DC Bus Capacitor Current
Robert W. Reese, Rockwell Automation, USA
Lixiang Wei, Rockwell Automation, USA
New Development IGBT Module with RE-Configurable Package
John Donlon, Powerex, Inc., USA
1200V V-series IGBT module with the 6th-generation Trench-IGBT chip technology
Masahito Otsuki, Fuji Electric Advanced Technology Co., Ltd., Japan
Yasuyuki Kobayashi, Fuji Electric Advanced Technology Co., Ltd., Japan
Tadashi Miyasaka, Fuji Electric Advanced Technology Co., Ltd., Japan
Investigations of New Package Structure for High Temperature IGBT Module
Masafumi Horio, Fuji Electric Advanced Technology Co., Ltd., Japan
Eiji Mochizuki, Fuji Electric Advanced Technology Co., Ltd., Japan
Rikihiro Maruyama, Fuji Electric Advanced Technology Co., Ltd., Japan
Tatsuo Nishizawa, Fuji Electric Advanced Technology Co., Ltd., Japan
Y. Takahashi, Fuji Electric Advanced Technology Co., Ltd., Japan

TUESDAY AFTERNOON SESSIONS

ENERGY SYSTEMS COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon A1

Session 31—Energy Systems II

Session Chair and Organizer: Wei-Jen Lee, University of Texas at Arlington, USA

IAS 31p1 Structural Design Criteria for Energy Saving in Electrical Installations
Giuseppe Parise, University of Rome “La Sapienza”, Italy

IAS 31p2 Design and Implementation of a Charge Equalization Using Positive/Negative
Pulse Charger
Wu-Shun Jwo, Chienkuo Technology University, Taiwan
Wei-Liang Chien, Chienkuo Technology University, Taiwan

IAS 31p3 Grid Security through Load Reduction in the ERCOT Market
Shun-Hsien Huang, ERCOT, USA
Carlos Gonzalez-Perez, ERCOT, USA
John Dumas, ERCOT, USA
Wei-Jen Lee, University of Texas–Arlington, USA

IAS 31p4 Coordination of Distributed Storage with Wind Energy in a Rural Distribution
System
Chad Abbey, McGill University, Canada
Geza Joos, McGill University, Canada

ELECTROSTATIC PROCESSES COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon A2

Session 32—Electrical Discharges

Session Chair: Mark N. Horenstein, Boston University, USA

Session Organizer: Rajesh Sharma, University of Arkansas at Little Rock, USA

IAS 32p1 Review of Progress in Understanding Propagating Brush Discharges
Mark N. Horenstein, Boston University, USA

IAS 32p2 Measurement of AC Ion Current from Ionizer by Using Faraday Cage
Kazutoshi Asano, affiliation not cited
Yoshinari Fukada, Koganei Corporation, Japan
Takashi Yasukawa, Koganei Corporation, Japan

IAS 32p3 Relations between the Medium Composition, Dielectric Properties, and Corona
Current
Zden Kucеровsky, University of Western Ontario, Canada

IAS 32p4 Experimental Study of the Corona Discharge in a Modified Coaxial Wire-cylinder
Electrostatic Precipitator
O. Blejan, Politehnica University, Romania
P. Notingher, Politehnica University, Romania

L. M. Dumitran, Politehnica University, Romania
M. Younes, University of Poitiers, France
A. Samuila, University of Poitiers, France
L. Dascalescu, University of Poitiers, France

IAS 32p5 Sterilization Using a Wide-gap Discharge Formed by Dielectric Barrier Discharge
Coupled with Surface Discharge under Atmospheric Pressure
Isamu Amano, Toyohashi University of Technology, Japan
Masakazu Tanino, Toyohashi University of Technology, Japan
Naoto Fujii, Toyohashi University of Technology, Japan
Yasuaki Tanino, Toyohashi University of Technology, Japan
Kazunori Takashima, Toyohashi University of Technology, Japan
Akira Mizuno, Toyohashi University of Technology, Japan

IAS 32p6 Formation of Hydrogen Peroxide, Hydrogen, and Oxygen in Gliding Arc
Electrical Discharge Reactors with Water Spray
Daniel Porter, Florida State University, USA
Micah D. Poplin, Florida State University, USA
Frank Holzer, Helmholtz Centre for Environmental Research UFZ, Germany
Wright C. Finney, Florida State University, USA
Bruce R. Locke, Florida State University, USA

IAS 32p7 Effect of Pressure on Chemical Reaction in a Liquid Phase Electrical Discharge
Reactor
Kai-Yuan Shih, Florida State University, USA
Radu Burlica, Florida State University, USA
Wright C. Finney, Florida State University, USA
Bruce R. Locke, Florida State University, USA

INDUSTRIAL LIGHTING AND DISPLAYS COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon A3

Session 33—LEDs and Drivers

Session Chair: Joep Jacobs, Philips Research Laboratories, Germany
Session Organizer: Jo Olsen, Sylvania, USA

IAS 33p1 Evaluation of Power LEDs Drivers with Supercapacitors and Digital Control
A. J. Calleja, Universidad de Oviedo, Spain
A. Torres, Universidad de Oviedo, Spain
J. Garcia, Universidad de Oviedo, Spain
M. Rico Secades, Universidad de Oviedo, Spain
J. Ribas, Universidad de Oviedo, Spain
J. Ángel Martínez, Universidad de Oviedo, Spain

IAS 33p2 Evaluation on the Efficiency of Power LEDs Driven with Currents Typical to
Switch Mode Power Supplies

M. Schmid, University Erlangen-Nuremberg, Germany
D. Kuebrich, University Erlangen-Nuremberg, Germany
M. Weiland, University Erlangen-Nuremberg, Germany
T. Duerbaum, University Erlangen-Nuremberg, Germany

IAS 33p3 Distributed Emergency Lighting System LEDs Driven by Two Integrated Flyback Converters

Alessandro A. M. Oliveira, Federal University of Santa Maria, Brazil
Tiago B. Marchesan, Federal University of Santa Maria, Brazil
Ricardo N. Prado, Federal University of Santa Maria, Brazil
Alexandre Campos, Federal University of Santa Maria, Brazil

IAS 33p4 Drivers for OLEDs

Joep Jacobs, Philips, Germany
Dirk Hente, Philips, Germany
Eberhard Waffenschmidt, Philips, Germany

IAS 33p5 New Imaging and Display System for Wide Gamut Color Reproduction

Yoshifumi Shimodaira, Shizuoka University, Japan
Hitoshi Suzuki, Shizuoka University, Japan
Maciej Kretkowski, Shizuoka University, Japan

IAS 33p6 Experimental Study on Distances of Objects Seen on Flat Panel Display Evaluated in Terms of Human Factors

Tetsuya Muraoka, Polytechnic University in Tokyo, Japan
Hiroaki Ikeda, IKEDA Technologies, Inc., Japan

ELECTRIC MACHINES COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon B1

Session 34—Induction Machines I

Session Chair: Alfio Consoli, University of Catania, Italy
Session Organizer: Marcello Pucci, I.S.S.I.A.-C.N.R., Italy

IAS 34p1 Effect of MMF Harmonics on Single-phase Induction Motor Performance – A Unified Approach

Mircea Popescu, University of Glasgow, UK
Claus B. Rasmussen, Grundfos A/S, Denmark
T. J. E. Miller, University of Glasgow, UK
Malcolm McGilp, University of Glasgow, UK

IAS 34p2 Modeling Split Phase Induction Motors with Center-tapped Windings and Asynchronous Torque Dips

David G. Dorrell, University of Glasgow, UK
Finn Jensen Grundfos, Management A/S, Denmark

IAS 34p3 Autonomous Self Commissioning Method for Speed Sensorless Controlled Induction Machines

T. M. Wolbank, Vienna University of Technology, Austria
M. A. Vogelsberger, Vienna University of Technology, Austria
R. Stumberger, Vienna University of Technology, Austria
S. Mohagheghi, Georgia Institute of Technology, USA
T. G. Habetler, Georgia Institute of Technology, USA
R. G. Harley, Georgia Institute of Technology, USA

IAS 34p4 Non-Intrusive Efficiency Determination of In-service Induction Machines Using the Genetic Algorithm and Air-gap Torque Methods

Bin Lu, Eaton Corporation, USA
Wenping Cao, University of Teesside, UK
Ian French, University of Teesside, UK
Keith J. Bradley, University of Nottingham, UK
Thomas G. Habetler, Georgia Institute of Technology, USA

IAS 34p5 Factors Affecting Losses in Induction Motors with Non-sinusoidal Supply

A. Boglietti, Politecnico di Torino, Italy
A. Cavagnino, Politecnico di Torino, Italy
A. M. Knight, University of Alberta, Canada
Y. Zhan, University of Alberta, Canada

IAS 34p6 Small-signal Modelling of Saturated Induction Machines with Closed or Skewed Rotor Slots

Marko Hinkkanen, Helsinki University of Technology, Finland
Anna-Kaisa Repo, Helsinki University of Technology, Finland
Mikaela Cederholm, Helsinki University of Technology, Finland
Jorma Luomi, Helsinki University of Technology, Finland

IAS 34p7 Determination of Parameters in the Universal Induction Motor Model

Behrooz Mirafzal, Rockwell Automation, USA
Gary L. Skibinski, Rockwell Automation, USA
Rangarajan M. Tallam, Rockwell Automation, USA

POWER SYSTEM PROTECTION COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon B2

Session 35—Power System Protection II

Session Chair: Chuck Mozina, Beckwith Electric, USA
Session Organizer: Rasheek Rifaat, Jacobs Engineering, Canada

IAS 35p1 Closed-loop Solution of Transient Recovery Voltage for Interrupted Induction Motor Starting

Mohit Singh, University of Texas–Austin, USA
Surya Santoso, University of Texas–Austin, USA

Christopher J. Melhorn, EPRI, USA
Mark F. McGranaghan, EPRI, USA

IAS 35p2 Stator Winding Grounding Fault Protection with Third Harmonic Current
Difference for Multi-generator Systems

Xia Yunfeng, Changsha University of Science and Technology, PRC
Zeng Xiangjun, Changsha University of Science and Technology, PRC
Wang Yuanyuan, Changsha University of Science and Technology, PRC
Ma Hongjiang, Changsha University of Science and Technology, PRC

IAS 35p3 Plant Efficiencies Benefit by Selection of Synchronous Motor

Jim Parrish, Lion Oil, USA
Steve Moll, Electric Machinery, USA
Richard C. Schaefer, Basler Electric, USA

IAS 35p4 Applications of Distance Protection Schemes for a Forked Inter-tie between
Industrial Cogeneration and a Large Utility: Tips, Tricks and Traps

Dwight Hulin, ExxonMobil, USA
Rasheek Rifaat, Jacobs Engineering, Canada

IAS 35p5 An Adaptive Criterion to Design the Lighting System in the Road Tunnels

Giuseppe Parise, University of Rome “La Sapienza”, Italy
Luigi Martirano, University of Rome “La Sapienza”, Italy
Simone Pierdomenico, University of Rome “La Sapienza”, Italy

INDUSTRIAL POWER CONVERTER COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon B3
Session 36—IPCC Products and Services

Session Chair and Organizer: Hui Li, Florida State University, USA

Ultracapacitors in combination with Lithium batteries in a hybrid energy storage system

John Miller, Maxwell Technologies, USA

Electrification of the Powertrain in GM Vehicles

Silva Hiti, GM Advanced Technology Center, USA

High Power, Current-Fed, DC Power Supplies for Laboratory Application

Ira Pitel, Magna-Power Electronics, USA

Microprocessor controlled high density DC/DC converters

Arthur Pfaelzer, Intronic Incorporated, USA

Electric Machines for Automotive Electrification

William CAI, Remy International, USA

Developments in High-speed High-Power PM Motor/Generator Applications

Zhiguo Pan, Directdrive systems, USA

More Electric Engines and More Electric Aircraft

Kaushik Rajashekara, Rolls-Royce, USA

INDUSTRIAL AUTOMATION AND CONTROL COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon C1

Session 37—Motion Control Systems

Session Chair: D. Kankam, NASA Glenn Research Center, USA

Session Organizer: Roy McCoy, University of Arkansas, USA

IAS 37p1 Development and Experimental Testing of a 3 ϕ Resolution-level Controlled WM Inverter-fed Induction Motor

S. A. Saleh, Memorial University of Newfoundland, Canada

M. A. Rahman, Memorial University of Newfoundland, Canada

IAS 37p2 Robust Control Design through Experimental Load Identification for Variable Speed Drives

Nnamdi Okaeme, University of Nottingham, UK

Pericle Zanchetta, University of Nottingham, UK

Mark Sumner, University of Nottingham, UK

IAS 37p3 Control of IPM Synchronous Generator for Maximum Wind Power Generation Considering Magnetic Saturation

Wei Qiao, Georgia Institute of Technology, USA

Liyan Qu, University of Illinois at Urbana–Champaign, USA

Ronald G. Harley, Georgia Institute of Technology, USA

IAS 37p4 A Novel Mechanical Sensorless Control for PMSM Tolerant to Stator Resistance Uncertainties

ThierryBoileau, Institut National Polytechnique de Lorraine, France

Mohammad Ali Shamsi, Institut National Polytechnique de Lorraine, France

Babak Nahid-Mobarakeh, Institut National Polytechnique de Lorraine, France

Farid Meibody-Tabar, Institut National Polytechnique de Lorraine, France

IAS 37p5 Implementation of a New Wavelet Controller for Interior Permanent Magnet Motor Drives

M. A. S. K. Khan, Memorial University of Newfoundland, Canada

M. A. Rahman, Memorial University of Newfoundland, Canada

IAS 37p6 Gate-level Simulation of an FPGA-based PMSM Drive Sensorless Control

Vincenzo Delli Colli, University of Cassino, Italy

Roberto Di Stefano, University of Cassino, Italy

Fabrizio Marignetti, University of Cassino, Italy

Maurizio Scarano, University of Cassino, Italy

INDUSTRIAL DRIVES COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon C2

Session 38—PM Drives I

Session Chair and Organizer: Z.Q. Zhu, University of Sheffield, UK

IAS 38p1 Design and Control of a Double-stator Permanent-magnet Motor Drive for Electric Vehicles

Shuangxia Niu, The University of Hong Kong, PRC

K. T. Chau, The University of Hong Kong, PRC

Dong Zhang, Shanghai University, PRC

J. Z. Jiang, Shanghai University, PRC

Zheng Wang, The University of Hong Kong, PRC

IAS 38p2 Torque Control Strategy of an IPMSM Considering the Flux Variation of the Permanent Magnet

Yeon-Su Kim, Seoul National University, Korea

Seung-Ki Sul, Seoul National University, Korea

IAS 38p3 A Robust, Efficiency Optimized Flux-weakening Control Algorithm for PM Synchronous Machines

Song Chi, Whirlpool Corporation, USA

Zheng Zhang, Whirlpool Corporation, USA

Longya Xu, The Ohio State University, USA

IAS 38p4 Novel Flux-weakening Control of an IPMSM for Quasi Six-step Operation

Gi-Young Choi, Seoul National University, Korea

Mu-Shin Kwak, Seoul National University, Korea

Tae-Suk Kwon, Seoul National University, Korea

Seung-Ki Sul, Seoul National University, Korea

IAS 38p5 Power Converter Design for an Integrated Modular Motor Drive

N. R. Brown, University of Wisconsin–Madison, USA

T. M. Jahns, University of Wisconsin–Madison, USA

R. D. Lorenz, University of Wisconsin–Madison, USA

IAS 38p6 Disturbance Free Operation of Permanent Magnet Motor Drives Under Short Circuit Faults Using Center-split Winding

Suman Dwari, Rensselaer Polytechnic Institute, USA

Leila Parsa, Rensselaer Polytechnic Institute, USA

IAS 38p7 Optimal Exploitation of the Constant Power Region of IPM Drives Based on Field Oriented Control

Gianmario Pellegrino, Politecnico di Torino, Italy

Eric Armando, Politecnico di Torino, Italy

Paolo Guglielmi, Politecnico di Torino, Italy

MINING INDUSTRY COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon D1

Session 39—Safety and Productivity

Session Chair and Organizer: Jorge Pontt, Technical University Federico Santa Maria, Chile

IAS 39p1 Best Practices for Implementing High-resistance Grounding in Mine Power Systems Joseph Sottile, University of Kentucky, USA
Anup Tripathi, University of Kentucky, USA
Thomas Novak, Virginia Polytechnic Institute and State University, USA

IAS 39p2 Grounding Faulted Feeder Detection Methods Applied in Chinese Ineffectively Earthed Distribution Systems
Xiangjun Zeng, Changsha University of Science and Technology, PRC
Yunfeng Xia, Changsha University of Science and Technology, PRC
Hongjiang Ma, Changsha University of Science and Technology, PRC
Yuanyuan Wang, Changsha University of Science and Technology, PRC

IAS 39p3 The Brookwood Disaster and Electrical Requirements for Hazardous (Classified) Locations
Thomas H. Dubaniewicz Jr., National Institute for Occupational Safety and Health, USA

IAS 39p4 Mitigation of Sympathetic Interaction Between Power Transformers Fed by Long Over Head Lines Caused by Inrush Transient Currents
J. Pontt, Technical University Federico Santa Maria, Brazil
J. Rodriguez, Technical University Federico Santa Maria, Brazil
J. San Martin, Technical University Federico Santa Maria, Brazil
R. Aguilera, Technical University Federico Santa Maria, Brazil

IAS 39p5 Understanding and Quantifying Arc Flash Hazards in the Mining Industry
Gerald T. Homce, United States Department of Health and Human Services, USA
James C. Cawley, United States Department of Health and Human Services, USA

IAS 39p6 Protecting Miners from Electrical Arcing Injury
James C. Cawley, United States Department of Health and Human Services, USA
Gerald T. Homce, United States Department of Health and Human Services, USA

IAS 39p7 Safety Analysis of Trailing Cables used on 2400 V Continuous Mining Machines
Thomas Novak, Virginia Polytechnic Institute and State University, USA

POWER ELECTRONICS DEVICES & COMPONENTS COMMITTEE

Tuesday, 25 September 2:00 PM – 6:00 PM Napoleon D2

Session 40—Thermal, Packaging and Sensing

Session Chair: Jean-Luc Schanen, LEG ENSIEG, France

Session Organizer: Enrico Santi, University of South Carolina, USA

IAS 40p1 A System Integration Philosophy for Demanding Requirements in Power Electronics
M. Gerber, Delft University of Technology, The Netherlands
J. A. Ferreira, Delft University of Technology, The Netherlands

IAS 40p2 Design of a Porous Electro-osmotic Pump, Used in Power Electronics Cooling

Y. Berrouche, Institut national polytechnique de Grenoble, France

Y. Avenas, Institut national polytechnique de Grenoble, France

C. Schaeffer, Institut national polytechnique de Grenoble, France

P. Wang, University of Notre Dame, USA

H-C. Chang, University of Notre Dame, USA

IAS 40p3 Electromagnetic Considerations for Designing Double-sided Power Modules

S. Mandray, Institut national polytechnique de Grenoble, France

J. M. Guichon, Institut national polytechnique de Grenoble, France

J. L. Schanen, Institut national polytechnique de Grenoble, France

M. Mermet, Alstom Transport, France

J. M. Dienot, IUT de Tarbes, France

IAS 40p4 DBC Technology for Extremely Thin Flat Heat Pipes

L. Kamenova, Institut national polytechnique de Grenoble, France

Y. Avenas, Institut national polytechnique de Grenoble, France

C. Schaeffer, Institut national polytechnique de Grenoble, France

G. Kapelski, Institut national polytechnique de Grenoble, France

S. Tzanova, Technical University of Sofia, Bulgaria

J. Schulz-Harder, Curamik Electronics GmbH, Germany

IAS 40p5 Experimental Study of a Pulsating Heat Pipe with Combined Circular and Square Section Channels

M. Vassilev, Institut national polytechnique de Grenoble, France

Y. Avenas, Institut national polytechnique de Grenoble, France

C. Schaeffer, Institut national polytechnique de Grenoble, France

J.-L. Schanen, Institut national polytechnique de Grenoble, France

J. Schulz-Harder, Curamik Electronics GmbH, Germany

IAS 40p6 Effective Use of Miniature, Multi-point, Field-based Current Sensors without Magnetic Cores

Erik R. Olson, Sandia National Laboratories, USA

Robert D. Lorenz, University of Wisconsin–Madison, USA

WEDNESDAY MORNING SESSIONS

ENERGY SYSTEMS COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM Napoleon A1

Session 41—Energy Systems III

Session Chair and Organizer: Wei-Jen Lee, University of Texas at Arlington, USA

IAS 41p1 A Novel Single-stage High-power-factor Electronic Ballast with Boost Topology for Multiple Fluorescent Lamps

Ying-Chun Chuang, Kun Shan University, ROC
Hsien-Wen Chen, Kaohsiung Rapid Transit Corporation, ROC

IAS 41p2 Battery-operated Electronic Ballast of Fluorescent Lamps for Photovoltaic Applications Ying-Chun Chuang, Kun Shan University, ROC
Yu-Lung Ke, Kun Shan University, ROC
Hung-Shiang Chuang, Kao Yuan University, ROC

IAS 41p3 Electrical Impact of Photovoltaic Plant in Distributed Network
Aldo Canova, Politecnico di Torino, Italy
Luca Giaccone, Politecnico di Torino, Italy
Filippo Spertino, Politecnico di Torino, Italy
Michele Tartaglia, Politecnico di Torino, Italy

IAS 41p4 Comparative Economical Analysis of a Small Scale Trigenerative Plant: A Case Study
Aldo Canova, Politecnico di Torino, Italy
Claudio Cavallero, Politecnico di Torino, Italy
Fabio Freschi, Politecnico di Torino, Italy
Luca Giaccone, Politecnico di Torino, Italy
Maurizio Repetto, Politecnico di Torino, Italy
Michele Tartaglia, Politecnico di Torino, Italy

IAS 41p5 The Partial Load Efficiency of Induction Motors
Emmanuel B. Agamloh, Advanced Energy Corporation, USA

ELECTROSTATIC PROCESSES COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM Napoleon A2

Session 42—Non-Thermal Plasma Reactors

Session Chair: Tetsuji Oda, University of Tokyo, Japan

Session Organizer: Masao Okubo, Osaka Prefecture University, Japan

IAS 42p1 Oxidation Process of Xylene in Air under Electron Beam Irradiation with TiO_2 and Ag/TiO_2
T. Hakoda, Japan Atomic Energy Agency, Japan
T. Kojima, Japan Atomic Energy Agency, Japan
K. Hirota, Japan Atomic Energy Agency, Japan
K. Matsumoto Saitama Institute of Technology, Japan
A. Mizuno Toyohashi University of Technology, Japan

IAS 42p2 Temperature Dependence of Toluene Decomposition Behavior in the Discharge–Catalyst Hybrid Reactor
Kazuo Hayashi, Toshiba Corporation, Japan
Hiroyuki Yasui, Toshiba Corporation, Japan
Motofumi Tanaka, Toshiba Corporation, Japan

Shigeru Futamura, National Institute of Advanced Industrial Science and Technology, Japan
Satoshi Kurita, Toshiba Corporation, Japan
Kenichi Aoyagi, Toshiba Corporation, Japan

IAS 42p3 Non-thermal Plasma Process for Dilute Trichloroethylene Decomposition with the
Help of Manganese-Dioxide Supported Catalyst
Tetsuji Oda, The University of Tokyo, Japan
Koichi Ono, The University of Tokyo, Japan
Ryo Ono, The University of Tokyo, Japan

IAS 42p4 Synergistic Effect of Nonthermal Plasma and Catalysts on the Decomposition of
VOCs
Masami Sugawara, National Institute of Advanced Industrial Science and Technology, Japan
Shigeru Futamura, National Institute of Advanced Industrial Science and Technology, Japan

IAS 42p6 Ammonia Production from Solid Urea using Non-thermal Plasma
Yoshihiro Iitsuka, Toyohashi University of Technology, Japan
Hiroki Yamauchi, Toyohashi University of Technology, Japan
Graciela Prieto, National University of Tucuman, Argentina
Kazunori Takashima, Toyohashi University of Technology, Japan
Akira Mizuno, Toyohashi University of Technology, Japan

IAS 42p5 Measurement of OH Density and Gas Temperature in Incipient Spark Ignited
Hydrogen-air Flame
Ryo Ono, The University of Tokyo, Japan
Yuya Saito, The University of Tokyo, Japan
Akihiro Maekawa, The University of Tokyo, Japan
Tetsuji Oda, The University of Tokyo, Japan

POWER SYSTEM ENGINEERING COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM Napoleon A3

Session 43—Power System Reliability / Power System Design

Session Chair: Jim Harvey, University of Michigan, USA

Session Organizer: Peter Sutherland, General Electric, USA

IAS 43p1 Current Distribution in Parallel Single-core Cables on Metal Tray
Y. Du, The Hong Kong Polytechnic University, PRC
Y. Z. Huan, The Hong Kong Polytechnic University, PRC

IAS 43p2 A Reduced Multivariate Polynomial Model for Estimation of Electric Load
Composition Soon Lee, Yonsei University, Korea
Jung-Wook Park, Yonsei University, Korea

IAS 43p3 A New On-line Measurement System of Dielectric Loss Angle for High Voltage
Capacitive Apparatus

Zewen Li Changsha, University of Science and Technology, PRC
Xianghui Chu Changsha, University of Science and Technology, PRC
Xiangjun Zeng Changsha, University of Science and Technology, PRC
Nan Chen, Changsha University of Science and Technology, PRC

IAS 43p4 Evaluation of Voltage Exposures Due to AC/DC Stray Currents
Massimo Mitolo, Chu & Gassman, USA
Giambattista Gruosso, Politecnico di Milano, Italy
Aldo Canova, Politecnico di Milano, Italy
Michele Tartaglia, Politecnico di Torino, Italy

ELECTRIC MACHINES COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM Napoleon B1

Session 44—Permanent Magnet Machines I

Session Chair and Organizer: Zhangjun (Zed) Tang, Ansoft, USA

IAS 44p1 Effect of Number of Phases on Losses in Conducting Sleeves of High Speed
Surface PM Machine Rotors
Ayman M. EL-Refaie, GE Global Research Center, USA
Manoj R. Shah, GE Global Research Center, USA
Ronghai Qu, GE Global Research Center, USA
John M. Kern, GE Global Research Center, USA

IAS 44p2 The Noise and Vibration Analysis of BLDC Motor Due to Asymmetrical
Permanent Magnet Overhang Effects
Gyu-Hong Kang, GEM-TECH Co., Ltd., Korea
Young-Dae Son, Dongseo University, Korea
Gyu-Tak Kim, Changwon National University, Korea

IAS 44p3 Analytic Determination of the Phase Inductances for a Brushless DC Motor with
Faulhaber Winding
Patrick Ragot, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Miroslav Markovic, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Yves Perriard, Ecole Polytechnique Fédérale de Lausanne, Switzerland

IAS 44p4 MMF Harmonics Effect on the Embedded FE-analytical Computation of PM
Motors
Nicola Bianchi, University of Padova, Italy
Luigi Alberti, University of Padova, Italy
Mircea Popescu, University of Glasgow, UK
T. J. E. Miller, University of Glasgow, UK

IAS 44p5 Permanent Magnet Synchronous Motor Magnet Designs with Skewing for Torque
Ripple and Cogging Torque Reduction
R. Islam, The University of Akron, USA

I. Husain, The University of Akron, USA
A. Fardoun, TRW Automotive, USA
K. McLaughlin, TRW Automotive, USA

IAS 44p6 Low Voltage High Current PM Traction Motor Design Using Recent Core Loss Results

Marubini J. Manyage, University of Cape Town, South Africa
Pragasen Pillay, Clarkson University, USA

INDUSTRIAL POWER CONVERTER COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM Napoleon B2

Session 45—Utility Interface and Power Quality II

Session Chair: Subhashish Bhattacharya, University of North Carolina, USA

Session Organizer: James H. Galloway, J. H. Galloway & Associates, USA

IAS 45p1 A Cooperative Unbalance Compensation Method for Distributed Generation Interface Converters

Po-Tai Po-Tai National Tsing Hua University, ROC
Chien-An Chen, National Tsing Hua University, ROC
Tzung-Lin Lee, National Tsing Hua University, ROC
Shen-Yuan Kuo, National Tsing Hua University, ROC

IAS 45p2 Control of Grid-interactive Inverters as Used in Small Distributed Generators
HaiminTao, Eindhoven University of Technology, The Netherlands
Jorge L. Duarte, Eindhoven University of Technology, The Netherlands
Marcel A. M. Hendrix, Eindhoven University of Technology, The Netherlands

IAS 45p3 A Low-harmonic Diode Rectifier-fed Drive using Zero-sequence Coupling between Machine and Grid
N. Ravisekhar Raju, GE Global Research, USA

IAS 45p4 Zero Energy Sag Correctors—Optimizing Dynamic Voltage Restorers for Industrial Applications
Anish Prasai, Georgia Institute of Technology, USA
Deepak Divan, Georgia Institute of Technology, USA

IAS 45p5 Comparative Design and Analysis of dc-Link-Voltage Controllers for Grid-connected Voltage Source Converter
Daniel Salomonsson, Royal Institute of Technology, Sweden
Ambra Sannino, ABB, Sweden

IAS 45p6 An Auxiliary Converter for a Diode Rectifier with Mitigated Circulating Current
Chung-Chuan Hou, Chung Hua University, ROC
Po-Tai Cheng, National Tsing Hua University, ROC

INDUSTRIAL POWER CONVERTER COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM

Napoleon B3

Session 46—Active Power Filters

Session Chair: Pericle Zanchetta, University of Nottingham, UK

Session Organizer: Sebastien Mariethoz, ETHZ Zurich, Switzerland

IAS 46p1 Analysis of Multi-sampled Current Control for Active Filters

L. Corradini, University of Padova, Italy

W. Stefanutti, University of Udine, Italy

P. Mattavelli, University of Padova, Italy

IAS 46p2 A Novel Shunt Active Power Filter Based on Voltage Detection for Harmonic Voltage Mitigation

Y. Z. Huan, The Hong Kong Polytechnic University, PRC

Y. Du, The Hong Kong Polytechnic University, PRC

IAS 46p3 Reference Generation for Shunt Active Power Filters Based on the Optimum Filtering Theory

Rafael Cardoso, Universidade Tecnológica Federal do Paran, Brazil

João Marcos Kaniecki, Universidade Federal de Santa Maria, Brazil

Humberto Pinheiro, Universidade Federal de Santa Maria, Brazil

Hilton Abílio Gründling, Universidade Federal de Santa Maria, Brazil

IAS 46p4 Motor Side Active Filter (MSAF)

C. Attaianesi, University of Cassino, Italy

M. Di Monaco, University of Cassino, Italy

V. Nardi, University of Cassino, Italy

G. Tomasso, University of Cassino, Italy

IAS 46p5 New Control Strategy for Hybrid Power Filters Using Sinusoidal Signal Integrators for Current Reference Generation

L. R. Limongi, Politecnico di Torino, Italy

R. Bojoi, Politecnico di Torino, Italy

G. Griva, Politecnico di Torino, Italy

A. Tenconi, Politecnico di Torino, Italy

IAS 46p6 A Simple Full Digital Adaptive Current Hysteresis Control with Constant Modulation Frequency for Active Power Filters

R. R. Pereira, Federal University of Itajubá, Brazil

C. H. da Silva, Federal University of Itajubá, Brazil

L. E. M. Cavalcanti, Federal University of Itajubá, Brazil

L. E. Borges da Silva, Federal University of Itajubá, Brazil

G. Lambert-Torres, Federal University of Itajubá, Brazil

J. O. P. Pinto, Federal University of Mato Grosso do Sul, Brazil

S. U. Ahn, CPFL Paulista, Brazil

B. K. Bose, University of Tennessee, USA

INDUSTRIAL AUTOMATION & CONTROL COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM

Napoleon C1

Session 47—Intelligent Controls

Session Chair and Organizer: Pericle Zanchetta, University of Nottingham, UK

IAS 47p1 DSP-based Implementation of Fuzzy-PID Controller Using Genetic Optimization for High Performance Motor Drives

Ahmed Rubaai, Howard University, USA

Marcel J. Castro-Sitiriche, Howard University, USA

Abdul Ofoli, Cummins Inc., USA

IAS 47p2 Change in Voltage Distortion Predictions at the PCC Due to Changing Nonlinear Load Current Profile Using Plant Startup Data

J. Mazumdar, Siemens Energy and Automation, USA

R. Harley, Georgia Institute of Technology, USA

F. Lambert, Georgia Institute of Technology, USA

G. K. Venayagamoorthy, University of Missouri–Rolla, USA

IAS 47p3 Optimal Tuning for Linear and Nonlinear Parameters of Power System Stabilizers in Hybrid System Modeling

Seung-Mook Baek, Yonsei University, Korea

Jung-Wook Park, Yonsei University, Korea

Ian A. Hiskens, University of Wisconsin–Madison, USA

IAS 47p4 A Novel Fuzzy Logic Controller based Torque and Flux Controls of IPM Synchronous Motor

M. Muminul Islam Chy, Lakehead University, Canada

M. Nasir Uddin, Lakehead University, Canada

IAS 47p5 Direct Torque Control of a Three Phase Induction Motor using a Hybrid PI/Fuzzy Controller

Hussein F. E. Soliman, Ain Shams University, Egypt

Malik E. Elbuluk, The University of Akron, USA

INDUSTRIAL DRIVES COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM

Napoleon C2

Session 48—Automotive

Session Chair: Mohammad Islam, Delphi Steering, USA

Session Organizer: Tony O'Gorman, Continental Automotive, USA

IAS 48p1 A PM Brushless DC Starter/Generator System for a Series-parallel 2×2 Hybrid Electric Vehicle

S. M. N. Hasan, The University of Akron, USA

I. Husain, The University of Akron, USA

R. J. Veillette, The University of Akron, USA

J. E. Carletta, The University of Akron, USA

IAS 48p2 Active Output Voltage Regulation for an Ironless Axial-flux PM Automotive Alternator with Electromechanical Flux Weakening
F. Giulii Capponi, University of Rome “La Sapienza”, Italy
R. Terrigi, University of Rome “La Sapienza”, Italy
F. Caricchi, University of Rome “La Sapienza”, Italy
L. Del Ferraro, Mc Quay Italia, Italy

IAS 48p3 Design and Control of a Doubly-excited Permanent-magnet Brushless Integrated Starter–Generator for Hybrid Electric Vehicles
Chunhua Liu, The University of Hong Kong, PRC
K. T. Chau, The University of Hong Kong, PRC
J. Z. Jiang, Shanghai University, PRC
Xinhua Liu, Shanghai University, PRC
Zheng Wang, The University of Hong Kong, PRC

IAS 48p4 Multi-operational Modes and Control Strategies of Dual Mechanical Port Machine for Hybrid Electrical Vehicles
Longya Xu, The Ohio State University, USA
Yuan Zhang, The Ohio State University, USA
Xuhui Wen, Chinese Academy of Science, PRC

IAS 48p5 Development and Testing of a Drive System for Electric Vehicles
N. A. Parker-Allotey, University of Cambridge, UK
C. Y. Leong, University of Cambridge, UK
R. McMahon, University of Cambridge, UK
P. R. Palmer, University of Cambridge, UK
A. T. Bryant, University of Warwick, UK
W. Dunford, The University of British Columbia, Canada

IAS 48p6 Automotive Alternator Synchronous Rectification via Self-sensing Method for Improved Vehicle Fuel Consumption
Tony O’Gorman, Continental Automotive, USA
Dennis Stephens, Continental Automotive, USA
Ted Bohn, Argonne National Labs, USA
Richard Carlson, Argonne National Labs, USA

MINING INDUSTRY COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM Napoleon D1

Session 49—High-power Converters and Drives

Session Chair and Organizer: Galina Mirzaeva, University of Newcastle, Australia

IAS 49p1 Reactive Power Compensation of Coal Conveyor Belt Drives by Using D-STATCOMs A. Cetin, TUBITAK Uzay, Turkey
H.F. Bilgin, TUBITAK Uzay, Turkey
A. Acik, TUBITAK Uzay, Turkey
T. Demirci, TUBITAK Uzay, Turkey

K.N. Kose, TUBITAK Uzay, Turkey
A. Terciyanli, TUBITAK Uzay, Turkey
B. Gultekin, TUBITAK Uzay, Turkey
N. Aksoy, TUBITAK Uzay, Turkey
B. Mutluer, TUBITAK Uzay, Turkey
I. Çadirci, Hacettepe University, Turkey; TUBITAK Uzay, Turkey
M. Ermis, Middle East Technical University, Turkey
K. Ongan, Kemerkoym Thermal Power Plant, Turkey
N. Akinci, Kemerkoym Thermal Power Plant, Turkey

IAS 49p2 Up-rating of Electrical Drives in Mining Installations
Jorge Pontt, Universidad Técnica Federico Santa María, Chile
Jose Rodríguez, Universidad Técnica Federico Santa María, Chile
Juan San Martin, Universidad Técnica Federico Santa María, Chile
Ricardo Aguilera, Universidad Técnica Federico Santa María, Chile
Jaime Rebolledo, Universidad Técnica Federico Santa María, Chile
Juan Dixon, Pontificia Universidad Católica de Chile, Chile

IAS 49p3 Short-circuit Detection for Electrolytic Processes Employing Optibar Inter-cell
Bars
Pablo E. Aqueveque, University of Concepcion, Chile
Eduardo P. Wiechmann, University of Concepcion, Chile
Rolando P. Burgos, Virginia Polytechnic Institute and State University, USA

IAS 49p4 A High Performance Drive for the Rotary Coal Breaker Application
G. Mirzaeva, University of Newcastle, Australia
C. Coates, University of Newcastle, Australia

IAS 49p5 Design and Implementation Issues of Active Front End based Systems in Mining
Draglines
Joy Mazumdar, Siemens Energy and Automation, USA
Walter Koellner, Siemens Energy and Automation, USA
Andreas Holweck, Siemens Aktiengesellschaft, Germany

IAS 49p6 Gearless Mill Drive Protection Improvements and Its Behavior at Minera
Escondida Ltda.
Luis Nieto, Minera Escondida Ltda, Chile
Markus Ahrens, ABB Switzerland Ltd., Switzerland

POWER ELECTRONICS DEVICES & COMPONENTS COMMITTEE

Wednesday, 26 September 8:00 AM – 12:00 PM Napoleon D2
Session 50—Magnetics

Session Chair: Charles R. Sullivan, Dartmouth College, USA
Session Organizer: Jean-Pierre Keradec, LEG ENSIEG, France

IAS 50p1 An Electrical Circuit based 3-D Steady State Thermal Model of a Fan cooled 60 Hz, 20 kW 3-phase Plasma Cutting Power Supply Transformer
Girish R. Kamath, Hypertherm, Inc., USA

IAS 50p2 Experimental Investigation of Iron-based Amorphous Metal and 6.5% Silicon Steel for High-current Inductors in Low–Medium Frequency DC–DC Converters
Brendan J. Lyons, University College Cork, Ireland
John G. Hayes, University College Cork, Ireland
Michael G. Egan, University College Cork, Ireland

IAS 50p3 Current Sharing Between Parallel Turns of a Planar Transformer: Prediction and Improvement Using a Circuit Simulation Software
X. Margueron, Institut Polytechnique de Grenoble, France
J-P. Keradec, Institut Polytechnique de Grenoble, France
A. Besri, Institut Polytechnique de Grenoble, France

IAS 50p4 Complete Analytical Calculation of Static Leakage Parameters. Application to HF Transformer Optimization
X. Margueron, Institut Polytechnique de Grenoble, France
J-P. Keradec, Institut Polytechnique de Grenoble, France
A. Besri, Institut Polytechnique de Grenoble, France

IAS 50p5 Analysis of Strap Losses for High Power High Frequency Inductors
Lixiang Wei, Rockwell Automation–Allen Bradley, USA
Richard A. Lukaszewski, Rockwell Automation–Allen Bradley, USA

IAS 50p6 Simulation Model of Common-mode Chokes for High-power Applications
Charles R. Sullivan, Dartmouth College, USA
Annette Muetze, University of Warwick, UK

IAS 50p7 Optimization of the Main Inductor in an LCL Filter for Three Phase Active Rectifier
Lixiang Wei, Rockwell Automation–Allen Bradley, USA
Richard A. Lukaszewski, Rockwell Automation–Allen Bradley, USA

WEDNESDAY AFTERNOON SESSIONS

INDUSTRIAL AUTOMATION & CONTROL COMMITTEE

Wednesday, 26 September 2:00 PM – 6:00 PM Napoleon A1

Session 51—Advanced Controls

Session Chair: Joy Mazundar, Seimens, USA

Session Organizer: A. Skorek, University of Quebec, Canada

IAS 51p1 Transient Modelling and Control of Z-source Current Type Inverter
D. M. Vilathgamuwa, Nanyang Technological University, Singapore
P. C. Loh, Nanyang Technological University, Singapore

M. N. Uddin, Lakehead University, Canada

IAS 51p2 Adaptive Acceleration Control of an AC Power Source-fed Electrodynamics Shaker

L. L. Della Flora, Universidade Federal de Santa Maria, Brazil

H. A. Gründling, Universidade Federal de Santa Maria, Brazil

IAS 51p3 A Model-based Controller for Cascade Multilevel Converter Used as a Shunt Active Filter

Gerardo Escobar, Instituto Potosino de Investigación Científica Tecnológica, Mexico

Andres A. Valdez, Instituto Potosino de Investigación Científica Tecnológica, Mexico

Misael F. Martínez-Montejano, Instituto Potosino de Investigación Científica Tecnológica, Mexico

Victor M. Rodríguez-Zermeño, Instituto Potosino de Investigación Científica Tecnológica, Mexico

IAS 51p4 Development and Implementation of a New Adaptive Intelligent Speed Controller for IPMSM Drive

M. Muminul Islam Chy, Lakehead University, Canada

M. Nasir Uddin, Lakehead University, Canada

IAS 51p5 Self-healing Control with Multifunctional Gate Drive Circuits for Power Converters Peng Xiao, University of Missouri–Rolla, USA

Ganesh K. Venayagamoorthy, University of Missouri–Rolla, USA

Keith A. Corzine, University of Missouri–Rolla, USA

Robert Woodley, 21st Century Systems, Inc., USA

IAS 51p6 Design of Multi-function Monitoring Integrated Device in Power System

Yang Tingfang, Changsha University of Science and Technology, PRC

Zeng Xiangjun, Changsha University of Science and Technology, PRC

Liu Pei, Huazhong University of Science and Technology, PRC

T. O. Ting, The Hong Kong Polytechnic University, PRC

H. R. Cai, The Hong Kong Polytechnic University, PRC

ELECTROSTATIC PROCESSES COMMITTEE

Wednesday, 26 September 2:00 PM – 6:00 PM Napoleon A2

Session 52—Pollution Control, Methods and Devices

Session Chair: Akira Mizuno, Toyohashi University of Technology, Japan

Session Organizer: Shigeru Futamura, AIST Tsukuba, Japan

IAS 52p1 Simultaneous Reduction of Diesel Particulate and NO_x Using Oxygen-poor Nonthermal Plasma Application

Masaaki Okubo, Osaka Prefecture University, Japan

Tomoyuki Kuroki, Osaka Prefecture University, Japan

Keiichiro Yoshida, Japan Science and Technology Agency, Japan

Toshiaki Yamamoto, Musashi Institute of Technology, Japan

IAS 52p2 NO_x Aftertreatment System for Diesel Engine Emission Using Thermal Desorption and Plasma Reduction Combined Process

Keiichiro Yoshida, Japan Science and Technology Agency, Japan

Adrian Mihalcioiu, Japan Science and Technology Agency, Japan

Masaaki Okubo, Osaka Prefecture University, Japan

Tomoyuki Kuroki, Osaka Prefecture University, Japan

Toshiaki Yamamoto, Musashi Institute of Technology, Japan

IAS 52p3 Design Factors for NO_x Reduction in Nitrogen Plasma

Adrian Mihalcioiu, Japan Science and Technology Agency, Japan

Keiichiro Yoshida, Japan Science and Technology Agency, Japan

Masaaki Okubo, Osaka Prefecture University, Japan

Tomoyuki Kuroki, Osaka Prefecture University, Japan

Toshiaki Yamamoto, Musashi Institute of Technology, Japan

IAS 52p4 Adsorption and Plasma Decomposition of Gaseous Acetaldehyde on Fibrous Activated Carbon

Takayuki Ohshima, Gunma University, Japan

Tomomi Kondo, Gunma University, Japan

Masayuki Sato, Gunma University, Japan

Nobuyoshi Kitajim, Textile Research Institute of Gunma, Japan

IAS 52p5 Application of Micro Plasma for NO_x Removal

Kazuo Shimizu, Shizuoka University, Japan

Takeki Sugiyama, Shizuoka University, Japan

Manisha Nishamani, Shizuoka University, Japan

Masaki Kanamori, Shizuoka University, Japan

IAS 52p6 Pulsed Plasma Treatment for NO_x Reduction from Filtered/Unfiltered Stationary Diesel Engine Exhaust

A. D. Srinivasan, S. J.College of Engineering, India

B. S. Rajanikanth, Indian Institute of Science–Bangalore, India

IAS 52p7 High Voltage Power Supply for Ozone Generation Based on Piezoelectric Transformer

J. M. Alonso, Universidad de Oviedo, Spain

C. Ordíz, Universidad de Oviedo, Spain

M. A. Dalla Costa, Universidad de Oviedo, Spain

J. Ribas, Universidad de Oviedo, Spain

J. Cardesín, Universidad de Oviedo, Spain

ELECTRIC MACHINES COMMITTEE

Wednesday, 26 September 2:00 PM – 6:00 PM

Napoleon B1

Session 54—Faults and Diagnostics I

Session Chair: Gerard Capolino, University of Picardie Jules Verne, France

Session Organizer: Alberto Bellini, University of Modena, Italy

IAS 54p1 An Accurate Model by Using the Legendre Polynomial Functions of a Dual Stator Induction Machine Dedicated to the Static Eccentricity Diagnosis

R.N. Andriamalala, Université Henri Poincaré, France

H. Razik, Université Henri Poincaré, France

G. Didier, Université Henri Poincaré, France

M. B. R. Corrêa, Institut national polytechnique de Lorraine, France

F. M. Sargos, Universidade Federal da Paraíba, Brazil

IAS 54p2 Diagnosis of Broken Bar Fault in Induction Machines using Discrete Wavelet Transform without Slip Estimation

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

IAS 54p3 Detection and Classification of Stator Turn Faults and High Resistance Electrical Connections for Induction Machines

Jangho Yun, Korea University, Korea

Kwanghwan Lee, Korea University, Korea

Kwangwoon Lee, Korea University, Korea

Sang Bin Lee, Korea University, Korea

Jiyeon Yoo, Korea University, Korea

IAS 54p4 An Analytical Comparison between DWT and Hilbert–Huang-based Methods for the Diagnosis of Rotor Asymmetries in Induction Machines

J. A. Antonino-Daviu, Polytechnic University of Valencia, Spain

M. Riera-Guasp, Polytechnic University of Valencia, Spain

J. Roger-Folch, Polytechnic University of Valencia, Spain

R. B. Pérez, University of Tennessee, USA

IAS 54p5 Neutral Voltage Analysis for Broken Rotor Bars Detection in Induction Motors Using Hilbert Transform Phase

M.E.K.Oumaamar, Université Mentouri-Constantine, Algérie

A. Khezzar, Université Mentouri-Constantine, Algérie

M. Boucherma, Université Mentouri-Constantine, Algérie

H. Razik, Université Henri Poincaré, France

R.N. Andriamalala, Université Henri Poincaré, France

L. Baghli, Université Henri Poincaré, France

IAS 54p6 Stator Inter-turn Fault Detection of Doubly-fed Induction Generators Using Rotor Current and Search Coil Voltage Signature Analysis

Dhaval Shah, University of Victoria, Canada

Subhasis Nandi, University of Victoria, Canada

Prabhakar Neti, University of Manitoba, Canada

INDUSTRIAL POWER CONVERTER COMMITTEE

Wednesday, 26 September 2:00 PM – 6:00 PM

Napoleon B3

Session 55—PWM and Control Techniques

Session Chair: Sebastien Mariethoz, ETHZ Zurich, Switzerland

Session Organizer: Yen-Shin Lai, National Taipei University of Technology, Taiwan

IAS 55p1 Design and Analysis of a Chaotic PWM Inverter for Electric Vehicles

Zheng Wang, The University of Hong Kong, PRC

K. T. Chau, The University of Hong Kong, PRC

IAS 55p2 New Direct Power Control Strategies of Three-phase VSIs for the Minimization of Common-mode Emissions in Distributed Generation Systems

Maurizio Cirrincione, Université de Technologie de Belfort-Montbéliard, France

Marcello Pucci, Institute on Intelligent Systems for the Automation, Italy

Gianpaolo Vitale, Institute on Intelligent Systems for the Automation, Italy

IAS 55p3 Analytical Determination of the Capacitor Voltage Balancing Dynamics for Three Phase Flying Capacitor Converters

B. P. McGrath, Monash University, Australia

D. G. Holmes, Monash University, Australia

IAS 55p4 A Comparison of High Power Multi-leg Voltage Fed Converters Modulated by Space Vector and Geometric Approach

I. W. Jaskulski, Universidade Federal de Santa Maria, Brazil

I. J. Gabe, Universidade Federal de Santa Maria, Brazil

J. P. da Costa, Universidade Federal de Santa Maria, Brazil

M. Stefanello, Universidade Federal de Santa Maria, Brazil

H. Pinheiro, Universidade Federal de Santa Maria, Brazil

INDUSTRIAL POWER CONVERTER COMMITTEE

Wednesday, 26 September 2:00 PM – 6:00 PM

Napoleon C1

Session 56—DC/DC Converters

Session Chair: Ray-Lee Lin, National Cheng Kung University, Taiwan

Session Organizer: William A. Peterson, E & M Power, USA

IAS 56p1 ZVZCS Full Bridge DC–DC Converter with Reduced Circulating Loss and Filter Requirement

Yu Ma, Zhejiang University, PRC

Xinke Wu, Zhejiang University, PRC

Junming Zhang, Zhejiang University, PRC

Zhaoming Qian, Zhejiang University, PRC

IAS 56p2 Layout Considerations and Thermal Analysis of a 1.8 MHz Resonant VRM

G. Spiazzi, University of Padova, Italy

L. Rossetto, University of Padova, Italy

P. Mattavelli, University of Padova, Italy

P. Cova, University of Parma, Italy

N. Delmonte, University of Parma, Italy

IAS 56p3 Implementation of a Non-isolated Three Level DC/DC Converter Suitable for High Power Systems

Robert M. Cuzner, DRS Power and Control Technologies, USA

Ashish R. Bendre, DRS Power and Control Technologies, USA

Peter J. Faill, DRS Power Systems, USA

Boris Semenov, DRS Power Systems, USA

IAS 56p4 HBCS Converter: A Bidirectional DC/DC Converter for Optimal Power Flow Regulation in Supercapacitor Applications

F. Giulii Capponi, University of Roma "La Sapienza", Italy

P. Santoro, University of Roma "La Sapienza", Italy

E. Crescenzi, University of Roma "La Sapienza", Italy

IAS 56p5 Conditions Limiting the Formation of the ZVZCT Switching in SAZZ Converter

Yukinori Tsuruta, Yokohama National University, Japan

Martin Pavlovský, Yokohama National University, Japan

Atsuo Kawamura, Yokohama National University, Japan

IAS 56p6 High-power Three-port Three-phase Bidirectional DC–DC Converter

Haimin Tao, Eindhoven University of Technology, The Netherlands

Jorge L. Duarte, Eindhoven University of Technology, The Netherlands

Marcel A. M. Hendrix, Eindhoven University of Technology, The Netherlands

INDUSTRIAL DRIVES COMMITTEE

Wednesday, 26 September 2:00 PM – 6:00 PM Napoleon C2

Session 57—Drives II

Session Chair: Fernando Briz Del Blanco, University of Oviedo, Spain

Session Organizer: Ashwin Khambadkone, National University Singapore, Singapore

IAS 57p1 Temperature Estimation in Inverter Fed Machines Using High Frequency Carrier Signal Injection

Fernando Briz, University of Oviedo, Spain

Michael W. Degner, Ford Motor Company, USA

Juan M. Guerrero, University of Oviedo, Spain

Alberto B. Diez, University of Oviedo, Spain

IAS 57p2 Dead-time Voltage Error Correction with Parallel Disturbance Observers for High Performance V/f Control

Tetsuma Hoshino, Nagaoka University of Technology, Japan

Jun-ichi Itoh, Nagaoka University of Technology, Japan

Takayuki Kaneko, Fuji Electric Advanced Technology Co., Ltd., Japan

IAS 57p3 Control Issues of High Pole Count Machines at High Speed Operation

Jung-Sik Yim, Seoul National University, Korea

Seung-Ki Sul, Seoul National University, Korea
Bon-Ho Bae, General Motors Co., Ltd.
Nitin Patel, General Motors Co., Ltd.
Silva Hiti, General Motors Co., Ltd.

IAS 57p4 Parameter Sensitivity Issues in Natural Field Orientation
G. Mirzaeva, University of Newcastle, Australia
R. E. Betz, University of Newcastle, Australia

IAS 57p5 Current Measurement Gain Tuning Using High Frequency Signal Injection
Michael C. Harke, Hamilton Sundstrand, USA
Juan M. Guerrero, University of Oviedo, Spain
Michael W. Degner, Ford Motor Company, USA
Fernando Briz, University of Oviedo, Spain
Robert D. Lorenz, University of Wisconsin–Madison, USA

IAS 57p6 Discrete-time Domain Modeling and Design for AC Machine Current Regulation
Kum-Kang Huh, University of Wisconsin–Madison, USA
Robert D. Lorenz, University of Wisconsin–Madison, USA

MINING INDUSTRY COMMITTEE

Wednesday, 26 September 2:00 PM – 6:00 PM Napoleon D1

Session 58—Instrumentation and Control

Session Chair and Organizer: John Sammarco, NIOSH, USA

IAS 58p1 Measurement of Cathodic Currents in Equipotential Inter-cell Bars for Copper
Electrowinning and Electrorefining Plants
Eduardo P. Wiechmann, University of Concepcion, Chile
Aníbal S. Morales, University of Concepcion, Chile
Pablo E. Aqueveque, University of Concepcion, Chile
Rolando P. Burgos, Virginia Polytechnic Institute and State University, USA

IAS 58p2 Measuring Methods of Ground Capacitance for Distribution Systems
Xiangjun Zeng, Changsha University of Science and Technology, PRC
Yao Xu, Changsha University of Science and Technology, PRC
Zhanglei Liu, Changsha University of Science and Technology, PRC
Hongjiang Ma, Changsha University of Science and Technology, PRC

IAS 58p3 Underground Coal Mine Communications and Tracking Status
Roy S. Nutter Jr., West Virginia University, USA

IAS 58p4 Visual Performance for Incandescent and Solid-state Cap Lamps in an
Underground Mining Environment
John J. Sammarco, National Institute for Occupational Safety and Health, USA
Timothy Lutz, National Institute for Occupational Safety and Health, USA

IAS 58p5 Remote Vision System for Dozers on Coal Stockpiles
William H. Schiffbauer, National Institute for Occupational Safety and Health, USA
Michael R. Yenchek, National Institute for Occupational Safety and Health, USA
Timothy Lutz, National Institute for Occupational Safety and Health, USA

IAS 58p6 Radar Level Sensor for Longwall Creep and Retreat Measurement
C. O. Hargrave, Queensland Centre for Advanced Technologies, Australia
N. V. Shuley, The University of Queensland, Australia
J. C. Ralston, Queensland Centre for Advanced Technologies, Australia
D. W. Hainsworth, Queensland Centre for Advanced Technologies, Australia

POWER SYSTEM ENGINEERING COMMITTEE

Wednesday, 26 September 2:00 PM – 6:00 PM Napoleon D2

Session 59—Power Systems Engineering / MOS

Session Chair: Susan C. Kozemko, Westinghouse Savannah River Co., USA

Session Organizer: Peter Sutherland, General Electric, USA

IAS 59p1 Relevance of Competence in Risk Reduction for Electrical Safety
Giuseppe Parise, University of Rome “La Sapienza”, Italy
Robert E. Nabours, R.E. Nabours Consulting, USA
Bruce McClung, Electrical Consulting LLC, USA

IAS 59p2 Simplified Arc-flash Hazard Analysis Using Energy Boundary Curves
Antony C. Parsons, Schneider Electric Engineering Services, USA
W. Blane Leuschner, Schneider Electric Engineering Services, USA
Kevin X. Jiang, Schneider Electric Engineering Services, USA

IAS 59p3 Safety and Risk Analysis of Standard Protective Measures against Electric Shock
Massimo Mitolo, Chu & Gassman, USA

IAS 59p4 Impact of Arc Flash Hazards on Medium Voltage Switchgear
K. R. Shah, Shah & Associates, Inc., USA
A. Cinsavich, Shah & Associates, Inc., USA
P. De Silva, Shah & Associates, Inc., USA

IAS 59p5 Arc Flash and Coordination Study Conflict in an Older Industrial Plant
Peter E. Sutherland, GE Energy Services, USA

THURSDAY MORNING SESSIONS

INDUSTRIAL DRIVES COMMITTEE

Thursday, 27 September 8:00 AM – 12:00 PM Napoleon A1

Session 60—PM Drives II

Session Chair: Mark Sumner, University of Nottingham, UK

Session Organizer: Z.Q. Zhu, University of Sheffield, UK

IAS 60p1 Design of PM Brushless Motor Taking into Account Tolerances of Mass Production—Six Sigma Design Method

G. Ombach, Siemens AG, Germany

J. Junak, Siemens AG, Germany

IAS 60p2 Acoustic Noise of Switched Reluctance and Permanent Magnet Motors: A Comparison in the Context of Electric Brakes

Avoki M. Omekanda, Delphi Powertrain Systems, USA

Suresh Gopalakrishnan, affiliation not cited

Harald Klode, affiliation not cited

IAS 60p3 Optimum Current Control in the Field Weakened Region for Permanent Magnet AC Machines

Gabriel Gallegos-López, General Motors Corporation, USA

Silva Hiti, General Motors Corporation, USA

IAS 60p4 Operating Area Analysis of Direct and Geared Brushless-DC Motor Drives for Electric Bicycles

Ewgenij Starschich, RWTH Aachen, Germany

Annette Muetze, University of Wisconsin–Madison, USA

IAS 60p5 Performance Analysis of a Surface Mounted Permanent Magnet Brushless DC Motor using an Improved Phase Variable Model

Jiaxin Chen, Donghua University, PRC

Youguang Guo, University of Technology, Australia

Jianguo Zhu, University of Technology, Australia

Jianxun Jin, University of Electronic Science and Technology of China, PRC

IAS 60p6 Design and Control of an Axial Flux Machine for a wide Flux-weakening Operation Region

Tae-Suk Kwon, Seoul National University, Korea

Seung-Ki Sul, Seoul National University, Korea

Luigi Alberti, University of Padova, Italy

Nicola Bianchi, University of Padova, Italy

ELECTROSTATIC PROCESSES COMMITTEE

Thursday, 27 September 8:00 AM – 12:00 PM Napoleon A2

Session 61—Electrostatic Hazards

Session Chair: William D. Greason, University of Western Ontario, Canada

Session Organizer: Lucian Dascalescu, University of Poitiers, France

IAS 61p1 Standards for Industrial Electrostatic Processes

Charles G. Noll, XiPro Technologies LLC, USA

IAS 61p2 Effect of Charge Injection due to ESD on the Operation of MEMS
William D. Greason, The University of Western Ontario, Canada

IAS 61p3 Dependency of the Transferred Charge of Provoked Discharges from Insulated Surfaces on Temperature and Humidity
Ulrich von Pidoll, Physikalisch-Technische Bundesanstalt, Germany

IAS 61p4 Relation between Extension of a Filamentary Channel from a Water Droplet Placed on a Hydrophobic Sheet under AC Field and Flashover via the Droplet
Yoshio Higashiyama, Yamagata University, Japan
M. Kosano, Yamagata University, Japan

ELECTRIC MACHINES COMMITTEE

Thursday, 27 September 8:00 AM – 12:00 PM Napoleon B1
Session 63—Reluctance Machines

Session Chair: Philippe Wendling, Magsoft, USA
Session Organizer: Avoki Omekanda, Delphi, USA

IAS 63p1 Noise Reduction Using Piezoelectric Active Control on High Speeds Switched Reluctance Drives
X. Ojeda, Ecole Normale Supérieure de Cachan, France
M. Gabsi, Ecole Normale Supérieure de Cachan, France
M. Lecrivain, Ecole Normale Supérieure de Cachan, France
X. Mininger, Ecole Supérieur d'Electricité, France

IAS 63p2 Novel Two-phase Switched Reluctance Machine using Common-pole E-core Structure: Concept, Analysis, and Experimental Verification
Cheewoo Lee, Virginia Polytechnic Institute and State University, USA
R. Krishnan, Virginia Polytechnic Institute and State University, USA
N. S. Lobo, Virginia Polytechnic Institute and State University, USA

IAS 63p3 Novel Two-switch based Switched Reluctance Motor Drive for Low-cost Applications
Jaehyuck Kim, Virginia Polytechnic Institute and State University, USA
R. Krishnan, Virginia Polytechnic Institute and State University, USA

IAS 63p4 Novel Measurement Disturbance Rejection Current Control for Linear Switched Reluctance Motor Drives
H. S. Lim, Virginia Polytechnic Institute and State University, USA
R. Krishnan, Virginia Polytechnic Institute and State University, USA

IAS 63p5 An Improved Strategy to Detect Stator Inter-turn Faults in Reluctance Synchronous Machines Using Both Negative Sequence Quantities and Stored Magnetic Energy After Supply Disconnection
Prabhakar Neti, University of Manitoba, Canada

Subhasis Nandi, University of Victoria, Canada

IAS 63p6 Design of Permanent Magnet-assisted Synchronous Reluctance Motors Made Easy

Salman Talebi, Texas A&M University, USA

Peyman Niazi, Seagate Technology, USA

Hamid A. Toliyat, Texas A&M University, USA

ELECTRIC MACHINES COMMITTEE

Thursday, 27 September 8:00 AM – 12:00 PM Napoleon B2

Session 64—Faults and Diagnostics II

Session Chair: Ernesto Wiedenburger, Baker Instrument, USA

Session Organizer: Subhasis Nandi, University of Victoria, Canada

IAS 64p1 Quad Demodulation: A Time Domain Diagnostic Method for Induction Machines

Alberto Bellini, University of Modena, Italy

Reggio Emilia, University of Modena, Italy

IAS 64p2 Broken Rotor Bar Detection in Line-fed Induction Machines Using Complex Wavelet Analysis of Startup Transients

Fernando Briz, University of Oviedo, Spain

Michael W. Degner, Ford Motor Company, USA

Pablo García, University of Oviedo, Spain

David Bragado, University of Oviedo, Spain

IAS 64p3 Diagnosis of Inter-turn Short Circuit for a Polyphase Induction Motor in Closed-loop Vector-controlled Drives

Ahmed Sayed-Ahmed, Marquette University, USA

Gennadi Y. Sizov, Marquette University, USA

Nabeel A. O. Demerdash, Marquette University, USA

IAS 64p4 Medium–Large Induction Machines Starting Currents: Scaling Accuracy & Saturation Uncertainties

Waqas M. Arshad, ABB Corporate Research, Sweden

Sami Kanerva, ABB Oy, Finland

Silvia Bono, ABB SACE, Italy

Massimo Menescardi, ABB SACE, Italy

Holger Persson, ABB Automation, Sweden

IAS 64p5 An Improvement of Stator Current based Detection of Bearing Fault in Induction Motors

Liling Sun, North China Electric Power University, PRC

Boqiang Xu, North China Electric Power University, PRC

INDUSTRIAL POWER CONVERTER COMMITTEE

Thursday, 27 September 8:00 AM – 12:00 PM Napoleon B3

Session 65—Design, Modeling and Analysis of Power Converters

Session Chair: Po-Tai Cheng, National Tsing Hua University, Taiwan

Session Organizer: Kevin Lee, Eaton Corporation, USA

IAS 65p1 New EMI Filter Design Method for Single Phase Power Converter using Software-based Noise Separation Method

Po-Shen Chen, National Taipei University of Technology, ROC

Yen-Shin Lai, National Taipei University of Technology, ROC

IAS 65p2 ESR Estimation Method for DC/DC Converters Through Simplified Regression Models

G. M. Buiatti, Alstom Transport, France

A. M. R. Amaral, Polytechnic Institute of Coimbra, Portugal

A. J. M. Cardoso, Polytechnic Institute of Coimbra, Portugal

IAS 65p3 Heavy Load Simulation Model of Flyback Switching DC–DC Converters and Its Application for Reliability Improvement

Jiaxin Chen, Donghua University, PRC

Youguang Guo, University of Technology, Australia

Jianguo Zhu, University of Technology, Australia

Jianxun Jin, University of Electronic Science and Technology of China, PRC

IAS 65p4 High Power Energy Feedback AC Electronic Load and Its Application in Power System Dynamic Physical Simulation

Jian-feng Zhao, Southeast University, PRC

Shi-feng Pan, Southeast University, PRC

Xun Wang, Southeast University, PRC

IAS 65p5 Component-minimized Buck-boost Voltage Source Inverters

F. Gao, Nanyang Technological University, Singapore

P. C. Loh, Nanyang Technological University, Singapore

F. Blaabjerg, Aalborg University, Denmark

R. Teodorescu, Aalborg University, Denmark

D. M. Vilathgamuwa, Nanyang Technological University, Singapore

IAS 65p6 Iron Core Saturation of a Welding Transformer in a Medium Frequency Resistance Spot Welding System caused by the Asymmetric Output Rectifier Characteristics

Beno Klopčič, Indramat elektromotorji d.o.o., Slovenia

Gorazd Štumberger, University of Maribor, Slovenia

Drago Dolinar, University of Maribor, Slovenia

INDUSTRIAL POWER CONVERTER COMMITTEE

Thursday, 27 September 8:00 AM – 12:00 PM Napoleon C1

Session 66—Control of Power Converters

Session Chair: Michael Newman, General Atomics, USA
Session Organizer: Pericle Zanchetta, University of Nottingham, UK

IAS 66p1 A New Adjustable-speed Drives (ASD) System Based on High-performance Z-source Inverter

Xinping Ding, Zhejiang University, PRC
Zhaoming Qian, Zhejiang University, PRC
Shuitao Yang, Zhejiang University, PRC
Bin Cui, Zhejiang University, PRC
Fangzheng Peng, Zhejiang University, PRC

IAS 66p2 Hybrid One-cycle Controller for Boost PFC Rectifier
Aluisio A. M. Bento, Universidade Federal de Campina Grande, Brazil
Edison R. C. da Silva, Universidade Federal de Campina Grande, Brazil

IAS 66p3 Multi-rate Repetitive Controller for UPS Applications
Márcio Stefanello, Universidade Federal de Santa Maria, Brazil
Humberto Pinheiro, Universidade Federal de Santa Maria, Brazil
Hilton Abílio Gründling, Universidade Federal de Santa Maria, Brazil

IAS 66p4 A Novel Nine-switch Inverter for Independent Control Two Three-phase Loads
Tsutomu Kominami, Yokohama National University, Japan
Yasutaka Fujimoto, Yokohama National University, Japan

IAS 66p5 New Self-commissioning Digital Power Converter with Peak Current Mode Control and Leading Edge Modulation using Low Sampling Frequency A/D Converter
Yen-Shin Lai, National Taipei University of Technology, ROC
Chia-An Yeh, National Taipei University of Technology, ROC
Ye-Then Chang, National Taipei University of Technology, ROC
Ko-Yen Lee, National Taipei University of Technology, ROC

INDUSTRIAL DRIVES COMMITTEE

Thursday, 27 September 8:00 AM – 12:00 PM Napoleon C2

Session 67—Sensorless Drives II

Session Chair: Fabio Giulii Capponi, University of Rome "Sapienza", Italy
Session Organizer: Giuseppe Scarcella, University of Catania, Italy

IAS 67p1 Improved Rotor Position Estimation by Signal Injection in Brushless AC Motors, Accounting for Cross-coupling Magnetic Saturation

Y. Li, University of Sheffield, UK
Z. Q. Zhu, University of Sheffield, UK
D. Howe, University of Sheffield, UK
C. M. Bingham, University of Sheffield, UK
D. Stone, University of Sheffield, UK

IAS 67p2 Pulsating Signal Injection-based Sensorless Control of PMSM Using Injection Axis Switching Scheme without Additional Offline Commissioning Test
Chan-Hee Choi, Yeungnam University, Korea
Jul-Ki Seok, Yeungnam University, Korea

IAS 67p3 Sensorless PMSM Drive with DC-link Current Measurement
Antti Piippo, Helsinki University of Technology, Finland
Kalle Suomela, ABB Oy, Finland
Marko Hinkkanen, Helsinki University of Technology, Finland
Jorma Luomi, Helsinki University of Technology, Finland

IAS 67p4 Influence of Machine Topology and Cross-coupling Magnetic Saturation on Rotor Position Estimation Accuracy in Extended Back-EMF based Sensorless PM Brushless AC Drives
Z. Q. Zhu, University of Sheffield, UK
Y. Li, University of Sheffield, UK
D. Howe, University of Sheffield, UK
C. M. Bingham, University of Sheffield, UK
D. Stone, University of Sheffield, UK

IAS 67p5 Expanding the Operating Speed Range of Model-based Sensorless Control for IPMSMs
Yukinori Inoue, Osaka Prefecture University, Japan
Koji Yamada, Osaka Prefecture University, Japan
Shigeo Morimoto, Osaka Prefecture University, Japan
Masayuki Sanada, Osaka Prefecture University, Japan

IAS 67p6 SPMSM Design Considerations for Initial Position and Magnet Polarity Estimation using Carrier Signal Injection
Kan Akatsu, Tokyo University of Agriculture and Technology, Japan
Michael C. Harke, Hamilton Sundstrand, USA
Robert D. Lorenz, University of Wisconsin–Madison, USA

IAS 67p7 Measurement and Adaptive Decoupling of Cross-saturation Effects and Secondary Saliencies in Sensorless-controlled IPM Synchronous Machines
David Reigosa, University of Oviedo, Spain
Pablo García, University of Oviedo, Spain
Dejan Raca, Magnetek Inc., USA
Fernando Briz, University of Oviedo, Spain
Robert D. Lorenz, University of Wisconsin–Madison, USA

POWER SYSTEM ENGINEERING COMMITTEE

Thursday, 27 September 8:00 AM – 12:00 PM Napoleon D2
Session 68—Power System Analysis / Power Quality
Session Chair: Chris Melhorn, EPRI, USA
Session Organizer: Peter Sutherland, General Electric, USA

IAS 68p1 All-electric LNG Liquefaction Plants—Technical Challenges and Possible Concept Solutions

Ambra Sannino, ABB, Sweden

Lars Liljestrand, ABB, Sweden

Bengt Rothman, ABB, Sweden

Tom Nestli, Nescon AS, Norway

Martin Kjäll-Ohlsson, ABB, Norway

Per-Erik Holsten, ABB, Norway

IAS 68p2 An Adaptive Control System for a dc Microgrid for Data Centers

Daniel Salomonsson, Royal Institute of Technology, Sweden

Lennart Söder, Royal Institute of Technology, Sweden

Ambra Sannino, ABB, Sweden

IAS 68p3 Hardware-in-the-Loop Simulation Software for Regulator Tests and Optimization

Antoine Béguin, Ecole Polytechnique Fédérale de Lausanne, Switzerland

Philippe Allenbach, Ecole Polytechnique Fédérale de Lausanne, Switzerland

Stefan Keller, Ecole Polytechnique Fédérale de Lausanne, Switzerland

Sven Brausewetter, Voith Siemens Hydro Power Generation GmbH & Co. KG, Germany

Jiri Koutnik, Voith Siemens Hydro Power Generation GmbH & Co. KG, Germany

IAS 68p4 Torsional Resonance Risk Management in Islanded Industrial Power Systems Supplying Large VFDs

K. S. Smith, Mott MacDonald, UK

L. Ran, University of Durham, UK

POWER SYSTEM ENGINEERING COMMITTEE

Thursday, 27 September 8:00 A.M. – 10:00 A.M. Napoleon A3

Session 69 – Power System Engineering Panel Session

Session Chair and Organizer: Robert Nabours, Nabours Consulting, USA

Factors Affecting the Consulting Electro-Forensic Engineer in Private Practice

Robert Nabours, Nabours Consulting, USA

Bruce McClung, Mc2Electrical Consulting LLC, USA

Erling Hesla, Consultant, USA

Factors Affecting the Consulting Electro-Forensic Engineer in Corporate Practice

Mike Hittel, General Motors, USA

David Mills, Bechtel Savannah River Inc., USA

Giuseppe Parise, University of Rome, Italy

Future of Electro-Forensic Working Group

Robert Nabours, Nabours Consulting, USA

Erling Hesla, Consultant, USA