2010 14th Biennial IEEE Conference on Electromagnetic Field Computation

(CEFC 2010)

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Technical Program

Opening Session — Monday

Speakers: Professor O. A. Mohammed, CEFC International Steering Committee Chair

Professor A. A. Arkadan, CEFC 2010 General Chairman

Rosemont Ballroom — 8:00-8:15 AM

Plenary Session — Monday

Session Chairs: Professor O. A. Mohammed, Florida International University, USA
Professor A. A. Arkadan, Marquette University, USA

Title: Numerical Computation Can Save Life: FEM Simulations for the Development of Artificial Hearts

Speaker: Professor Kay Hameyer, Institute of Electrical Machines, RWTH Aachen University, Germany
CEFC2010-1880

Rosemont Ballroom — 8:15-9:00 AM

Oral Session 1 — Monday

Bioelectric Field Computation

Session Chairs: Prof. Charles Choi, National Chiao Tung University, Taiwan, ROC
Dr. Zsolt Badics, Rhythmia Medical, Inc., USA

Rosement AB Ballroom — 9:15-10:15 AM

1 **Numerical Analysis for Intra-Body Communication**

Charles Choi, National Chiao Tung University, Taiwan
Shu Hai Sun, National Chiao Tung University, Taiwan
CEFC2010-1174

2 **EEG Inverse Problem Solution Using a Selection Procedure On a High Number of Electrodes with Minimal Influence of Conductivity**

Bertrand Russel Yitembe, Ghent University, Belgium
Guillaume Crevecoeur, Ghent University, Belgium
Roger VanKeer, Ghent University, Belgium
Luc Dupre, Ghent University, Belgium
CEFC2010-1276

3 **Field Model of Electrical Activity of the Brain During the Hand Movement: A Source Identification Problem**

Paolo Di Barba, University of Pavia, Italy
Fabio Freschi, Politecnico di Torino, Italy
Maria Evelina Mognaschi, University of Pavia, Italy
Anna Pichiecchio, I.R.C.C.S. Neurological Institute, Italy
Maurizio Repetto, Politecnico di Torino, Italy
Antonio Savini, University of Pavia, Italy
Angela Vultaggio, I.R.C.C.S. Neurological Institute, Italy

CEFC2010-1472

4 **Domain Decomposition for Computing Extremely Low Frequency Induced Current in the Human Body**

Riccardo Scorretti, Universite Lyon, France
Ronan Perrussel, Ecole Centrale de Lyon, France
Damien Voyer, Ecole Centrale de Lyon, France
Noel Burais, Universite Lyon, France
Laurent Nicolas, Ecole Centrale de Lyon, France
CEFC2010-1501

Oral Session 2 — Monday

Wave Propagation

Session Chairs: Prof. Atef Elsherbeni, The University of Mississippi, USA
Prof. Andrew Peterson, Georgia Institute of Technology, USA

Rosement CD Ballroom — 9:15-10:15 AM

5 **Evolutional Design of Small Antennas for Passive UHF-band RFID**

Hidetoshi Makimura, Hokkaido University, Japan
Yuta Watanabe, Hokkaido University, Japan
Kota Watanabe, Hokkaido University, Japan
Hajime Igarashi, Hokkaido University, Japan
CEFC2010-1378

6 **3D Full-Maxwell Simulations of Very Fast Transients in GIS**

Jasmin Smajic, ABB Corporate Research Ltd., Switzerland
Walter Holaus, ABB Switzerland Ltd., Switzerland
Jadran Kostovic, ABB Switzerland Ltd., Switzerland
Uwe Riechert, ABB Switzerland Ltd., Switzerland
CEFC2010-1581

7 **Higher Order Basis Based Integral Equation Solver with Automatic Goal Oriented Optimization**

Daniel Garc, University Carlos III of Madrid, Spain
Zhang Yu, Syracuse University, USA
Zhao Weixin, Syracuse University, USA
Tapan K.Sarkar, Syracuse University, USA
Luis-Emilio Garcia-Castillo, University Carlos III of Madrid, Spain
Magdalena Salazar-Palma, University Carlos III of Madrid, Spain
CEFC2010-1657

8 **The Relay Effect on Wireless Power Transfer Using Witricity**

Fei Zhang, University of Pittsburgh, USA
Steven Hackworth, University of Pittsburgh, USA
Weinong Fu, The Hong Kong Polytechnic University, Hong Kong

Mingui Sun, University of Pittsburgh, USA

CEFC2010-1747

Coffee Break

Entry Level Foyer — 10:15-10:45 AM

Poster Session 1 — Monday

Coupled Problems 1

Session Chair: Prof. Yoshihiro Kawase, Gifu University, Japan

United A/B and L.A.X A/B — 10:45 AM-12:15 PM

9 **An Extension of PEEC Method for Magnetic Materials Modeling in Frequency Domain**

Ivana Kovacevic, ETH Zurich, Switzerland

Andreas Muesing, ETH Zurich, Switzerland

Johann W. Kolar, ETH Zurich, Switzerland

CEFC2010-1101

10 **Thermal Analysis of an Interior Permanent Magnet Synchronous Motor for Electric Scooters**

Jae-Bum Park, Hanyang University, Korea

Sang-Hwan Ham, Hanyang University, Korea

Jong-Bin IM, Hanyang University, Korea

Joong-Woo Lee, Hanyang University, Korea

Ju Lee, Hanyang University, Korea

CEFC2010-1125

11 **Fully Coupled Finite Element Modeling for Accurate Prediction of Breakdown Voltage in Air at Atmospheric Pressure**

Nam-Kyung Kim, Kyungpook University, Korea

Se-Hee Lee, Kyungpook University, Korea

G. E. Georghiou, University of Cyprus, Cyprus

Sunghwan Lim, Kyungpook University, Korea

Dong-Hun Kim, Kyungpook University, Korea

CEFC2010-1148

12 **Analysis of the Saturated Electromagnetic Devices Under DC Bias Condition by the Modified Harmonic Balance Finite Element Method**

Xiaojun Zhao, North China Electric Power University, China

Junwei Lu, Griffith University, Australia

Lin Li, North China Electric Power University, China

Zhiguang Cheng, North China Electric Power University, China

Tiebing Lu, North China Electric Power University, China

CEFC2010-1231

13 **Interaction Body Force Density in Soft Magnetic Materials with External Fields**

19 **Modeling of Rotary Machines Using Finite-Element Method of Transient Magnetic Field Computation**

H. L. Li, The Hong Kong Polytechnic University, Hong Kong

S. L. Ho, The Hong Kong Polytechnic University, Hong Kong

W. N. Fu, The Hong Kong Polytechnic University, Hong Kong

CEFC2010-1548

20 **Dynamic Analysis of Axial-Type Magnetic Gear Employing 3-D FEM**

Niguchi Noboru, Osaka University, Japan

Hirata Katsuhiro, Osaka University, Japan

Muramatsu Masari, Osaka University, Japan

Hayakawa Yuichi, Osaka University, Japan

CEFC2010-1557

Poster Session 2 — Monday

Devices and Applications 1

Session Chair: Dr. Jasmin Smajic, ABB Corporate Research Ltd., Switzerland

United A/B and L.A.X A/B — 10:45 AM-12:15 PM

21 **Investigation of Magnetic Coupling of Phases in a Novel Transverse Flux Machine by Consideration of Self- and Mutual- Inductance**

Qian Wang, Harbin Institute of Technology, China

Jibin Zou, Harbin Institute of Technology, China

Xinghe Fu, Harbin Institute of Technology, China

Xintong Jiang, Harbin Institute of Technology, China

CEFC2010-1035

22 **Equivalent Circuit Modeling of Induction Motors Considering Stray Load Loss and Harmonic Torques Using Finite Element Method**

Katsumi Yamazaki, Chiba Institute of Technology, Japan

Akihiro Suzuki, Chiba Institute of Technology, Japan

Motomichi Ohto, Yaskawa Electric Corporation, Japan

Teruyuki Takakura, Yaskawa Electric Corporation, Japan

Satoshi Nakagawa, Yaskawa Electric Corporation, Japan

CEFC2010-1047

23 **Analysis of Flux-Switching Permanent-Magnet Machine by Nonlinear Magnetic Network Model Considering Saturation**

Gan Zhang, Southeast University, China

Ming Cheng, Southeast University, China

Wei Hua, Southeast University, China

Xikai Sun, Southeast University, China

CEFC2010-1049

24 **Optimal Design of a Double-Stator Permanent Magnet Brushless Machine**

Yubin Wang, Southeast University, China University of Petroleum, China

Ming Cheng, Southeast University, China
Ying Fan, Southeast University, China
K.T. Chau, Southeast University, University of Hong Kong, China
Xikai Sun, Southeast University, China
Wei Hua, Southeast University, China
CEFC2010-1050

25 **A Sensorless Position Detection Strategy for Surface Mounted Permanent Magnet Motors at Low Speed Using Transient Finite-Element Analysis**

Wang Zhao, The Hong Kong Polytechnic University, Hong Kong
Wei-Nong Fu, The Hong Kong Polytechnic University, Hong Kong
Siu-Lau Ho, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1073

26 **Dynamic Characteristics Analysis of Incremental Sensor Using 3-D Finite Element Method with Mesh Modification Method Based on Laplace Equation**

Noriharu Ogiso, MATSUO Industries Inc., Japan
Yuji Sekitomi, MATSUO Industries Inc., Japan
Yuki Yamakawa, MATSUO Industries Inc., Japan
Shigeru Komaba, MATSUO Industries Inc., Japan
Yoshihiro Kawase, Gifu University, Japan
Tadashi Yamaguchi, Gifu University, Japan
CEFC2010-1098

27 **A Novel Single-Axis Flat Electro-Magnetic Actuator Using Shorted Turn for Fast Initial Response**

Ki-Il Hwang, Yeungnam University, Korea
Jin-Ho Kim, Yeungnam University, Korea
Je-Hoon Kim, Yeungnam University, Korea
Jung-Hun Lee, Yeungnam University, Korea
CEFC2010-1177

28 **A New Flywheel Energy Storage System (FESS) Using Z-Source Inverter**

Liu Kai, Harbin Institute of Technology, China
Zou Jibin, Harbin Institute of Technology, China
Fu Xinghe, Harbin Institute of Technology, China
Jiang Xintong, Harbin Institute of Technology, China
Xu Fei, Harbin Institute of Technology, China
CEFC2010-1184

29 **Electromagnetic Design of Dual Resonant Structures for Improved Sensitivity of Terahertz Label Free Bio-Sensing**

Mihai Rotaru, University of Southampton, England
Jan Sykulski, University of Southampton, England
CEFC2010-1426

30 **Compound Coordinates-Based Analytical Solution for Eddy-Current Problem in Induction Heating System with Distributed Planar Spiral Multi-Coils**

Lichan Meng, The Hong Kong Polytechnic University, China
Ka Wai Eric Cheng, The Hong Kong Polytechnic University, China
CEFC2010-1453

31 **Preliminary Studies of Putative Bioeffects of Experimental Ultra High Voltage Transmission Environment on Mice**

D.Y. Geng, Hebei University of Technology, China
X. H. Zhang, College of Hebei Medical University, China
G. Z. Xu, Hebei University of Technology, China
L. X. Xing, College of Hebei Medical University, China
L. Y. Xue, College of Hebei Medical University, China
W. L. Yan, Hebei University of Technology, China
F. G. Liu, Hebei University of Technology, China
CEFC2010-1534

32 **Optimization with Sequential GA and Dynamic Force Analysis of Capacitor-Driven Inductive Coilgun**

Ningning Guo, Xi'an Jiaotong University, China
shuhong Wang, Xi'an Jiaotong University, China
Jie Qiu, Xi'an Jiaotong University, China
Jian Guo Zho, University of Technology, Australia
Youguang Guo, University of Technology, Australia
CEFC2010-1589

33 **Design of Grid-Connected to Rotor Type Doubly-Fed Induction Generators for Wind Turbine System**

Sang-hoon Kim, Hanyang University, Korea
Yong-min You, Hanyang University, Korea
Thomas-A. Lipo, University of Wisconsin-Madison, USA
Byung-il Kwon, Hanyang University, Korea
CEFC2010-1808

34 **Microwave Characterization Using Ridge Polynomial Neural Networks and Least-Square Support Vector Machines**

Hacib Tarik, Univ. Jijel, Algeria
Acikgoz Hulusi, Univ. Paris, France
Le BihanYann, Univ. Paris, France
Meyer Olivier, Univ. Paris, France
Pichon Lionel, Univ. Paris, France
CEFC2010-1873

Poster Session 3 — Monday

Devices and Applications 2

Session Chair: Prof. Antonino Musolino, University of Pisa, Italy

United A/B and L.A.X A/B — 10:45 AM-12:15 PM

35 **Analysis and Characterization of Linear Switched Reluctance Motors: Static, Dynamic, Frequency Spectrum and Thermal Analyses**

Lenin Chokkalingam, Anna University, India

Arumugam Rengasamy, SSN College of Engineering, India

CEFC2010-1077

36 **Analysis of Hysteresis in Resonance-Based Position Estimation of Switched Reluctance Drives**

Kristof Geldhof, Ghent University, Belgium

Peter Sergeant, University College Ghent, Belgium

Jan Melkebeek, Ghent University, Belgium

CEFC2010-1085

37 **Influence of Rotor Tooth Shape on Air-Gap Magnetic Field in Homopolar Inductor Alternator**

Xinghe Fu, Harbin Institute of Technology, China

Jibin Zou, Harbin Institute of Technology, China

Xintong Jiang, Harbin Institute of Technology, China

CEFC2010-1091

38 **Dynamic Simulation and Experimental Validation of Flux Reversal Linear Synchronous Motor**

Chung Shi-Uk, Korea Electrotechnology Research Institute, Korea

Kim Kwang-Woon, Korea Electrotechnology Research Institute, Korea

Kim Ji-Won, Korea Electrotechnology Research Institute, Korea

Lee Ji-Young, Korea Electrotechnology Research Institute, Korea

Woo Byung-Chul, Korea Electrotechnology Research Institute, Korea

CEFC2010-1106

39 **Optimal Design of Stator and Rotor of Interior Permanent Magnet Motor with Reduced Torque Ripple for Wide Speed Range Operation**

Jeonghu Kwack, Hanyang University, Korea

Seungjae Min, Hanyang University, Korea

Jung-Pyo Hong, Hanyang University, Korea

CEFC2010-1108

40 **A Study on 4-layer Hybrid Winding Layout of the IPMSM and Location of the Permanent Magnets**

Won-Ho Kim, Hanyang University, Korea

Jae-Nam Bae, Hanyang University, Korea

Ik-Sang Jang, Hanyang University, Korea

Ju Lee, Hanyang University, Korea

CEFC2010-1117

41 **Influence of Contact Resistance on Shielding Efficiency of Shielding Gutters For HV Cables**

Selim Koroglu, Yildiz Technical University, Turkey
Peter Sergeant, Ghent Universitu, University College Ghent, Belgium
Ruth Sabariego, ACE, Belgium
Vuong Dang Quoc, ACE, Belgium
Marc De Wulf, ArcelorMittal Global R&D, Belgium
CEFC2010-1200

42 **3D Modeling of Time Reversal Microwave Imaging in Nondestructive Evaluation**

Naiguang Lei, Michigan State University, USA
Solimar Reyes-Rodr, Michigan State University, USA
Lalita Udpa, Michigan State University, USA
S. Satish Udpa, Michigan State University, USA
CEFC2010-1201

43 **Near-field Coupling Between EMC Filter Components**

Sana Zangui, Laboratoire Ampere, France
Benjamin Vincent, Laboratoire Ampere, France
Kevin Berger, Laboratoire Ampere, France
Ronan Perrussel, Laboratoire Ampere, France
Edith Clavel, Laboratoire G2Elab, France
Christian Vollaire, Laboratoire Ampere, France
O. Chadebec, Laboratoire G2Elab, France
CEFC2010-1329

44 **Proposal of Electromagnetic Inspection Method of Outer Side Defect on Steel Tube With Steel Support Plate Using Optimal Differential Search Coils**

Yuji Gotoh, Oita University, Japan
Hitoshi Fujioka, Oita University, Japan
Norio Takahashi, Okayama University, Japan
CEFC2010-1332

45 **Stochastic Modeling of the Pull-In Voltage in a MEMS Beam Structure**

Francisc Boloni, Universite Lille, France
Abdelkader Benabou, Universite Lille, France
Abdelmouna Tounzi, Universite Lille, France
CEFC2010-1471

46 **Finite Element Analysis and Corresponding Experiments of Resonant Energy Transmission for Wireless Transmission Devices Using Witricity**

Junhua Wang, The Hong Kong Polytechnic University, Hong Kong
S.L. Ho, The Hong Kong Polytechnic University, Hong Kong
W.N. Fu, The Hong Kong Polytechnic University, Hong Kong

Mingui Sun, University of Pittsburg, USA
CEFC2010-1478

47 **Modeling of a Crucible Induction Furnace Taking Into Account the Inter-Laminar Losses**
Mauricio V. Ferreira da Luz, Universidade Federal de Santa Catalina, Brazil
Amilcar B. Bodini, CNX Tecnologia em Informatica Ltda., Brazil
CEFC2010-1739

48 **Analytical Analysis of the Magnetic Field and No-Load Voltage of the Double Dided Axial Flux Permanent Magnet Synchronous Generator**
Qudsia Junaid, Hanyang University, Korea
Junaid Ikram, Hanyang University, Korea
Byung-il Kwon, Hanyang University, Korea
CEFC2010-1818

Poster Session 4 — Monday

Material Modeling 1

Session Chair: Prof. Patrick Dular, University of Liege, Belgium

United A/B and L.A.X A/B — 10:45 AM-12:15 PM

49 **Study on Electroforming Ni-Fe-SiC Alloy for Micro Fabrication**
Xiaohu Zheng, Huaiyin Institute of Technology, China
Yuanwei Liu, Huaiyin Institute of Technology, China
Feng Gu, Huaiyin Institute of Technology, China
CEFC2010-1076

50 **The Short Time Transient Thermal Analysis of IMCCR in Two Special Operating State**
Junci Cao, Beijing Jiaotong University, Harbin Institute of Technology, China
Weili Li, Harbin Institute of Technology, China
Xiaochen Zhang, Harbin Institute of Technology, China
Weihong Tang, Harbin Institute of Technology, China
CEFC2010-1170

51 **Electromagnetic Performance Analysis of a New Stator Permanent Magnet Doubly Salient Flux Memory Motor Using a Piecewise-linear Hysteresis Model**
Xiaoyong Zhu, Jiangsu University, China
Li Quan, Jiangsu University, China
Dajian Chen, Jiangsu University, China
Ming Cheng, Jiangsu University, China
Wei Hua, Jiangsu University, China
Xikai Sun, Jiangsu University, China
CEFC2010-1183

52 **A Novel Method of Modeling 2D Magnetic Properties of Electrical Steel Sheet in**

Electromagnetic Devices

Xiaoyan Wang, Shenyang University of Technology, China
Dexin Xie, Shenyang University of Technology, China
W.N. Fu, Hong Kong Polytechnic University, China
CEFC2010-1195

53 **E&SS Model Based Simulation of Core Loss and Heat Build-up in Electrical Steel.**

Shimoji Hiroyasu, Oita University, Japan
Enokizono Masato, Oita University, Japan
CEFC2010-1202

54 **High-Speed Method for Analyzing Shielding Current Density in High-Temperature Superconductor**

Atsushi Kamitani, Yamagata University, Japan
Teruou Takayama, Yamagata University, Japan
Soichiro Ikuno, Yamagata University, Japan
CEFC2010-1283

55 **Iron Losses Modeling Under Rotational Magnetic Flux**

Jean Vianei Leite, Centro Politecnico, Brazil
Abdelkader Benabou, L2EP, France
Mauricio Ferreira da Luz, GRUCAD/EEL/UFSC, Brazil
Nelson Sadowski, GRUCAD/EEL/UFSC, Brazil
CEFC2010-1319

56 **A Modified Method for Jiles-Atherton Hysteresis Model and its Application in Numerical Simulation of Devices Involving Magnetic Materials**

Huiqi Li, North China Electric Power University, China
Qingfeng Li, North China Electric Power University, China
Xiao-bang Xu, Clemson University, USA
Tiebing Lu, North China Electric Power University, China
Li Lin, North China Electric Power University, China
CEFC2010-1438

57 **Modeling and Analysis of 3-D Tensor Magnetic Reluctivity Properties of Soft Magnetic Composite Material**

Yongjian Li, Hebei University of Technology, University of Technology, China
Qingxin Yang, Hebei University of Technology, China
Jianguo Zhu, University of Technology, Australia
Jingfeng Sun, Hebei University of Technology, China
Lei Guo, Hebei University of Technology, China
Cuihuan Li, Hebei University of Technology, China
CEFC2010-1551

58 **Finite Element Implementation of a Generalized Chua-type Vector Hysteresis Model and Application to Iron Loss Analysis of Three-phase Transformer**

Heesung Yoon, Chungbuk National University, Korea
Inhyun Kim, Chungbuk National University, Korea
Pan Seok Shin, Hongik University, Korea
Chang Seop Koh, Chungbuk National University, Korea
CEFC2010-1834

59 **Improvement of Intgral-Type Dynamic E&S Modeling**

Takeru Sato, Oita University, Japan
Takashi Todaka, Oita University, Japan
Masato Enokizono, Oita University, Japan
CEFC2010-1858

Poster Session 5 — Monday

Numerical Techniques 1

Session Chair: Dr Istvan Bardi, Ansys Inc, USA

United A/B and L.A.X A/B — 10:45 AM-12:15 PM

60 **Accelerating the Convergence of Algebraic Multigrid for Quadratic Finite Element Method by Introducing Grid Information and p-Multigrid**

Chijie Zhuang, Tsinghua University, China
Rong Zeng, Tsinghua University, China
Bo Zhang, Tsinghua University, China
Shuiming Chen, Tsinghua University, China
Jinliang He, Tsinghua University, China
CEFC2010-1094

61 **A Sparse Finite Element Method for Modeling Evanescent Modes in the Stopband of Periodic Structures**

Ali Bostani, McGill University, Canada
Jon Webb, McGill University, Canada
CEFC2010-1119

62 **Finite Element Analysis of Magnetic Field Problem with Open Boundary Using Infinite Element Technique**

Satoshi Tamitani, Waseda University, Japan
Tomoaki Takamatsu, Waseda University, Japan
Asuka Otake, Waseda University, Japan
Shinji Wakao, Waseda University, Japan
Akihisa Kameari, Science Solutions International Laboratory, Inc, Japan
Yasuhito Takahashi, Kyoto University, Japan
CEFC2010-1152

63 **Performance Evaluation of Parallel Fast Multipole Accelerated Boundary Integral Equation Method in Electrostatic Field Analysis**

CEFC2010-1431

69 **An Efficient Parallel Remeshing Method**

Cassia Nunes, Universidade Federal de Sao Joao del-Rei, Brazil
Pollyana Mayrink, Universidade Federal de Sao Joao del-Rei, Brazil
Renato Mesquita, Universidade Federal de Mionas Gerais, Brazil
David Lowther, McGill University, Canada
CEFC2010-1448

70 **Implementation of Variable Preconditioned GCR with Mixed Precision on GPU using CUDA**

Soichiro Ikuno, Tokyo University of Technology, Japan
Norihisa Fujita, Tokyo University of Technology, Japan
Susumu Yamamoto, Tokyo University of Technology, Japan
Susumu Nakata, Ritsumeikan University, Japan
CEFC2010-1455

71 **An Efficient Mesh Reconstruction Method for Optimizing the Shapes of Electromagnetic Devices Using Finite Element Method**

Ningning Chen, The Hong Kong Polytechnic University, China
S. L. Ho, The Hong Kong Polytechnic University, China
W. N. Fu, The Hong Kong Polytechnic University, China
CEFC2010-1457

72 **Simultaneous Multi-Frequency Simulation by Recycling Krylov Subspaces in FDFD Formulation**

Toshio Murayama, Sony Corporation, Japan
Shin-Ichiro Sugimoto, The University of Tokyo, Japan
Shinobu Yoshimura, The University of Tokyo, Japan
CEFC2010-1723

Poster Session 6 — Monday

Optimization and Design 1

Session Chair: Dr. Toufic Hijazi, Hariri Canadian University, Lebanon

United A/B and L.A.X A/B — 10:45 AM-12:15 PM

73 **Convexity-Oriented Method for the Topology Optimization of Ferromagnetic Parts in Electromagnetic Actuators Using the Maxwell Stress Tensor**

Thibaut Labbe, Universite Catholique de Louvain, Belgium
Bruno Dehez, Universite Catholique de Louvain, Belgium
CEFC2010-1051

74 **Optimum Design of the Single-Phase Outer Rotor Type Brushless DC Motor for Pump Application Using Response Surface Methodology and Kriging**

Do-Kwan Hong, Korea Electrotechnology Research Institute, Korea
Byung-Chul Woo, Korea Electrotechnology Research Institute, Korea

Jong-Moo Kim, Korea Electrotechnology Research Institute, Korea
Kwon-Hee Lee, Dong-A University, Korea
CEFC2010-1093

75 **Topology Optimization of Magnetic Actuator Based on a Level-Set and a Phase-Field Approach**

Sunghoon Lim, Hanyang University, Korea
Takayuki Yamada, Kyoto University, Korea
Seungjae Min, Hanyang University, Korea
Shinji Nishiwaki, Kyoto University, Korea
CEFC2010-1103

76 **Efficient Design of Microstrip Antennas Using Modified PSO Algorithm**

Arezoo Modiri, University of Texas, USA
Kamran Kiasaleh, University of Texas, USA
CEFC2010-1295

77 **Evolutionary Optimization of Permanent Magnet Machine Design for Traction Applications**

Minos Beniakar, National Technical University of Athens, Greece
Evangelos Tsampouris, National Technical University of Athens, Greece
Patsios Charalampos, National Technical University of Athens, Greece
Kladas Antonios, National Technical University of Athens, Greece
CEFC2010-1321

78 **An Optimal Material Distribution Design of Brushless DC Motor by Genetic Algorithm Considering a Cluster of Material**

Takeo Ishikawa, Gunma University, Japan
Kouki Yonetake, Gunma University, Japan
Nobuyuki Kurita, Gunma University, Japan
CEFC2010-1327

79 **Using Hybrid Constricted Particles Swarm and Simulated Annealing Algorithm for Electric Motor Design**

Lhassane Idoumghar, University of haute-Alsace, France
Daniel Fodorean, University of Technology of Belfort-Montbeliard, France
Abdellatif Miraoui, University of Technology of Belfort-Montbeliard, France
CEFC2010-1382

80 **Joint Direction of Arrival and Amplitude Estimation using Particle Swarm Optimization and a Single Snapshot**

Borja Errasti-Alcal, National Institute of Aerospace Technology, Spain
David Escot-Bocanegra, National Institute of Aerospace Technology, Spain
David Poyatos-Martinez, National Institute of Aerospace Technology, Spain
Antonio Jurado-Lucena, National Institute of Aerospace Technology
R. Fernandez-Recio, National Institute of Aerospace Technology, Spain

CEFC2010-1461

81 **Particle Swarm Optimization of Coupled Electromechanical Systems**

Nizar Al-Aawar, Hairi Canadian University, Lebanon
Toufic Hijazi, Hairi Canadian University, Lebanon
Abdul-Rahman Arkadan, Hairi Canadian University, Lebanon
CEFC2010-1482

82 **Optimization of Frequency Selective Surface by the Genetic Algorithm**

Jingyu Han, Beijing University of Technology, China
Qun Wang, Beijing University of Technology, China
Zhanghong Tang, Beijing University of Technology, China
Meiwu Shi, Quartermaster Equipment Research Institute, China
Maohui Li, Quartermaster Equipment Research Institute, China
CEFC2010-1599

83 **Using Genetic Algorithms for Device Modeling**

Hermano A. Cabral, Federal University of Pernambuco, Brazil
Marcos T. de Melo, Federal University of Pernambuco, Brazil
CEFC2010-1843

Poster Session 7 — Monday

Static and Quasi-static Fields 1

Session Chair: Dr. Dan Ionel, A. O. Smith Corp, USA

United A/B and L.A.X A/B — 10:45 AM-12:15 PM

84 **Calculation of Transient Electric Field of Converter Transformer Under Polarity Reversal Voltage**

Lin Li, North China Electric Power University, China
Feng Ji, North China Electric Power University, China
Gang Liu, North China Electric Power University, China
Youliang Sun, North China Electric Power University, China
CEFC2010-1045

85 **A New Formulation of Anisotropic Equivalent Conductivity in Laminations**

Wang Jian, Southeast University, China
Lin Heyun, Southeast University, China
Huang Yunkai, Southeast University, China
Sun Xikai, Southeast University, China
CEFC2010-1084

86 **Finite Element Simulation of Hard Magnetoelastic Thin Films**

Matthew Barham, Lawrence Livermore National Laboratory, USA
Dan White, Lawrence Livermore National Laboratory, USA
CEFC2010-1089

87 **A Calculation Method for 3-D Ionized Field under HVDC Transmission Lines**

Zhaonan Luo, North China Electric Power University, China
Xiang Cui, North China Electric Power University, China
Weidong Zhang, North China Electric Power University, China
Jiayu Lu, China Electric Power Research Institute, China
CEFC2010-1096

88 **Inductance Calculation by Relative Permeance for the IPMSM design**

Jaenam Bae, Hanyang University, Korea
Chang-Sung Jin, Hanyang University, Korea
Won-ho Kim, Hanyang University, Korea
Ik-sang Jang, Hanyang University, Korea
Sung-hong Won, Hanyang University, Korea
Ju Lee, Hanyang University, Korea
CEFC2010-1097

89 **Electric Field Computation in Non Conducting Regions Using AV After a t_0-Φ Surface Impedance Magnetoharmonic Computation**

Christophe Gu, Chemin de Malacher, France
Gerard Meunier, Saint-Martin-d, France
Phuong Pham Quang, Chemin de Malacher and Saint-Martin-d, France
CEFC2010-1115

90 **Design and Analysis of a Novel Ironless Trapezoid Winding Array with Single-Sided and Well Sinusoidal Magnetic Field**

Gan Zhou, Southeast University Nanjing, China
Xueliang Huang, Southeast University Nanjing, China
Hao Jiang, Southeast University Nanjing, China
Rui Bo, Southeast University Nanjing, China
CEFC2010-1121

91 **Improvement of Convergence Characteristics for Steady State Analysis of Motors with Simplified Singularity Decomposition-Explicit Error Correction Method**

Hirokatsu Katagiri, Gifu University, Japan
Yoshihiro Kawase, Gifu University, Japan
Tadashi Yamaguchi, Gifu University, Japan
Takeshi Tsuji, Gifu University, Japan
Yoshiyasu Shibayama, Gifu University, Japan
CEFC2010-1131

92 **The Influence of Additional Loss on Rotor Surface Heat Transfer Coefficient and Temperature Field of Large Air-Cooled Hydro-Generator**

Weili Li, Harbin University of Science and Technology, China
Dongmei Wang, Harbin University of Science and Technology, China

CEFC2010-1168

93 **Parallel Hierarchical Block Wavelet Compression for an Optimal Compression Rate of 3-D BEM Problems**

Christian Scheiblich, University of Stuttgart, Germany
Remus Banucu, University of Stuttgart, Germany
Veronika Reinauer, University of Stuttgart, Germany
Wolfgang M. Rucker, University of Stuttgart, Germany
CEFC2010-1261

94 **Equivalent Single Conductor Capacitance Extraction for Densely-Packed CNT Bundle Interconnects via an Integral Formulation**

Luigi Egiziano, Università degli Studi di Salerno, Italy
Alessandro Giustiniani, Università degli Studi di Salerno, Italy
Vincenzo Tucci, Università degli Studi di Salerno, Italy
Walter Zamboni, Università degli Studi di Salerno, Italy
CEFC2010-1282

95 **Implementation of Generalized Back Projection Algorithm in 3D EIT Model**

Hongbin Wang, Hebei University of Technology, China
Guizhi Xu, Hebei University of Technology, China
Shuai Zhang, Hebei University of Technology, China
Duyan Geng, Hebei University of Technology, China
Qingxin Yang, Hebei University of Technology, China
Weili Yan, Hebei University of Technology, China
CEFC2010-1410

96 **Inverse Problem Approach to Characterize and Model Magnetization Changes in a Thin Shell Structure Undergoing Magneto-Mechanical Effects**

Antoine Viana, Université de Grenoble, France
Laure-Line Rouve, Université de Grenoble, France
Olivier Chadebec, Université de Grenoble, France
Gilles Cauffet, Université de Grenoble, France
Jean-Louis Coulomb, Université de Grenoble, France
CEFC2010-1492

97 **Distortion of Sensed Electric Field by Conducting Sensor Platforms**

Phillip A.M. Sandborn, U.S. Army Research Laboratory, USA
David M. Hull, U.S. Army Research Laboratory, USA
Stephen J. Vinci, U.S. Army Research Laboratory, USA
CEFC2010-1610

Lunch

Red Bar Entry Level Foyer — 12:15-1:15 PM

Poster Session 8 — Monday

Devices and Applications 3

Session Chair: Prof. Chang Eob Kim, Hoseo University, Korea

United A/B and L.A.X A/B — 1:15-2:45 PM

98 **Compensation of Inductance Parameters of Interior Permanent Magnet Synchronous Motors Affected by Magnet Size**

Jang Iksang, Hanyang University, Korea
Kim Wonho, Hanyang University, Korea
Bae Jaenam, Hanyang University, Korea
Ju Lee, Hanyang University, Korea
CEFC2010-1110

99 **Design Algorithm Using Torque Separation Method for LSPM Motor**

Won-Ho Kim, Hanyang University, Korea
Jae-Nam Bae, Hanyang University, Korea
Ik-Sang Jang, Hanyang University, Korea
Ju Lee, Hanyang University, Korea
CEFC2010-1111

100 **Calculation and Experimental Analysis of Induction Motor Eccentricity**

Mauricio Rigoni, Universidade Federal de Santa Catarina, Brazil
Nelson Sadowski, Universidade Federal de Santa Catarina, Brazil
Nelson Jhoe Batistela, Universidade Federal de Santa Catarina, Brazil
Joao Pedro Bastos, Universidade Federal de Santa Catarina, Brazil
Sebastiao Nau, WEG S/A, Brazil
Arnulf Kost, TU-Berlin, Germany
CEFC2010-1124

101 **The Optimal Design of the Rotor Bar for LSPMSM Considering the Starting Torque and Magnetic Saturation**

Kwangsoo Kim, Hanyang University, Korea
Seung-Joo Kim, Hanyang University, Korea
Won-ho Kim, Hanyang University, Korea
Jong-Bin Im, Hanyang University, Korea
Suyeon Cho, Hanyang University, Korea
Lee Ju, Hanyang University, Korea
CEFC2010-1126

102 **Torque Characteristics Analysis of Synchronous Reluctance Motor Based on Winding Function Theory**

Kyung-il Woo, Pukyong National University, Korea
Sang-hoon Park, Pukyong National University, Korea
Han-Seok Park, Pukyong National University, Korea
CEFC2010-1130

103 **Power-saving Effect of Permanent Magnet on Oscillating Electromagnetic Linear Actuator**

Jung-Hun Lee, Yeungnam University, Korea
Jin-Ho Kim, Yeungnam University, Korea
Sang-Hyun Jeong, Korea Institute of Machinery & Materials, Korea
Bang-Woo Han, Korea Institute of Machinery & Materials, Korea
CEFC2010-1176

104 **Transformer Joints FE Analysis Using Pseudo-Source Technique**

Themistoklis Kefalas, National Tech. Univ. of Athens, Greece
George Loizos, National Tech. Univ. of Athens & Schneider Electric, Greece
Antonios Kladas, National Tech. Univ. of Athens, Greece
CEFC2010-1215

105 **Simulation Analysis of Steady State Characteristics of Parallel-Axis Permanent Magnetic Gear**

Xing Jingwei, Harbin Institute of Technology, China
Li Yong, Harbin Institute of Technology, China
Jiang Xintong, Harbin Institute of Technology, China
Fu Xinghe, Harbin Institute of Technology, China
Yin Zhijun, Harbin Electric Machinery Company, China
CEFC2010-1256

106 **Design of a Linear Magnetic Refrigeration Structure Running with Rotating Bar-Shaped Magnets**

Houssem Rafik El Hana Bouchekara, Umm Al-Qura University, Saudi Arabia
Mohammed Talal Simsim, Umm Al-Qura University, Saudi Arabia
CEFC2010-1347

107 **Study on Separable Transformer's Efficiency for Contactless Energy Transmission System**

Ning Lin, Zhejiang University, China
Yingying Yao, Zhejiang University, China
Youtong Fang, Zhejiang University, China
Shiyou Yang, Zhejiang University, China
CEFC2010-1412

108 **Optimal Design of Auxiliary teeth to Minimized Unbalanced Phase by End Effect of PMLSM**

Ki-Bong Jang, Changwon National University, Korea
Jee-Hyun Kim, Changwon National University, Korea
Ho-Jin An, Changwon National University, Korea
Gyu-Tak Kim, Changwon National University, Korea
CEFC2010-1542

109 **Optimization and Analysis of Rotor Structure for Maximum Torque Control of**

Spoke-type Interior Permanent Magnet Synchronous Motor

Yul-kyu Son, Hanyang University, Korea

Kyu-yun Hwang, Hanyang University, Korea

Byung-il Kwon, Hanyang University, Korea

CEFC2010-1819

110 **Grid Computing and Surrogate Objective Function Assisted Multi-objective Shape Optimal Design of PMLSM**

Minho Song, Chungbuk National University, Korea

Heesung Yoon, Chungbuk National University, Korea

Hong-soon Choi, Kyungbuk National University, Korea

Chang Seop Koh, Chungbuk National University, Korea

CEFC2010-1840

111 **Iron Loss and Torque Analysis of FE-based Model for Inverter-Fed Spoke type IPMSM with Optimized Rotor Pole for Sinusoidal Distributed back-EMF**

Kyu-yun Hwang, Hanyang University, Korea

Byung-il Kwon, Hanyang University, Korea

CEFC2010-1841

Poster Session 9 — Monday

Devices and Applications 4

Session Chair: Prof. Giovanni Aiello, University of Catania, Italy

United A/B and L.A.X A/B — 1:15-2:45 PM

112 **Magnetic Field Analysis of Matrix-Rotor Induction Motor**

Yoshihiro Kawase, Gifu University, Japan

Tadashi Yamaguchi, Gifu University, Japan

Takeshi Tsuji, Gifu University, Japan

Ken Tanaka, Gifu University, Japan

Norimoto Minoshima, Toyota Industries Corporation, Japan

Tatsuya Hattori, Toyota Industries Corporation, Japan

CEFC2010-1133

113 **Electromagnetic Losses Calculation of 5kW Class High-Speed Permanent Magnet Synchronous Motor Considering Current Waveform**

Kyoung-Jin Ko, Chungnam National University, Korea

Seok-Myeong Jang, Chungnam National University, Korea

Ji-Hoon Park, Chungnam National University, Korea

Sung-Ho Lee, Korea Institute of Industrial Technology, Korea

CEFC2010-1136

114 **Electromagnetic Active Linear Absorber(ALA) System of Engine Vibration in Automobile**

Jung-Hun Lee, Yeungnam University, Korea

Jin-Ho Kim, Yeungnam University, Korea

Un-Hwan Park, Pyung Hwa Co., Korea
Ho-Seok Shim, Pyung Hwa Co., Korea
Jeong-Hoon Kim, Hyundai Motor Company & Kia Motors Co., Korea
CEFC2010-1150

115 **Coupling Analysis of High Speed PM Generator Used for Distributed Generation System**

Zhang Xiaochen, Harbin Institute of Technology, China
Li Weili, Harbin University of Science and Technology, China
Cheng Shukang, Harbin Institute of Technology, China
Kou Baoquan, Harbin Institute of Technology, China
Geng Jiamin, Harbin Dongan Engine Group Co., China
CEFC2010-1175

116 **A Novel Electromagnetic Latching Device for Variable Valve Timing in Automotive Engine**

Jin-Ho Kim, Yeungnam University, Korea
Joung-Hwan Chang, Dong-A University, Korea
Se-Myung Park, Yeungnam University, Korea
Ki-Il Hwang, Yeungnam University, Korea
Jae-Yong Lee, Yeungnam University, Korea
CEFC2010-1179

117 **A Novel Axial-flux Electric Machine for In-wheel Gearless Drive in Plug-in Hybrid Electric Vehicles**

W. N. Fu, The Hong Kong Polytechnic University, Hong Kong
S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1558

118 **A Study on the Improvement of High Power in Interior Permanent Magnet**

Dae-Sung Jung, Hanyang University, Korea
Hyung-Woo Lee, Hanyang University, Korea
Ju Lee, Hanyang University, Korea
CEFC2010-1574

119 **Design and Dynamic Analysis of Electromagnets for Magnetic Levitation Application Systems**

Jang-Young Choi, Chungnam National University, Korea
So-Young Sung, Chungnam National University, Korea
Seok-Myeong Jang, Chungnam National University, Korea
CEFC2010-1628

120 **GA-Optimiation to Damp the Resonance of Large Power/Ground Planes, Combined with Adaptive Frequency Sampling**

Sungtek Kahng, University of Incheon, Korea
Tae-Kyung Chung, Chung-Ang University, Korea

Hyeong-seok Kim, Chung-Ang University, Korea
CEFC2010-1630

121 **Numerical Methods for Eddy Currents Modeling of Planar Transformers**
Jérémie Aimé, G2Elab & MICROSPIRE R&D Center, France
Bruno Cogitore, MICROSPIRE R&D Center, France
Gérard Meunier, G2Elab, France
Edith Clavel, G2Elab, France
Yves Maréchal, G2Elab, France
CEFC2010-1648

122 **Comparison of Two Methods for Modeling Thin Regions in Eddy Current Non-Destructive Testing**
Alejandro Opsina, UPMC University, France
Houda Zaidi, UPMC University, France
Laurent Santandrea, UPMC University, France
Guillaume Krebs, UPMC University, France
Yann Le Bihan, UPMC University, France
CEFC2010-1653

123 **Study of Insulator Performance under Contaminated Conditions Using a 3D Formulation of Quasi-Static Electric Fields**
Mauricio V. Ferreira da Luz, Universidade Federal de Santa Catarina, Brazil
Fernando H. Molina, CELESC Distribui, Brazil
Emilio R. Arend, Universidade Federal de Santa Catarina, Brazil
CEFC2010-1661

124 **Reduction Design of Cogging Torque of BLDC Motor for EPS Application**
Young-Kyoun Kim, Korea Electronics Tech. Inst. Yatap-Dong, Korea
Se-hyun Rhyu, Korea Electronics Tech. Inst. Yatap-Dong, Korea
In-Soung Jung, Korea Electronics Tech. Inst. Yatap-Dong, Korea
CEFC2010-1820

125 **Magnetic Design of Transformers for 20kW Charging Stations of Electrical Vehicles**
Chengxi Liu, The Hong Kong Polytechnic University, China
S.L. Ho, The Hong Kong Polytechnic University, China
W.N. Fu, The Hong Kong Polytechnic University, China
S. Z. Hai, The Hong Kong Polytechnic University, China
CEFC2010-1822

Poster Session 10 — Monday

Devices and Applications 5

Session Chair: Prof. Igor Ticar, University of Maribor, Slovenia

United A/B and L.A.X A/B — 1:15-2:45 PM

126 **Design and Experimental Implementation of Easily Detachable Permanent Magnet Reluctance Wheel for Wall-Climbing Mobile Robot**

Jin-Ho Kim, Yeungnam University, Korea
Sang-Shin Park, Yeungnam University, Korea
Se-Myung Park, Yeungnam University, Korea
Je-Hoon Kim, Yeungnam University, Korea
Jae-Yong Lee, Yeungnam University, Korea
CEFC2010-1180

127 **Compensated Phase Method of Current for Reducing Torque Ripple of Multi-Degree of Freedom Surfaced Permanent-magnet Motor**

Dong-Woo Kang, Hanyang University, Korea
Sung-Chul Go, Hanyang University, Korea
Sung-Hong Won, Hanyang University, Korea
Hyung-Woo Lee, Hanyang University, Korea
Ju Lee, Hanyang University, Korea
CEFC2010-1182

128 **Analysis of an Axial Flux Permanent Magnet Synchronous Generator with a Double-sided Rotor**

Tze-Fun Chan, The Hong Kong Polytechnic University, China
Weimin Wang, The Hong Kong Polytechnic University, China
Loi-Lei Lai, City University London, UK
CEFC2010-1189

129 **A New Modular Flux-Switching Permanent-Magnet Motor Using Fault-Tolerant Teeth**

Zhao Wenxiang, Southeast University AND Jiangsu University, China
Cheng Ming, Southeast University, China
K.T. Chau, Southeast University AND University of Hong Kong, China
Ji Jinghua, Jiangsu University, China
Hua Wei, Southeast University, China
Cao Ruiwu, Southeast University, China
CEFC2010-1190

130 **Effect of Step Skewed Rotor Type IPMSM on Noise and Vibration**

Jae-Woo Jung, Hanyang University, Korea
Do-Jin Kim, Hanyang University, Korea
Sang-Ho Lee, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
Dong-Hoon Lee, S&T Daewoo Co., Korea
CEFC2010-1193

131 **Design Studies on a Permanent Magnet Synchronous Machine with Star- and Delta-connected Stator Winding**

Mauricio V. Ferreira da Luz, Universidade Federal de Santa Catarina, Brazil
Arnulf Kost, Brandenburgische Technische Universit, Germany
Ralf T. Jacobs, Brandenburgische Technische Universit, Brazil
Nelson Sadowski, Universidade Federal de Santa Catarina, Brazil
Djonny Weinzierl, Centro Universit, Brazil
Mauricio Rigoni, Universidade Federal de Santa Catarina, Brazil
N.J. Batistela, Universidade Federal de Santa Catarina, Brazil
CEFC2010-1654

138 **Passively Stabilized Magnetic Bearings**
Antonino Musolino, University of Pisa, Italy
Rocco Rizzo, University of Pisa, Italy
CEFC2010-1664

139 **Optimal Design of Distributed Winding Axial Flux Permanent Magnet Synchronous Generator for Wind Turbine Systems**
Yong-Min You, Hanyang University, Korea
Kyu-yun Hwang, Hanyang University, Korea
Byung-il Kwon, Hanyang University, Korea
CEFC2010-1821

140 **One-dimensional Field Computation for Leakage Impedance of Induction Wok System with Radical Windings**
Ka Wai Eric Cheng, The Hong Kong Polytechnic University, China
L.C. Meng, The Hong Kong Polytechnic University, China
K.W. Chan, The Hong Kong Polytechnic University, China
S.L. Ho, The Hong Kong Polytechnic University, China
CEFC2010-1878

Poster Session 11 — Monday

Software Methodology 1

Session Chair: Prof. Nelson Sadowski, Universidade Feferal de Santa Catarina, Brasil

United A/B and L.A.X A/B — 1:15-2:45 PM

141 **EMSoft - Software for Graduate and Undergraduate Educational Electromagnetics**
Houssem R.E.H. Bouchekara, Umm Al-Qura University, Saudi Arabia
Mohammed Talal Simsim, Umm Al-Qura University, Saudi Arabia
CEFC2010-1348

142 **A Framework for Meshless Methods using Generic Programming**
Naisses Zoia Lima, Federal University of Minas Gerais, Brazil
Renato Cardoso Mesquita, Federal University of Minas Gerais, Brazil
Marcos L. A. Junior, Federal University of Minas Gerais, Brazil
CEFC2010-1435

143 **Magnetic Equivalent Circuit Coupled to Finite Element Analysis for Flux Focusing PM Machine Modeling**

Nedjar Boumedyen, CNRS UniverSud, France
Hlioui Sami, CNRS UniverSud, France
Vido Lionel, University Cergy Pontoise, France
M. Gabsi, CNRS UniverSud, France
Y. Amara, GREAH, France
A. Miraoui, UTBM, France
CEFC2010-1615

144 **Proposal of a Language for Describing Differentiable Sizing Models for Electromagnetic Devices Design**

Petre Enciu, INPG/UJF/CNRS,ENSE, France
F. Wurtz, INPG/UJF/CNRS,ENSE, France
Laurent Gerbaud, INPG/UJF/CNRS,ENSE, France
CEFC2010-1707

145 **Semi-three-dimensional Visualization of Electromagnetic Field Analysis Results with Volumetric Display**

Tomoaki Inaba, Hokkaido University, Japan
So Noguchi, Hokkaido University, Japan
Hajime Igarashi, Hokkaido University, Japan
CEFC2010-1845

Poster Session 12 — Monday

Static and Quasi-static Fields 2

Session Chair: Dr. Kazuhiro Muramatsu, Saga University, Japan

United A/B and L.A.X A/B — 1:15-2:45 PM

146 **A Novel Fault-Tolerant Multi-Tooth Flux-Switching Motor with Hybrid Excitation for Electro-mechanical Actuator**

Yu Wang, Nanjing University of Aeronautics and Astronautics, China
Zhi-quan Deng, Nanjing University of Aeronautics and Astronautics, China
Xiao-lin Wang, Nanjing University of Aeronautics and Astronautics, China
CEFC2010-1141

147 **Analysis of a Short-Stroke DC Linear Motor for Nanopositioning**

Liyi Li, Harbin Institute of Technology, China
Donghua Pan, Harbin Institute of Technology, China
Baoquan Kou, Harbin Institute of Technology, China
CEFC2010-1167

148 **Numerical Anlysis of Axial-Radial Flux Type Fully Superconducting Synchronous Motor**

Weili Li, Harbin University of Science and Technology, China
Chengyu Song, Harbin University of Science and Technology, China

Junci Cao, Harbin University of Science and Technology, China
Liyi Li, Harbin University Technology, China
CEFC2010-1188

149 **New Technique of Magnetoacoustic Tomography with Magnetic Induction**
Yang Zhang, Chinese Academy of Sciences, China
Guoqiang Liu, Chinese Academy of Sciences, China
Wenjing He, Chinese Academy of Sciences, China
Hui Xia, Chinese Academy of Sciences, China
Yanhong Li, Chinese Academy of Sciences, China
Shiyou Yang, Zhejiang University, China
CEFC2010-1207

150 **Inductance Parameter Simulation Analysis and Measurement of Permanent Magnet Synchronous Motors**
Jiang Xin-tong, Heilongjiang Bayi Agricultural University & Harbin Institute of Technology, China
LI Wei-kai, Heilongjiang Bayi Agricultural University, China
LI Yong, Harbin Institute of Technology, China
Zhu Hongwei, Harbin Institute of Technology, China
CEFC2010-1209

151 **Object-Oriented Development and Runtime Investigation of 3-D electrostatic FEM problems in Pure Java**
Veronika Reinauer, University of Stuttgart, Germany
Tassilo Wendland, University of Stuttgart, Germany
Christian Scheiblich, University of Stuttgart, Germany
Remus Banucu, University of Stuttgart, Germany
Wolfgang M.Rucker, University of Stuttgart, Germany
CEFC2010-1284

152 **Layer Recurrent Neural Network Solution for an Electromagnetic Interference Problem**
Dan Doru Micu, Technical University of Cluj Napoca, Romania
Levente Czumbil, Technical University of Cluj Napoca, Romania
Andrei Ceclan, Technical University of Cluj Napoca, Romania
Anca Mutu, Technical University of Cluj Napoca, Romania
Denisa Stet, Technical University of Cluj Napoca, Romania
CEFC2010-1320

153 **Nonlinear Eddy Current Analysis by Boundary Integral Equation of One Component Utilizing Impedance Boundary Condition**
Kasuhisa Ishibashi, ABB Switzerland Ltd, Japan
Zoran Andjelic, ABB Switzerland Ltd, Japan
David Pusch, ABB Switzerland Ltd, Japan

CEFC2010-1323

154 **Numerical Analysis of Transitional Behavior of Ferrofluid Employing MPS Method and FEM**

Yoshikawa Gaku, Osaka University, Japan
Hirata Katuhiro, Osaka University, Japan
Miyasaka Fumikazu, Osaka University, Japan
Yu Okaue, Osaka University, Japan
CEFC2010-1373

155 **Three Dimensional Transient Modeling of a Halbach Rotor Moving above a Conductive Guideway using Fictitious Magnetic Charge**

Subhra Paul, University of North Carolina, USA
Dheeraj Bobba, University of North Carolina, USA
Jonathan Bird, University of North Carolina, USA
CEFC2010-1440

156 **Analysis of Corona Onset Electric Field Considering the Effect of Space Charges**

Tiebing Lu, North China Electric Power University, China
Gaolin Xiong, North China Electric Power University, China
Hong Rao, China Southern Power Grid Co., Ltd, China
Qi Wang, China Southern Power Grid Co., Ltd, China
CEFC2010-1590

157 **Analysis of Radial Electromagnetic Force under Different Poles/Slots Matched in Large Torque PMSMs**

Xintong Jiang, Harbin Institute of Technology, China
Yong Li, Harbin Institute of Technology, China
Xinghe Fu, Harbin Institute of Technology, China
Chenxiao Jiu, Harbin Institute of Technology, China
Yongping Lu, Harbin Institute of Technology, China
CEFC2010-1644

158 **Hydrodynamic Modeling for Discharge Analysis in Dielectric Liquids with Finite Element Method under Lightning Impulse**

HoYoung Lee, Kyungpook National University, Korea
YoungSun Kim, Sungkyunkwan University, Korea
HongKyu Kim, Korea Electrotechnology Research Institute, Korea
GeunYoung Jeong, Kyungpook National University, Korea
HeungGeun Kim, Kyungpook National University, Korea
SeHee Lee, Kyungpook National University, Korea
CEFC2010-1750

159 **Successful 3D Simulation of Branching Streamer in Air Bridging the Gap Between Main Electrodes Using Charge Simulation Method**

Matjaz Gaber, University of Maribor, Slovenia

Mladen Trlep, University of Maribor, Slovenia
Bojan Štumberger, University of Maribor, Slovenia
CEFC2010-1753

Poster session 13 — Monday

Wave Propagation 1

Session Chair: Dr. Lionel Pichon, Laboratoire de Genie Electrique de Paris, France

United A/B and L.A.X A/B — 1:15-2:45 PM

160 **Time Domain Hybrid Finite Elements/ Finite Differences Method For Solving Electromagnetic Compatibility Problems**
Mohamed El-Hachemi, BAE-Systems Advanced Technology Centre, UK
CEFC2010-1088

161 **Optimal Coefficients of the Special FD Operator for the CNS-FDTD Method**
Tadao Ohtani, Mitsubishi Heavy Industries, Ltd., Japan
Yasushi Kanai, Niigata Institute of Technology, Japan
CEFC2010-1159

162 **Dyadic Green's Functions for Two-Layered Electrically Gyrotropic Medium**
Abdullah Eroglu, Indiana University- Purdue University Fort Wayne, USA
CEFC2010-1250

163 **A Model Order Reduction Method for Efficient Band Structure Calculations of Photonic Crystals**
Christian Scheiber, Graz University of Technolgy, Austria
Alwin Schultschik, Saarland University, Germany
Oszkar Biro, Graz University of Technolgy, Austria
Romanus Dyczij-Edlinger, Saarland University, Germany
CEFC2010-1280

164 **Modeling the Simultaneous Switching Noise in the Power-Ground Planes with Slot**
Guoping Zou, North China Electric Power University, China
Erping Li, A*STAR Institute of High Performance Computing, Singapore
Xiang Cui, North China Electric Power University, China
Weidong Zhang, North China Electric Power University, China
Zhaonan Luo, North China Electric Power University, China
CEFC2010-1325

165 **Optimization of Meander Line Antenna Considering Coupling Between Non-linear Circuit and Electromagnetic Waves for UHF-band RFID**

Yuta Watanabe, Hokkaido University, Japan
Kota Watanabe, Hokkaido University, Japan
Hajime Igarashi, Hokkaido University, Japan
CEFC2010-1349

166 **Space-Time Finite Integration Method for Electromagnetic Field Computation**

Tetsuji Matsuo, Kyoto University, Japan
CEFC2010-1356

167 **Accelerated Spectral Domain Approach For Shielded Microstrip Lines By Approximating Summation With Super Convergent Series**

Sidharath Jain, Iowa State University, USA
Jiming Song, Iowa State University, USA
CEFC2010-1364

168 **Simulated and Measured Results for a S-Shaped Monopole Patch Antenna on a BiNbO4 Layer**

Ranilson Carneiro Filho, Federal University of Rio Grande do Norte, Brazil
José H. Araújo, Federal University of Rio Grande do Norte, Brazil
Ronaldo A. Martins, Federal University of Rio Grande do Norte, Brazil
Adaildo G. d'Assunção, Federal University of Rio Grande do Norte, Brazil
Laércio M. Mendonça, Federal University of Rio Grande do Norte, Brazil
CEFC2010-1381

169 **Numerical Analysis of Inverse Scattering in Microwave Imaging**

Lin Yang, Zhejiang University, China
Siu Lau Ho, The Hong Kong Polytechnic University, Hong Kong
Shiyou Yang, Zhejiang University, China
CEFC2010-1390

170 **Study of the Scattering Mechanisms of a Set of Conospheres**

R. Fernandez-Recio, National Institute for Aerospace Technology, Spain
Antonio Jurado-Lucena, National Institute for Aerospace Technology, Spain
Borja Errasti-Alcal, National Institute for Aerospace Technology, Spain
David Escot-Bocanegra, National Institute for Aerospace Technology, Spain
David Poyatos-Martinez, National Institute for Aerospace Technology, Spain
CEFC2010-1462

171 **Study on the Time-variated Radiation Model of Converter Valve**

Weidong Zhang, North China Electric Power University, China
Jiacui Gu, North China Electric Power University, China
Xiang Cui, North China Electric Power University, China
Jie Zhao, China Southern Power Grid Co., Ltd., China

Hong Rao, China Southern Power Grid Co., Ltd., China
Xioalin Li, China Southern Power Grid Co., Ltd., China
Qi Wang, China Southern Power Grid Co., Ltd., China
CEFC2010-1467

172 **An Efficient Solution of Finite-Difference Frequency-Domain (FDFD) Equations**
Veysel Demir, Northern Illinois University, USA
Erdogan Alkan, Syracuse University, USA
Atef Z. Elsherbeni, The University of Mississippi, USA
Ercument Arvas, Syracuse University, USA
CEFC2010-1512

173 **Wide Stop-band Cascaded Frequency Selective Surfaces with Koch Fractal Elements**
Robson H. C. Mani, Federal University of Rio Grande do Norte, Brazil
Adaildo G. d'Assunção, Federal University of Rio Grande do Norte, Brazil
Antonio L. P. S. Campos, Federal University of Rio Grande do Norte, Brazil
CEFC2010-1700

174 **Evaluation of Radiated Electromagnetic Field Interference Due to Frequency Switching in PWM Motor Drives by 3D Finite Elements**
Osama Mohammed, Florida International University, USA
Andrew Rosales, Florida International University, USA
Ali Sarikhani, Florida International University, USA
CEFC2010-1888

175 **Extension of the TLM Method to the Electromagnetic Wide Band Analysis of Anisotropic Ferrite-Based Structures**
Farhat Arij, UMR, France
Queffelec Patrick, UMR, France
Ney Michel, UMR, France
CEFC2010-1398

Coffee Break
Entry Level Foyer — 2:45-3:15 PM

Oral Session 3 — Monday
Material Modeling

Session Chairs: Prof. Ermanno Cardelli, Perugia University, Italy
Prof. Masato Enokizono, Oita University, Japan

Rosement AB Ballroom — 3:15-5:15 PM

176 **Electromagnetic Inspection Technique of Thickness of Nickel-Layer on Steel Plate Without Influence of Lift-Off Between Steel and Inspection Probe**
Yuji Gotoh, Oita University, Japan
Aya Matsuoka, Oita University, Japan

Norio Takahashi, Okayama University, Japan
CEFC2010-1028

177 **Finite Element Harmonic Modeling of Magnetoelectric Effect for Bilayer Composite**
Thu Trang Nguyen, UPMC, France
Xavier Miniger, UPMC, France
Frédéric Bouillault, UPMC, France
Laurent Daniel, UPMC, France
CEFC2010-1377

178 **Magnetization Process Simulation of Nd-Fe-B Magnets Taking the Demagnetization Phenomenon Into Account**
Yasushi Nakahata, Oita University, Japan
Takashi Todaka, Oita University, Japan
Masato Enokizono, Oita University, Japan
CEFC2010-1429

179 **Vector Hysteresis Modeling for Anisotropic Magnetic Materials**
Ermanno Cardelli, Perugia University, Italy
Edward Della Torre, George Washington University, Italy
Antonio Faba, Perugia University, Italy
CEFC2010-1578

180 **Full Wave Analysis of Annular Ring Microstrip Antenna on Metamaterial**
Christianne F.L. Vasconcelos, Universidade Federal do Rio Grande do Norte, Brazil
Maria R.M.L. Albuquerque, Universidade Federal do Rio Grande do Norte, Brazil
Sandro G. Silva, Universidade Federal do Rio Grande do Norte, Brazil
Jose R.S. Oliveira, Centro Federal de Educa, Brazil
Adaildo G. d'Assunção, Universidade Federal do Rio Grande do Norte, Brazil
CEFC2010-1696

181 **Activation of Trapped Field Magnets by Flux Pumping**
Kent R. Davey, Independent Consultant, USA
Roy Weinstein, University of Houston, USA
Ravi Sawh, University of Houston, USA
CEFC2010-1770

Oral Session 4 — Monday

Optimization and Design I

Session Chairs: Prof. Norio Takahashi, Okayama University, Japan
Dr. David Lowther, McGill University, Canada

Rosement CD Ballroom — 3:15-5:15 PM

182 **Generalized Continuum Sensitivity Formula for Shape Optimization of**

High-Frequency Devices in Frequency Domain

Nak-Sun Choi, Kyungpook National University, Korea
Gi-Woo Jeung, Kyungpook National University, Korea
Jin-Kyu Byun, Soongsil University, Korea
Heung-Geun Kim, Kyungpook National University, Korea
Dong-Hun Kim, Kyungpook National University, Korea
CEFC2010-1143

183 **A Population Based Incremental Learning Vector Algorithm for Multiobjective Optimal Designs**

Siu Lau Ho, The Hong Kong Polytechnic University, Hong Kong
Shiyou Yang, Zhejiang University, China
CEFC2010-1391

184 **Kriging Assisted Determination of the Optimal Geometry and Covering Material for a Bushing Shield**

Adnan Glotic, University of Maribor, Slovenia
Joze Pihler, University of Maribor, Slovenia
Peter Kitak, University of Maribor, Slovenia
Igor Ticar, University of Maribor, Slovenia
CEFC2010-1428

185 **The Use of Semantic Networks to Adapt a Design Prototype for Electromagnetic Device Optimization**

Jun Ouyang, McGill University, Canada
David Lowther, McGill University, Canada
CEFC2010-1602

186 **A Multiobjective Gaussian Quantum-Inspired Particle Swarm Approach Applied to Electromagnetic Optimization**

Luiz Lebensztajn, Escola Polit, Brazil
Leandro Coelho, Escola Polit, Brazil
CEFC2010-1712

187 **A Robust Global Optimization Algorithm of Electromagnetic Devices Utilizing Gradient Index and Surrogate Objective Function**

Minh-Trien Pham, Chungbuk National University, Korea
Minho Song, Chungbuk National University, Korea
Dong-Hoon Kim, Chungbuk National University, Korea
Chang Seop Koh, Chungbuk National University, Korea
CEFC2010-1868

Oral Session 5 — Tuesday

Coupled Problems

Session Chairs: Prof. Doug Lavers, University of Toronto, Canada

Prof. Erich Schmidt, Technical University of Viena, Austria

Rosement AB Ballroom — 8:00-10:00 AM

188 **Demagnetizing Field in Micromagnetic Simulation under Periodic Boundary Condition**

Tetsuji Matsuo, Kyoto University, Japan

Yuya Yamazaki, Kyoto University, Japan

CEFC2010-1194

189 **Hybrid Technique for Dynamic Modelling of the Performance of Linear Generators with Skewed Mounted Permanent Magnets**

Nikolaos Kimoulakis, National Technical University of Athens, Greece

Antonios Kladas, National Technical University of Athens, Greece

CEFC2010-1469

190 **Computation of Local Electromagnetic Force**

Tuomas Kovanen, Tampere University of Technology, Finland

Timo Tarhasaari, Tampere University of Technology, Finland

Lauri Kettunen, Tampere University of Technology, Finland

CEFC2010-1485

191 **Semi-Analytical Magnetic-Structural Coupling with Contact Analysis for MEMS/NEMS**

Phuong Pham Quang, Grenoble Electrical Engineering Laboratory, France

Benoit Delinchant, Grenoble Electrical Engineering Laboratory, France

Jean-Louis Coulomb, Grenoble Electrical Engineering Laboratory, France

Bertrand Du Peloux, Grenoble Electrical Engineering Laboratory, France

CEFC2010-1499

192 **Development of Numerical Simulation Method for Magnetic Separation of Magnetic Particles**

So Noguchi, Hokkaido University, Japan

SeokBeom Kim, Hokkaido University, Japan

CEFC2010-1552

193 **An Advanced Solidification Stage Electromagnetic Stirring System for Continuously Casting Steel Billets**

Doug Lavers, University of Toronto, Canada

Len Beitelman, University of Toronto, Canada

Chris Curran, University of Toronto, Canada

CEFC2010-1798

Oral Session 6 — Tuesday

Devices and Applications I

Session Chairs: Prof. Oszkar Biro, Graz University of Technology, Austria
Prof. Antonios Kladas, National Technical University of Athens, Greece

194 **Optimization of IPM Motors with Machaon Rotor Flux Barriers**

Piergiorgio Alotto, University of Padova, Italy
Nicola Bianchi, University of Padova, Italy
Massimo Barcaro, University of Padova, Italy
Massimo Guarnieri, University of Padova, Italy
CEFC2010-1525

195 **Design of Open-Type Magnetically Shielded Room Combined with Square Cylinders Made of Magnetic and Conductive Materials for MRI**

Keita Yamazaki, Takenaka Corp., Japan
Yu Haraguchi, Saga Univ., Japan
Kazuhiro Muramatsu, Saga Univ., Japan
Akira Haga, Tohoku-Gakuin Univ., Japan
Hitomi Sasaki, Iwate Univ., Japan
Koichiro Kobayashi, Iwate Univ., Japan
Shigetaka Hirosato, Takenaka Corp., Japan
Kiyotaka Kamata, Kagoshima National College of Tech., Japan
CEFC2010-1102

196 **Design of Novel Coaxial High Pass Filter for RF Applications**

Abdullah Eroglu, Indiana University AND Purdue University, USA
Richard Goulding, Oak Ridge National Laboratory, USA
Phil Ryan, Oak Ridge National Laboratory, USA
John Caughman, Oak Ridge National Laboratory, USA
David Rasmussen, Oak Ridge National Laboratory, USA
CEFC2010-1351

197 **Robust Optimum Design of PIFA for RFID Mobile Dongle Applications**

Kim Koon-Tae, Chung-Ang Univ., Seoul, Korea
Ko Jae-Hyeong, Chung-Ang Univ., Seoul, Korea
Choi Kyung, Kangwon Univ, Korea
Kim Hyeong-Seok, Chung-Ang Univ., Seoul, Korea
CEFC2010-1595

198 **Flexible Measures in Magnetic Active Shielding**

Alessandro Formisano, Seconda Universit, Italy
Maria Carmina Lupoli, Seconda Universit, Italy
Raffaele Martone, Seconda Universit, Italy
CEFC2010-1641

199 **Numerical Analysis of Brushes Commutation in Helical Launchers**

Antonino Musolino, University of Pisa, Italy
Rocco Rizzo, University of Pisa, Italy

CEFC2010-1662

Coffee Break

Entry Level Foyer — 10:00-10:30 AM

Poster Session 14 — Tuesday

Coupled Problems 2

Session Chair: Prof. Steve McFee, McGill University, Canada

United A/B and L.A.X A/B — 10:30 AM-12:00 PM

200 **Optimization of Sound Pressure Lever and Total Harmonic Distortion Performance of Microspeakers**

KwangIk Jang, Pusan National University, Korea
JinHun Park, Pusan National University, Korea
ChangMin Lee, Pusan National University, Korea
SangMoon Hwang, Pusan National University, Korea
CEFC2010-1274

201 **System Simulation of a PMSM Servo Drive using the Field-Circuit Coupling**

Thomas Herold, Institute of Electrical Machines, Germany
Enno Lange, Institute of Electrical Machines, Germany
Kay Hameyer, Institute of Electrical Machines, Germany
CEFC2010-1357

202 **Numerical Simulation and Experimental Validation of a Coupled Mechanical-Thermal-Electrical Contact Model**

Massimo Guarnieri, Università di Padova, Italy
Carmelo Majorana, Università di Padova, Italy
Gianluca Mazzucco, Università di Padova, Italy
Federico Moro, Università di Padova, Italy
CEFC2010-1376

203 **Time Domain Finite Element Analysis of Transient Transmission Lines With and Without Branches**

Chaoqun Jiao, Bejing Jiaotong University, China
Lei Gao, Bejing Jiaotong University, China
Siu-lau Ho, The Hong Kong Polytechnic University, China
Weinong Fu, Bejing Jiaotong University, China
CEFC2010-1420

204 **Design and Analysis of Resonant Coupling Wireless Power Transmission System**

Zhuo Yan, Hebei University of Technology, China
Haiyan Chen, Hebei University of Technology, China
Qingxin Yang, Hebei University of Technology, China
Chao Zhang, Hebei University of Technology, China

Guizhi Xu, Hebei University of Technology, China
Lei Guo, Hebei University of Technology, China
CEFC2010-1449

205 **FEM Thermal Analysis of Magnetic Fluid Heating Power**
Milos Bekovic, University of Maribor, Slovenia
Anton Hamler, University of Maribor, Slovenia
CEFC2010-1476

206 **Numerical Modeling of Magnetic Properties of Ferromagnetic Shape Memory Materials Depending on Temperature and Stress**
Takashi Todaka, Oita University, Japan
Masato Enokizono, Oita University, Japan
CEFC2010-1555

207 **Dynamic Analysis of 3-DOF Actuator Employing 3-D Finite Element Method**
Mingyu Tong, Osaka University, Japan
Katsuhiro Hirata, Osaka University, Japan
Syuhei Maeda, Osaka University, Japan
CEFC2010-1624

208 **Dynamic Analysis Method of Repulsion Forces on Current-Carrying Contact using 3-D FEM**
Tomohiro Ota, Panasonic Electric Works Analysis Center Co., Japan
Satoshi Suzuki, Panasonic Electric Works Co., Japan
Katsuhiro Hirata, Osaka University, Japan
CEFC2010-1625

209 **Modeling and Analyzing of Electrowetting Using Electromagnetic Body Force Density and Surface Tension**
Tan Il Sung, Sungkyunkwan University, Korea
Hong Soon Choi, Kyungpook National University, Korea
Young Sun Kim, Sungkyunkwan University, Korea
Il Han Park, Sungkyunkwan University, Korea
CEFC2010-1663

210 **Shape Calculation of Ferrofluid Droplet with Three Effects of Magnetic Field, Gravitational Field and Surface Tension Using FEA Coupled with LSM**
Young Sun Kim, Sungkyunkwan University, Korea
Se Hee Lee, Kyungpook National University, Korea
Il Han Park, Sungkyunkwan University, Korea
CEFC2010-1727

211 **Optimal Design of Energy Transmission System for Implantable Device Base on WiTricity**
Qingxin Yang, Tianjin Polytechnic University, China

Guizhi Xu, Hebei University of Technology, China
Jianqiang Jin, Hebei University of Technology, China
Duyan Geng, Hebei University of Technology, China
Weinong Fu, Hong Kong Polytechnic University, China
Weili Yan, Hebei University of Technology, China
CEFC2010-1799

212 **Frequency Dependent Coupled Field-Circuit Modeling of Armored Power Cables using Finite Elements**
Nagy Abed, Mansoura University, Egypt
Osama Mohammed, Florida International University, USA
CEFC2010-1890

Poster Session 15 — Tuesday

Devices and Applications 6

Session Chair: Dr. Tze-Fun Chan, The Hong Kong Polytechnic University, Hong Kong

United A/B and L.A.X A/B — 10:30 AM-12:00 PM

213 **Design and Basic Characteristics of Permanent Magnet Hybrid Type Axial Magnetic Bearings**
Nobuyuki Kurita, Gunma University, Japan
Youhei Takahashi, Gunma University, Japan
Takeo Ishikawa, Gunma University, Japan
Daniel Timms, Gunma University, Japan
Nicholas Greatrex, Gunma University, Japan
Toru Masuzawa, Gunma University, Japan
CEFC2010-1224

214 **Linear Position Detection Method Using Magnetic Sensors for Transverse Flux Linear Motor**
Junghwan Chang, Dong-A University, Korea
Jiwon Kim, Electric motor research center, KERI, Korea
Jiyoung Lee, Electric motor research center, KERI, Korea
Dohyun Kang, Electric motor research center, KERI, Korea
Kwangwoon Kim, University Of Science & Technology, UST, Korea
CEFC2010-1230

215 **Comparison of Flux-Regulation Capability of a Hybrid-Excited Flux-Switching Machine with Different Magnet Materials**
Wei Hua, Southeast University, China
Gan Zhang, Southeast University, China
Ming Cheng, Southeast University, China
Xikai Sun, Southeast University, China
CEFC2010-1232

216 **Analysis Method for Loss Evaluation Considering the Half-Turn Effect in**

Three-Phase Autotransformers

Chang-Wook Kim, HYUNDAI Heavy Industries Co., Korea
Dong-Hyun Kim, HYUNDAI Heavy Industries Co., Korea
Myung-Jun Choi, HYUNDAI Heavy Industries Co., Korea
Byung-San Baek, HYUNDAI Heavy Industries Co., Korea
Sang-Bong Park, HYUNDAI Heavy Industries Co., Korea
CEFC2010-1233

217 **Efficiency Evaluation of PMASynRM vs. SynRM Using Coupling FEM & Preisach Modeling**

Jung Ho Lee, Hanbat National University, Korea
Il Kyo Lee, Hanbat National University, Korea
Byeong Du Lee, Hanbat National University, Korea
CEFC2010-1244

218 **Design of Low Cost Line-Start Permanent Magnet Motor with Optimized Rotor Shape**

Song Jeong-Tae, Dong-A University, Korea
Li Jian, Dong-A University, Korea
Cho Yun-Hyun, Dong-A University, Korea
CEFC2010-1254

219 **Influence of Axial Length Ratio of Stator Segment on Performance of Tubular Transverse Flux Linear Machine**

Zou Ji-bin, Harbin Institute of Technology, China
Zhao Mei, Harbin Institute of Technology, China
Jiang Xintong, Harbin Institute of Technology, China
Fu Xinghe, Harbin Institute of Technology, China
Sadarangani Chandur, KTH, Teknikringen, Sweden
CEFC2010-1257

220 **Detent Force Reduction of Permanent Magnet Linear Synchronous Motor by Imposing Auxiliary Poles Technique**

Yu-wu Zhu, Dong-A University, Korea
Yun-hyun Cho, Dong-A University, Korea
CEFC2010-1266

221 **Efficiency Optimization of an Axial Flux Permanent-Magnet Synchronous Generator with Concentrated Pole Windings**

Hendrik Vansompel, Ghent University, Belgium
Peter Sergeant, Ghent University, Belgium
Luc Dupre, Ghent University, Belgium
CEFC2010-1272

222 **Fault Analysis of IPM type BLDC Motor Using Nonlinear Modeling of Stator Inter Turn Faults**

Kyung-Tae Kim, University of Ulsan, Korea
Jin Hur, University of Ulsan, Korea
Byeong-Woo Kim, University of Ulsan, Korea
Young-Kook Lee, Hyundai Motor Company, Korea
CEFC2010-1335

223 **Partial Least Square Regression for Quantitative Evaluation of Small Anomalies in Non-Destructive Testing**

Yann LeBihan, Laboratoire de Génie, France
Claude Marchand, Laboratoire de Génie, France
Jozsef Pavo, Laboratoire de Génie, Hungary
Guillaume Krebs, Laboratoire de Génie, France
CEFC2010-1571

224 **Magnetic Field and Rotordynamic Analysis of 30 krpm 220 kW Rated High Speed Motor for Blower Supported Magnetic Bearing**

Do-Kwan Hong, Electrique de Paris, Korea
Ki-Chang Lee, Electrique de Paris, Korea
Byung-Chul Woo, Electrique de Paris, Korea
Yeon-Ho Jeong, Electrique de Paris, Korea
Dae-Hyun Koo, Korea Electrotechnology Research Institute, Korea
Chan-Woo Ahn, Dong-A University, Korea
CEFC2010-1732

225 **Glass Net Design of Mold Transformer to Ruduce Electric Field Based on Surface Response Method and FEM**

Chang Eob Kim, Hoseo University, Korea
Mun HoJeon, Hoseo University, Korea
Pan Seok Shin, Hongik University, Korea
CEFC2010-1738

226 **Multi-objective Optimal Design of 2 Phase In-Wheel PMSM for Mobile Robot**

Dong-ju Shin, Hanyang University, Korea
Byung-il Kwon, Hanyang University, Korea
CEFC2010-1823

Poster Session 16 — Tuesday

Devices and Applications 7

Session Chair: Prof. Joao Pedro Bastos, Universidade Federal de Santa Catarina, Brasil

United A/B and L.A.X A/B — 10:30 AM-12:00 PM

227 **Structure Selection of Permanent Magnet Linear Synchronous Motor for Ropeless Elevator System**

Yu-wu Zhu, Dong-A University, Korea
Yun-hyun Cho, Dong-A University, Korea
CEFC2010-1267

228 **Modeling and Analysis of Fractional Slot Axial Flux Permanent-Magnet Machine Considering Overhang Effect**

Jian Li, Dong-A University, Korea
Byungkuk Kim, Dong-A University, Korea
Yunhyun Cho, Dong-A University, Korea
CEFC2010-1285

229 **Direct and Inverse Analytical Models of a Switched Reluctance Motor**

Larisa Strete, Technical University of Cluj-Napoca, Romania
Iqbal Husain, University of Akron, USA
O Cornea, Technical University of Timisoara, Romania
Ioan-Adrian Viorel, Technical University of Cluj-Napoca, USA
CEFC2010-1286

230 **Torque and Loss Calculation of Rotating Machines Considering Laminated Cores Using Post 1-D Analysis**

Katsumi Yamazaki, Chiba Institute of Technology, Japan
Noriaki Fukushima, Chiba Institute of Technology, Japan
CEFC2010-1297

231 **The Optimal Shape Design of Claw-Pole for PM Stepping Motor Considering Magnetic Saturation and Leakage Flux**

Cho Su Yeon, Hanyang University, Korea
Bae Jae Nam, Hanyang University, Korea
Kim Kwang Soo, Hanyang University, Korea
Ham Sang Hwan, Hanyang University, Korea
Lee Ju, Hanyang University, Korea
CEFC2010-1307

232 **Thermal Analysis of Dual Mechanical Port Machine for Wind Power Application with Co-simulation Method**

Xikai Sun, Southeast University, China
Ming Cheng, Southeast University, China
Wei Hua, Southeast University, China
Longya Xu, The Ohio State University, China
CEFC2010-1309

233 **Modeling of a Dual-Channel Switched Reluctance Generator Including the Effects of Mutual Coupling**

Wen Ding, Xi'an Jiaotong University, China

Deliang Liang, Xi'an Jiaotong University, China
Jianyong Lou, Xi'an Jiaotong University, China
CEFC2010-1310

234 **Influence of the Electrical Steel Grade on the Performance of the Direct-Drive Permanent Magnet Machine for Wind Energy Generation**

Damian Kowal, Ghent University, Belgium
Luc Dupré, Ghent University, Belgium
Peter Sergeant, Ghent University, Belgium
Lode Vandenbossche, ArcelorMittal Global R&D Gent, Belgium
Marc DeWulf, ArcelorMittal Global R&D Gent, Belgium
CEFC2010-1315

235 **Torque Characteristic Analysis of IPM Type BLDC Motor Considering Pole/Slot Combination Under Stator-Turn Fault Condition**

Hee-Woon Kim, University of Ulsan, Korea
Jin-Gyu Youn, University of Ulsan, Korea
Jin Hur, University of Ulsan, Korea
Byeong-Woo Kim, University of Ulsan, Korea
CEFC2010-1334

236 **Design and Analysis of Specific High-Speed Solid Rotor Induction Motor with Copper End Rings**

Yoseph Gessese, Darmstadt University of Technology, Germany
Andreas Binder, Darmstadt University of Technology, Germany
CEFC2010-1336

237 **The Novel Method for Vibration Reduction of IPM Type BLDC Motor**

Jin-Wook Reu, University of Ulsan, Korea
Jin Hur, University of Ulsan, Korea
Byeong-Woo Kim, University of Ulsan, Korea
Gyu-Hong Kang, Korea Marine Equipment Research Institute, Korea
CEFC2010-1395

238 **Design of Flux Barriers in a Rotor of an Interior PM Synchronous Motor for Reducing Harmonics Losses**

Jang Jin-seok, Kunsan National University, Korea
Kim Ho-hyun, Kunsan National University, Korea
Song Jeong-hyun, Kunsan National University, Korea
Lee Yul-jae, Sinok Tech Co., Korea
Kim Byung-taek, Kunsan National University, Korea
CEFC2010-1425

239 **A Research on Method to Discriminate the Fitness of Phase Coil Arrangement in the Permanent**

Kim DongSok, Pusan National University, Korea

Cho SungYeol, Pusan National University, Korea
Park GwanSoo, Pusan National University, Korea
Choi HongSoon, Kyungpook National University, Korea
CEFC2010-1812

240 **The Design and Modeling of Brushless Dual Rotors Machine**
Chengxi Liu, The Hong Kong Polytechnic University, Hong Kong
S. L.Ho, The Hong Kong Polytechnic University, Hong Kong
W. N.Fu, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1859

Poster Session 17 — Tuesday

Numerical Techniques 2

Session Chair: Prof. Maurizio Repetto, Politecnico di Torino, Italy

United A/B and L.A.X A/B — 10:30 AM-12:00 PM

241 **Spectral Stochastic Simulation of a Ferromagnetic Cylinder Rotating at High Speed**
Eveline Rosseel, Katholieke Universiteit Leuven, Belgium
Herbert DeGersem, Katholieke Universiteit Leuven, Belgium
Stefan Vandewalle, Katholieke Universiteit Leuven, Belgium
CEFC2010-1105

242 **Numerical Analysis of Electromagnetic Levitation of Molten Metal Employing MPS Method and FEM**
Gaku Yoshikawa, Osaka University, Japan
Katuhiro Hirata, Osaka University, Japan
Fumikazu Miyasaka, Osaka University, Japan
CEFC2010-1142

243 **Development of Two-Dimensional Meshless Approaches without Using Integration Cells**
Ayumu Saitoh, University of Hyogo, Japan
Nobuyuki Matsui, University of Hyogo, Japan
Taku Itoh, University of Hyogo, Japan
Atsushi Kamitani, University of Hyogo
CEFC2010-1413

244 **Powerful Heuristics Make Computational Homology Viable**
Matti Pellikka, Tampere University of Technology, Finland
Saku Suuriniemi, Tampere University of Technology, Finland
Lauri Kettunen, Tampere University of Technology, Finland
CEFC2010-1416

245 **Heat Transfer Model of the Human Eye Using Web-Spline Technique**
Fulya C. Kunter, Bogazici University, Turkey

Selim Seker, Bogazici University, Turkey
CEFC2010-1417

246 **A Meshless Local Boundary Integral Equation Method for Three Dimensional Scalar Problems**
Williams Nicomedes, Federal University of Minas Gerais, Brazil
Renato Mesquita, Federal University of Minas Gerais, Brazil
Fernando Moreira, Federal University of Minas Gerais, Brazil
CEFC2010-1439

247 **Preconditioner for Mortar Method Applied to the FEM**
Abdelatif Tinzefte, Universit, France
Mathieu Aubertin, Universit, France
Thomas Henneron, Universit, France
Fran Piriou, Universit, France
CEFC2010-1460

248 **Parallel Algorithm for Meshfree Radial Point Interpolation Method on Graphics Hardware**
Susumu Nakata, Ritsumeikan University, Japan
Yu Takeda, Ritsumeikan University, Japan
Norihisa Fujita, Tokyo University of Technology, Japan
Soichiro Ikuno, Tokyo University of Technology, Japan
CEFC2010-1465

249 **Development of Three-Dimensional Extended Boundary-Node Method for Potential Problem**
Taku Itoh, Seikei University, Japan
Ayumu Saitoh, Seikei University, Japan
Atsushi Kamitani, Seikei University, Japan
CEFC2010-1497

250 **Overlapping Finite Elements Used to Connect Non-Conforming Meshes in 3D With a Vector Potential Formulation**
Guillaume Krebs, CNRS UMR 8507, Supelec, France
Thomas Henneron, Universit, France
Yann LeBihan, ParisTech Arts et M, France
CEFC2010-1508

251 **3D Parallel Conjugate Gradient Solver Optimized for GPUs**
Rogerio F. Carvalho, Pontifical Catholic University of Minas Gerais, Brazil
Carlos A.P.S. Martins, Pontifical Catholic University of Minas Gerais, Brazil
Rose M.S. Batalha, Pontifical Catholic University of Minas Gerais, Brazil
Ana F.P. Camargos, Federal Institute of Minas Gerais, Brazil
CEFC2010-1617

252 **Multigrid Method with Adaptive IDR-based Jacobi Smoother**

Kota Watanabe, Hokkaido University, Japan

Seiji Fujino, Kyushu University, Japan

Hajime Igarashi, Hokkaido University, Japan

CEFC2010-1689

253 **One-Ampare Conductor Method for Tubular Linear Induction Motor for Size Reduction of Primary Iron Core**

Byeong-Hwa Lee, Hanyang University, Korea

Soon-O Kwon, Hanyang University, Korea

Jeong-Jong Lee, Hanyang University, Korea

Jung-Pyo Hong, Hanyang University, Korea

CEFC2010-1692

Poster Session 18 — Tuesday

Optimization and Design 2

Session Chair: Mr. Behzad Forghani, Infolytica, Canada

United A/B and L.A.X A/B — 10:30 AM-12:00 PM

254 **Topology Optimization of Electromagnetic Devices Composed of Iron and Coils: Adaptive Remeshing Algorithm for the Convexity-Oriented Mapping Method**

Thibaut Labbe, Université Catholique de Louvain, Belgium

Bruno Dehez, Université Catholique de Louvain, Belgium

CEFC2010-1052

255 **Accurate Prediction of Unknown Corrosion Currents Distributed on the Hull of a Naval Ship Utilizing Material Sensitivity Analysis**

Hyun-Ju Chung, Agency for Defense Development, Korea

Chang-Seob Yang, Agency for Defense Development, Korea

Jae-Jin Jeon, Agency for Defense Development, Korea

Gi-Woo Jeung, Kyungpook National Univ, Korea

Dong-Hun Kim, Kyungpook National Univ, Korea

CEFC2010-1145

256 **Optimal Design of Meander-Line Antennas for Radio Frequency Identification**

A. C. Lisboa, ENACOM - Handcrafted Technologies, Brazil

X. L. Travassos, SENAI - Integrated Center of Manufacture and Technology, Brazil

M. M. B. Lima, SENAI - Integrated Center of Manufacture and Technology, Brazil

D. A. G. Vieira, ENACOM - Handcrafted Technologies, Brazil

CEFC2010-1359

257 **A Inverse Scattering Technique for Objects Buried in Planar Layered Based on an Estimation of Distribution Algorithm**

Xiaoming Chen, Huazhong University of Science and Technology, China

K.R Shao, Huazhong University of Science and Technology, China

Youguang Guo, University of Technology, Australia

Jianguo Zhu, University of Technology, Australia
J.D. Lavers, University of Toronto, Canada
CEFC2010-1386

258 **Robust Optimization using a Methodology based on Cross Entropy Methods**
SiuLau Ho, The Hong Kong Polytechnic University, Hong Kong
Shiyou Yang, Zhejiang University, Hong Kong
Yingying Yao, Zhejiang University, Hong Kong
CEFC2010-1389

259 **Particle Swarm Optimization of the Stator of a High Speed PM Synchronous Machine**
Anouar Belahcen, Aalto University, Finland
Floran Martin, Polytech'Nantes, France
Mohammed-El-Hadi Zaim, Polytech'Nantes, France
Emad Dlala, Aalto University, Finland
Zlatko Kolondzovski, Aalto University, Finland
CEFC2010-1470

260 **Design Optimization of Axial-Flux Permanent Magnet Generator**
Nizar Al-Aawar, Hariri Canadian University, Lebanon
Toufic Hijazi, Hariri Canadian University, Lebanon
Abdul-Rahman Arkadan, Hariri Canadian University, Lebanon,USA
CEFC2010-1483

261 **Optimization of Rotor of Actual IPM Motor using ON/OFF Method**
Norio Takahashi, Okayama University, Japan
Takaya Yamada, Okayama University, Japan
Daisuke Miyagi, Okayama University, Japan
CEFC2010-1567

262 **Simulation and Optimization of Structure Parameters in 550kV Disconnectors Based on Response Surface Method**
Ruilei Gong, Xi'an Jiaotong University, China
Shuhong Wang, Xi'an Jiaotong University, China
Xianjue Luo, Xi'an Jiaotong University, China
Jie Qiu, Xi'an Jiaotong University, China
Jian Guo Zhu, University of Technology, Australia
Youguang Guo, University of Technology, Australia
CEFC2010-1586

263 **Forecast and Analysis of Electromagnetic Interference in Substation**
Huijuan Zhang, Hebei University of Technology, China
Yanting Wang, Hebei University of Technology, China
Shitao Wang, Hebei University of Technology, China

Meng Wu, Hebei University of Technology, China
Weili Yan, Hebei University of Technology, China
CEFC2010-1588

264 **Robust Design of Dual Band/Polarization Patch Antenna Using Sensitivity Analysis and Taguchi's Method**
Ko Jae-Hyeong, Chung-Ang Univ, Korea
Park Jun-Seok, Kookmin University, Korea
Kim Hyeong-Seok, Chung-Ang Univ, Korea
CEFC2010-1597

Poster Session 19 — Tuesday

Static and Quasi-static Fields 3

Session Chair: Dr. Ruth V. Sabariego, University of Liège, Belgium

United A/B and L.A.X A/B — 10:30 AM-12:00 PM

265 **Convergence Acceleration in Transient Analysis of Rotating Machines Using Time-Periodic Explicit Error Correction Method**
Yasuhito Takahashi, Doshisha University, Japan
Hiroyuki Kaimori, Science Solutions International Laboratory, Japan
Akihisa Kameari, Science Solutions International Laboratory, Japan
Tadashi Tokumasu, Toshiba Corporation Power Systems Company, Japan
Masafumi Fujita, Toshiba Corporation Power Systems Company, Japan
Shinji Wakao, Waseda University, Japan
CEFC2010-1265

266 **Numerical Method of Solving Singularity Problems on Potential Computation in Spheroidal Systems**
Omonowo Momoh, Prairie View A&M University, USA
Matthew Sadiku, Prairie View A&M University, USA
Cajetan Akujuobi, Prairie View A&M University, USA
CEFC2010-1289

267 **Modeling of Large Air Gap Transformers Using Magnetic Equivalent Circuit for Designing of High Power Application**
Jean-Romain Sibu, G2ELAB, ALSTROM BP4, France
Jean-Paul Ferrieux, G2ELAB, France
Gérard Meunier, G2ELAB, France
Robert Periot, ALSTROM BP4, France
CEFC2010-1316

268 **Generic Magnetostatic BEM Formulation Using One Unknown Double Layer Charge**
Kazuhisa Ishibashi, ABB Switzerland Ltd., Japan
Zoran Andjelic, ABB Switzerland Ltd., Japan
David Pusch, ABB Switzerland Ltd., Japan

CEFC2010-1324

269 **Field-Circuit Coupling With Element-Free Galerkin Method**

Eduardo Coppoli, Centro Federal de Educa, Brazil
Renato Mesquita, Universidade Federal de Minas Gerais, Brazil
Renato Silva, Laborat, Brazil
CEFC2010-1384

270 **Ships Magnetic Anomaly Computation with Integral Equation and Fast Multipole Method**

Jean-Michel Guichon, Universit, France
Olivier Chadebec, Universit, France
Patrice Labie, Universit, France
Jean-Louis Coulomb, Universit, France
Trung-Son Nguyen, Universit, France
CEFC2010-1403

271 **Measurement and Calculation of Iron Loss and Flux inside Silicon Steel Lamination Under DC Biasing**

Zhigang Zhao, Hebei University of Technology, China
Fugui Liu, Hebei University of Technology, China
Zhiguang Cheng, R & D Center, Baoding Tianwei Group Co., LTD, China
Lanrong Liu, R & D Center, Baoding Tianwei Group Co., LTD, China
Weili Yan, Hebei University of Technology, China
CEFC2010-1447

272 **Deflation Techniques for Computational Electromagnetism, Part II: Numerical Applications**

Hajime Igarashi, Hokkaido University, Japan
Kota Watanabe, Hokkaido University, Japan
CEFC2010-1459

273 **Eddy Current Induced by Villari-Effect in Magnetostrictive Energy Harvesting Devices**

Daniele Davino, Università degli Studi del Sannio, Italy
Alessandro Giustiniani, Università degli Studi di Salerno, Italy
Ciro Visone, Università degli Studi del Sannio, Italy
Walter Zamboni, Università degli Studi di Salerno, Italy
CEFC2010-1475

274 **A 2D Analytic Based Model of a Rotor Moving Over a Conductive Guideway**

Nirmal Paudel, University of North Carolina, USA
Jonathan Bird, University of North Carolina, USA
CEFC2010-1524

275 **A Direct Circuit Parameter Extraction Method of Eddy-Current Magnetic Field**

W. N. Fu, The Hong Kong Polytechnic University, Hong Kong
S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1545

276 **2D/3D Hybrid Computation of Ion Flow Field around House near HVDC Bipolar Transmission Lines**

Bo Zhang, Tsinghua University, China
Wei Li, Tsinghua University, China
Jinliang He, Tsinghua University, China
Rong Zeng, Tsinghua University, China
CEFC2010-1592

277 **A Non-Standard Axisymmetric FE-BE Method**

Giovanni Aiello, Universit, Italy
Salvatore Alfonzetti, Universit, Italy
Nunzio Salerno, Universit, Italy
CEFC2010-1735

278 **Numerical Simulation of a Self-Decoupling Magneto-Rheological Damper on Electromagnetic-Thermal Coupling**

Chengbin Du, Hohai University, China
Guojun Yu, Hohai University, China
Faxue Wan, Hohai University, China
CEFC2010-1836

Lunch

Red Bar Entry Level Foyer — 12:00-1:00 PM

Poster Session 20 — Tuesday

Devices and Applications 8

Session Chair: Prof. Hyeong-Seok Kim, Chung-Ang University, Korea

United A/B and L.A.X A/B — 1:00-2:30 PM

279 **Characteristics Analysis of an IPM Motor Driven by Voltage Source Using 3-D Finite Element Method with Prismatic Elements**

Hirokatsu Katagiri, Gifu University, Japan
Yoshihiro Kawase, Gifu University, Japan
Tadashi Yamaguchi, Gifu University, Japan
Yoshiyasu Shibayama, Gifu University, Japan
Kazuya Kishida, Toyo Denki Seizo K.K., Japan
Keiichi Morinaga, Toyo Denki Seizo K.K., Japan
CEFC2010-1352

280 **Comparative Study of Linear Double Salient Permanent Magnet Motors**

Ruiwu Cao, Southeast University, China

Ming Cheng, Southeast University, China
Wei Hua, Southeast University, China
Wenxiang Zhao, Southeast University, China
CEFC2010-1354

281 **Experimental Works and Power Loss Calculations of Low-Speed Permanent Magnet Wind Turbine Generator**

Jang-Young Choi, Chungnam National University, Korea
Kyoung-Jin Ko, Chungnam National University, Korea
Seok-Myeong Jang, Chungnam National University, Korea
CEFC2010-1374

282 **Automated Virtual Prototyping of Permanent Magnet Synchronous Machines for HEV's**

Martin Hafner, RWTH Aachen University, Germany
Thomas Finken, RWTH Aachen University, Germany
Matthias Felden, RWTH Aachen University, Germany
Kay Hameyer, RWTH Aachen University, Germany
CEFC2010-1379

283 **Dynamic Analysis of Circuit Breaker with Oil Dashpot Using Multi-Mesh Modification Method**

Suzuki Satoshi, Gifu University, Japan
Kawase Yoshihiro, Gifu University, Japan
Yamaguchi Tadashi, Gifu University, Japan
Kakami Shuhei, Gifu University, Japan
Toyama Shuhei, Gifu University, Japan
Hirata Katsuhiro, Osaka University, Japan
Ota Tomohiro, 3Panasonic Electric Works, Ltd., Japan
CEFC2010-1387

284 **Irreversible Demagnetization Analysis of IPM type BLDC Motor Considering the Circulating Current by Stator Turn fault**

Hyung-Gyu Kim, University of Ulsan, Korea
Jin Hur, University of Ulsan, Korea
Byeong-Woo Kim, University of Ulsan, Korea
Gyu-Hong Kang, Korea Marine Equipment Research Institute, Korea
CEFC2010-1394

285 **Fast Design Process for a Complete Machine Series Applying Coupled Analytical and Numerical Simulations**

Matthias Felden, RWTH Aachen University, Germany
Martin Hafner, RWTH Aachen University, Germany
Kay Hameyer, RWTH Aachen University, Germany
CEFC2010-1401

286 **Design Methodology of a Single-phase Line Start PM Motor Using Conditions for Magnetic Balance and Copper Loss Minimization**

Soo-whang Baek, Hanyang University, Korea
Myoung-hyun Choi, Kunsan National University, Korea
Byung-il Kwon, Hanyang University, Korea
Byung-taek Kim, Kunsan National University, Korea
CEFC2010-1422

287 **Optimization of a Squirrel Cage Rotor of a Written Pole Motor For Improvement of Magnetization Characteristics**

Seong-cheol Park, Kunsan National University, Korea
Jeong-hyun Song, Kunsan National University, Korea
Byung-taek Kim, Kunsan National University, Korea
CEFC2010-1423

288 **Levitation Force and Thrust Analysis of Hybrid-Excited Linear Synchronous Motor for Magnetically Levitated Vehicles**

Han-Wook Cho, Korea Institute of Machinery and Materials, Korea
Chang-Hyun Kim, Korea Institute of Machinery and Materials, Korea
Jong-Min Lee, Korea Institute of Machinery and Materials, Korea
Hyung-Suk Han, Korea Institute of Machinery and Materials, Korea
Bong-Sup Kim, Korea Institute of Machinery and Materials, Korea
Dong-Sung Kim, Korea Institute of Machinery and Materials, Korea
CEFC2010-1430

289 **3D Field Effects in Tubular Permanent Magnet Actuators with quasi-Halbach Magnetization**

Koen J. Meessen, Eindhoven University of Technology, The Netherlands
Bart L. J. Gysen, Eindhoven University of Technology, The Netherlands
Johannes J.H. Paulides, Eindhoven University of Technology, The Netherlands
Elena A. Lomonova, Eindhoven University of Technology, The Netherlands
CEFC2010-1506

290 **Position Detection of a Dual-structure Permanent Magnet Machine at Low Speed and Standstill Using Transient Finite Element Analysis**

Shuangxia Niu, The Hong Kong Polytechnic University, Hong Kong
S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
W.N. Fu, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1538

291 **Hysteresis Effects on the Detent Torque in Permanent Magnet Motors**

Y. B. Li, Johnson Electric, Inc, Hong Kong
S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
W. N. Fu, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1549

Poster Session 21 — Tuesday

Devices and Applications 9

Session Chair: Prof. Takashi Todaka, Oita University, Japan

United A/B and L.A.X A/B — 1:00-2:30 PM

292 **Characteristics Analysis in a Pole Changing Memory Motor Using Coupled**

Jung Holee, Hanbat National University, Korea
Seung Chullee, Hanbat National University, Korea
Tae Hoonlee, Hanbat National University, Korea
CEFC2010-1240

293 **Thermal Analysis of Direct Drive Transverse Flux Rotary Machine with Two Types of Stators**

Ji-Young Lee, Korea Electrotechnology Research Institute, Korea
Do-Kwan Hong, Korea Electrotechnology Research Institute, Korea
Byung-Chul Woo, Korea Electrotechnology Research Institute, Korea
Jung-Pyo Hong, Hanyang University, Korea
CEFC2010-1464

294 **Coil Optimization Design of Permanent Magnet Vibration-to-Electrical Power Generator**

Zhihua Wang, Hebei University of Technology, China
Bowen Wang, Hebei University of Technology, China
Li Wang, Hebei University of Technology, China
Jia Deng, Hebei University of Technology, China
Weili Yan, Hebei University of Technology, China
Lei Guo, Hebei University of Technology, China
CEFC2010-1473

295 **Hybrid Modeling Method for the Analysis of a Linear Flux Switching Machine**

Davy Krop, Eindhoven University of Technology, The Netherlands
Laurentiu Encica, Eindhoven University of Technology, The Netherlands
Elena Lomonova, Eindhoven University of Technology, The Netherlands
CEFC2010-1507

296 **Design and Optimization of a Device with Contactless Actuation for 4-Axis Machining**

Remus Banucu, University of Stuttgart, Germany
Jan Albert, University of Stuttgart, Germany
Christian Scheiblich, University of Stuttgart, Germany
Veronika Reinauer, University of Stuttgart, Germany
Wolfgang Rucker, University of Stuttgart, Germany
CEFC2010-1514

297 **Study of Interturn Short Circuit in Rotor Windings of a Synchronous Generator Using FEM**

Bruno Iamamura, EDF R&D, France
Yvonnick Le Menach, L2EP-LAMEL, France
A. Tounzi, L2EP-LAMEL, France
Nelson Sadowski, GRUCAD, Brazil
Eilin Guillot, EDF R&D, France
CEFC2010-1517

298 **Nondestructive Inspection Using Rotating Field Eddy Current (RoFEC) Probes**
Junjun Xin, Michigan State University, USA
Naiguang Lei, Michigan State University, USA
Lalita Udpa, Michigan State University, USA
Satish Udpa, Michigan State University, USA
CEFC2010-1030

299 **Short-Circuit Current Reduction of PM Motors by Magnet Segmentation Technique**
Babak Vaseghi, Nancy University, France
Noureddine Takorabet, Nancy University, France
Farid Meibody-Tabar, Nancy University, France
CEFC2010-1527

300 **Loss Analysis of the IPMSM for HEV**
Won-Ho Kim, Hanyang University, Korea
Jae-Nam Bae, Hanyang University, Korea
Ik-Sang Jang, Hanyang University, Korea
Ju Lee, Hanyang University, Korea
CEFC2010-1532

301 **Design and Field Analysis of a Magnetic Gear Integrated Tubular Linear Permanent Magnet Machine**
S.L. Ho, The Hong Kong Polytechnic University, Hong Kong
Shuangxia Niu, The Hong Kong Polytechnic University, Hong Kong
W.N. Fu, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1536

302 **Optimal Design of FRLSM to Increase Thrust and Reduce the Detent Force**
Ki-Bong Jang, Changwon National University, Korea
Se-Ho Pyo, Changwon National University, Korea
Ho-Jin An, Changwon National University, Korea
Gyu-Tak Kim, Changwon National University, Korea
CEFC2010-1543

303 **A Flux-modulated Low-speed Motor with an Improved Structure and its Performance Analysis Using Finite-element Method**
W. N. Fu, The Hong Kong Polytechnic University, Hong Kong

S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1546

304 **Electric Field in Overhead Transmission Line for PLC Signal**
Francisco Sabino Jr., Hydro Electrical Company of S, Brazil
Ulysses Vitor, Federal University of Pernambuco, Brazil
Marcos DeMelo, Federal University of Pernambuco, Brazil
CEFC2010-1784

Poster Session 22 — Tuesday

Material Modeling 2

Session Chair: Dr. Aly Flores Filho, Federal University of Rio Grande do Sul, Brasil

United A/B and L.A.X A/B — 1:00-2:30 PM

305 **Statistical Modeling of an Anisotropic Lamination Stack**
Adil Jarrah, L2EP/Arts et M, France
S. Clenet, 1L2EP/Arts et M, France
Abdelkader Benabou, 2L2EP/Universit, France
Rindrarivelo Ramarotafika, 1L2EP/Arts et M, France
CEFC2010-1495

306 **Magnetic Dynamic Process of Magnetic Layers Around Grain Boundary for Sensitized Alloy 600**
Katsuhiko Yamaguchi, Fukushima University, Japan
Suzuki Kenji, Fukushima University, Japan
Nittono Osamu, Fukushima University, Japan
Tetsuya Uchimoto, Tohoku Univ, Japan
Toshiyuki Takagi, Tohoku Univ, Japan
CEFC2010-1572

307 **Trade-off Optimal Design in Single-phase Line-start Permanent Magnet Synchronous Motor**
Jung Dae-Sung, Hanyang University, Korea
Lee Hyung-Woo, Hanyang University, Korea
Lee Ju, Hanyang University, Korea
CEFC2010-1575

308 **Magnetic Field Analysis of Polar Anisotropic Ferrite Bonded Magnet to Outer Rotor Type Brushless DC Motor Considering Magnetizing Process**
Su-Jin Lee, Hanyang University, Korea
Jeong-Jong Lee, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
Byoung-Young Song, GMB Korea Corp, Korea
Jong-Won Park, GMB Korea Corp, Korea
CEFC2010-1579

309 **Modeling of Soft Magnetic Composite Material Using a Non Linear Homogenization Method**

Mohamed Belkadi, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique, France

Didier Trichet, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique, France

Brahim Ramdane, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique, France

Javad Fouladgar, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique, France

CEFC2010-1585

310 **Dynamic Finite Element Hysteresis Model for Iron Loss Calculation Under PWM Excitation**

Charalampos Patsios, National Technical University of Athens, Greece

Evangelos Tsampouris, National Technical University of Athens, Greece

Minos Beniakar, National Technical University of Athens, Greece

Antonios Kladas, National Technical University of Athens, Greece

CEFC2010-1594

311 **Differential Evolution Approaches Applied to the Jiles-Atherton Vector Hysteresis Parameters Estimation**

Leandro Coelho, Federal University of Paran, Brazil

Viviana Mariani, Federal University of Paran, Brazil

Jean Leite, Federal University of Paran, Brazil

CEFC2010-1613

312 **Hysteresis Modeling Using Multi-Preisach Model in Electromagnetic Computation**

Jeong-Jong Lee, Hanyang University, Korea

Seung-Hee Chai, Hanyang University, Korea

Jung-Pyo Hong, Hanyang University, Korea

CEFC2010-1646

313 **Finite Element Calculation in Transformer Cores Considering Anisotropic Magnetic Property Under Distorted Rotational Magnetic Flux Condition**

Yanli Zhang, Shenyang University of Technology, China

Xiaona Li, Shenyang University of Technology, China

Dexin Xie, Shenyang University of Technology, China

Chang Seop Koh, Chungbuk National University, Korea

CEFC2010-1658

314 **Electromagnetic and Thermal Modeling of Composite Materials Using Multilayer Shell Elements**

Brahim Ramdane, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

Didier Trichet, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

Mohamed Belkadi, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

Tayeb Saidi, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

Javad Fouladgar, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

CEFC2010-1671

315 **Research on Inductance Model of Giant Magnetostrictive Actuator**

Li Liyi, Harbin Institute of Technology, China

Zhang Chengming, Harbin Institute of Technology, China

Yan Baiping, Harbin Institute of Technology, China

Cao Jiwei, Harbin Institute of Technology, China

CEFC2010-1683

Poster Session 23 — Tuesday

Optimization and Design 3

Session Chair: Dr. Zhiguang Cheng, Baoding Tianwei Group Co., Ltd, China

United A/B and L.A.X A/B — 1:00-2:30 PM

316 **Sequential Design of Experiments Techniques for the Optimization Design of Electromagnetic Devices**

Gang Lei, Huazhong University of Science and Technology, China

K. R. Shao, Huazhong University of Science and Technology, China

Guangyuan Yang, Huazhong University of Science and Technology, China

Youguang Guo, University of Technology, Australia

Jianguo Zhu, University of Technology, Australia

J. D. Lavers, University of Toronto, Canada

CEFC2010-1427

317 **Gaussian Artificial Bee Colony Algorithm Approach Applied to Loney**

Leandro dos Santos Coelho, Pontifical Catholic University of Paran, Brazil

Piergiorgio Alotto, Universit, Italy

CEFC2010-1502

318 **Multiobjective Design Optimization of Electric Machine by Using Genetic Algorithm with Aggressive Species Diversity**

Yusuke Tsurumi, Waseda University, Japan

Shinji Wakao, Waseda University, Japan

CEFC2010-1553

319 **Multiobjective Optimization for Determination of the Electrothermal Parameters in Switchgear Cell Housing**

Peter Kitak, University of Maribor, Slovenia

Adnan Glotic, University of Maribor, Slovenia
Igor Ticar, University of Maribor, Slovenia
Joze Pihler, University of Maribor, Slovenia
CEFC2010-1560

320 **3D Stochastic Spectral Finite Element Method in Static Electromagnetism Using Vector Potential Formulation**
Karim Beddek, L2EP/USTL, France
Yvonnick Lemenach, L2EP/USTL, France
Stephane Clenet, L2EP/Arts et M, France
Olivier Moreau, EDF R&D, France
CEFC2010-1593

321 **A Creative Design System for Electromagnetic Device Optimization**
Jun Ouyang, McGill University, Canada
David Lowther, McGill University, Canada
CEFC2010-1603

322 **Topological Sensitivity Analysis for Steady State Eddy Current Problems with an application to Nondestructive Testing**
Min Li, McGill University, Canada
David Lowther, McGill University, Canada
CEFC2010-1605

323 **Vector Potential Current Method for Design Sensitivity Analysis of Static Electromagnetic-Structure Coupled Problem**
Tae HeeLee, Hanyang University, Korea
Minuk Lee, Hanyang University, Korea
CEFC2010-1634

324 **Calculation and Analysis of Electromagnetic in an Induction Motor Based on Continuous Quantum Ant Colony Optimization**
Weili Li, Harbin University of Science and Technology, China
Qiaoyu Yin, Harbin University of Science and Technology, China
Xiaochen Zhang, Harbin University of Science and Technology, China
CEFC2010-1649

325 **An Adaptive Optimization Method Using Kriging Model and Latin Hypercube Design and its Application to Optimum Design of PMLSM**
Yanli Zhang, Shenyang University of Technology, China
Bing Yan, Shenyang University of Technology, China
Dexin Xie, Shenyang University of Technology, China
Chang Seop Koh, Chungbuk National University, Korea
CEFC2010-1659

326 **Optimum Design of 75 Nm, 300 rpm Rated Transverse Flux Rotary Machine for**

Direct Drive Motor Using Penalty Method and Kriging with Constraint

Do-Kwan Hong, Korea Electrotechnology Research Institute, Korea
Ji-Young Lee, Korea Electrotechnology Research Institute, Korea
Byung-Chul Woo, Korea Electrotechnology Research Institute, Korea
Do-Hyun Kang, Korea Electrotechnology Research Institute, Korea
Kwon-Hee Lee, Dong-A University, Korea
CEFC2010-1665

327 **Magnetic Circuit Design of IPMSM to Improve Maximum Power in the Field Weakening Region**

Ho-Kyoung Lim, Hanyang University, Korea
Jeong-Jong Lee, Hanyang University, Korea
Soon-O Kwon, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
CEFC2010-1678

Poster Session 24 — Tuesday

Static and Quasi-static Fields 4

Session Chair: Prof. Hajime Igarashi, Hokkaido University, Japan

United A/B and L.A.X A/B — 1:00-2:30 PM

328 **Loss Calculation and Thermal Analysis of Three Modes of Retaining Sleeve for High-Speed PM Generators**

Weili Li, Harbin University of Science and Technology, China
Jing Wang, Harbin University of Science and Technology, China
Xiaochen Zhang, Harbin Institute of Technology, China
Baoquan Kou, Harbin Institute of Technology, China
CEFC2010-1204

329 **Potential Computation in a Conducting Prolate Spheroidal Shell using Exodus Method**

Omonowo Momoh, Prairie View A&M University, USA
Matthew Sadiku, Prairie View A&M University, USA
Cajetan Akujuobi, Prairie View A&M University, USA
CEFC2010-1290

330 **Moving Least-Square Approximation Based Interface Element with Variable Nodes for Modeling Sliding-interface in Electric Machines**

S. L. Ho, The Hong Kong Polytechnic University, China
Ningning Chen, The Hong Kong Polytechnic University, China
W. N. Fu, The Hong Kong Polytechnic University, China
CEFC2010-1314

331 **A Second Order Cell Method for Poisson**

Piergiorgio Alotto, Universit, Italy
Fabio Freschi, Politecnico di Torino, Italy

CEFC2010-1317

332 **Transformation Methods for Static Field Problems with Random Domains**

Duy HungMac, L2EP/Arts et M, France
S. Clenet, L2EP/Arts et M, France
Jean-Claude Mipo, VALEO-Syst, France
CEFC2010-1326

333 **Efficient Multipoles Modeling for Linear Magnetized Beads Manipulations**

Kauffmann Paul, Biopuces, CEA, France
Haguet Vincent, Biopuces, CEA, France
Reyne Gilbert, Grenoble Electrical Engineering lab, France
Delinchant Benoit, Grenoble Electrical Engineering lab, France
CEFC2010-1442

334 **3D Analytical and Numerical Modeling of Skewed Tubular Magnet Arrays**

Bart Gysen, Eindhoven University of Technology, The Netherlands
Koen Meessen, Eindhoven University of Technology, The Netherlands
J. H. Paulides, Eindhoven University of Technology, The Netherlands
Elena Lomonova, Eindhoven University of Technology, The Netherlands
CEFC2010-1466

335 **Analytical Model for External Induction Variations of a Ferromagnetic Cylinder Undergoing High Mechanical Stresses in a Low Magnetic Field of any Orientation**

Antoine Viana, Universit, France
Laure-Line Rouve, Universit, France
Gilles Cauffet, Universit, France
Jean-Louis Coulomb, Universit, France
CEFC2010-1491

336 **Analysis of Near and Far Stray Magnetic Fields of Dry-Type Transformers: 3D Simulations vs. Measurements**

Jasmin Smajic, ABB Corporate Research Ltd, Switzerland
Thorsten Steinmetz, ABB Corporate Research Ltd, Switzerland
Bogdan Cranganu-Cretu, ABB Corporate Research Ltd, Switzerland
Antonio Nogues, ABB S.A., Spain
Rafael Murillo, ABB AG, Spain
Jens Tepper, ABB AG, Germany
CEFC2010-1580

337 **Analysis of Eddy Current Damping for Short-Stroke DC Linear Motor**

Li Liyi, Harbin Institute of Technology, China
Pan Donghua, Harbin Institute of Technology, China
Kou Baoquan, Harbin Institute of Technology, China

CEFC2010-1583

338 **Multi-physical Coupling Calculation of 1000MW Supercritical Turbine Generator**

Weili Li, Harbin University of Science and Technology, China

Chunwei Guan, Harbin Institute of Technology, China

Feiyang Huo, Beijing Jiao Tong University, China

CEFC2010-1629

339 **Novel Network Model for Dynamic Stray Capacitance Analysis of Planar Inductor with Nanocrystal Magnetic Core in High Frequency**

Jianyong Lou, Xi'an Jiaotong University, China

Yitong Chen, Xi'an Jiaotong University, China

Deliang Liang, Xi'an Jiaotong University, China

Lin Gao, Xi'an Jiaotong University, China

Fei Dang, Xi'an Jiaotong University, China

Fangjun Jiao, Xi'an Jiaotong University, China

CEFC2010-1744

Poster Session 25 — Tuesday

Wave Propagation 2

Session Chair: Dr. Olivier Chadebec, G2ELab - Grenoble University, France

United A/B and L.A.X A/B — 1:00-2:30 PM

340 **Fast Three-Dimensional GPR Forward and Inverse Scattering Based on Wideband Diagonal Tensor Approximation**

Yueqin Huang, Xiamen University, China

Qing-Huo Liu, Duke University, USA

Jianzhong Zhang, Xiamen University, China

CEFC2010-1302

341 **Minimizing Sidelobe Levels and Facilitating Null Placements of Nonlinear Antenna Arrays Using an Improved Particle Swarm Optimization**

SiuLau Ho, The Hong Kong Polytechnic University, Hong Kong

Shiyou Yang, Zhejiang University, Hong Kong

Ka Wai Eric Cheng, The Hong Kong Polytechnic University, Hong Kong

CEFC2010-1388

342 **Effect of Square Slot in Microstrip Patch Antennas Using Artificial Neural Networks**

Wellington C. Araújo, Federal University of Rio Grande do Norte, Brazil

Adaildo G. d'Assunção, Federal University of Rio Grande do Norte, Brazil

Laércio M. Mendonça, Federal University of Rio Grande do Norte, Brazil

CEFC2010-1393

343 **Prediction of Conducted and Radiated Perturbations in Embedded Cable Systems Using a 3D PEEC approach**

Wissem Yahyaoui, IRSEEM Technop, France
Lionel Pichon, LGEP UMRS, France
Fabrice Duval, IRSEEM Technop, France
CEFC2010-1397

344 **Multi-Components Mobile Propagation Model of Park Environment**
Selim Seker, Bogazici University, Turkey
Yusuf Oc, Bogazici University, Turkey
Fulya Kunter, Bogazici University, Turkey
CEFC2010-1415

345 **Study of a Jamming System Positioning Using 2D Ray-Tracing Technique Associated with a Multi-Objective Particle Swarm Optimizer**
Guilherme Santos, Universidade Federal de Santa Catarina, Brazil
W. P. Carpes Jr., Universidade Federal de Santa Catarina, Brazil
J. P. A. Bastos, Universidade Federal de Santa Catarina, Brazil
Stevan Grubisic, Universidade Federal de Santa Catarina, Brazil
CEFC2010-1437

346 **Susceptibility Analysis of a Nonlinear System Using Hybrid Method of Electromagnetic Topology and Harmonic Balance**
Yoon-Mi Park, Seoul National University, Korea
Min-Hyuk Kim, Seoul National University, Korea
Changyul Cheon, Seoul National University, Korea
Hyun-Kyo Jung, Seoul National University, Korea
Young-Seek Chung, Seoul National University, Korea
CEFC2010-1444

347 **Analysis of Spurious Modes in Mixed Finite Element Method for Maxwell**
Jiefu Chen, Duke University, USA
Qing Liu, Duke University, USA
Mei Chai, Intel Corporation, USA
Jason Mix, Intel Corporation, USA
CEFC2010-1446

348 **Detection and Location of Defects in Wiring Networks Using Time Domain Reflectometry and Neural Networks**
Mostafa Kamel Smail, Laboratoire de G, France
Tarik Hacib, Univ. Jijel, Algeria
Lionel Pichon, Laboratoire de G, France
Florent Loete, Laboratoire de G, France
CEFC2010-1486

349 **Wave Propagation Along a Thin Wire Antenna Placed in a Horizontally Layered Medium**

Yingkang Wei, Norwegian University of Science and Technology (NTNU), Norway
Bengt Holter, Sintef IKT, Norway
Ingve Simonsen, Norwegian University of Science and Technology (NTNU), Norway
Karsten Husby, Sintef IKT, Norway
Jacob Kuhnle, Sintef IKT, Norway
Lars Norum, Norwegian University of Science and Technology (NTNU), Norway
CEFC2010-1490

350 **PEEC Modeling of a Two-Port TEM Cell for Radio Frequency Applications**
Piergiorgio Alotto, Univ. di Padova, Italy
Daniele Desideri, Univ. di Padova, Italy
Fabio Freschi, Politecnico di Torino, Italy
Alvise Maschio, Univ. di Padova, Italy
Maurizio Repetto, Politecnico di Torino, Italy
CEFC2010-1500

351 **Improved Equivalent Circuit Modeling for RF Components by The Real-Coefficient Adaptive Frequency Sampling Technique**
Hyun Paek, Chung-Ang Univ., Korea
Koon-Tae Kim, Chung-Ang Univ., Korea
Sungtek Kahng, Eng., Univ. of Incheon, Korea
Hyeong-Seok Kim, Chung-Ang Univ., Korea
CEFC2010-1596

352 **Analysis of Electromagnetic Radiation from HVAC Test Transmission Line Due to Corona Discharge**
Tiebing Lu, North China Electric Power University, China
Yang Zou, North China Electric Power University, China
Hong Rao, China Southern Power Grid Co., Ltd, China
Qi Wang, China Southern Power Grid Co., Ltd, China
CEFC2010-1681

353 **Wave Propagation in Layered Anisotropic Medium**
Abdullah Eroglu, Indiana University-Purdue University Fort Wayne, USA
CEFC2010-1851

Coffee Break

Entry Level Foyer — 2:30-3:00 PM

Oral Session 7 — Tuesday

Nanomagnetics & Nanophotonics

Session Chairs: Prof. Yasushi Kanai, Niigata Institute of Technology, Japan
Dr. Alexander Kildishev, Birck Nanotechnology Center, USA

Rosement AB Ballroom — 3:30-5:00 PM

354 **Characterization of Nanophotocic Structures Using the Finite Element Method**

Istvan Bardi, ANSYS Inc, USA

Leon Vardapetyan, ANSYS Inc, USA

John Manges, ANSYS Inc, USA

CEFC2010-1515

355 **Introduction and Analysis of the MRAM with Pole Type System by Using Micromagnetic Approach for High Gb/Chip**

Won Hyuk, Pusan National University, Korea

Cho SungYeol, Pusan National University, Korea

Park GwanSoo, Pusan National University, Korea

CEFC2010-1792

356 **FE Modeling of Plasmonic Nanoantennas with Realistic 3D Roughness and Distortion**

Joshua Borneman, Purdue University, USA

Alexander Kildishev, Purdue University, USA

Kuo-Ping Chen, Purdue University, USA

Xingjie Ni, Purdue University, USA

Vladimir Drachev, Purdue University, USA

CEFC2010-1831

357 **Time-Domain Modeling of Metal-Dielectric Nanostructures Characterized by a Set of Single-Pole Dispersion Terms**

Ludmila Prokopeva, Institute of Computational Technologies, Russia

Joshua Borneman, Purdue University, Russia

Alexander Kildishev, Purdue University, Russia

CEFC2010-1847

Oral Session 8 — Tuesday

Software Methodology

Session Chairs: Prof. Dexin Xie, Shenyang University of Technology, China
Dr. Kent Davey, Consultant, USA

Rosement CD Ballroom — 3:30-5:00 PM

358 **A Post-processing Integral Formulation for the Computation of Magnetic Field in Conductors**

Arnaud Guibert, Universit, France

Jean-Louis Coulomb, Universit, France

Olivier Chadebec, Universit, France

Corinne Rannou, BCRM de Brest, GESMA, France

CEFC2010-1488

359 **Understanding the Efficiency of Parallel Incomplete Cholesky Preconditioners on the Performance of ICCG Solvers for Multi-Core and GPU Systems**

Hussein Moghnieh, McGill University, Canada

David Lowther, McGill University, Canada
CEFC2010-1704

360 **Power Performance Analysis of 3-D Finite Element Mesh Refinement with Tetrahedra by CUDA/MPI on Multi-core and GPU Architecture**
Da Qi Ren, the University of Tokyo & JST, Japan
Dennis Giannacopoulos, McGill University, Canada
Reiji Suda, the University of Tokyo & JST, Japan
CEFC2010-1867

361 **Reverse Engineering Legacy Code for Finite Element Field Computation in Magnetics**
T. Arudchelvam, Rensselaer Polytechnic Institute, USA
J. Wijayakulasooriya, Rensselaer Polytechnic Institute, USA
S. Ratnajeevan H. Hoole, Rensselaer Polytechnic Institute, USA
CEFC2010-1891

Oral Session 9 — Wednesday

Devices and Applications II

Session Chairs: Prof. Chang Seop Koh, Chungbuk National University, Korea
Prof. S. Ratnajeevan Hoole, Rensselaer Polytechnic Institute, USA

Rosement AB Ballroom — 8:00-10:00 AM

362 **Finite Element Analysis of a Novel Design of a Three Phase Transverse Flux Machine with an External Rotor**
Erich Schmidt, Vienna University of Technology, Austria
CEFC2010-1199

363 **Application of a Non-Linear Numerical Integral Method to Predict Microfluxgate Output**
Vuillermet Yannick, DIHS, France
Audoin Marcel, CEA-LETI/DIHS, France
CEFC2010-1262

364 **Trajectory Analysis of Spherical Resonant Actuator Using 3-D FEM**
Suzuki Satoshi, Gifu University, Japan
Kawase Yoshihiro, Gifu University, Japan
Yamaguchi Tadashi, Gifu University, Japan
Kakami Shuhei, Gifu University, Japan
Toyama Shuhei, Gifu University, Japan
Hirata Katsuhiro, Osaka University, Japan
Tomohiro Ota, Panasonic Electric Works, Ltd., Japan
CEFC2010-1385

365 **Inductance Identification of PM Motor with Winding Turn Short Circuit Fault**
Babak Vaseghi, Nancy University, France

Babak Nahidmobarakeh, Nancy University, France
Noureddine Takorabet, Nancy University, France
Farid Meibody-Tabar, Nancy University, France
CEFC2010-1528

366 **Efficient Modeling of Thin Wires in a Lossy Medium by Finite Elements**
Viviane Cristine Silva, Universidade de S, Brazil
Lucas Blattner Martinho, Instituto de Pesquisas Tecnol, Brazil
Jose Roberto Cardoso, Universidade de Sao Paulo, Brazil
CEFC2010-1693

367 **Magnetic Hand Tracking for Human-Computer Interface**
Yinghong Ma, Xidian University, USA,China
Zhi-Hong Mao, University of Pittsburgh, USA
Wenyan Jia, University of Pittsburgh, USA
Chengliu Li, University of Pittsburgh, USA
Jiawei Yang, University of Pittsburgh, China
Mingui Sun, Xidian University, USA
CEFC2010-1745

Oral Session 10 — Wednesday

Numerical Techniques

Session Chairs: Prof. Arnolf Kost, TU Berlin, Germany
Dr. Costin Ifrim, MagFields Engineering, USA

Rosement CD Ballroom — 8:00-10:00 AM

368 **Modeling of the Magnetic Field Around a Ferrite-Cored Generator in a Proximity Detection System**
Jingcheng Li, The National Institute for Occupational Safety and Health, USA
Jacob Carr, The National Institute for Occupational Safety and Health, USA
John Bartels, The National Institute for Occupational Safety and Health, USA
CEFC2010-1005

369 **Parallel Computing of Magnetic Field for Rotating Machines Excited from Voltage Sources on the Earth Simulator**
Tomohito Nakano, Gifu University, Japan
Yoshihiro Kawase, Gifu University, Japan
Tadashi Yamaguchi, Gifu University, Japan
Yoshiyasu Shibayama, Gifu University, Japan
Masanori Nakamura, TOYO DENKI SEIZO K.K, Japan
Noriaki Nishikawa, Japan Agency for Marine-Earth Science and Technology, Japan
Hitoshi Uehara, Japan Agency for Marine-Earth Science and Technology, Japan
CEFC2010-1064

370 **A Novel Time-Domain Electric Field Integral Equation of Thin Wire Structures in Lossy Half-Space**

Hongxia Huang, North China Electric Power University, China
Lin Li, North China Electric Power University, China
Zhibin Zhao, North China Electric Power University, China
CEFC2010-1112

371 **The Analysis of Flow Characteristics of Molten Metal Coupling Electromagnetic with Navier-Stokes Equation**
Chang Eob Kim, Hoseo University, Korea
Mun Ho Jeon, Hoseo University, Korea
Pan Seok Shin, Hongik University, Korea
Qing H. Liu, Duke University, Korea
CEFC2010-1350

372 **Correction of Thin Shell Finite Element Magnetic Models via a Subproblem Method**
Patrick Dular, University of Liège, Belgium
Vuong Q. Dang, University of Liège, Belgium
Ruth V. Sabariego, University of Liège, Belgium
Laurent Krähenbühl, University of Liège, France
Christophe Geuzaine, University of Liège, Belgium
CEFC2010-1609

373 **Enhancing the Performance of Conjugate Gradient Solvers on Graphic Processing Units**
Maryam Mehri-Dehnavi, McGill University, Canada
David Fern, McGill University, Canada
Dennis Giannacopoulos, McGill University, Canada
CEFC2010-1672

Coffee Break
Entry Level Foyer — 10:00-10:30 AM

Poster Session 26 — Wednesday
Bioelectric Field Computation 1
Session Chair: Prof. Weili Yan, Hebei University of Technology, China
United A/B and L.A.X A/B — 10:30 AM-12:30 PM

374 **Estimation of Magnetoencephalography Focal Sources Using ECoG Signals Characteristics Driven Approach (ESCDA)**
Feng Luan, Seoul National University, Korea
Chany Lee, Seoul National University, Korea
Jong-Ho Choi, Seoul National University, Korea
Hyun-Kyo Jung, Seoul National University, Korea
CEFC2010-1014

375 **Classification of Mental Task from EEG Signals Using Immune Feature**

Weighted Support Vector Machine

Lei Guo, Hebei University of Technology, China
Youxi Wu, Hebei University of Technology, China
Ting Cao, Hebei University of Technology, China
Weili Yan, Hebei University of Technology, China
Xueqin Shen, Hebei University of Technology, China
CEFC2010-1042

376 **3D Reconstruction of Encephalic Tissue in MRI Image Using Immune Sphere-Shaped SVM**

Lei Guo, Hebei University of Technology, China
Ying Li, Hebei University of Technology, China
Dongbo Miao, Hebei University of Technology, China
Weili Yan, Hebei University of Technology, China
Xueqin Shen, Hebei University of Technology, China
CEFC2010-1043

377 **Thermal Ablation in Biological Tissue Using Tubular Electrode**

Carlos Antunes, University of Coimbra,Sa, Portugal
Tony Almeida, University of Coimbra, Portugal
Nelia Raposeiro, Sa, Portugal
Belarmino Goncalves, Hospitais Universit, Portugal
Paulo Almeida, Hospital de Santo Andr, Portugal
CEFC2010-1056

378 **Effects of the Geometry of a Tubular Electrode on the Temperature Distribution in Biological Tissue**

Carlos Antunes, University of Coimbra,Sa, Portugal
Tony Almeida, University of Coimbra, Portugal
Nelia Raposeiro, Sa, Portugal
Belarmino Goncalves, Hospitais Universit, Portugal
Paulo Almeida, Hospital de Santo Andr, Portugal
CEFC2010-1173

379 **FDTD-based Temperature Distribution Computation of Microwave Hyperthermia for Breast Cancer**

Baodong Bai, Shenyang University of Technology, China
Xiaoming Yin, Shenyang University of Technology, China
Dexin Xie, Shenyang University of Technology, China
Yanli Zhang, Shenyang University of Technology, China
CEFC2010-1185

380 **Optimal Design of a Focused Hyperthermia Device Using Finite Element Method**

S.L. Ho, The Hong Kong Polytechnic University, Hong Kong
Shuangxia Niu, The Hong Kong Polytechnic University, Hong Kong

W.N. Fu, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1540

381 **A Novel Array-type Transcranial Direct Current Stimulation (tDCS) System for Accurate Focusing on Targeted Brain Regions**
Ji-Hye Park, Yonsei University, Korea
Do-Won Kim, Yonsei University, Korea
Chang-Hwan Im, Yonsei University, Korea
CEFC2010-1633

382 **Strategies for Brain Sources and Tissues Properties Identification from EEG/MEG and EIT Signals**
Ida Caminiti, Seconda Univ. degli Studi di Napoli, Italy
Fabrizio Ferraioli, Ansaldo Energia branch office, Italy
Alessandro Formisano, Seconda Univ. degli Studi di Napoli, Italy
Raffaele Martone, Seconda Univ. degli Studi di Napoli, Italy
CEFC2010-1637

383 **Computation of Eddy Currents in Human Body Due to Pulsed Magnetic Field**
Fabio Freschi, Politecnico di Torino, Italy
Alessandra Guerrisi, Politecnico di Torino, Italy
Maurizio Repetto, Politecnico di Torino, Italy
CEFC2010-1749

384 **Three Dimensional Detection and Imaging for Human Lung Based on Node Back-Projection Algorithm with a 64 Electrodes EIT System**
Zhang Shuai, Hebei University of Technology, China
Xu Guizhi, Hebei University of Technology, China
Zhang Jianjun, Hebei University of Technology, China
Wang Hongbin, Hebei University of Technology, China
Geng Duyan, Hebei University of Technology, China
Shen Xueqin, Hebei University of Technology, China
CEFC2010-1755

385 **Simulation Study of EIT Inverse Problem Based on Bayesian Method**
Ying Li, Hebei University of Technology, China
Huifang Zhao, Hebei University of Technology, China
Renjie He, University of Texas at Houston, USA
Liyun Rao, The Methodist Hospital Research Institute, USA
Xueqin Shen, Hebei University of Technology, China
Weili Yan, Hebei University of Technology, China
Dirar S Khoury, The Methodist Hospital Research Institute, USA
CEFC2010-1801

386 **Modeling Deep Brain Stimulation Using Current Steering Scheme**

Charles T. M. Choi, National Chiao Tung University, Taiwan
Yen-Ting Lee, National Chiao Tung University, Taiwan
CEFC2010-1807

387 **Generating Virtual Channels in Retinal Prostheses**
Charles T. M. Choi, National Chiao Tung University, Taiwan
Shen Jen You, National Chiao Tung University, Taiwan
CEFC2010-1846

388 **Boundary Element Analysis of the Electrostatic Interactions between Organic Scaffolds and Transmembrane Proteins**
Domenico Patrizio Ansalone, Istituto Nazionale di Ricerca Metrologica, Italy
Oriano Bottauscio, Istituto Nazionale di Ricerca Metrologica, Italy
Alessandra Manzin, Istituto Nazionale di Ricerca Metrologica, Italy
CEFC2010-1424

Poster Session 27 — Wednesday

Devices and Applications 10

Session Chair: Prof. Carlos Antunes, University of Coimbra, Portugal

United A/B and L.A.X A/B — 10:30 AM-12:30 PM

389 **Effect of Pole and Slot Combination on Noise and Vibration in Permanent Magnet Synchronous Motor**
Tao Sun, Hanyang University, Korea
Yong-Ho Kim, Hanyang University, Korea
Wan-Jin Cho, Hanyang University, Korea
Liang Fang, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
CEFC2010-1564

390 **Optimal Design for Tooth and Yoke Width of Motor for Maximum Output**
Hae-Joong Kim, Hanyang University, Korea
Soon-O Kwon, Hanyang University, Korea
Do-Jin Kim, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
CEFC2010-1565

391 **Analytic Expressions for the Lorentz Force and Torque on a Line Current with Arbitrary Orientation Due to a Cuboidal Permanent Magnet**
J.M.M. Rovers, Eindhoven University of Technology, The Netherlands
J.W. Jansen, Eindhoven University of Technology, The Netherlands
E.A. Lomonova, Eindhoven University of Technology, The Netherlands
CEFC2010-1569

392 **On the Effect of Winding Parallel Paths in Synchronous Permanent Magnet Electric Machine Drives**

CEFC2010-1636

399 **Optimized Design of a Permanent Magnet Tubular Linear Generator for Wave Energy Conversion**

Haitao Yu, Southeast University, China
Bang Yuan, Southeast University, China
Hengshan Yang, Southeast University, China
Minqiang Hu, Southeast University, China
Lei Huang, Southeast University, China
CEFC2010-1639

400 **A Novel Flux-Switching Permanent Magnet Linear Generator for Wave Energy Extraction**

Lei Huang, Southeast University, China
Haitao Yu, Southeast University, China
Jing Zhao, Southeast University, China
Minqiang Hu, Southeast University, China
CEFC2010-1642

401 **Coupling 3D Finite Element Method and Electro-Magnetic Field Theory for Optimized Secondary Overhang Design of Linear Induction Motor**

Seok-Myeong Jang, Chungnam Nat, Korea
Yu-Seop Park, Chungnam Nat, Korea
Ji-Hoon Park, Chungnam Nat, Korea
Kyoung-Jin Ko, Chungnam Nat, Korea
Jang-Young Choi, Chungnam Nat, Korea
CEFC2010-1685

402 **Investigation of an Axial-Axial Flux Compound-Structure Permanent-Magnet Synchronous Machine Used for HEVs**

Jing Zhao, Harbin Institute of Technology, China
Ping Zheng, Harbin Institute of Technology, China
Ranran Liu, Harbin Institute of Technology, China
Qian Wu, Harbin Institute of Technology, China
Chengde Tong, Harbin Institute of Technology, China
CEFC2010-1703

403 **Optimization of 2 Phase In-wheel IPMSM for Wide Speed Range by Using the Kriging Model Based on Latin Hypercube Sampling**

Jae-beum Kim, Hanyang University, Korea
Kyu-yun Hwang, Hanyang University, Korea
Byung-il Kwon, Hanyang University, Korea
CEFC2010-1815

Poster Session 28 — Wednesday

Devices and Applications 11

Session Chair: Prof. Masato Enokizono, Oita University, Japan

United A/B and L.A.X A/B — 10:30 AM-12:30 PM

404 **Initial Design Using Space Harmonic Analysis Methods in Permanent Magnet Synchronous Machines**

Yong-Ho Kim, Hanyang University Seoul, Korea
Soon-O Kwon, Hanyang University Seoul, Korea
Tao Sun, Hanyang University Seoul, Korea
Jung-Pyo Hong, Hanyang University Seoul, Korea
CEFC2010-1566

405 **Magnetic Field Computation of Axial Flux Permanent Magnet Machines with Halbach and Axially Magnetized Rotor Using Quasi-3-D Analysis Modeling**

Jang-Young Choi, Chungnam National University, Korea
Yu-Seop Park, Chungnam National University, Korea
Seok-Myeong Jang, Chungnam National University, Korea
CEFC2010-1635

406 **A Method to Estimate Hysteresis Torque Using Core Loss**

Jeong-Jong Lee, Hanyang University, Korea
Baik-Kee Song, Hanyang University, Korea
Sung-Il Kim, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
CEFC2010-1645

407 **Electromagnetic Performance Evaluation of Synchronous Generator with Outer Permanent Magnet Rotor Considering Wind Power Turbine Characteristics**

Kyoung-Jin Ko, Chungnam National University, Korea
Seok-Myeong Jang, Chungnam National University, Korea
Yu-seop Park, Chungnam National University, Korea
Jang-Young Choi, Chungnam National University, Korea
CEFC2010-1668

408 **Thrust analysis and Optimization for the Segmented Armature Type Permanent Magnet Linear Synchronous Motor**

Ma Mingna, Harbin Institute of Technology, China
Liyi Li, Harbin Institute of Technology, China
Baoquan Kou, Harbin Institute of Technology, China
Liqing Li, Harbin Institute of Technology, China
Qingquan Chen, Harbin Institute of Technology, China
CEFC2010-1669

409 **Design of a Brushless Compound-Structure Permanent-Magnet Synchronous Machine for HEV Propulsion System**

Ping Zheng, Harbin Institute of Technology, China

Qian Wu, Harbin Institute of Technology, China
Ranran Liu, Harbin Institute of Technology, China
Jing Zhao, Harbin Institute of Technology, China
Chengde Tong, Harbin Institute of Technology, China
CEFC2010-1675

410 **Parameter Modeling for Interior Permanent Magnet Synchronous Motors for Parametric Design**
Soon-O Kwon, Hanyang University, Korea
Liang Fang, Hanyang University, Korea
Hae-Joong Kim, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
CEFC2010-1684

411 **Dynamic Characteristics Considering Vehicle Load and Jerk Condition of Linear Induction Motor by Using Equivalent Circuit with Electro-Magnetic Field Theory**
Seok-Myeong Jang, Chungnam Nat, Korea
Yu-Seop Park, Chungnam Nat, Korea
Kyoung-Jin Ko, Chungnam Nat, Korea
Ji-Hoon Park, Chungnam Nat, Korea
Jung-Ho Lee, Hanbat National Univ., Korea
CEFC2010-1688

412 **Design and Performance Analysis of a Vacuum Permanent Magnet Contactor**
Shuhua Fang, Southeast University, China
Heyun Lin, Southeast University, China
Xianbing Wang, Southeast University, China
Ping Jin, Southeast University, China
CEFC2010-1690

413 **Modeling of Coreloss Resistance for d-q Equivalent Circuit Analysis of IPMSM Considering Harmonic Linkage Flux**
Byeong-Hwa Lee, Hanyang University, Korea
Soon-O Kwon, Hanyang University, Korea
Jeong-Jong Lee, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
CEFC2010-1691

414 **Research on Compound-Structure Permanent-Magnet Synchronous Machine Used for Hybrid Electric Vehicles**
Jing Zhao, Harbin Institute of Technology, China
Ping Zheng, Harbin Institute of Technology, China
Chengde Tong, Harbin Institute of Technology, China
Qian Wu, Harbin Institute of Technology, China
Ranran Liu, Harbin Institute of Technology, China

CEFC2010-1701

415 **Investigation of a Unified Controller of Compound Structure Permanent-Magnet Synchronous Machine for HEV Applications**

Chengde Tong, Harbin Institute of Technology, China
Ping Zheng, Harbin Institute of Technology, China
Jing Zhao, Harbin Institute of Technology, China
Qian Wu, Harbin Institute of Technology, China
CEFC2010-1702

416 **Reluctance Network Model for the In-wheel motor of a Series-Hybrid Truck Using Tooth Contour Method**

M.F.J. Kremers, Eindhoven University of Technology, The Netherlands
Esin Ilhan, Eindhoven University of Technology, The Netherlands
D.C.J. Krop, 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
CEFC2010-1705

417 **A Back EMF Optimization of Double Layered Large Scale BLDC MOTOR by Using Hybrid Optimization Method**

YongBae Kim, Hongik University, Korea
Hyeong Taek Jang, Hongik University, Korea
Hong Soon Choi, Kyungpook National University, Korea
Chang Seop Koh, Chungbuk National University, Korea
Pan Seok Shin, Hongik University, Korea
CEFC2010-1713

Poster Session 29 — Wednesday

Optimization and Design 4

Session Chair: Dr. So Noguchi, Hokkaido University, Japan

United A/B and L.A.X A/B — 10:30 AM-12:30 PM

418 **Improved Differential Evolution Optimization Algorithm for the Design of a Brushless DC Wheel Motor**

Leandro dos Santos Coelho, Pontifical Catholic University of Paran, Brazil
Piergiorgio Alotto, Pontifical Catholic University of Paraná, Brazil
Viviana Cocco Mariani, Università di Padova, Italy
CEFC2010-1509

419 **Worst Case Analysis in Robust Design of NMR Magnets**

Angelo Ambrisi, Seconda Universit, Italy
Alessandro Formisano, Seconda Universit, Italy
Martone Raffaele, Seconda Università di Napoli, Italy
CEFC2010-1638

420 **Design of a Microwave Applicator for Sterilization Using Multiobjective Optimization and Phase Control Scheme**

Diogo B.Oliveira, Federal University of Minas Gerais, Brazil
Jésus J. S. Santos, Federal University of Minas Gerais, Brazil
Elson J. Silva, Federal University of Minas Gerais, Brazil
Oriane M. Neto, Federal University of Minas Gerais, Brazil
CEFC2010-1667

421 **Automatic Differentiation for Sensitivity Calculation in Electromagnetism: Application for Optimization of a Linear Actuator**

Petre Enciu, INPG/UJF/CNRS, France
F. Wurtz, INPG/UJF/CNRS, France
Laurent Gerbaud, INPG/UJF/CNRS, France
CEFC2010-1706

422 **Optimal Impedance Matching Design for Broadband Archimedean Spiral Antennas**

A. C. Lisboa, Universidade Federal de Minas Gerais, ENACOM - Handcrafted technologies, Brazil
D. A. G. Vieira, Universidade Federal de Minas Gerais, ENACOM - Handcrafted technologies, Brazil
R. R. Saldanha, Universidade Federal de Minas Gerais, Brazil
CEFC2010-1760

423 **Intelligent Memetic Algorithm Using GA and Guided MADS for the Optimal Design of Interior PM Synchronous Machine**

Dongsu Lee, Dong-A University, Korea
Seungho Lee, Dong-A University, Korea
Jong-Wook Kim, Dong-A University, Korea
Cheol-Gyun Lee, Dong-Eui University, Korea
Sang-Yong Jung, Dong-A University, Korea
CEFC2010-1766

424 **Optimal Design of Direct-Driven Wind Generator using Genetic Algorithm combined with Expert System**

Shang-Hoon Kim, Dong-A University, Korea
Sang-Yong Jung, Dong-A University, Korea
CEFC2010-1771

425 **Optimal Shape Design of a Thomson-coil Actuator Utilizing Generalized Topology Modification Based on Equivalent Circuit Method**

Wei Li, Chungbuk National University, Korea
Ziyan Ren, Chungbuk National University, Korea
Chang Seop Koh, Chungbuk National University, Korea
CEFC2010-1803

426 **A New Global Optimization Algorithm for Mixed-Integer-Discrete-Continuous Variables based on Particles Swarm Optimization**

Ziyan Ren, Chungbuk National University, Korea
Minh-Trien Pham, Chungbuk National University, Korea
Wei Li, Chungbuk National University, Korea
Chang Seop Koh, Chungbuk National University, Korea
CEFC2010-1813

427 **A Modified Tabu Search Method Applied to Inverse Problems**

Siguang An, Zhejiang University, China
Shiyou Yang, Zhejiang University, China
S.L Ho, The Hong Kong Polytechnic University, Hong Kong
Tao Li, Zhejiang University, China
CEFC2010-1826

428 **Utilizing Grid Computing Technique for Numerically Efficient Global Optimization of Electromagnetic Devices**

Minho Song, Chungbuk National University, Korea
Minh-Trien Pham, Chungbuk National University, Korea
Heesung Yoon, Chungbuk National University, Korea
Chang Seop Koh, Chungbuk National University, Korea
CEFC2010-1839

429 **Hybrid GA-PSO Multi-Objective Design Optimization of Coupled PM Synchronous Motor-Drive Using Physics-Based Modeling Approach**

Ali Sarikhani, Florida International University, USA
Osama Mohammed, Florida International University, USA
CEFC2010-1889

Poster Session 30 — Wednesday

Static and Quasi-static Fields 5

Session Chair: Dr. Antonio Faba, University of Perugia, Italy

United A/B and L.A.X A/B — 10:30 AM-12:30 PM

430 **An Approach to Determine the Circulation of Magnetic Field in FEM Computation Code with Vector Potential Formulation**

T. Henneron, Université Lille 1, France
F. Piriou, Université Lille 1, France
J-Y Roger, EDF R&D, France
CEFC2010-1493

431 **Magnetic Field Computation Using Compact Support Radial Basis Functions**

Rajeev Das, McGill University, Canada
David A. Lowther, McGill University, Canada
CEFC2010-1604

432 **Analyzing and Reducing Error in 2-D Frequency Domain Homogenization of Windings for R, L Parameters FE Computation**

Z. De Grève, Faculty of Engineering-Umons, Belgian Fund for Research F.R.S/FNRS, Belgium
O. Deblecker, Faculty of Engineering-Umons, Belgium
J. Lobry, Faculty of Engineering-Umons, Belgium
R.V. Sabariego, Institut Montefiore-Ulg, Belgium
P. Dular, Institut Montefiore-Ulg, Belgian Fund for Research F.R.S/FNRS, Belgium
C. Geuzaine, Institut Montefiore-Ulg, Belgium
CEFC2010-1607

433 **Finite Element Simulation of Electromagnetic Fields of a Self-decoupling Magneto-rheological Damper**

Chengbin Du, Hohai University, China
Faxue Wan, Hohai University, China
Guojun Yu, Hohai University, China
CEFC2010-1652

434 **Characteristics Analysis of Tubular Linear Induction Motor Using Axisymmetric Model**

Ji-Min Kim, Hanyang University, Korea
Byeong-Hwa Lee, Hanyang University, Korea
Jeong-Jong Lee, Hanyang University, Korea
Jung-Pyo Hong, Hanyang University, Korea
CEFC2010-1666

435 **Capacitance Parameter Extraction of HVDC converter system by the Method of Moments**

Jufang Wei, North China Electric Power University, China
Lei Qi, North China Electric Power University, China
Shili Liu, North China Electric Power University, China
Xiang Cui, North China Electric Power University, China
Weidong Zhang, North China Electric Power University, China
CEFC2010-1719

436 **The Effect of Laminated Structure on Coupled Magnetic Field and Mechanical Analyses of Iron Core and Its Homogenization Technique**

Yanhui Gao, Saga Univ., Japan
Kazuhiro Muramatsu, Saga Univ., Japan
Muhd Juzail Hatim, Saga Univ., Japan
CEFC2010-1726

437 **Fast Global Quantity Evaluation Based on Dual Magneto-quasistatic Field Formulations**

T. Steinmetz, ABB Schweiz AG, Switzerland
B. Cranganu-Cretu, ABB Schweiz AG, Switzerland

F. Kraemer, ETH Zuerich, Switzerland
J. Smajic, ABB Schweiz AG, Switzerland
CEFC2010-1733

438 **A Comparison Between Hybrid Methods for Open-Boundary Problems**
G. Aiello, Università di Catania, Italy
S. Alfonzetti, Università di Catania, Italy
S. A. Rizzo, Università di Catania, Italy
N. Salerno, Università di Catania, Italy
CEFC2010-1736

439 **Dissipative Processes in Electrical Engineering: A Multi-Scale Approach**
Vincent Mazauric, Schneider Electric, France
Nadia Ma, MINES ParisTech, France
Loïc Rondot, CEDRAT, France
Philippe Wendling, Magsoft Corporation, USA
CEFC2010-1764

440 **Comparison Study of Biot-Savart Law and 3D FEM of Electromagnetic Forces Acting on End Windings**
Ki-Chan Kim, Hanbat National University, Korea
Soo-Jin Hwang, Hanbat National University, Korea
CEFC2010-1780

441 **Refinement of Inductor Models via a Subproblem Finite Element Method**
Patrick Dular, University of Liège, Belgium
Mauricio V. Ferreira da Luz, University of Liège, Brazil
Patrick Kuo-Peng, UFSC, Brazil
Ruth V. Sabariego, University of Liège, Belgium
Laurent Krähenbühl, Université de Lyon , France
Christophe Geuzaine, University of Liège, Belgium
CEFC2010-1795

442 **Magnetic Fields Study of Various Planar Halbach Permanent Magnet Array**
Hao Jiang, Southeast University, China
Gan Zhou, Southeast University, China
Xueliang Huang, Southeast University, China
Shuang Wang, Southeast University, China
Lei Huang, Southeast University, China
CEFC2010-1797

443 **Induced Current and Planar Force in an Induction Planar Actuator**
Nolvi Francisco Baggio Filho, Federal University of Rio Grande do Sul, Brazil
Aly Ferreira Flores Filho, Federal University of Rio Grande do Sul, Brazil
CEFC2010-1837

Poster Session 31 — Wednesday

Wave Propagation 3

Session Chair: Dr. Daniel White, Lawrence Livermore National Laboratory, USA

United A/B and L.A.X A/B — 10:30 AM-12:30 PM

444 **Radio Propagation Path Loss Prediction of UMTS for an Urban Area**

Sati Yelen, Bogazici University, Turkey

S. Selim Seker, Bogazici University, Turkey

Fulya C. Kunter, Bogazici University, Turkey

CEFC2010-1418

445 **A Comparative Study between Witricity and Traditional Inductive Coupling in Wireless Energy Transmission**

Junhua Wang, The Hong Kong Polytechnic University, Hong Kong

S.L. Ho, The Hong Kong Polytechnic University, Hong Kong

W.N. Fu, The Hong Kong Polytechnic University, Hong Kong

Mingui Sun, University of Pittsburgh, USA

CEFC2010-1480

446 **Modeling of Switching Transient on Long Nonuniform Transmission Line Using Precise Integration Method in Time Domain**

Zhen Li, Tsinghua University, China

Shunchao Wang, Tsinghua University, China

Jinliang He, Tsinghua University, China

CEFC2010-1591

447 **Analysis of FSS with Koch Island Patch Elements Using the Wave Concept Iterative Procedure**

Alfrêdo Gomes Neto, Federal Institute of Education, Brazil

Fábio M. Pontes, Federal Institute of Education, Brazil

Jefferson C. Silva, Federal Institute of Education, Brazil

Paulo H. da F. Silva, Federal Institute of Education, Brazil

Adaildo Gomes D´Assunção, Federal University of Rio Grande do Norte, Brazil

CEFC2010-1650

448 **Meshless Local Petrov-Galerkin in Solving Microwave Guide Problems**

Bruno C. Correa, Federal University of Minas Gerais, Brazil

Elson J. Silva, Federal University of Minas Gerais, Brazil

Alexandre R. Fonseca, Federal University of Jequitinhonha and Mucuri Valleys, Brazil

Diogo B. Oliveira, Federal University of Minas Gerais, Brazil

Renato C. Mesquita, Federal University of Minas Gerais, Brazil

CEFC2010-1694

449 **Edge Elements and the Decomposition Projective Method to Solve Scattering Problems of Electrically Large Objects**

Lianyou Sun, Southeast University, China
Jon P. Webb, McGill University, Canada
Wei Hong, Southeast University, China
CEFC2010-1698

450 **Analysis of Stop-Band Frequency Selective Surfaces with D**
José I. A. Trindade, Federal University of Rio Grande do Norte, Brazil
Paulo H. da F. Silva, Federal University of Rio Grande do Norte, Brazil
Antonio L. P. S. Campos, Federal University of Rio Grande do Norte, Brazil
Adaildo Gomes D´Assunção, Federal University of Rio Grande do Norte, Brazil
CEFC2010-1699

451 **Electromagnetic Coupling through a Dielectric Layer with a Left-hand Circular Polarization**
A. Serres, UFCG, Brazil
G. Fontgalland, UFCG, Brazil
J. E. P. de Farias, UFCG, Brazil
H. Baudrand, L.A.P.L.A.C.E-G.R.E, France
CEFC2010-1708

452 **A Generalized Multi-conductor Transmission Line Model and Generalized Method for the Solution of the MTL**
Chaoqun Jiao, Bejing Jiaotong University, China
Lei Gao, Bejing Jiaotong University, China
S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
W. N. Fu, The Hong Kong Polytechnic University, Hong kong
CEFC2010-1716

453 **A Model Reduction Algorithm for Solving Multiple Scattering Problems Using Iterative Methods**
A. Vion, University of Li`ege, Belgium
R.V. Sabariego, University of Li`ege, Belgium
C. Geuzaine, University of Li`ege, Belgium
CEFC2010-1741

454 **A Modular Approach to FEM-MOM Hybridization for the Analysis of Finite Arrays of Antennas**
Luis E. Garcia-Castilo, Universidad Carlos III, Spain
Belen Andres, Universidad Carlos III, Spain
Ignacio Gomez-Revuelto, Universidad Politecnica de Madrid, Spain
Luis E. Garcia-Munoz, Universidad Carlos III, Spain
Cristophe Craeye, Universite Catholique de Louvain, Belgium
CEFC2010-1774

455 **Numerical Synthesis of Dielectric Embedded Electronically Steerable Multiple Beam Antenna Array**

Lei Liu, Zhejiang University, China
Junwei Lu, Griffith University, China
Shiyou Yang, Zhejiang University, China
CEFC2010-1829

456 **Sparse Wavelet Approximations to Transient Space-Time**
Steve McFee, McGill University, Canada
Adrian Ngoly, McGill University, Canada
CEFC2010-1844

457 **Monopole Microstrip Antennas for UWB Systems with Circular Ring Patch and Parasitic Elements**
Bruna A. L. da Silva, Federal University of Rio Grande do Norte, Brazil
Adaildo Gomes D´Assunção, Federal University of Rio Grande do Norte, Brazil
CEFC2010-1875

458 **Optimization of the Input Impedance of Koch Triangular Quasi-Fractal Antennas Using Genetic Algorithms**
Elder Eldervitch C. de Oliveira, Federal University of Rio Grande do Norte, Brazil
Adaildo Gomes D´Assunção, Federal University of Rio Grande do Norte, Brazil
Cláudio R. M. da Silva, Federal University of Rio Grande do Norte, Brazil
CEFC2010-1876

459 **A New Configuration of Planar Monopole Quasi-Fractal Antenna for Wireless Communications**
Marcelo Ribeiro da Silva, Federal University of Rio Grande do Norte, Brazil
Clarissa de Lucena Nóbrega, Federal University of Rio Grande do Norte, Brazil
Paulo H. da F. Silva, Federal Institute of Education, Science and Technology of Para, Brazil
Adaildo Gomes D´Assunção, Federal University of Rio Grande do Norte, Brazil
CEFC2010-1877

Lunch

Red Bar Entry Level Foyer — 12:15-1:15 PM

Poster Session 32 — Wednesday

Coupled Problems 3

Session Chair: Prof. Katsuhiro Hirata, Osaka University. Japan

United A/B and L.A.X A/B — 1:00-2:30 PM

460 **A Parametric Approach for Multiphysical Modeling of Magnetic Bearings**
Antje Deckert, Institute of Aerospace Engineering, Germany
Uwe Keller, Institute of Aerospace Engineering, Germany
Stefanos Fasoulas, Institute of Aerospace Engineering, Germany
CEFC2010-1086

461 **Modeling and Design of a Wireless Power Transfer Cell with Planar Spiral Structures**

Xiu Zhang, The Hong Kong Polytechnic University, Hong Kong
S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
W. N. Fu, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1479

462 **Enhanced Acoustic Emission Detection Induced by Electromagnetic Stimulation with External Magnetic Field**

Liang Jin, Hebei University of Technology, China
Qingxin Yang, Hebei University of Technology, China
Suzhen Liu, Hebei University of Technology, China
Li Peng, Hebei University of Technology, China
Liu Fugui, Hebei University of Technology, China
Guo Lei, Hebei University of Technology, China
CEFC2010-1537

463 **A Unified Formulation of Finite-element Methods for 2-D and Axisymmetric Magnetic Fields**

W. N. Fu, The Hong Kong Polytechnic University, Hong Kong
S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1547

464 **Eddy Current Analysis of Magnetic Gear Employing 3-D FEM**

Niguchi Noboru, Osaka University, Japan
Hirata Katsuhiro, Osaka University, Japan
Muramatsu Masari, Osaka University, Japan
Hayakawa Yuichi, Osaka University, Japan
CEFC2010-1556

465 **Application of Meshless Collocation Method to Solve Eddy Current Magnetic Field Problems Involving Conductor Movement**

Guangyuan Yang, Huazhong University of Science and Technology, China
Xiaoming Chen, Huazhong University of Science and Technology, China
K.R. Shao, Huazhong University of Science and Technology, China
Youguang Guo, University of Technology, Australia
Jianguo Zhu, University of Technology, Australia
J.D. Lavers, University of Toronto, Canada
CEFC2010-1563

466 **Geometry Optimization of Power Transformer Cooling System Based on Coupled 3D FEM Thermal-CFD Analysis**

Eleftherios Amoiralis, Technical University of Crete, Greece
Marina Tsili, National Technical University of Athens, Greece
Antonios Kladas, National Technical University of Athens, Greece

Athanassios Souflaris, 3Schneider Electric A.E.B.E, Greece
CEFC2010-1570

467 **3-D Finite Element Analysis of Linear Resonance Actuator under PID Control**
Katsuhikro Hirata, Osaka University, Japan
Yasuyoshi Asai, Osaka University, Japan
Tomohiro Ota, Panasonic Electric Works, Ltd., Japan
CEFC2010-1623

468 **Eddy Current Analysis in Permanent Magnet of PM Motors Considering Temperature Nonlinearity of Conductivity**
Seung Chul Cha, Sungkyunkwan University, Korea
Young Sun Kim, Sungkyunkwan University, Korea
Hong Soon Choi, Kyungpook National University, Korea
Il Han Park, Sungkyunkwan University, Korea
CEFC2010-1695

469 **Multiphysics Modeling of Induction Hardening of Ring Gears for the Aerospace Industry**
Alessandro Candeo, University of Padova, Italy
Philippe Bocher, Ecole de Technologie Superieure, Canada
Fabrizio Dughiero, University of Padova, Italy
CEFC2010-1751

470 **Design and Thermal Analysis of Traction Motor for Electric Vehicle Based on Driving Duty Cycle**
JinXin Fan, Beijing Institute of Technology, China
ChengNing Zhang, Beijing Institute of Technology, China
ZhiFu Wang, Beijing Institute of Technology, China
Abdul Rehman Tariq, Michigan State University, China
Carlos. E Nino, Michigan State University, China
Elias Strangas, Michigan State University, China
CEFC2010-1804

Poster Session 33 — Wednesday

Devices and Applications 12

Session Chair: Prof. S. L. Ho, The Hong Kong Polytechnic University, Hong Kong

United A/B and L.A.X A/B — 1:00-2:30 PM

471 **Computation of Rotating Force Waves in Induction Machines Using Multi-Slice Models**
Bernhard Weilharter, Graz University of Technology, Austria
Oszkar Biro, Graz University of Technology, Austria
Siegfried Rainer, Graz University of Technology, Austria
CEFC2010-1714

472 **Electrical, Structural and Rotordynamic Analysis of Ultra High Speed Motor with Shrink Fit Rotor for Air Blower Cooling Fuel Cells**

Do-Kwan Hong, Korea Electrotechnology Research Institute, Korea
Byung-Chul Woo, Korea Electrotechnology Research Institute, Korea
Dae-Hyun Koo, Korea Electrotechnology Research Institute, Korea
Chan-Woo Ahn, Dong-A University, Korea
CEFC2010-1724

473 **Partial Segment Force on Ferromagnetic Material of High-Field Magnetic System**

Young Sun Kim, Sungkyunkwan University, Korea
Hong Soon Choi, Kyungpook National University, Korea
Il Han Park, Sungkyunkwan University, Korea
CEFC2010-1730

474 **Transient Analysis by using Current Vector of Three Dimensional Space for Multi-degree of Freedom Permanent-magnet Motor**

Kang Dong-Woo, Hanyang University, Korea
Won Sung-Hong, Hanyang University, Korea
Lee Ju, Hanyang University, Korea
CEFC2010-1746

475 **Evaluation of Line-Start Interior Permanent Magnet Synchronous Motor Model Parameters Using Finite Elements**

Bojan Štumberger, University of Maribor, Slovenia
Tine Marcic, Research and Development Centre for Electrical Machines, Slovenia
Miralem Hadziselimovic, University of Maribor, Slovenia
Mladen Trlep, University of Maribor, Slovenia
CEFC2010-1748

476 **Design and FE Analysis of a Double Rotor Synchronous PM Machine**

Peter Pisek, Research and Development Centre for Electrical Machines, Slovenia
Bojan Stumberger, Research and Development Centre for Electrical Machines, University of Maribor, Slovenia
Tine Marcic, Research and Development Centre for Electrical Machines, Slovenia
Peter Virtic, University of Maribor, Slovenia
CEFC2010-1752

477 **Permanent Magnet Shape Optimization for High Efficiency Traction Motors**

Konstantinos Laskaris, National Technical University of Athens, Greece
Antonios Kladas, National Technical University of Athens, Greece
CEFC2010-1758

478 **Analysis and Performance Evaluation of Compound Permanent Magnet Generator with Controllable Airgap Flux**

Huijun Wang, School of Instrumentation Science and Opto-electronics Engineering,

China

Jinxin Fan, Beijing Institute of Technology, China

CEFC2010-1767

479 **Analysis of the Novel Laminated Structure of Double Excited Three-Degree-of-Freedom Motor**

Young-Boong Kim, Hanyang University, Korea

Byung-Il Kwon, Hanyang University, Korea

CEFC2010-1769

480 **Design Methodology using the Newly proposed Synthetic Flux Linkages Considering Cross-Magnetization for Interior PM Synchronous Machine**

Youngjun Ahn, Dong-A University, Korea

Sang-Yong Jung, Dong-A University, Korea

CEFC2010-1772

481 **Tolerance Analysis in BLDC Motor Based on the Stochastic Response Surface Methodology**

Young-Kyoun Kim, Korea Electronics Technology Institute, Korea

Se-hyun Rhyu, Korea Electronics Technology Institute, Korea

In-Soung Jung, Korea Electronics Technology Institute, Korea

CEFC2010-1775

482 **Performance Analysis of Interior Permanent Magnet Synchronous Motor for Electric Vehicle considering Magnetic Saturation Effect**

Ki-Chan Kim, Hanbat National University, Korea

Ki-Yong Sung, Hanbat National University, Korea

CEFC2010-1777

484 **Parametric Analysis of Thomson-coil Actuator Using Adaptive Equivalent Circuit Method**

Wei Li, Chungbuk National University, Korea

Chang Seop Koh, Chungbuk National University, Korea

CEFC2010-1786

485 **A Surge Voltage Distribution Analysis of 22.9 kV Power Transformer**

Hyeong Taek Jang, Hongik University, Korea

Yong Bae Kim, Hongik University, Korea

Mun Ho Jeon, Hongik University, Korea

Pan Seok Shin, Hongik University, Korea

CEFC2010-1796

Poster Session 34 — Wednesday

Devices and Applications 13

Session Chair: Prof. Dennis Giannacopoulos, McGill University, Canada

486 **Optimum Design Criteria for Maximum Torque Density & Minimum Torque Ripple of Flux Switching Motor using Response Surface Methodology**

Jungho Lee, Hanbat National University, Korea
Taehoon Lee, Hanbat National University, Korea
Ahram Jeon, Hanbat National University, Korea
CEFC2010-1235

487 **Characteristic Analysis & Optimum Design of Permanent Magnet Assisted**

Jungho Lee, Hanbat National University, Korea
Taewon Yun, Hanbat National University, Korea
Ahram Jeon, Hanbat National University, Korea
CEFC2010-1239

488 **Optimal Design of Auxiliary Core to Reduce Detent Force According to End Effect in PMLSM**

Ki-Bong Jang, Changwon National University, Korea
Ji-Hyun Kim, Changwon National University, Korea
Ho-Jin An, Changwon National University, Korea
Gyu-Tak Kim, Changwon National University, Korea
CEFC2010-1541

489 **Effect of Magnetic Anisotropy on Operating Condition of Synchronous Reluctance Motor**

Daisuke Miyagi, Okayama University, Japan
Naoki Ono, Okayama University, Japan
Norio Takahashi, Okayama University, Japan
Kan Akatsu, Okayama University, Japan
CEFC2010-1805

490 **Improvement of Accuracy in Cogging Torque Computation in Fractional-slot Flux Modulating Permanent Magnet Machines**

Shuangxia Niu, The Hong Kong Polytechnic University, Hong Kong
S.L. Ho, The Hong Kong Polytechnic University, Hong Kong
W.N. Fu, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1817

491 **Optimal Design of Brushless DC Motor by Utilizing Novel Coefficient Modeling for Skewed PM and Overhang Structure**

Kyu-yun Hwang, Hanyang University, Korea
Se-hyun Rhyu, Hanyang University, Korea
Byung-il Kwon, Hanyang University, Korea
CEFC2010-1824

492 **The Design Method to Realize Magnetic Decoupling for a Radial-Radial Flux**

Compound-Structure Permanent-Magnet Synchronous Machine

Ranran Liu, Harbin Institute of Technology, China
Ping Zheng, Harbin Institute of Technology, China
Chengde Tong, Harbin Institute of Technology, China
Jing Zhao, Harbin Institute of Technology, China
Wei Shi, Harbin Institute of Technology, China
CEFC2010-1827

493 **Design and Analysis of Transverse Flux Switched Reluctance Generator for Wind Turbine**

Song Ui-seop, Hanyang University, Korea
You Yong-min, Hanyang University, Korea
Byung-il Kwon, Hanyang University, Korea
CEFC2010-1828

494 **3D Finite Element Study of Transient Electromagnetic Forces Acting on the Stator End-Windings of a Large Turbo-generator**

JIa Zhang, Zhejiang University, China
Shiyou Yang, Zhejiang University, China
S.L. Ho, The Hong Kong Polytechnic University, Hong Kong
Yingying Yao, Zhejiang University, China
CEFC2010-1832

495 **Core Loss Analysis of Permanent Magnet Synchronous Motor for Electric Vehicle**

JinXin Fan, Beijing Institute of Technoloy, China
ChengNing Zhang, Beijing Institute of Technoloy, China
HuiJun Wang, 2Beijing University of Aeronautics & Astronautics, China
CEFC2010-1833

496 **Finite Element Analysis of Iron Loss Estimation of 3MVA Three-Phase Transformer Utilizing Generalized Chua-type Vector Hysteresis Model**

Heesung Yoon, Chungbuk National University, Korea
Chang Soon Park, Korea University of Technology and Education, Korea
Chang Seop Koh, Chungbuk National University, Korea
CEFC2010-1838

497 **Function Validations of a Radial-Radial Flux Compound-Structure Permanent-Magnet Synchronous Machine for HEVs**

Ranran Liu, Harbin Institute of Technology, China
Ping Zheng, Harbin Institute of Technology, China
Chengde Tong, Harbin Institute of Technology, China
Jing Zhao, Harbin Institute of Technology, China
Qian Wu, Harbin Institute of Technology, China
CEFC2010-1849

498 **Calculation and Investigation of End-Effect for a High-Precision Planar Magnetic Levitation**

Hao Jiang, Southeast University, China
Gan Zhou, Southeast University, China
Xueliang Huang, Southeast University, China
Haitao Yu, Southeast University, China
Lei Huang, Southeast University, China
CEFC2010-1863

499 **Design and Comparison between IM and PMSM for Hybrid Electrical Vehicles**

Kwangsoo Kim, Hanyang University, Korea
Jaenam Bea, Hanyang University, Korea
San-Hwan Ham, Hanyang University, Korea
Won-Ho Kim, Hanyang University, Korea
Suyeon Cho, Hanyang University, Korea
CEFC2010-1869

500 **Design Procedures of Transverse Flux Linear Motor**

Junghwan Chang, Dong-A University, Korea
Jiwon Kim, Electric motor research center, Korea
Jiyoung Lee, Electric motor research center, Korea
Dohyun Kang, Electric motor research center, Korea
Kwangwoon KIm, University Of Science & Technology, Korea
CEFC2010-1885

Poster Session 35 — Wednesday

Material Modeling 3

Session Chair: Prof. Mauricio Ferreira da Luz, Federal University of Santa Catarina – UFSC, Brasil

United A/B and L.A.X A/B — 1:00-2:30 PM

501 **Dynamic Model of an RM Type Ferrite Core to Simulate the Effects of Saturation and Power Losses via 2D Finite Elements in the Time Domain**

Rosa Ana Salas, Universidad Carlos III de Madrid, Spain
Jorge Pleite, Universidad Carlos III de Madrid, Spain
CEFC2010-1505

502 **The Analysis of Electromagnetic Waves Transmitting on Fabric Based Frequency Selective Surface**

Chuanyou Li, Beijing University of Technology, China
Qun Wang, Beijing University of Technology, China
Zhanghong Tang, Beijing University of Technology, China
Jingyu Han, Beijing University of Technology, China
Meiwu Shi, The Quartermaster Equipment Research Institute of the General Logistics Department of the PLA, China

Maohui Li, The Quartermaster Equipment Research Institute of the General Logistics Department of the PLA, China

CEFC2010-1598

503 **Experimental Tests of a Stress-Dependent Controller for Magnetostrictive Transducers**

Daniele Davino, University of Sannio, Italy

Alessandro Giustiniani, University of Salerno, Italy

Ciro Visone, University of Sannio, Italy

CEFC2010-1655

504 **Combined Experimental and Modeling Analysis to Study Accommodation Phenomenon**

Ermanno Cardelli, University of Perugia, Italy

Antonio Faba, University of Perugia, Italy

Marco Marracci, University of Pisa, Italy

Bernardo Tellini, University of Pisa, Italy

CEFC2010-1709

505 **Microscopic and Macroscopic Electromagnetic and Thermal Modeling of Carbon Fiber Reinforced Polymer Composites**

Guillaume Wasselynck, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

Didier Trichet, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

Brahim Ramdane, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

Javad Fouladgar, Institut de Recherche en Electrotechnique et Electronique de Nantes Atlantique (IREENA), France

CEFC2010-1717

506 **Scalable Spatial Harmonic Analysis Solver for Modeling Plasmonic Bi-periodic Multilayer Nanostructures**

Xingjie Ni, Purdue University, USA

Zhengtong Liu, Purdue University, USA

Alexandra Boltasseva, Purdue University, USA

Alexander Kildishev, Purdue University, USA

CEFC2010-1720

507 **The Importance of Including Fiber Oriented Conductivity Data in Computational Myocardium Defibrillation Analyses**

Steve McFee, McGill University, Canada

Maryam Golshayan, McGill University, Canada

CEFC2010-1778

508 **Analysis and Measurement of the Magnetophoretic Display System by Using**

Bistable Magnetic Ball for Extremely Low Power Consumptions

Hyuk Won, Pusan National University, Korea
SungHo Lee, Pusan National University, Korea
GwanSoo Park, Pusan National University, Korea
CEFC2010-1800

509 **A Generalized Chua-type Vector Hysteresis Model for Both the Non-Oriented and Grain-oriented Electrical Steel Sheets**

Minho Song, Chungbuk National University, Korea
Heesung Yoon, Chungbuk National University, Korea
Pan Seok Shin, Hongik University, Korea
Chang Seop Koh, Chungbuk National University, Korea
CEFC2010-1835

510 **Loss Evaluation of an Induction Motor Model Core by Vector Magnetic Characterisitc Analysis**

Naoki Kunihiro, Oita University, Japan
Takashi Todaka, Oita University, Japan
Masato Enokizono, Oita University, Japan
CEFC2010-1854

511 **Magnetic Characteristic Analysis of SPM Motor By Means of Dynamic E&S Modeling**

Takeru Sato, Oita University, Japan
Takashi Todaka, Oita University, Japan
Masato Enokizono, Oita University, Japan
CEFC2010-1856

Poster Session 36 — Wednesday

Nanomagnetics & Nanophotonics 1

Session Chair: Dr. Fabio Freschi, Politecnico di Torino, Italy

United A/B and L.A.X A/B — 1:00-2:30 PM

512 **Magnetic Vortex Chirality Switching Driven by a Spin-Polarized Current**

Mario Carpentieri, University of Calabria, Italy
Giovanni Finocchio, University of Messina, Italy
Bruno Azzerboni, University of Messina, Italy
Ermanno Cardelli, University of Perugia, Italy
Antonio Faba, University of Perugia, Italy
CEFC2010-1172

513 **Efficiency of the Geometric Integration of Landau-Lifshitz-Gilbert Equation Based on Cayley Transform**

Oriano Bottauscio, Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
Alessandra Manzin, Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
CEFC2010-1392

514 **Micromagnetic Simulations of Linewidth and Nonlinear Frequency Shift Coefficient in Spin-Torque Nanoscillators**

Mario Carpentieri, University of Calabria, Italy
Ermanno Cardelli, University of Perugia, Italy
Antonio Faba, University of Perugia, Italy
Torres Luis, University of Salamanca, Spain
CEFC2010-1710

515 **Magnetic Hysteresis Modeling in Perpendicular MRAM System for High Gb/Chip**

Hyuk Won, Pusan National University, Korea
SeungHo Yun, Pusan National University, Korea
GwanSoo Park, Pusan National University, Korea
CEFC2010-1785

516 **Analyzing the Effect of a Metamaterial Surface on Electric and Magnetic Dipole Emissions Using Green**

Xingjie Ni, Purdue University, USA
Alexander Kildishev, Purdue University, USA
Shalaev Vladimir, Purdue University, USA
CEFC2010-1842

Poster Session 37 — Wednesday

Numerical Techniques 3

Session Chair: Prof. Luis E. Garcia-Castillo, Universidad Carlos III de Madrid, Spain

United A/B and L.A.X A/B — 1:00-2:30 PM

517 **A Combination of Algebraic Multigrid Method and Adaptive Mesh Refinement for Large-scale Electromagnetic Field Calculation**

Tang Zhanghong, Beijing University of Technology, China
Yuan Jiansheng, Beijing University of Technology, China
CEFC2010-1255

518 **Fast Time-domain Finite Element Analysis of 3D Nonlinear Time-Periodic Eddy Current Problems with T,ΦΦ Formulation**

Biro Oszkar, Graz University of Technology, Austria
Koczka Gergely, Graz University of Technology, Austria
Preis Kurt, Graz University of Technology, Austria
CEFC2010-1360

519 **Shielding Current Analysis in High-Temperature Superconductor: Highly**

Accurate Evalu ation of Improper Integrals for EFG

Soichiro Ikuno, Tokyo University of Technology, Japan
Teruou Takayama, Yamagata University, Japan
Atsushi Kamitani, Yamagata University, Japan
CEFC2010-1456

520 **New Smoothing Method in the Automatic Hexahedral Mesh Generator for Impoving Solver Convergence Property**

So Noguchi, Hokkaido University, Japan
Yuichiro Motooka, Hokkaido University, Japan
Hajime Igarashi, Hokkaido University, Japan
CEFC2010-1554

521 **Evaluation and Comparison of Hierarchical Vector Basis Functions for Quadrilateral Cells**

Andrew Peterson, Georgia Institute of Technology, USA
Roberto Graglia, Politecnico di Torino, Italy
CEFC2010-1608

522 **Efficient Parallel Implementation of Large-Scale Finite Difference Time Domain Electromagnetic Schemes Using Hash Table and Multicolor Ordering**

Toshio Murayama, Sony Corporation, Japan
Kenzo Nishikawa, Sony Corporation, Japan
Shinobu Yoshimura, The University of Tokyo, Japan
CEFC2010-1721

523 **Parallel Implementation of Extended Node Patch Preconditioner for Electromagnetic 3D Full-Wave FEM Problem**

Toshio Murayama, Sony Corporation, Japan
Kenzo Nishikawa, Sony Corporation, Japan
Shinobu Yoshimura, The University of Tokyo, Japan
CEFC2010-1722

524 **Superimposed Preconditioner for Full-Wave Electromagnetic Finite Element Problems**

Toshio Murayama, Sony Corporation, Japan
Shinobu Yoshimura, The University of Tokyo, Japan
CEFC2010-1725

525 **Coupling of Finite Element Method and Fourier Series Expansion for Open Boundary Problem**

Young Sun Kim, Sungkyunkwan University, Korea
Il Han Park, Sungkyunkwan University, Korea
Ki Sik Lee, Dankook University, Korea
Dong Jin Kim, Dankook University, Korea
CEFC2010-1729

526 **Coupling of Point Collocation Meshfree Method and Finite Element Method for Poisson Problem**

Chany Lee, Seoul National University, Korea
Jong-Ho Choi, Seoul National University, Korea
Luan Feng, Seoul National University, Korea
Hyun-Kyo Jung, Seoul National University, Korea
Do Wan Kim, Hanyang University, Korea
CEFC2010-1810

527 **Dealing with Floating Conductors in Finite Element Method of Electrostatic Field**

W. N. Fu, The Hong Kong Polytechnic University, Hong Kong
S. L. Ho, The Hong Kong Polytechnic University, Hong Kong
CEFC2010-1816

528 **Study on GPU-accelerated Extraction of Interconnects Parasitic Using CUDA and MPI**

Xiaoyu Xu, Chinese Academy of Sciences, China
Guoqiang Liu, Chinese Academy of Sciences, China
Hui Qu, Chinese Academy of Sciences, China
Wei Xu, University of Technology Sydney, Australia
Yang Zhang, Chinese Academy of Sciences, China
CEFC2010-1830

529 **Analysis of Real Overvoltage Transient in a TLM-Modeled**

L. H. A. de Medeiros, Universidade Federal de Pernambuco, Brazil
M. T. de Melo, Universidade Federal de Pernambuco, Brazil
P. R. de Freitas, Universidade Federal de Pernambuco, Brazil
M. H. L. de Sousa, Universidade Federal de Pernambuco, Brazil
F. N. Fraga, Universidade Federal de Pernambuco, Brazil
CEFC2010-1288

Poster Session 38 — Wednesday

Static and Quasi-Static Fields 6

Session Chair: Prof. Kay Hameyer, Rwth Aachen University, Germany

United A/B and L.A.X A/B — 1:00-2:30 PM

530 **New Force Expression of Dielectrics Conjectured by Electromagnetic Duality**

Hong-soon Choi, Kyungpook National University, Korea
Se-hee Lee, Kyungpook National University, Korea
CEFC2010-1116

531 **On a Return Stroke Lightning Identification Procedure by Inverse Formulation and Regularization**
Andrei Ceclan, Technical University of Cluj-Napoca, Romania
Dan Doru Micu, Technical University of Cluj-Napoca, Romania
Levente Czumbil, Technical University of Cluj-Napoca, Romania
CEFC2010-1434

532 **Deflation Techniques for Computational Electromagnetism, Part I: Theoretical Considerations**
Hajime Igarashi, Hokkaido University, Japan
Kota Watanabe, Hokkaido University, Japan
CEFC2010-1458

533 **Application of the Finite Element Method for the Analysis of the Grounding Grid Implying the Finite Line Elements**
Anton Habjanic, University of Maribor, Slovenia
Marko Jesenik, University of Maribor, Slovenia
Bojan Štumberger, University of Maribor, Slovenia
Mladen Trlep, University of Maribor, Slovenia
CEFC2010-1463

534 **A Proper Generalized Decomposition Approach for Modeling Fuel Cell Polymeric Membranes**
Piergiorgio Alotto, Università di Padova, Italy
Massimo Guarnieri, Università di Padova, Italy
Federico Moro, Università di Padova, Italy
Andrea Stella, Università di Padova, Italy
CEFC2010-1477

535 **Calculation and Analysis of the Magnetic Field of a Tubular Linear motor**
Liyi Li, Harbin Institute of Technology, China
Xuzhen Huang, Harbin Institute of Technology, China
Baoquan Kou, Harbin Institute of Technology, China
CEFC2010-1584

536 **Interaction Between Ring Shaped Permanent Magnets with Symbolic Gradients: Application to Magnetic Bearing System Optimization**

Benoit Delinchant, Grenoble Electrical Engineering lab, France
F. Wurtz, Grenoble Electrical Engineering lab, France
Jean-Paul Yonnet, Grenoble Electrical Engineering lab, France
Jean-Louis Coulomb, Grenoble Electrical Engineering lab, France
CEFC2010-1643

537 **Modeling of a Magnetic Shunt and an Aluminum Screen Using the Perturbation Finite Element Method**

Mauricio V. Ferreira da Luz, Universidade Federal de Santa Catarina, Brazil
Patrick Dular, ACE, Dept. of Electrical Engineering and Computer Science;University of Li`ege, Belgium
Ruth V. Sabariego, ACE, Dept. of Electrical Engineering and Computer Science, Belgium
Patrick Kuo-Peng, Universidade Federal de Santa Catarina, Brazil
CEFC2010-1651

538 **Combining Surface Impedance Boundary Conditions with Volume Discretisation in Time-Domain Finite-Element Modeling**

Johan Gyselinck, BEAMS Department, Universit, Belgium
Patrick Dular, ACE, Dept. of Electrical Engineering and Computer Science;University of Li`ege, Belgium
Christophe Geuzaine, ACE, Dept. of Electrical Engineering and Computer Science, Belgium
Ruth Sabariego, ACE, Dept. of Electrical Engineering and Computer Science, Belgium
CEFC2010-1728

539 **On the Symmetrization of Magnetodynamic Problems in Current-Based T-Φ Formulations**

Loic Rondot, CEDRAT, 15 chemin de Malacher, France
Eric Rodriguez, CEDRAT, 15 chemin de Malacher, France
Christophe Guerin, CEDRAT, 15 chemin de Malacher, France
Vincent Mazauric, Schneider Electric, Strategy & Innovation, France
CEFC2010-1742

540 **Effectiveness of Nonconforming Mesh in Magnetic Field Analysis With Voxel Modelling**

Shunya Odawara, Saga University, Japan
Yanhui Gao, Saga University, Japan
Kazuhiro Muramatsu, Saga University, Japan
CEFC2010-1743

541 **Numerical Modeling of Biomolecular Electrostatic Properties by the Element-Free Galerkin Method**

Alessandra Manzin, Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
Domenico PatrizioAnsalone, Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
Bottauscio Oriano, Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
CEFC2010-1340

542 **A Priori Error Estimation of Magnetic Material Characteristics Using Stochastic Uncertainty Analysis**

Ahmed Abou-Elyazied Abdallh, Department of Electrical Energy, Systems and Automation, Ghent University, Belgium
Guillaume Crevecoeur, Department of Electrical Energy, Systems and Automation, Ghent University, Belgium
Luc Dupré, Department of Electrical Energy, Systems and Automation, Ghent University, Belgium
CEFC2010-1164

Coffee Break

Entry Level Foyer — 2:30-3:00 PM

Oral Session 11 — Wednesday

Optimization and Design II

Session Chairs: Prof. Piergiorgio Alotto, Università degli Studi di Padova, Italy
Prof. Raffaele Martone, Seconda Università di Napoli, Italy

Rosement AB Ballroom — 3:00-4:45 PM

543 **Design of Magnet Shape in Interior Permanent Magnet Synchronous Motor by Response Surface Methodology in Consideration of Torque and Vibration**

Takeo Ishikawa, Gunma University, Japan
Michihisa Yamada, Gunma University, Japan
Nobuyuki Kurita, Gunma University, Japan
CEFC2010-1127

544 **Mult-level Robust Surrogate-Based Optimization Applied to Design of Electrical Machines**

Francis Lubajo Bokose, Ghent University, Belgium
Vandevelde Lieven, Ghent University, Belgium
Jan Melkebeek, Ghent University, Belgium
CEFC2010-1293

545 **Fast Solution of Inverse Problems in the RF Domain Using Topological Sensitivity and Hybrid-ON/OFF Method**

Jin-Kyu Byun, Soongsil University, Korea
Hyang-Beom Lee, Soongsil University, Korea
Dong-Hun Kim, Kyungpook Nat, Korea
CEFC2010-1402

546 **Particle Swarm Optimization of a Multi-Coil Transverse Flux Induction Heating System**

Piergiorgio Alotto, University of Padua, Italy
Aristide Spagnolo, University of Padua, Italy
Paya Bernard, EDF R&D Division, France
CEFC2010-1498

547 **Investigation on the Evolution Strategies for Slot Shape Optimization of a Permanent Magnet Synchronous Machine**

Yang Zhan, University of Alberta, Canada
Andrew Knight, University of Alberta, Canada
CEFC2010-1788

Oral Session 12 — Wednesday

Static and Quasi Static Fields

Session Chairs: Dr. Jean-Louis Coulomb, Grenoble-INP G2Elab, France
Prof. Hajime Igarashi, Hokkaido University, Japan

Rosement CD Ballroom — 3:00-4:45 PM

548 **Folded IC Preconditioning in Quasi-Static Field Analysis Taking Account of Both Tree-Cotree and Φ = 0 Gauge Conditions**

Yasuhito Takahashi, Doshisha University, Japan
Takeshi Mifune, Kyoto University, Japan
Takeshi Iwashita, Kyoto University, Japan
Koji Fujiwara, Doshisha University, Japan
Yoshiyuki Ishihara, Doshisha University, Japan
CEFC2010-1264

549 **A New Vector Potential BEM for Magnetic Fields Bounded by Perfect Conductors**

Ioan R. Ciric, The University of Manitoba, Romania
Florea I. Hantila, Politehnica University of Bucharest, Romania
Mihai Maricaru, Politehnica University of Bucharest, Romania
CEFC2010-1337

550 **Effect of Variation of B-H Properties on Loss and Flux Inside Silicon Steel Lamination**

Zhiguang Cheng, R & D Center, Baoding Tianwei Group Co., China
Norio Takahashi, Okayama University, Japan
Behzad Forghani, Infolytica, Montreal, Canada, Canada
Y. Du, R & D Center, Baoding Tianwei Group Co., China
Y. Fan, R & D Center, Baoding Tianwei Group Co., China
L. Liu, R & D Center, Baoding Tianwei Group Co., China
Z. Zhao, R & D Center, Baoding Tianwei Group Co., China
CEFC2010-1372

551 **Charge Density - Scalar Potential Formulation for Adaptive Time-Integration of**

Nonlinear Electroquasistatic Problems

Zsolt Badics, Rhythmia Medical, Inc, USA

CEFC2010-1600

552 **FEM-BEM Computation of Electrostatic Fields in the Absence of Dirchlet Boundary Conditions**

Giovanni Aiello, Università di Catania, Italy
Salvatore Alfonzetti, Università di Catania, Italy
Giuseppe Borzi, Università di Catania, Italy
Emanuele Dilettoso, Università di Catania, Italy
Nunzio Salerno, Università di Catania, Italy

CEFC2010-1737

Closing Session and Poster Paper Awards

Wednesday — 4:45-5:15 PM