[MM_O1] Numerical Techniques 1	
Session Date	**June 3 (Mon.), 2024**
Session Time	**10:20-12:00**
Session Room	**Room 1 (Samda A)**
Session Chair(s)	**TBA**

[MM_O1_01] **10:20-10:40**

Efficient Shape Uncertainty Quantification for the TESLA Cavity

David Ebert[1], Anna Ziegler[2], Jürgen Dölz[1], and Sebastian Schöps[2]
[1]University of Bonn, Germany, [2]Darmstadt University of Technology, Germany

[MM_O1_02] **10:40-11:00**

Magnetodynamic and Thermal Homogenisation of Foil Windings for Magnetic Components

Ruth V. Sabariego[1], Wilmar Martinez[1], Patrick Kuo-Peng[2], and Johan Gyselinck[3]
[1]KU Leuven, Belgium, [2]Federal University of Santa Catarina, Brazil, [3]Free University of Brussels, Belgium

[MM_O1_03] **11:00-11:20**

Model Order Reduction of Cage Induction Motor with Stator and Rotor Failures Based on Multiport Cauer Ladder Network Method

Yuta Takenaka[1], Hiroki Maruyama[1], Yasuhito Takahashi[1], Fujiwara Koji[1], Kengo Sugahara[2], and Tetsuji Matsuo[3]
[1]Doshisha University, Japan, [2]Kindai University, Japan, [3]Kyoto University, Japan

[MM_O1_04] **11:20-11:40**

Effective Material and Static Magnetic Field for the 2D/1D-Problem of Laminated Electrical Machines

Karl Hollaus, Valentin Hanser, and Markus Schöbinger
Institute of Analysis and Scientific Computing Vienna University of Technology, Austria

[MM_O1_05] **11:40-12:00**

S-Domain FE Analysis of Magneto-Quasi-Static Problem Using Discrete Laplace Transform

Cheng Chi, Fan Yang, Yisha Xia, Hui Jiang, and Pengbo Wang
Chongqing University, China

[MM_O2] Static and Quasi-Static Fields 1	
Session Date	**June 3 (Mon.), 2024**
Session Time	**10:20-12:00**
Session Room	**Room 2 (Samda B)**
Session Chair(s)	**TBA**

[MM_O2_01] **10:20-10:40**

Implementation of an Anisotropic Magnetic Model Based on the Effective Field in a Finite Element Model

Floran Martin[1], Ruiying Chen[2], Julien Taurines[1], and Anouar Belahcen[1]
[1]Aalto University, Finland, [2]Hebei University of Technology, China

[MM_O2_02] **10:40-11:00**

Fixed-Point Cauer Ladder Network Method for Eddy-Current Problems with Hysteresis

Kengo Sugahara[1], Miwa Tobita[2], Tetsuji Matsuo[2], and Yasuhito Takahashi[3]
[1]Kindai University, Japan, [2]Kyoto University, Japan, [3]Doshisha University, Japan

[MM_O2_03] **11:00-11:20**

The Harmonic-Balanced Finite Element Method Coupled with Dynamic Hysteresis Model

Shengze Gao[1], Xiaojun Zhao[1], Yanhui Gao[2], Lanrong Liu[3], Kazuhiro Muramatsu[4], Takashi Todaka[2], Yongsheng Xu[5], and Mingli Fu[5]
[1]North China Electric Power University, China, [2]Oita University, Japan, [3]Hebei Provincial Key Laboratory of Electromagnetic and Structural Performance of Power Transmission and Transformation Equipment, China, [4]Saga University, Japan, [5]Electric Power Research Institute of China Southern Power Grid, China

[MM_O2_04] **11:20-11:40**

Foil Winding Homogenization with Consideration of Capacitive Effects

Jonas Bundschuh, Yvonne Späck-Leigsnering, and Herbert De Gersem
Darmstadt University of Technology, Germany

[MM_O2_05] **11:40-12:00**

Estimation of Condition Number of Quasi-Static Darwin Model

Shingo Hiruma, Takeshi Mifune, and Tetsuji Matsuo
Kyoto University, Japan

[MM_O3] Optimization and Design 1	
Session Date	**June 3 (Mon.), 2024**
Session Time	**10:20-12:00**
Session Room	**Room 3 (301)**
Session Chair(s)	**TBA**

[MM_O3_01] **10:20-10:40**

Stochastic Determination of Synchronous Machines Parameters from Frequency Response FEM Simulations with Noisy Data

V. M. Jimenez-Mondragon, R. Escarela-Perez, L. E. Castillo Gonzalez, J. C. Olivares-Galvan, I. Lopez Garcia, and F. Gonzalez-Montañez

Metropolitan Autonomous University, Mexico

[MM_O3_02] **10:40-11:00**

Shape Sensitivity Analysis for Optimal Design of Time-Harmonic Electroquasistatic System Based on Continuum Approach

Seung Eun Rho and Il Han Park

Sungkyunkwan University, Korea

[MM_O3_03] **11:00-11:20**

Analytical Design and Optimization of Surface-Mounted PMSMs with Equal-Thickness Air Gap

Ning Wang, Wenliang Zhao, Gaoyang Xu, and Xiuhe Wang

Shandong University, China

[MM_O3_04] **11:20-11:40**

Improving Air Gap Field Distributions in Synchronous and Switched Reluctance Machines

Ryszard Palka, Marcin Wardach, Michal Cichowicz, and Kamil Cierzniewski

West Pomeranian University of Technology in Szczecin, Poland

[MM_O3_05] **11:40-12:00**

Topology Optimization of Microwave Devices with Thin Structure

Takuto Jibiki[1], Takeshi Kawasaki[2], Masahiro Tanomura[2], and Hajime Igarashi[1]

[1]Hokkaido University, Japan, [2]Sumitomo Electric Industries, Ltd., Japan

[MM_O4] Devices and Applications 1	
Session Date	**June 3 (Mon.), 2024**
Session Time	**10:20-12:00**
Session Room	**Room 4 (302)**
Session Chair(s)	**TBA**

[MM_O4_01] **10:20-10:40**

Dual Inverter Parallel Consequent Pole PM-Assisted Two-Layer Sub-Harmonic Synchronous Machine

S M Sajjad Hossain Rafin[1], Qasim Ali[2], and Osama Mohammed[1]
[1]Florida International University, USA, [2]Sukkur IBA University, Pakistan

[MM_O4_02] **10:40-11:00**

Analytical Computation of Torque-Speed Characteristics and Efficiency Map for PM Motors

Ajay Pal Singh[1], Sai Ram Boggavarapu[2], and Ikenna Cajetan Nlebedim[1]
[1]Critical Materials Innovation Hub, Ames National Laboratory, USA, [2]Indian Institute of Technology Dharwad, India

[MM_O4_03] **11:00-11:20**

Torque Ripple Suppression in AC Motor Using Magnetic Periodic Reversal Spring

Haruaki Ito and Masayuki Kato
Ibaraki University, Japan

[MM_O4_04] **11:20-11:40**

A Design Method of Reducing No-Load Harmonic Voltage of Interior Permanent Magnet Shaft Generator for Ships

Jaemyung Cha[1], Gihoon Yoo[1], and Seungyong Hahn[2]
[1]HD Hyundai Electric Co., Ltd., Korea, [2]Seoul National University, Korea

[MM_O4_05] **11:40-12:00**

Structural and Analytical Modeling of a Long Stroke Variable Stiffness Magnetic Spring with Application to Wave Energy Converter

Jiyu Zhang, Lei Huang, Haitao Liu, and Jianlong Yang
Southeast University, China

[MA_O1] Numerical Techniques 2	
Session Date	**June 3 (Mon.), 2024**
Session Time	**15:20-17:00**
Session Room	**Room 1 (Samda A)**
Session Chair(s)	**TBA**

[MA_O1_01] **15:20-15:40**

Efficient Low-Frequency Human Exposure Assessment with the Maximum Entropy Snapshot Sampling

Steven Stroka, Fotios Kasolis, Norman Haußmann, and Markus Clemens

University of Wuppertal, Germany

[MA_O1_02] **15:40-16:00**

A *T*,Φ-Φ Multiscale Finite Element Formulation for Eddy Current Problems in Open Magnetic Circuits

Valentin Hanser, Markus Schöbinger, and Karl Hollaus

Institute of Analysis and Scientific Computing Vienna University of Technology, Austria

[MA_O1_03] **16:00-16:20**

Time-Domain Homogenization of Windings Using B-Input Cauer Ladder Network Method

Yasuhito Takahashi[1], Shingo Hiruma[2], Koji Fujiwara[1], and Satoshi Imamori[3]

[1]Doshisha University, Japan, [2]Kyoto University, Japan, [3]Fuji Electric Co., Ltd., Japan

[MA_O1_04] **16:20-16:40**

Efficient DGTD Method with LTS and IWDL Formulation to Solve Multi-Scale Electromagnetic Scattering Problems

Marlon Jesus Lizarazo Urbina and Elson Jose Silva

Federal University of Minas Gerais, Brazil

[MA_O1_05] **16:40-17:00**

Effective Interface Condition for Electromagnetic Shielding Using the *T*-Φ-Formulation in 3D

Markus Schöbinger and Karl Hollaus

Institute of Analysis and Scientific Computing Vienna University of Technology, Austria

[MA_O2] Static and Quasi-Static Fields 2	
Session Date	**June 3 (Mon.), 2024**
Session Time	**15:20-17:00**
Session Room	**Room 2 (Samda B)**
Session Chair(s)	**TBA**

[MA_O2_01] **15:20-15:40**

Fast Calculation of Shielding Effectiveness in Wireless Power Transfer Systems

Leonardo Sandrolini, Mattia Simonazzi, and Ugo Reggiani
University of Bologna, Italy

[MA_O2_02] **15:40-16:00**

Multiscale Hysteresis Model of Electrical Steel Sheet in Finite Element Simulation of Transformer

Floran Martin[1], Julien Taurines[1], Paavo Rasilo[2], Anouar Belahcen[1], and Laurent Daniel[3]
[1]Aalto University, Finland, [2]Tampere University, Finland, [3]Laboratory of Electrical Engineering and Electronics of Paris (GeePs), France

[MA_O2_03] **16:00-16:20**

Attenuation Effect of Shielding Lines on Ionized Field of HVDC Conductors with the Presence of Atmospheric Fine Particles

Zhilong Zou
Harbin Institute of Technology, China

[MA_O2_04] **16:20-16:40**

Homogenization Method Based on Cauer Ladder Network Representaion of Unit Cell

Shingo Hiruma[1], Yasuhito Takahashi[2], and Tetsuji Matsuo[1]
[1]Kyoto University, Japan, [2]Doshisha University, Japan

[MA_O2_05] **16:40-17:00**

Interior Penalty Galerkin Methods for Time Domain Eddy Current Problems

Sebastian Strasser and Hans-Georg Herzog
Technical University of Munich, Germany

[MA_O3] Optimization and Design 2	
Session Date	**June 3 (Mon.), 2024**
Session Time	**15:20-17:00**
Session Room	**Room 3 (301)**
Session Chair(s)	**TBA**

[MA_O3_01] **15:20-15:40**

Physics-Informed Conditional Generative Adversarial Network for Inverse Electromagnetic Problems

Amir Akbari and David Lowther

McGill University, Canada

[MA_O3_02] **15:40-16:00**

Parameter and Topology Optimization Method for IPM Motors Using Multimodal Neural Network

Kazuhisa Iwata[1], Hidenori Sasaki[1], Hajime Igarashi[2], Daisuke Nakagawa[3], and Tomoya Ueda[3]

[1]Hosei University, Japan, [2]Hokkaido University, Japan, [3]Nidec Research and Development Center, Nidec Corporation, Japan

[MA_O3_03] **16:00-16:20**

Optimization Design of Surface Permanent Magnet Synchronous Motor with Hybrid Magnets Using Analytical Method

Chengwu Diao[1], Wenliang Zhao[1], Longxuan Li[1], and Byung-Il Kwon[2]

[1]Shandong University, China, [2]Hanyang University, Korea

[MA_O3_04] **16:20-16:40**

A Topology Optimization of Electromagnetic Devices Based on Kernel Ridge Regression as a Variant of Gaussian Network-Based Shape Representation

Takahiro Sato[1], Kota Watanabe[1], and Hajime Igarashi[2]

[1]Muroran Institute of Technology, Japan, [2]Hokkaido University, Japan

[MA_O3_05] **16:40-17:00**

Multi-Condition Design and Optimization of a Hairpin Permanent Magnet Motor Based on Space Dimension Reduction

Chunlei Han, Xiaoyong Zhu, and Zixuan Xiang

Jiangsu University, China

[MA_O4] Devices and Applications 2	
Session Date	**June 3 (Mon.), 2024**
Session Time	**15:20-17:00**
Session Room	**Room 4 (302)**
Session Chair(s)	**TBA**

[MA_O4_01] **15:20-15:40**

A Neural-Network Model for Helping the Synthesis of a Dual-Frequency Induction Heating Device

Paolo Di Barba[1], Arash Ghafoorinejad[1], Maria Evelina Mognaschi[1], Fabrizio Dughiero[2], Michele Forzan[2], and Elisabetta Sieni[3]

[1]University of Pavia, Italy, [2]University of Padova, Italy, [3]University of Insubria, Italy

[MA_O4_02] **15:40-16:00**

A Novel Topology of an Axial Flux Type Synchronous Motor

Se-Eun Kim and Yong-Min You

Chonnam National University, Korea

[MA_O4_03] **16:00-16:20**

Analysis of Split-Tooth Dual Winding Dual Magnet Machines with Low Mutual Inductance

Pengcheng Sun, Shaofeng Jia, and Deliang Liang

State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China

[MA_O4_04] **16:20-16:40**

High-Power and -Speed Induction Machines Iron Loss Calculation Incorporating the Electro-Thermal Impact

Omolbanin Taqavi, Ze Li, and Narayan C. Kar

University of Windsor, Canada

[MA_O4_05] **16:40-17:00**

Power Factor Improvement of Variable Leakage Flux PM Motor under Different Operation Conditions

Xue Zhou, Xiaoyong Zhu, and Zixuan Xiang

Jiangsu University, China

[TM_O1] Numerical Techniques 3	
Session Date	**June 4 (Tue.), 2024**
Session Time	**10:00-11:20**
Session Room	**Room 1 (Samda A)**
Session Chair(s)	**TBA**

[TM_O1_01] **10:00-10:20**

Time Signals Prediction from Electromagnetic Simulations of Lossy Devices Using LSTM

Rodrigo Silva Rezende, Albert Piwonski, and Rolf Schuhmann
Technical University of Berlin, Germany

[TM_O1_02] **10:20-10:40**

Simulation of Thin Wires and Dielectric Bodies in Multilayered Medium Using FEBI

Shubin Zeng[1], Yiqian Mao[1], Yueqin Huang[2], and Jiefu Chen[2]
[1]Cyentech, USA, [2]University of Houston, USA

[TM_O1_03] **10:40-11:00**

Rigorous Treatment of Construction Imperfections in High-Frequency Microstrip EMC Filters

Ioannis Koutzoglou[1], Ioannis Stamatopoulos[2], Dimitrios I. Karatzidis[1], Christos S. Antonopoulos[1], and Nikolaos V. Kantartzis[1]
[1]Aristotle University of Thessaloniki, Greece, [2]Directorate of Transport and Communucations of Eastern Thessaloniki, Greece

[TM_O1_04] **11:00-11:20**

Parametrized Cauer Ladder Network Equations for Reduced Representation of Nonlinear Magnetic Field

Tetsuji Matsuo[1], Miwa Tobita[1], and Hamed Eskandari[2]
[1]Kyoto University, Japan, [2]Science Solutions International Laboratory, Inc., Japan

[TM_O2] Static and Quasi-Static Fields 3	
Session Date	**June 4 (Tue.), 2024**
Session Time	**10:00-11:20**
Session Room	**Room 2 (Samda B)**
Session Chair(s)	**TBA**

[TM_O2_01] **10:00-10:20**

Calculation of Ion Flow Field of HVDC Lines Considering the Influence of Stochastic Suspended-Particles

Nanxuan Shen, Fuqin Hao, Tiebing Lu, and Xingming Bian
North China Electric Power University, China

[TM_O2_02] **10:20-10:40**

Structural Aspects of Electromagneto-Quasistatic Field Formulations of Darwin-Type Derived in the Port-Hamiltonian System Framework

Markus Clemens, Marvin-Lucas Henkel, Fotios Kasolis, and Michael Günther
University of Wuppertal, Germany

[TM_O2_03] **10:40-11:00**

A GPU Accelerated Semi-Implicit Method for Large-Scale Nonlinear Eddy-Current Problems Using Adaptive Time Step Control

Bernhard Kähne and Markus Clemens
University of Wuppertal, Germany

[TM_O2_04] **11:00-11:20**

Computation of Movement Involved Eddy Current Field Using Boundary Adaptation of Overlapping Mesh

Xiaotong Fu[1,2], Shuai Yan[1], Zhifu Chen[1], and Zhuoxiang Ren[1,3]
[1]Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China, [3]Laboratory of Electrical Engineering and Electronics of Paris (GeePs), France

[TM_O3] Material Modeling 1	
Session Date	**June 4 (Tue.), 2024**
Session Time	**10:00-11:20**
Session Room	**Room 3 (301)**
Session Chair(s)	**TBA**

[TM_O3_01] **10:00-10:20**

Multiscale Thin Shell Finite Element Model for Mn-Zn Ferrites with Realistic Grain Structure

Reda Elkhadrawy[1], Joonas Vesa[1], Janne Ruuskanen[1], Timo Tarhasaari[1], Vasiliki Tsakaloudi[2], and Paavo Rasilo[1]

[1]Tampere University, Finland, [2]Centre for Research & Technology Hellas, Greece

[TM_O3_02] **10:20-10:40**

Effect of Anisotropic Localization in a Ferroelectric Multiscale Model

Zhaochen Li[1,2] and Romain Corcolle[1,2,3]

[1]New York University Shanghai, China, [2]New York University, USA, [3]Paris-Saclay University, France

[TM_O3_03] **10:40-11:00**

AC Hysteresis Modeling of Grain-Oriented Silicon Steel Considering DC Hysteresis and Anomalous Field

Ayane Kira[1], Yanfui Gao[1], Weimin Guan[2], Hamzehbahmani Hamed[3], and Kazuhiro Muramatsu[4]

[1]Oita University, Japan, [2]Wuhan University, China, [3]Durham University, UK, [4]Saga University, Japan

[TM_O3_04] **11:00-11:20**

Local Resistivity Model for Soft Magnetic Composite Materials

Joonas Vesa[1], Antero Marjamäki[1], Reda Elkhadrawy[1], Hajime Igarashi[2], and Paavo Rasilo[1]

[1]Tampere University, Finland, [2]Hokkaido University, Japan

[TM_O4] Devices and Applications 3	
Session Date	**June 4 (Tue.), 2024**
Session Time	**10:00-11:20**
Session Room	**Room 4 (302)**
Session Chair(s)	**TBA**

[TM_O4_01] **10:00-10:20**

Post-Processing-Based Flux-Weakening Control of Variable Flux Reluctance Machines

Doga Ceylan, Konstantin Boynov, and Elena Lomonova
Eindhoven University of Technology, The Netherlands

[TM_O4_02] **10:20-10:40**

Power Transmission Characteristics Analysis of Multi-Port Dual-Flux-Modulator Magnetic Geared Machine Based on Analytical Model

Meng Lu, Shuo Qin, and Xiao Liu
Hunan University, China

[TM_O4_03] **10:40-11:00**

Experimental Validation of RC Snubber Circuit for GaN-Based Battery Formation Device with Switching Noise Coupling Problem

Jong-Hun Lim[1], Je-yeong Lim[1], Dong Hwan Kim[1], Kiseok Jeong[2], Taemin Jang[2], and Byoung Kuk Lee[1]
[1]Sungkyunkwan University, Korea, [2]WONIK PNE Co., Ltd., Korea

[TM_O4_04] **11:00-11:20**

Comparative Analysis of Electromagnetic Characteristics of Permanent Magnet Linear Oscillating Actuators with Different Laminated Methods

Hongbin Zhang[1], Zhike Xu[2], Zhan Shen[2], Shuhua Fang[2], and Haitao Yu[2]
[1]Jiangsu Maritime Institute, China, [2]Southeast University, China

[TA_O1] Numerical Techniques 4	
Session Date	**June 4 (Tue.), 2024**
Session Time	**15:50-17:10**
Session Room	**Room 1 (Samda A)**
Session Chair(s)	**TBA**

[TA_O1_01] **15:50-16:10**

Modeling of a Winding by Segmentation and a Two Domain Method

Karl Hollaus[1], Markus Schöbinger[1], and Christian Türk[2]

[1]Institute of Analysis and Scientific Computing Vienna University of Technology, Austria, [2]Federal Ministry of Defense, Austria

[TA_O1_02] **16:10-16:30**

Application of POD to Time Domain Simulation of Nonlinear Field-Circuit Coupled Problems

Yaxing Zhou[1], Shuai Yan[1], Tianyu Zheng[1], Xi Ran[1,2], Xiaoyu Xu[1], and Zhuoxiang Ren[1,3]

[1]Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China, [3]Sorbonne University, France

[TA_O1_03] **16:30-16:50**

Error Estimation of the Cauer Ladder Network Method for the Time-Domain Analysis

Miwa Tobita[1], Stéphane Clénet[2], Shingo Hiruma[1], Wei Chen[2], and Tetsuji Matsuo[1]

[1]Kyoto University, Japan, [2]Arts et Metiers Institute of Technology, University of Lille, France

[TA_O1_04] **16:50-17:10**

A Prediction Model of Torque Control Parameters Considering Temperature-Dependency of IPMSM for High Speed Railway Applications

Vu Khanh Tran[1], Jae-Gil Lee[2], Pil-Wan Han[2], and Yon-Do Chun[2]

[1]University of Science and Technology, Korea, [2]Korea Electrotechnology Research Institute, Korea

[TA_O2] Static and Quasi-Static Fields 4	
Session Date	**June 4 (Tue.), 2024**
Session Time	**15:50-17:10**
Session Room	**Room 2 (Samda B)**
Session Chair(s)	**TBA**

[TA_O2_01] **15:50-16:10**

Identification of an Arbitrary-Surface Harmonic Magnetic Model from Close Measurements

Gauthier Derenty-Camenen[1,2], Olivier Chadebec[1], Olivier Pinaud[1], Laure-Line Rouve[1], and Steeve Zozor[2]

[1]University Grenoble Alpes, CNRS Grenoble INP, G2Elab, France, [2]University Grenoble Alpes, CNRS Grenoble INP, GIPSA-Lab, France

[TA_O2_02] **16:10-16:30**

Numerical Analysis of Partial Discharge on Multi-Dielectric Insulator Forming Migration-Ohmic Model

Hyemin Kang, Yonghee Kim, and Se-Hee Lee

Kyungpook National University, Korea

[TA_O2_03] **16:30-16:50**

A Posteriori Error Estimators for Quantity of Interest in Eddy Current-Based Non-Destructive Testings

Zuqi Tang[1], Emmanuel Creusé[2], and Serge Nicaise[2]

[1]University of Lille, France, [2]Polytechnic University of Hauts-de-France, France

[TA_O2_04] **16:50-17:10**

A Modified Fixed-Point Iteration Algorithm for Magnetic Field Computation with Hysteresis Models

Shuaichao Yue[1], Jiatong Yin[1], Yongjian Li[1], Yu Dou[1], Ruiying Chen[1], and Jun Liu[2]

[1]State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, China, [2]Cardiff University, UK

[TA_O3] Material Modeling 2	
Session Date	**June 4 (Tue.), 2024**
Session Time	**15:50-17:10**
Session Room	**Room 3 (301)**
Session Chair(s)	**TBA**

[TA_O3_01] **15:50-16:10**

Shielding Effectiveness Evaluation of Wall-Integrated Energy Storage Devices

Leonardo Sandrolini and Mattia Simonazzi
University of Bologna, Italy

[TA_O3_02] **16:10-16:30**

Anisotropic Vector Hysteresis Modeling under Multiaxial Stress

Ruiying Chen[1], Floran Martin[2], Yongjian Li[1], Shuaichao Yue[1], Yating Li[1], and Anouar Belahcen[2]
[1]Hebei University of Technology, China, [2]Aalto University, Finland

[TA_O3_03] **16:30-16:50**

An Anisotropic Hysteresis Model Considering Microstructural Feature

Yating Li[1], Yongjian Li[1], Shuaichao Yue[1], Ruiying Chen[1], Zhiwei Lin[1], and Jun Liu[2]
[1]State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, China, [2]Cardiff University, UK

[TA_O3_04] **16:50-17:10**

Macroscopic Modeling of Mn-Zn Ferrites Based on Analytical Dynamic Material Models

Reda Elkhadrawy[1], Joonas Vesa[1], Vasiliki Tsakaloudi[2], and Paavo Rasilo[1]
[1]Tampere University, Finland, [2]Centre for Research & Technology Hellas, Greece

[TA_O4] Devices and Applications 4	
Session Date	**June 4 (Tue.), 2024**
Session Time	**15:50-17:10**
Session Room	**Room 4 (302)**
Session Chair(s)	**TBA**

[TA_O4_01] **15:50-16:10**

Research on Dynamic Model of Linear Induction Machine Considering Edge Effect and Core Saturation from Winding Function Theory

Dingying Wu[1], Jin Xu[1,2], Heyun Lin[1], and Mingke Li[2]
[1]Southeast University, China, [2]Naval University of Engineering, China

[TA_O4_02] **16:10-16:30**

A Study on Field Current Ripple and Iron Loss for Wound Field Synchronous Motor Using Response Surface Methodology

Jae-Hoon Cho, Nam-Ho Kim, Ho-Jin Oh, Young-Ho Hwang, Seok-Won Jung, and Sang-Yong Jung
Sungkyunkwan University, Korea

[TA_O4_03] **16:30-16:50**

Analysis of Electromagnetic Force and Vibration in Interior Permanent Magnet Synchronous Motors with Dynamic Eccentricity

Jun Nie[1], Daohan Wang[1,2], Rongxiao Yan[1], Bingdong Wang[1], Xinchen Tu[1], and Xiuhe Wang[1]
[1]Shandong University, China, [2]Shenzhen Research Institute of Shandong University, China

[TA_O4_04] **16:50-17:10**

Design and Analysis of a Hybrid Excited Linear Machine with Characteristic of Air Gap Balanced

Rong Guo[1], Baocheng Guo[2], Fengyu Zhang[3], and Yuxin Shen[1]
[1]Beijing University of Civil Engineering and Architecture, China, [2]Nanjing Normal University, China, [3]University of Nottingham, UK

[WM_O1] Numerical Techniques 5	
Session Date	**June 5 (Wed.), 2024**
Session Time	**10:00-11:20**
Session Room	**Room 1 (Samda A)**
Session Chair(s)	**TBA**

[WM_O1_01] **10:00-10:20**

Analysis of Electromagnetic Field Interactions on Silver Nanospheres and Silver Nanowires

Aslihan Aktepe[1], Zeliha Cansu Canbek Özdil[2], Tugba Haykir Ergin[2], and Hüseyin Arda Ülkü[2]
[1]Gebze Technical University, Turkiye, [2]Yeditepe University, Turkiye

[WM_O1_02] **10:20-10:40**

High-Speed Numerical Simulation of Shielding Current Analysis in Crack-Free HTS Thin Film: Improvement of ICCGH Method

Ayumu Saitoh
Yamagata University, Japan

[WM_O1_03] **10:40-11:00**

Homogenization Technique of Nanocrystalline Cores Considering the Inter-Laminar Eddy Currents

Shengze Gao[1], Yanhui Gao[2], Xiaojun Zhao[1], Kazuhiro Muramatsu[3], Weimin Guan[4], and Takashi Todaka[2]
[1]North China Electric Power University, China, [2]Oita University, Japan, [3]Saga University, Japan, and [4]Wuhan University, China

[WM_O1_04] **11:00-11:20**

Toward the Modeling of Thin Conductive Layer with Hybrid FDTD-PITD Method

Liang Ma, Xikui Ma, Mingjun Chi, Ru Xiang, and Xiaojie Zhu
State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China

[WM_O2] Coupled Problems	
Session Date	**June 5 (Wed.), 2024**
Session Time	**10:00-11:20**
Session Room	**Room 2 (Samda B)**
Session Chair(s)	**TBA**

[WM_O2_01] **10:00-10:20**

Adaptive Mesh Refinement and Embedded Boundary Method for Streamer Discharge Simulations

Bo Lin[1], Chijie Zhuang[2], and Qingyuan Shi[2]
[1]National University of Singapore, Singapore, [2]Tsinghua University, China

[WM_O2_02] **10:20-10:40**

Adaptive Local Mesh Refinement for Steady State and Transient Simulation of Semiconductor Devices

Qingyuan Shi[1], Chijie Zhuang[1,2], Bo Lin[3], Dan Wu[2], Li Li[2], and Rong Zeng[1]
[1]Tsinghua University, China, [2]Beijing Huairou Laboratory, China, [3]National University of Singapore, Singapore

[WM_O2_03] **10:40-11:00**

A Comprehensive Coupled Methodology for Calculation and Suppression of DC Bias in UHVDC Transmission Systems

Jun Luo[1], Shiyou Yang[2], and Xiaoyong Zhu[1]
[1]Jiangsu University, China, [2]Zhejiang University, China

[WM_O2_04] **11:00-11:20**

Study on Transformer Electric Field in Different Degrees of Insulation Aging Considering Temperature Effects

Dezhi Chen[1], Sijun Wang[1], Jiangxiong Song[2], Haonan Bai[1], Xianghui Chang[1], and Ziyuan Xin[1]
[1]Shenyang University of Technology, China, [2]State Grid Xingtai Power Supply Co., Ltd., China

[WM_O3] Optimization and Design 3	
Session Date	**June 5 (Wed.), 2024**
Session Time	**10:00-11:20**
Session Room	**Room 3 (301)**
Session Chair(s)	**TBA**

[WM_O3_01] **10:00-10:20**

A Multi-Topology Efficient Optimization Model for Hairpin Permanent Magnet Synchronous Motor Based on Automated Machine Learning

Jun Luo, Xiaoyong Zhu, and Jiqi Wu
Jiangsu University, China

[WM_O3_02] **10:20-10:40**

Fast Analysis and Design for 3D-Structured Magnetic Components Using Surrogate Model from Transfer Learning

Yuki Sato[1], Hirokazu Matsumoto[1], Akito Maruo[2], Takahiro Sato[3], and Hidenori Sasaki[4]
[1]Aoyama Gakuin University, Japan, [2]Fujitsu Ltd., Japan, [3]Muroran Institute of Technology, Japan, [4]Hosei University, Japan

[WM_O3_03] **10:40-11:00**

Grounding Current Mechanism of Converter Transformer Core and Clamp

Haonan Bai[1], Dezhi Chen[1], Guoxin Zhao[1], Xiu Zhou[2], Ziyuan Xin[1], and Xiaofeng Zheng[1]
[1]Key Laboratory of Special Machine and High Voltage Apparatus, Shenyang University of Technology, China, [2]State Grid Ningxia Electric Power Co., Ltd., China

[WM_O3_04] **11:00-11:20**

Structural Parameters Optimization of Double Pendulum Damper Used in AC Transmission Lines Aiming at Reducing Corona Discharge Noise

Donghui Wang[1,2], Songyang Zhang[1], Shengchang Ji[2], Honglu Guan[1], Zhuangzhuang Zhang[1], Shanshan Quan[3], and Wenyi Wang[4]
[1]State Grid Henan Electric Power Research Institute, China, [2]Xi'an Jiaotong University, China, [3]China Electric Power Research Institute, China, [4]Central Southern China Electrical Power Design Institute, China

[WM_O4] Devices and Applications 5	
Session Date	**June 5 (Wed.), 2024**
Session Time	**10:00-11:20**
Session Room	**Room 4 (302)**
Session Chair(s)	**TBA**

[WM_O4_01] **10:00-10:20**

Alternative PM Motor Configurations Comparison for UAV Applications

Maria Sofia C. Pechlivanidou and Antonios G. Kladas
National Technical University of Athens, Greece

[WM_O4_02] **10:20-10:40**

A Magnetic Flux-Modulated Permanent Magnet Machine for Shaftless Pump-Jet Propulsor

Qinghai Qin, Haitao Yu, Shuhua Fang, Qiongfang Zhang, and Yulei Liu
Southeast University, China

[WM_O4_03] **10:40-11:00**

Characteristic Analysis of Two-Phase Stator-Permanent-Magnet Hybrid Stepping Machines with Radial and Tangential Magnetization

Xiaobao Chai, Jinglin Liu, Qian Zhang, and Lanlan Zheng
Northwest Polytechnical University, China

[WM_O4_04] **11:00-11:20**

Analytical Study and Experimental Verification of Electromagnetic Vibration Sources and Optimization of Rotor Skew in Surface Mounted Permanent Magnet Synchronous Machine

Jun-Won Yang[1], Manh-Dung Nguyen[1], Tae-Seong Kim[1], Yong-Joo Kim[1], Kyung-Hun Shin[2], and Jang-Young Choi[1]
[1]Chungnam National University, Korea, [2]Changwon National University, Korea

[WA_O1] Numerical Techniques 6	
Session Date	**June 5 (Wed.), 2024**
Session Time	**15:50-17:10**
Session Room	**Room 1 (Samda A)**
Session Chair(s)	**TBA**

[WA_O1_01] **15:50-16:10**

An Auxiliary Differential Equation–Finite Element Method for 3D Transient Simulation of Currents in HVDC Insulation

Luca Edoardo Mosconi, Carlo de Falco, and Luca Di Rienzo
Politecnico di Milano, Italy

[WA_O1_02] **16:10-16:30**

Multi-Scale Finite Element Method Applied in 3D Nonlinear Problem

Xinyu Ma[1], Nana Duan[1], Weijie Xu[2], and Shuhong Wang[1]
[1]Xi'an Jiaotong University, China, [2]State Grid Shanxi Electric Power Research Institute, China

[WA_O1_03] **16:30-16:50**

Homogenized-Winding Model of Inductor Considering Stray Capacitance at High Frequency for Finite Element Electromagnetic Filed Analysis

Xuanda Hou[1], Kazuya Kawai[1], Hiroshi Dozono[1], Kazuhiro Muramatsu[1], Norihiro Ogishima[2], Nguyen Thao[2], Keisuke Fujisaki[2], Yanhui Gao[3], Weimin Guan[4], Cuihua Tian[4], Jiaxin Yuan[4], and Baichao Chen[4]
[1]Saga University, Japan, [2]Toyota Technological Institute, Japan, [3]Oita University, Japan, [4]Wuhan University, China

[WA_O1_04] **16:50-17:10**

Inductance Computation Acceleration with Fast Multipole Method for PEEC Simulation

Riki Sakakibara and So Noguchi
Hokkaido University, Japan

[WA_O2] Wave Propagation	
Session Date	**June 5 (Wed.), 2024**
Session Time	**15:50-17:10**
Session Room	**Room 2 (Samda B)**
Session Chair(s)	**TBA**

[WA_O2_01] **15:50-16:10**

Measurement Uncertainty of Schumann Resonances with the EFIELD Experiment on Board Dragonfly

Paul Lagouanelle and Alice Le Gall
LATMOS/IPSL, UVSQ Paris-Saclay University, Sorbonne University, France

[WA_O2_02] **16:10-16:30**

Electron Density Inversion of Plasma Wake of Hypersonic Target

Zhou Zhou, Jing Tian, and Pu Tang
University of Electronic Science and Technology of China, China

[WA_O2_03] **16:30-16:50**

A Stable Discontinuous Galerkin Time-Domain Method with Implicit-Explicit Time-Marching for Lossy Media

Ru Xiang, Xikui Ma, Liang Ma, Mingjun Chi, and Jiawei Wang
Xi'an Jiaotong University, China

[WA_O2_04] **16:50-17:10**

An Improved Method for Electromagnetic Calculations of Dynamically Varying Cantilever Beam RF-MEMS Switches

Wei Wang, Jiawei Wang, Minyu Mao, and Jinghui Shao
State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China

[WA_O3] Optimization and Design 4	
Session Date	**June 5 (Wed.), 2024**
Session Time	**15:50-17:10**
Session Room	**Room 3 (301)**
Session Chair(s)	**TBA**

[WA_O3_01] **15:50-16:10**

A Manufacturing Oriented Topology Optimization Methodology for Permanent Magnet Synchronous Motor

Meng Xia[1], Jing li[1], and Shiyou Yang[2]
[1]Hangzhou City University, China, [2]Zhejiang University, China

[WA_O3_02] **16:10-16:30**

Design and Optimization of a High-Efficiency Light-Weight Permanent Magnet In-Wheel Motor with Torque Enhancement

Zixuan Xiang, Suiyuan Gui, and Jiaqiang Wei
Jiangsu University, China

[WA_O3_03] **16:30-16:50**

Design of Anode Saturable Reactor Core Based on Electromagnetic-Thermal Simulation and Neural Network Modeling

Jiaxin Yuan[1], Xuzhe Li[1], Hang Zhou[1], Yifan Wang[1], Zuoquan Mo[2], Yanli Zhang[3], Yanhui Gao[4], and Muramatsu Kazuhiro[5]
[1]Wuhan University, China, [2]China Railway Guangzhou Group Co., Ltd., China, [3]Shenyang University of Technology, China, [4]Oita University, China, [5]Saga University, China

[WA_O3_04] **16:50-17:10**

Motor Characteristics Map Prediction Using Deep Operator Neural Networks

Hidenori Sasaki[1], Kazuhisa Iwata[1], Takahiro Sato[2], and Yuki Sato[3]
[1]Hosei University, Japan, [2]Muroran Institute of Technology, Japan, [3]Aoyama Gakuin University, Japan

[WA_O4] Devices and Applications 6	
Session Date	**June 5 (Wed.), 2024**
Session Time	**15:50-17:10**
Session Room	**Room 4 (302)**
Session Chair(s)	**TBA**

[WA_O4_01] **15:50-16:10**

Analysis and Reduction of Detent Force in Flat Permanent Magnet Linear Motor with Inner-Arc Auxiliary Teeth

Qiongfang Zhang, Haitao Yu, Yulei Liu, and Qinghai Qin

Southeast University, China

[WA_O4_02] **16:10-16:30**

Novel Distributed Magnet Flux Modulation Machines with High Power Factor and Torque Density

Pengcheng Sun, Shaofeng Jia, and Deliang Liang

State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China

[WA_O4_03] **16:30-16:50**

Transient Performance Characterization for a Shielded Rogowski Coil Based Low Power Current Transformer

Youpeng Huangfu[1], Marco Faifer[2], Roberto Ottoboni[2], Sergio Toscani[2], and Shuhong Wang[1]

[1]Xi'an Jiaotong University, China, [2]Politecnico di Milano, Italy

[WA_O4_04] **16:50-17:10**

Multi-Physics Modeling for Thermal Interruption Capability Estimation of CO_2/O_2 Mixed Gas Circuit Breaker

Hyun-Mo Ahn[1], Hyun-Jae Jang[1], Jun-Kyu Park[1], Ki-Dong Song[1], Sung-Chin Hahn[2], and Yeon-Ho Oh[1]

[1]Korea Electrotechnology Research Institute, Korea, [2]Korea Electrical Manufacturers Association, Korea