MA_P
Poster Session 1

Session Date	June 3 (Mon.), 2024
Session Time	13:30-15:00
Session Room	Lobby
Session Chair(s)	Prof. Dezhi Chen (Shenyang University of Technology, China) Prof. Kota Watanabe (Muroran Institute of Technology, Japan)

MA_P_01 13:30–15:00

A Design Method of Biplanar Coils Based on Magnetic Shielding Rooms

Shuai Yuan, Minxia Shi, Leran Zhang, Jianzhi Yang, Teng Li, and Yuzheng Ma
Beihang University, China

MA_P_02 13:30–15:00

Study on Numerical Calculation Method of Magnetic Induction Heating of CF Dry Cloth Using Integral Equations

Yoshikazu Tanaka[1], Rikuto Miyake[1], Tomoyoshi Horie[2], Daiki Matsuyama[3], Kiyoka Takagi[3], and Nobuyuki Kamihara[3]
[1]Hiroshima University, Japan, [2]Kyushu Institute of Technology, Japan, [3]Mitsubishi Heavy Industries, Ltd., Japan

MA_P_03 13:30–15:00

Improving Beam Commissioning by Fast Computation of Magnetic Field of Accelerator Magnets Considering Magnetic Hysteresis

Yoshitake Onchi[1], Kengo Sugahara[1], Akira Ahagon[2], Yoshihiro Ishi[3], and Yoshiki Hane[4]
[1]Kindai University, Japan, [2]JSOL Corporation, Japan, [3]Kyoto University, Japan, [4]Tohoku University, Japan

MA_P_04 13:30–15:00

Calculation and Experimental Study of Floating Potential on Metal Shielding in Wireless Power Transfer System

Lihua Zhu[1], Xiaoxuan Song[1], Xian Zhang[2], Shuai Zhao[3], and Jianying Hao[1]
[1]Tianjin University of Technology, China, [2]Hebei University of Technology, China, [3]Tiangong University, China

MA_P_05 13:30–15:00

Reduced Order Modeling of Rectangular Wires in a Magneto-Quasi-Static Field for Integral Formulation

Shingo Hiruma[1], Luca Di Rienzo[2], and Carlo de Falco[2]
[1]Kyoto University, Japan, [2]Politecnico di Milano, Italy

MA_P_06 13:30–15:00

- **Complementary Formulations for Electroquasistatics**

  Antonino Vacalebre, Aldi Hoxha, and Ruben Specogna

  University of Udine, Italy

MA_P_07 13:30–15:00

- **Design and Analysis of Linear Haptic Motor with Pure Magnetic Spring**

  ZhiXiong Jiang[1], DanPing Xu[2], KyeongTak Park[1], and SangMoon Hwang[1]

  [1]Pusan National University, Korea, [2]Shanghai University, China

MA_P_08 13:30–15:00

- **Electromagnetic–Mechanical Model Consideration of High–Speed Train High Voltage Traction Motor**

  Sarbajit Paul[1], Pil–Wan Han[1], and Junghwan Chang[2]

  [1]Korea Electrotechnology Research Institute, Korea, [2]Dong–A University, Korea

MA_P_10 13:30–15:00

- **Anisotropic 3D Thermal Modeling for a Racetrack Foil Coil**

  Gan Fu, Mitrofan Curti, and Elena A. Lomonova

  Eindhoven University of Technology, The Netherlands

MA_P_11 13:30–15:00

- **Fast Calculation Method of Magnetic Field in Transformer Core Based on Circuit–Magnetic Coupling Model**

  Pengning Zhang[1], Quanjiang Li[1], Zheng Zhao[2], Xiaohong Li[1], Jian Zhang[3], and Jiqing Gao[4]

  [1]China University of Mining and Technology, China, [2]State Grid Corporation of Zhejiang Province, China, [3]China Electric Power Research Institute, China, [4]Shandong Energy Group Electric Power Group Co., Ltd, China

MA_P_12 13:30–15:00

- **Hybrid Boundary Element – Physics Informed Neural Network Formulation for Electromagnetics Problems**

  Sami Barmada[1], Mauro Tucci[1], Alessandro Formisano[2], Paolo Di Barba[3], and Maria Evelina Mognaschi[3]

  [1]University of Pisa, Italy, [2]University of Campania Luigi Vanvitelli, Italy, [3]University of Pavia, Italy

MA_P_13 13:30–15:00

- **Model Order Reduction of Transient Magnetic Field Based on POD and DEIM Methods**

  Shengwei Wu and Lin Li

  North China Electric Power University, China

MA_P_14 13:30–15:00

- **Nonlinear MOR of Induction Motor with Reduced Representation of Airgap Harmonics**

  Tetsuji Matsuo, Toshihiro Ozeki, Miwa Tobita, Shingo Hiruma, and Takeshi Mifune

  Kyoto University, Japan

MA_P_15 13:30–15:00

- **Application of the Deep Operator Network (DeepONet) to Electromagnetic Simulations**

  Ali Akbarzadeh-Sharbaf, Jakob Rylo, and Dennis Giannacopoulos

  McGill University, Canada

MA_P_17 13:30–15:00

- **Multi-Level Optimization Based on Approximate Models for Double-Sided Linear Flux Switching Permanent Magnet Motors**

  Qiankai Zhao[1], Cheng Wen[2], Lei Huang[1], and Yuan Li[1]

  [1]Southeast University, China, [2]Shijiazhuang Tiedao University, China

MA_P_18 13:30–15:00

- **Multi-Objective Topology Optimization of Synchronous Reluctance Motor with Autoencoder Simultaneously Considering Material Selection and Shape Change**

  Masahiro Kishi[1], Sinji Wakao[1], Noboru Murata[1], Hiroaki Makino[2], Katsutoku Takeuchi[2], and Makoto Matsushita[2]

  [1]Waseda University, Japan, [2]Toshiba Infrastructure Systems & Solutions Corporation, Japan

MA_P_19 13:30–15:00

- **Artificial Neural Network Based Electro-Thermal Optimization of Induction Machine for EV Applications**

  Omolbanin Taqavi, Alexandre J. Bourgault, Ze Li, and Narayan C. Kar

  Centre for Hybrid Automotive Research and Green Energy (CHARGE), University of Windsor, Canada

MA_P_20 13:30–15:00

- **Optimal Design of SPMSM for Robot Joint Using Least Square Boosting Assisted Multi Objective Opimization Algorithm**

Jong-Min Ahn and Dong-Kuk Lim
University of Ulsan, Korea

MA_P_21 13:30–15:00

- **Combination of Extra Random Trees and Genetic Algorithm for Optimal Design of SPMSM for Robot Joints**

Min-Su Kwon and Dong-Kuk Lim
University of Ulsan, Korea

MA_P_22 13:30–15:00

- **Surrogate-Based Optimization of SMT Inductors**

Christian Riener[1,2], Alice Reinbacher-Köstinger[2], Thomas Bauernfeind[1,2], Samuel Kvasnicka[1,2], Klaus Roppert[1,2], and Manfred Kaltenbacher[1,2]
[1]TU-Graz SAL GEMC Lab, Silicon Austria Labs, Austria, [2]Institute of Fundamentals and Theory in Electrical Engineering, Graz University of Technology, Austria

MA_P_24 13:30–15:00

- **Topology Optimization of Magnetic Microstructures for Eddy Current Loss and Permeability**

Shuli Yin and Hajime Igarashi
Hokkaido University, Japan

MA_P_25 13:30–15:00

- **Data-Efficient Machine Learning Methods for Electric Motor Surrogate Models**

Bingnan Wang[1] and Yusuke Sakamoto[2]
[1]Mitsubishi Electric Research Laboratories (MERL), USA, [2]Mitsubishi Electric Corporation, Japan

MA_P_26 13:30–15:00

- **Modeling and Simulations of Semiconductor Structures at Highest Frequencies**

Mario Kupresak, Jasmin Smajic, and Juerg Leuthold
Institute of Electromagnetic Fields (IEF), ETH Zurich, Switzerland

MA_P_27 13:30–15:00

- **An Implementation Method of Incorporating Hysteretic Material Models into Electromagnetic FEA**

  Shuaichao Yue[1], Yating Li[1], Ruiying Chen[1], Ming Yang[1], Philip Anderson[2], and Yongjian Li[1]

  [1]Hebei University of Technology, China, [2]Cardiff University, UK

MA_P_28 13:30–15:00

- **Data-Driven Finite Element Mesh Generation Expert System Based on BP Neural Network**

  Yufeng Niu, Shuhong Wang, Nana Duan, Naming Zhang, Yilun Wang, and Zhenggang He

  Xi'an Jiaotong University, China

MA_P_29 13:30–15:00

- **Improving Electrically Evoked Compound Action Potential Based on Electrical Field Imaging and Electrode Interfaces**

  Charles T. M. Choi, Chun Ting Ke, Jelani Lawrence, and Alexander C. C. Wang

  National Yang Ming Chiao Tung University, Taiwan ROC

MA_P_30 13:30–15:00

- **Efficient Electric Field Evaluation of a Point Source near the Infant Torso**

  Anna A. Varvari[1], Dimitrios I. Karatzidis[1], Theodoros T. Zygiridis[2], Christos S. Antonopoulos[1], and Nikolaos V. Kantartzis[1]

  [1]Aristotle University of Thessaloniki, Greece, [2]University of Western Macedonia, Greece

MA_P_31 13:30–15:00

- **Elliptical Loop-Microstrip Array for Focus Brain Lobe Imaging with 11.4 Teslas MRI System**

  Daniel Hernandez, Taewoo Nam, Eunwoo Lee, Yeji Han, Yeunchul Ryu, and Kyoung-Nam Kim

  Gachon University, Korea

MA_P_32 13:30–15:00

- **Using Point Clouds for Material Properties Smoothing in Low-Frequency Numerical Dosimetry Simulations**

  Norman Haussmann, Steven Stroka, Shaghayegh Mazaheri Kalahroudi, and Markus Clemens

  University of Wuppertal, Germany

MA_P_33 13:30–15:00

- **Dynamic Multi-Physical Field Coupling Analysis for Enhanced Electromagnetic Driving Devices**

Rongge Yan and Haokai Zhao
State Key Laboratory of Reliability and Intelligence of Electrical Equipment, Hebei University of Technology, China

MA_P_34 13:30–15:00

- **Novel Microspeaker Design for Smartwatches with Integrated Woofer and Tweeter Units**

KyeongTak Park, ZhiXiong Jiang, YeongIn Oh, and SangMoon Hwang
Pusan National University, Korea

MA_P_35 13:30–15:00

- **Analysis of a Field Modulation Multi-Port Generator for Wave Power Generation**

Yuan Li, Lei Huang, Minshuo Chen, and Minqiang Hu
Southeast University, China

MA_P_37 13:30–15:00

- **Performance Improvement of WFSM for EV Propulsion Applying Grain Oriented Electrical Steel**

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

MA_P_38 13:30–15:00

- **Semi-Implicit Time Integration Method for a FEM-Parameterized Plant Model of a Permanent Magnet Synchronous Motor**

Kota Takagi[1], Yasuhito Takahashi[1], Akira Ahagon[2], Tetsuji Matsuo[3], and Koji Fujiwara[1]
[1]Doshisha University, Japan, [2]JSOL Corporation, Japan, [3]Kyoto University, Japan

MA_P_39 13:30–15:00

- **Design of a High Reliability and High Performance Permanent Magnet Synchronous Motor Used in Oil-Submersible Electric Pump System**

Peng Zhou[1], Yanliang Xu[1], and Wenji Zhang[2]
[1]Shandong University, China, [2]Shengli Oil Field Shengli Pump Industry Co., Ltd., China

MA_P_42 13:30–15:00

- **Investigation of Dual-Side Consequent-Pole Permanent Magnet Machine with Improved Magnetic Field Modulation Effect**

  Shaoshuai Wang, Jianzhong Zhang, Ning Wang, and Yongbin Wu

  Southeast University, China

MA_P_43 13:30–15:00

- **A Study on Shaft Voltage of IPMSM Applying Tapering for Reducing Cogging Torque**

  Ji-Sung Lee[1], Jong-Min Ahn[1], Dong-Kuk Lim[1], and Kyungjin Kang[2]

  [1]University of Ulsan, Korea, [2]LG Magna, Korea

MA_P_44 13:30–15:00

- **Mitigation of AC Copper Loss via Transposition Method Considering Circulating Current in Large Ship Propulsion Motors**

  Nam-Ho Kim[1], Chang-Hyun Wang[1], Ho-Yong Choi[2], and Sang-Yong Jung[1]

  [1]Sungkyunkwan University, Korea, [2]Hyosung Heavy Industries, Korea

MA_P_45 13:30–15:00

- **Design and Analysis of Broadband Vibrational Energy Harvester Based on Switchable Dynamical System Using Electropermanent Magnet**

  Masayuki Kato and Fumiya Kitayama

  Ibaraki University, Japan

MA_P_47 13:30–15:00

- **On the Equivalence of Working Volumes in Undermoded Reverberation Chambers**

  Anett Kenderes[1,2], Szabolcs Gyimóthy[1], and Péter Tamás Benkő[2]

  [1]Budapest University of Technolgy and Economics, Hungary, [2]Automotive Electronics-Electromagnetic Compatibility, Robert Bosch Kft., Hungary

MA_P_48 13:30–15:00

- **Design and Analysis of Novel Multiple Magnetic Source Axial Flux Modulation Machines**

  Pengcheng Sun, Shaofeng Jia, Zhidong Yuan, and Deliang Liang

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

MA_P_49 13:30–15:00

Design of Shaft Voltage Reduction Shield Considering Eddy Current Loss of IPMSM

Jun-Hyeok Heo[1], Jun-Kyu Kang[1], Jun-Hyuk Im[1], and Jin Hur[1]
[1]Incheon National University, Korea, [2]Daegu Mechatronics & Materials Institute, Korea

MA_P_50 13:30–15:00

Electrostatic Field Analysis Using Physics Informed Neural Net and Partial Differential Equation Solver Analysis

Kart-Leong Lim
*Institute of Microelectronics, A*STAR, Singapore*

MA_P_51 13:30–15:00

Analysis on Conductive Screen Effects on Dual Air-Gap Surface Permanent Magnet Synchronous Motor

Tae Jun Ahn[1], Do Hyun Kang[2], and Gwan Soo Park[1]
[1]Pusan National University, Korea, [2]VAM, Korea

MA_P_52 13:30–15:00

Calculation Method of *d*-Axis Inductance Considering Magnetic Saturation and Cross Coupling Effects under Load Conditions

Dong Su Kim[1], Byeong Hwa Lee[2], Myung Seob Lim[3], and Jae Woo Jung[1]
[1]Daegu University, Korea, [2]Korea Automotive Technology Institute, Korea, [3]Hanyang University, Korea

MA_P_53 13:30–15:00

A Study on the Comparison of Electromagnetic Design according to the Application of CFRP Sleeve to IPMSM

Mun-Seok Jang, Dong-Su Kim, and Jae-Woo Jung
Daegu University, Korea

MA_P_54 13:30–15:00

Simplified Optimization of Curved Barrier in Synchronous Reluctance Motor

Sung Chan Hong and Chaelim Jeong
Tongmyong University, Korea

MA_P_55 13:30–15:00

- **Study on Performance Changes of EV Traction Motor Applying CFRP Sleeve to IPMSM**

Si-Uk Jung, Dong-Su Kim, Jae-Seung Lee, and Jae-Woo Jung

Daegu University, Korea

MA_P_56 13:30–15:00

- **New Winding Structure for VR Resolver for Robustness and Fault Diagnosis**

Sung-Won Lee, Jun-Kyu Kang, Jun-Hyeok Heo, and Jin Hur

Incheon National University, Korea

MA_P_57 13:30–15:00

- **An Efficient Hybrid DC Circuit Breaker Based on Current Commutation with Mechanical and Power Electronics**

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

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

MA_P_58 13:30–15:00

- **Acceleration of Waveform Cotrol for Measurement of Magnetic Hysteresis Based on Single Sheet Tester Using Neural Network**

Tatsuya Yamaguchi[1], Yuki Kuroda[1], Yoshifumi Okamoto[1], Hidenori Sasaki[1], and Koji Fujiwara[2]

[1]Hosei University, Japan, [2]Doshisha University, Japan

MA_P_59 13:30–15:00

- **Nondestructive Estimation of Permanent Magnet Magnetization Using Measured Value of Leakage Flux Originating from PMSM Rotor**

Narichika Nakamura, Masahide Shioyama, and Yoshifumi Okamoto

Hosei University, Japan

MA_P_60 13:30–15:00

- **Study on the Rotor Bar Curvature to Increase Starting Torque in Cryogenic Induction Motor**

Younghyun Song, Seung Ahn Chae, and Gwan Soo Park

Pusan National University, Korea

MA_P_61 13:30–15:00

- **Study on Equivalent 2-D Finite Element Analysis Model for Axial Flux Permanent Magnet Motor Considering the End Effect in Radial Direction**

  Jae-Seung Lee, Dong-Su Kim, Si-Uk Jung, and Jae-Woo Jung

  Daegu University, Korea

MA_P_62 13:30–15:00

- **A Comprehensive Design Approach to Minimize Position Error in Variable Reluctance Resolvers**

  Jungmoon Kang and Gilsu Choi

  Inha University, Korea

MA_P_63 13:30–15:00

- **A Novel Mesh-Based Reluctance Network Model for Magnetic Lead Screw**

  Junfei Wu[1], Lixun Zhu[1], Wei Li[2], Weimin Wu[1], and Chang-seop Koh[3]

  [1]Shanghai Maritime University, China, [2]Tongji University, China, [3]Chungbuk National University, Korea

TM_P
Poster Session 2

Session Date	June 4 (Tue.), 2024
Session Time	11:20-12:30
Session Room	Lobby
Session Chair(s)	Prof. Chijie Zhuang (Tsinghua University, China) Prof. Jaewoo Jung (Daegu University, Korea)

TM_P_01 11:20–12:30

Higher-Order Frequency Derivatives of Electroquasistatic System

Seung Eun Rho, Jong Oh Park, and Il Han Park
Sungkyunkwan University, Korea

TM_P_02 11:20–12:30

Convolutional Physics-Informed Neural Networks for Fast Prediction of Core Losses in Axisymmetric Transformers

Philipp Brendel, Vlad Medvedev, and Andreas Rosskopf
Fraunhofer Institute for Integrated Systems and Device Technology IISB, Germany

TM_P_03 11:20–12:30

PEEC Based Fast 3D Litz Wire Model

Tianming Luo[1], Mohamad Ghaffarian Niasar[1], and Peter Vaessen[1,2]
[1]Delft University of Technology, The Netherlands, [2]KEMA Laboratories, The Netherlands

TM_P_04 11:20–12:30

Modal Analysis for Induced Currents in Metallic Plates

Alessandro Formisano[1], Sami Barmada[2], and Ehsan Akbari Sekehravani[1]
[1]University of Campania Luigi Vanvitelli, Italy, [2]University of Pisa, Italy

TM_P_05 11:20–12:30

Physics-Informed Neural Network fo 2D Magneto-Quasi-Static Problems in Time Domain

Ziqing Guo and Ruth V. Sabariego
KU Leuven, Belgium

TM_P_06 11:20–12:30

- **The Analytical Calculation and Measurements of the Magnetic Force between Permanent Magnet and Rotor Yoke of a Large-Scale Permanent Magnet Synchronous Generator**

Woo-Sung Jung[1], Hyo-Seob Shin[2], Kyung-Hun Shin[3], and Jang-Young Choi[1]
[1]Chungnam National University, Korea, [2]Hyundai Mobis, Korea, [3]Changwon National University, Korea

TM_P_07 11:20–12:30

- **Comparison of Electromagnetic Vibration and Noise of Sensorless Control with Pulsating Voltage Injection**

Daohan Wang[1], Shuang Xu[2], Yonghua Huang[3], Cheng Xu[4], Xiaoji Wang[3], and Xiuhe Wang[3]
[1]Shenzhen Research Institute of Shandong University, China, [2]Qingdao Power Supply Company, Shandong Electric Power Company State Grid, China, [3]Shandong University, China, [4]Shandong Luruan Digital Technology Co., Ltd., China

TM_P_08 11:20–12:30

- **Crack Propagation of Ground Insulation Failure for Large Motor End-Winding Based on Electromechanical Coupling Phase Field Model**

Xiaobo Wu[1], Haijun Zhang[1], Bolong Wang[1], and Guowen Cao[2]
[1]Hubei Key Laboratory of Power System Design and Test for Electrical Vehicle Hubei University of Arts and Science, China, [2]Xiangyang CRRC Motor Technology Co., Ltd., China

TM_P_09 11:20–12:30

- **An Improved Time Period FEM for Numerical Analysis of Electromagnetic Fields of Power Transformers under DC Bias**

Xiaowen Xu[1], Shiyou Yang[2], Guoping Zou[3], and Cancan Rong[1]
[1]China University of Mining and Technology, China, [2]Zhejiang University, China, [3]China Jiliang University, China

TM_P_10 11:20–12:30

- **Self-Consistent Model of Low-Pressure Plasma Column Sustained by Electromagnetic Surface Waves**

Ivan Ganachev[1,2], Haruka Nakano[1], and Keiji Nakamura[2]
[1]Shibaura Mechatronics Corporation, Japan, [2]Chubu University, Japan

TM_P_11 11:20–12:30

- **A Domain Decomposition Finite Element Method for the Magneto-Thermal Field Analysis of Electric Machines**

Yunpeng Zhang[1], Jinpeng Cheng[1], Xinsheng Yang[2], Qibin Zhou[1], and Weinong Fu[3]
[1]Shanghai University, China, [2]Hebei University of Technology, China, [3]Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

TM_P_12 11:20–12:30

- **Design and Analysis of PM-Assisted Synchronous Reluctance Machines Considering Rotor Structural Integrity**

Jaesung Choi[1], Sangwon Min[1], Gilsu Choi[1], and Jihyun Kim[2]
[1]Inha University, Korea, [2]Stellantis, USA

TM_P_13 11:20–12:30

- **Coupled Electromagnetic-Fluid-Thermal Analysis in Large Scale Water-Hydrogen-Hydrogen Cooled Generator-Condenser under Different Operations**

Weili li[1], Yalei li[1], Tianhuai Qiao[1], Chunsun Tian[2], Mingyang liu[2], and Yang Xiao[3]
[1]Beijing Jiao Tong University, China, [2]Electric Power Research Institute of State Grid Henan Electric Power Company, China, [3]China Electric Power Research Institute Company Ltd., China

TM_P_14 11:20–12:30

- **Research on Vibration and Noise Characteristics of 110kV Three-Phase Three-ColumnTransformer**

Pengning Zhang[1], Wenjie Liao[1], Xueqian Zhao[2], Yajin Yang[1], Jian Zhang[3], and Jiqing Gao[4]
[1]China University of Mining and Technology, China, [2]State Grid Beijing Electric Power Company Electric Power Science Research Institute Beijing, China, [3]China Electric Power Research Institute, China, [4]Shandong Energy Group Co., Ltd., China

TM_P_15 11:20–12:30

- **Mesh Error Estimation Using Graph Neural Networks**

Jakob Rylo and Dennis Giannacopoulos
McGill University, Canada

TM_P_16 11:20–12:30

Analysis of Coordinate Transformation in Permanent Magnet Motors

Zekun Wu[1], Baocheng Guo[1], Yanchen Wu[1], and ZhiXiong Jiang[2]
[1]Nanjing Normal University, China, [2]Pusan National University, Korea

TM_P_17 11:20–12:30

Finite Element Models for High Voltage Cables with Large Cross Sections Using Dimensional Reduction and Homogenization

Albert Piwonski[1], Julien Dular[2], Rodrigo Silva Rezende[1], and Rolf Schuhmann[1]
[1]Technical University of Berlin, Germany, [2]CERN (TE-MPE-PE), Switzerland

TM_P_18 11:20–12:30

Fuel Cell Stack Magnetic Tomography with Adjoint Method

Leonard Freisem[1], Olivier Chadebec[1], Gilles Cauffet[1], Yann Bultel[2], and Sebastien Rosini[3]
[1]University Grenoble Alpes, CNRS, Grenoble INP, G2ELab, France, [2]University Grenoble Alpes, University Savoie-Mont Blanc, CNRS Grenoble INP, LEPMI, France, [3]University Grenoble Alpes CEA LITEN, France

TM_P_19 11:20–12:30

Electromagnetic Performance Improvement of Asymmetric Hybrid PM Motor Considering Various Operating Conditions

Chen Yunyun, Lu Mingjie, Xu Yushan, and Cai Tongle
Yangzhou University, China

TM_P_20 11:20–12:30

A Novel Multi-Layer Coupler with High Efficiency and High Misalignment Tolerance

Wei Wang, Kairui Li, Mingrong Duan, Chenjin Xu, Siyuan Sheng, and Zheng Lu
Nanjing Normal University, China

TM_P_21 11:20–12:30

Comprehensive Optimization Design of Axial-Flux Permanent Magnet Synchronous Machine for Large-Capacity Flywheel Energy Storage System

Mingxin Sun and Yanliang Xu
Shandong University, China

TM_P_22 11:20–12:30

- **An Optimization Method for Coil Design Problems Based on Physarum Polycephalum Algorithm and Evolutionary Computation**

Takahiro Sato[1], Kengo Sugahara[2], and Yuki Hidaka[3]

[1]Muroran Institute of Technology, Japan, [2]Kindai University, Japan, [3]Nagaoka University of Technology, Japan

TM_P_23 11:20–12:30

- **Utilizing an Efficient Magnetic Equivalent Circuit Model and Manifold Mapping Method for Two-Level Optimization of Axial Flux Machine**

Gensheng Li and Yanliang Xu

Shandong University, China

TM_P_24 11:20–12:30

- **Use of an Inference Technique for Sensitivity Analysis of RL Parameters of Wound Inductors Extracted from the Finite Element Method**

Geoffrey Lossa[1], Olivier Deblecker[2], and Zacharie De Grève[3]

[1]Institut Superieure Pedagogique et Technique de Kinshasa, D.R. Congo, [2]University of Mons, Belgium

TM_P_25 11:20–12:30

- **Electromagnetic Field Analysis Using Physics Informed Neural Network Considering Eddy Current**

Ji-Hoon Han, Jong-Hoon Park, Seung-Min Song, and Sun-Ki Hong

Hoseo University, Korea

TM_P_26 11:20–12:30

- **A New Hybrid Algorithm Based on PSO and Fireworks Algorithm for Optimal Design of Metasurface Absorber in RF Energy Harvesting**

Na Chen[1], Shiyou Yang[1], and Siguang An[2]

[1]Zhejiang University, China, [2]China Jiliang University, China

TM_P_27 11:20–12:30

- **Surrogate Model-Based Synthesis of NFC-Transponders**

Christoph Koger[1], Eniz Museljic[1], Thomas Bauernfeind[1,2], and Alice Reinbacher-Köstinger[1]

[1]Institute of Fundamentals and Theory in Electrical Engineering, Graz University of Technology, Austria, [2]TU-Graz SAL GEMC Lab, Silicon Austria Labs, Austria

TM_P_28 11:20–12:30

- **Novel Wedge-Less Stator to Reduce the Shaft Voltage in the IPMSM for EV Propulsion Simplifying Manufacturing Process**

Han-Joon Yoon[1], Jin-Hwan Lee[2], Seok-Won Jung[1], and Sang-Yong Jung[1]
[1]Sungkyunkwan University, Korea, [2]Chonnam National University, Korea

TM_P_29 11:20–12:30

- **Conductor Design Method Considering AC Resistance for High Efficiency of PMSM Using High Fill Factor Winding**

Kyoung-Soo Cha[1], Soon-O Kwon[1], and Myung-Seop Lim[2]
[1]Korea Institute of Industrial Technology, Korea, [2]Hanyang University, Korea

TM_P_30 11:20–12:30

- **2-Step Monte Carlo Tree Search for Optimal Design of High-Frequency Toroidal Inductors in Power Electronics Circuits**

Nobuto Misono, Tomoki Hirosawa, Yuki Sato, and Matsumoto Hirokazu
Aoyama Gakuin University, Japan

TM_P_31 11:20–12:30

- **Modeling and Analysis of a Hybrid Excitation Electromagnetic Lead Screw Based on the Equivalent Magnetic Circuit Method**

Yuanhang Li[1], Lixun Zhu[1], Wei Li[2], Weimin Wu[1], and Chang-seop Koh[3]
[1]Shanghai Maritime University, China, [2]Tongji University, China, [3]Chungbuk National University, Korea

TM_P_32 11:20–12:30

- **Estimating Parameters of Synchronous Generator Using Sudden Three Phase Short Circuit Test**

Junki Park, Peter Nkwocha Harmony, and Jeihoon Baek
Korea University of Technology and Education, Korea

TM_P_33 11:20–12:30

- **Estimation of Fluxgate Magnetometer PSD in High-Performance and Large-Scale MSR**

Zhilong Zou
Harbin Institute of Technology, China

TM_P_34 11:20–12:30

- **Analysis of a Linear-Rotary Generator with Magnetic Gears for Wave Power Generation**

  Yuan Li, Lei Huang, Minshuo Chen, and Minqiang Hu

  Southeast University, China

TM_P_35 11:20–12:30

- **Dynamic Process Modeling in Induction Heating Considering Temperature-Dependent Magnetic Properties**

  Xiaohan Kong[1], Keito Kubo[1], Toshihito Shimotani[2], Sanga Takagi[2], Eiji Hashimoto[2], Hiroyuki Imanari[2], and Hajime Igarashi[1]

  [1]Hokkaido University, Japan, [2]Toshiba Mitsubishi-Electric Industrial Systems Corporation, Japan

TM_P_36 11:20–12:30

- **Shape Optimization of Synchronous Motors for Torque Ripple Reduction Using Continuum Sensitivity Analysis**

  Eunchae Jung, Kyungsik Seo, Yunjung Hwang, and Il Han Park

  Sungkyunkwan University, Korea

TM_P_37 11:20–12:30

- **Multi-Objective Optimization Design of an AFFMPM Machine Based on SVM and NSGA-II Algorithm**

  Shuai Wang[1], Mingyao Lin[1], and C. C. Chan[2]

  [1]Southeast University, China, [2]The University of Hong Kong, Hong Kong S.A.R.

TM_P_38 11:20–12:30

- **Development of Magnetic Eddy Current Testing for Opposite-side Defect Detection in Ferromagnetic Steel Pipeline Inspection**

  Seung Ahn Chae[1], Dae Yong Um[2], and Gwan Soo Park[1]

  [1]Pusan National University, Korea, [2]Newcastle University, UK

TM_P_39 11:20–12:30

- **Design of Anti-Saturated Coil for Robust Wireless Power Transfer in Magnetic Latching System**

  Yujun Shin[1] and Bumjin Park[2]

  [1]Keimyung University, Korea, [2]Samsung Electronics Co., Ltd., Korea

TM_P_40 11:20–12:30

- **Disturbance-Observer-Based Sliding Mode Speed Control for Variable Flux Memory Machines Considering Magnetization State Manipulations**

Yuxiang Zhong, Heyun Lin, and Hui Yang
Southeast University, China

TM_P_41 11:20–12:30

- **A Novel Electromagnetic Voltage Transformer Based on Magnetic Valve**

Jiaxin Yuan[1], Guangchen Ma[1], Hang Zhou[1], Jingwen Hou[1], Yanhui Gao[2], and Kazuhiro Muramatsu[3]
[1]Wuhan University, China, [2]Oita University, Japan, [3]Saga University, Japan

TM_P_43 11:20–12:30

- **Estimation of Local Demagnetization in Ferrite Magnet Using Pinching-Type Sigmoid Function Based on Gradient Method (P-SiGrad)**

Shunsuke Yamaguchi, Narichika Nakamura, and Yoshifumi Okamoto
Hosei University, Japan

TM_P_44 11:20–12:30

- **Efficient Digital Twin of SPM Based on FEA Enabling Drive Current Harmonics Elimination**

Antonios V. Sideris, Georgios K. Sakkas, and Antonios G. Kladas
National Technical University of Athens, Greece

TM_P_45 11:20–12:30

- **Design of a Low-Cost PM Vernier Machine with Improved Electromagnetic Performance**

Abdur Rehman and Gilsu Choi
Inha University, Korea

TM_P_46 11:20–12:30

- **Examination of Thickness Measurement Method for Hot Spring Scale inside Steel Pipes using Electromagnetic Force Vibration**

Ryota Takasugi, Shinya Shiota, Hiroyuki Ikusada, Shotaro Niwa, Yanhui Gao, and Yuji Gotoh
Oita University, Japan

TM_P_47 11:20–12:30

- **Electromagnetic Performance Analysis and Multi-Objective Optimal Design of a Novel Magnet-Shifted PM Motor for Reducing Torque Ripple**

Yonghua Huang[1], Daohan Wang[1,2], Zhipeng Li[1], Xinchen Tu[1], Jun Nie[1], and Xiuhe Wang[1]
[1]Shandong University, China, [2]Shenzhen Research Institute of Shandong University, China

TM_P_48 11:20–12:30

- **Electromagnetic Design Process of Limited Angle Actuator for Wrist Applications of Industrial Robot**

Sarbajit Paul[1], Imjae Lee[2], and Junghwan Chang[2]
[1]Korea Electrotechnology Research Institute, Korea, [2]Dong-A University, Korea

TM_P_49 11:20–12:30

- **Effective Design Method of Axial Flux Permanent Magnet Synchronous Motor for Electric Vehicle Using Initial State Finite Element Analysis and Machine Learning**

Min-Su Kwon and Dong-Kuk Lim
University of Ulsan, Korea

TM_P_50 11:20–12:30

- **Novel Salient Stator Pole-Shoe Structure for Reducing the Shaft Voltage of the PMSM**

Ji-Sung Lee[1], Jong-Min Ahn[1], Dong-Kuk Lim[1], and Kyungjin Kang[2]
[1]University of Ulsan, Korea, [2]LG Magna, Korea

TA_P
Poster Session 3

Session Date	June 4 (Tue.), 2024
Session Time	14:00-15:30
Session Room	Lobby
Session Chair(s)	Prof. Charles Choi (National Yang Ming Chiao Tung University, Taiwan ROC) Prof. Lixun Zhu (Shanghai Maritime University, China)

TA_P_01 14:00–15:30

Ion Flow Field Numerical Simulation Method of High-Altitude UHVDC Transmission Lines Based on Weibull-WSE-UFEM

Guohua Yue, Zhiye Du, Gen Li, Jingwen Huang, Yu Zhan, and Ziren Huang
Wuhan University, China

TA_P_02 14:00–15:30

Multidirectional Magnetic Field Decoupling Model Based on Particle Swarm Optimization

Leran Zhang, Minxia Shi, Jianzhi Yang, Ziyang Shi, Yuzheng Ma, and Ao Zhang
Beihang University, China

TA_P_03 14:00–15:30

A Technique for Predicting Magnetic Field Signal of Warship by Applying Spatial Permeability to Reduce Computational Resources

Hyunwon Jeong[1], Youngmin Kim[1], Chunghwan Kim[1], Hyeunsoo Oh[1], Shinhyung Kim[1] Sanghyeon Im[2], and Hyangbeom Lee[3]
[1]Hanwha Ocean, Korea, [2]Dong-Eui University, Korea, [3]Soongsil University, Korea

TA_P_05 14:00–15:30

Effect of Building Modeling on Ion Flow Field of HVDC Transmission Lines

Jianhui Wang[1], Li Xie[2], Tiebing Lu[1], Yifan Wang[3], Ming Sun[3] and Mingquan Zeng[3]
[1]North China Electric Power University, China, [2]China Electric Power Research Institute, China, [3]State Grid Zhejiang Electric Power Co.Ltd. Research Institute, China

TA_P_07 14:00–15:30

- **State Space Modelling of Microstrip Lines**

Lukas Quehenberger[1,2], Christian Riener[1,2], and Thomas Bauernfeind[1,2]

[1]Institute of Fundamentals and Theory in Electrical Engineering, Graz University of Technology, Austria, [2]TU-Graz SAL GEMC Lab, Silicon Austria Labs, Austria

TA_P_08 14:00–15:30

- **The Influence of Load Factors on Vibration and Noise Characteristics of 10kV Three-Phase Oil Immersed Transformer**

Zhuangzhuang Zhang, Donghui Wang, Songyang Zhang, Xu Tian, Haodong Feng, Weipo Liu, and Yuan Li

State Grid Henan Electric Power Research Institute, China

TA_P_09 14:00–15:30

- **Accelerated 3D Analysis of Metasurfaces for RIS Applications by Characteristic Basis Functions**

Botond Tamás Csathó[1], Zsolt Badics[1,2], József Pávó[1], and Bálint Péter Horváth[1]

[1]Budapest University of Technology and Economics, Hungary, [2]Tensor Research, LLC, USA

TA_P_10 14:00–15:30

- **A Second-Order Split-Step Precise Integration Time Domain Method for Solving Maxwell's Equations and Its Numerical Analysis**

Mingjun Chi, Xikui Ma, Liang Ma, Xiaojie Zhu, and Ru Xiang

Xi'an Jiaotong University, China

TA_P_11 14:00–15:30

- **Field Distribution Study for Microwave Processing Plasma Uniformity Enhancement**

Keekon Kang[1], Dohan Kim[2], Chae-Hwa Shon[1], Jong-Soo Kim[1], and Seong-Tae Han[1]

[1]Korea Electrotechnology Research Institute, Korea, [2]Nagoya University, Japan

TA_P_12 14:00–15:30

- **Scattering Invariant Mode Wave Propagation in 3D Structure**

Olivér Csernyava[1], József Pávó[1], and Zsolt Badics[1,2]

[1]Budapest University of Technology, Hungary, [2]Tensor Research, LLC, USA

TA_P_13 14:00–15:30

- **Study on the Effect of Different Tank Sizes on Transformer Noise Considering Propagation Paths**

  Ziyuan Xin, Dezhi Chen, Haonan Bai, Xianghui Chang, Yuan Wang, and Yibo Zhao

  Shenyang University of Technology, China

TA_P_16 14:00–15:30

- **Magnetic Property Calibration for Vibrating Sample Magnetometers Based on Magnetic Field Analysis**

  Xiaohan Kong[1], Yuji Uehara[2], Naoya Terauchi[3], Natsuko Sato[3], Yoshibumi Matsuda[3], Masanori Nagano[3], and Hajime Igarashi[1]

  [1]Hokkaido University, Japan, [2]Magnetic Device Laboratory Ltd., Japan, [3]TAIYO YUDEN Co., Ltd., Japan

TA_P_17 14:00–15:30

- **A Vector Extension of the D–D–D Hysteresis Model**

  Valerio De Santis[1] and Alessandro Giuseppe D'Aloia[2]

  [1]University of L'Aquila, Italy, [2]Sapienza University of Rome, Italy

TA_P_18 14:00–15:30

- **Study of Magnetostrictive Characteristics Based on Dynamic J–A Model under DC Bias**

  Zhen Wang[1], Runjie Yu[1], Yanli Zhang[1], Dezhi Chen[1], Ziyan Ren[1], and Chang Seop Koh[2]

  [1]Shenyang University of Technology, China, [2]Chungbuk National University, Korea

TA_P_19 14:00–15:30

- **An Improved Thermodynamic Hysteresis Model for Electrical Steel Using Minimum of Magnetic Domain Energy to Compute Anhysteresis Magnetization**

  Xin Wu[1], Yanli Zhang[1], Ying Jing[1], and Chang Seop Koh[2]

  [1]Shenyang University of Technology, China, [2]Chungbuk National University, Korea

TA_P_20 14:00–15:30

- **Computer Simulation of Magnetic Properties of Fe–Ni System Bilayer Ribbons under Bending Stress**

  Ryota Hirose, Shunsuke Nakashima, Takeshi Yanai, Akihiro Yamashita, Masaki Nakano, and Hirotoshi Fukunaga

  Nagasaki University, Japan

TA_P_21 14:00–15:30

- **Permanent Magnet Motor Torque Waveform Prediction Using Learned Gap Flux**

  Yusuke Sakamoto[1], Bingnan Wang[2], Tatsuya Yamamoto[1], and Yuki Nishimura[1]

  [1]Mitsubishi Electric Corporation, Japan, [2]Mitsubishi Electric Research Laboratories (MERL), USA

TA_P_22 14:00–15:30

- **A Sensitivity-Region-Extended Robust Optimization Approach for Spoke-Type Permanent Magnet Synchronous Motor**

  Jiqi Wu, Xiaoyong Zhu, and Zixuan Xiang

  Jiangsu University, China

TA_P_23 14:00–15:30

- **End Effect Calculation of Surface Mounted PM Machine Based on Mesh-Based 2D Magnetic Equivalent Circuit Model**

  Yanchen Wu[1], Baocheng Guo[1], Zekun Wu[1], and ZhiXiong Jiang[2]

  [1]Nanjing Normal University, China, [2]Pusan National University, Korea

TA_P_24 14:00–15:30

- **Magnetization Estimation for Permanent Magnet Using Convolutional Neural Network**

  Kazuki Igarashi, Hidenori Sasaki, Masahide Shioyama, and Yoshifumi Okamoto

  Hosei university, Japan

TA_P_25 14:00–15:30

- **Harmonic-Orientated Optimization of a Double-Rotor Flux-Modulated Permanent Magnet Motor**

  Zixuan Xiang, Hucheng Qian, and Yuting Zhou

  Jiangsu University, China

TA_P_26 14:00–15:30

- **Magnetic Circuit Analysis of Hybrid Excitation Flux Switching Motor with Non-Uniform Auxiliary Air Gap**

  Daohan Wang[1], Guangsheng Xu[2], Cheng Xu[3], Zhipeng Li[4], Shuang Xu[5], and Xiuhe Wang[4]

  [1]Shenzhen Research Institute of Shandong University, China, [2]Laiwu Power Supply Company Shandong Electric Power Company State Grid, China, [3]Shandong Luruan Digital Technology Co., Ltd., China, [4]Shandong University, China, [5]Qingdao Power Supply Company Shandong Electric Power Company State Grid, China

TA_P_27 14:00–15:30

- **A Study on the Design of Novel Slotless Axial Flux Motor through Comparison With Radial Flux Motor for Collaborative Robot**

Jun-Ho Kang[1], Chae-Won Jo[1], Cheol-Soon Park[2], Sung-Hyun Yoon[2], Chang-Sung Jin[2], and Ju Lee[1]
[1]Hanyang University, Korea, [2]Wonkwang University, Korea

TA_P_28 14:00–15:30

- **Topology Optimization of Magnetic Structure for Electromagnetic Force Maximization Supported by Error Correction Method**

Ryota Sawada[1], Yoshifumi Okamoto[1], and Akira Ahagon[2]
[1]Hosei University, Japan, [2]JSOL Corporation, Japan

TA_P_29 14:00–15:30

- **A Study on the Torque Characteristics of Permanent Magnet-Assisted Synchronous Reluctance Motor with Magnetic Neutral Point Movement**

Jeongwon Kim[1], Hyeon-Bin Hong[1], Chae-Won Jo[1], Hee-Won Koo[1], Sol Kim[2], and Ju Lee[1]
[1]Hanyang University, Korea, [2]Yuhan University, Korea

TA_P_30 14:00–15:30

- **Electromagnetic Design Optimization of a PMSG Using a Deep Neural Network Approach**

Belen Campos[1], Luis Diaz[1], Concepcion Hernandez[1], Marco Arjona[1], and Jorge Lara[2]
[1]La Laguna Institute of Technology, Mexico, [2]Lerdo Institute of Technology, Mexico

TA_P_31 14:00–15:30

- **Complete Characterization of EMI for ECMs with PEEC Method**

Abdullah Eroglu
University of Massachusetts Boston, USA

TA_P_32 14:00–15:30

- **Study on High-Frequency Transformer Variable Inductance for Extending the Maximum Power Level of DAB Converter**

Cheol-Woong Choi, Jae-Hyeon So, Jae-Sub Ko, and Dae-Kyong Kim
Sunchon National University, Korea

TA_P_33 14:00–15:30

- **A New Magnetic Design with Annular Sector Coils of an Inductive Angular Position Sensor**

Dan-Ping Xu[1], Silong Fang[1], Yi Zhao[1], Fanlin Zeng[2], and Sang-Moon Hwang[3]
[1]Shanghai University, China, [2]Shanghai Zenidrive Technology Co., China [3]Pusan National University, Korea

TA_P_34 14:00–15:30

- **Modeling and Experimental Verification of Multilayer Winding Method for the Vibration Improvement of Electric Motor with Sub-Harmonics**

Myung-Hwan Yoon, Ki-Doek Lee, Jae-Kwang Lee, and Jeong-Jong Lee
Korea Electronics Technology Institute, Korea

TA_P_35 14:00–15:30

- **Electromagnetic Force Analysis of Interior Permanent Magnet Synchronous Motors with T-Shaped Notching Rotor**

Xinchen Tu[1], Daohan Wang[1,2], BingDong Wang[1], Chengqi Wang[1], Wenqiang Miao[1], and Xiuhe Wang[1]
[1]Shandong University, China, [2]Shenzhen Research Institute of Shandong University, China

TA_P_36 14:00–15:30

- **Characteristic Analysis and Designing of 3kW E-Booster and Motor Drive**

Eui-Jong Park and Yong-Jae Kim
Chosun University, Korea

TA_P_37 14:00–15:30

- **New BH Curve Tracking Method Based on Magnetic Contact Force**

Chang-Hoon Seok, Jangho Seo, Gui-Hwan Kim, and Hong-Soon Choi
Kyungpook National University, Korea

TA_P_38 14:00–15:30

- **Experimental Verification for Electromagnetic and Thermal Characteristics of a High-Speed Permanent Magnet Motor with Two Different Rotors**

Su-Min Kim[1], Jong-Hyeon Woo[2], Sang-Hyeop Kim[1], Kyeong-Won Kwak[1], Yong-Joo Kim[1], Kyung-Hun Shin[3], and Jang-Young Choi[1]
[1]Chungnam National University, Korea, [2]LG Electronics Inc., Korea, [3]Changwon National University, Korea

TA_P_39 14:00–15:30

- **Effect of Coil Shape on the Critical Load Resistance of Frequency Splitting Phenomenon in Magnetic Resonance Wireless Power Transfer**

Min Seung Song, Ho Yeong Lee, and Gwan Soo Park
Pusan National University, Korea

TA_P_40 14:00–15:30

- **Thermal Analysis of SPMSM Based on Phase Change Material Cooling Method**

Xuyang Hu, Zhanyang Yu, Yan Li, Jing Wang, and Pengzhe Zhuang
Shenyang University of Technology, China

TA_P_41 14:00–15:30

- **Detection and Location Estimate of External Surface Defects Using Velocity Effects from Double-Sided Quadrupole Permanent Magnets**

Masafumi Kuromizu[1], Akihiko Motoyama[1], Kai Komatsubara[1], Takaaki Nara[2], and Yuji Gotoh[1]
[1]Oita University, Japan, [2]The University of Tokyo, Japan

TA_P_42 14:00–15:30

- **Study on Rotor Bar Loss due to Space Harmonics of Line Start Synchronous Reluctance Motor**

Hyeonbin Hong[1], Chaewon Jo[1], Cheolsoon Park[2], Jaehyeon Yu[2], Sol Kim[3], and Ju Lee[1]
[1]Hanyang University, Korea, [2]Wonkwang University, Korea, [3]Yuhan University, Korea

TA_P_43 14:00–15:30

- **Development of MR-Sensor-Based Measurement System for Weak Magnetic Field Derived from Fuel Cell and Its Application to Inverse Estimation of Current Density Distribution**

Eiji Atsumi, Enoch Choi, Shunsuke Yamaguchi, and Yoshifumi Okamoto
Hosei University, Japan

TA_P_44 14:00–15:30

- **A Study on the 2D Demagnetization Analysis Error Caused by the 3D End Effect in an Interior Permanent Magnet Synchronous Motor**

Sung Gu Lee[1] and Jaenam Bae[2]
[1]Dong-A University, Korea, [2]Dongyang Mirae University, Korea

TA_P_45 14:00–15:30

- **Development of High-Speed Magnetization Estimator with Multi-Estimation Points in Permanent Magnet**

  Yuto Hirose, Masahide Shioyama, and Yoshifumi Okamoto

  Hosei University, Japan

TA_P_46 14:00–15:30

- **Performance Evaluation of Single Phase Flux Switching Reluctance Machine for Low Cost Turbo Machinery**

  Zhipeng Li[1], Daohan Wang[1,2], Guangsheng Xu[3], Shuang Xu[4], Yonghua Huang[1], and Xiuhe Wang[1]

  [1]Shandong University, China, [2]Shenzhen Research Institute of Shandong University, China, [3]Laiwu Power Supply Company Shandong Electric Power Company State Grid Shandong University, China, [4]Qingdao Power Supply Company Shandong Electric Power Company State Grid, China

TA_P_47 14:00–15:30

- **Variable Frequency Transformer Design for New Energy Microgrids and Grid Interconnections**

  Yifan Zhang[1], Sheng Huang[1], Bo Ma[1], Jianguo Zhu[2], and Gang Lei[3]

  [1]Hunan University, China, [2]The University of Sydney, Australia, [3]University of Technology Sydney, Australia

TA_P_48 14:00–15:30

- **A Study on the Characteristics of Electromagnetic Field of Twin-Inverter System Traction Motor**

  Hong-Jae Jang[1], Cheol-Min Kim[2], Chung-Ho Lee[3], Tae-su Kim[1], Jae-Gak Shin[1], and Ki-Chan Kim[1]

  [1]Hanbat National University, Korea, [2]SPG, Korea, [3]MCSYS, Korea

TA_P_49 14:00–15:30

- **Dynamic Analysis of a Novel Arc Linear Permanent Magnet Synchronous Motor**

  Ikhlaq Ahmad[1], Mudassir Raza Siddiqi[1], Houng-Joong Kim[2], and Jin Hur[1]

  [1]Incheon National University, Korea, [2]KOVERY Motor Inc., Korea

TA_P_50 14:00–15:30

- **DC-Link Voltage Control Strategy Considering Vessel Condition for Efficiency Improvement of IH Cooktops with PFC Rectifier**

  Yun Seong Hwang, Hyeon Soo Kim, Seung Hyun Kang, Man Jae Kwon, and Byoung Kuk Lee

  Sungkyunkwan University, Korea

TA_P_51 14:00–15:30

- **Study on Arc Diagnostic Device for 1000V Class Electric Vehicle Systems**

  Jun-Kyu Park, Hyun-Jae Jang, Ki-Dong Song, Yeon-Ho Oh, and Hyun-Mo Ahn

  Korea Electrotechnology Research Institute, Korea

TA_P_52 14:00–15:30

- **Investigation of Convergence of Linear Solvers in Electromagnetic Finite Element Analysis with Electric Circuit**

  Kota Watanabe and Naruki Tokunaga

  Muroran Institute of Technology, Japan

TA_P_53 14:00–15:30

- **Analysis of an Inductive Angular Position Sensor Using Eddy Current Effect**

  Dan-Ping Xu[1], Guochao Ma[1], Silong Fang[1], Fanlin Zeng[2], and Sang-Moon Hwang[3]

  [1]Shanghai University, China, [2]Shanghai Zenidrive Technology Co., Ltd., China, [3]Pusan National University, Korea

TA_P_54 14:00–15:30

- **Comparison of Characteristics according to Permanent Magnet Arrangement of Permanent Magnet Linear Synchronous Generator**

  Cheol Han[1], Kyung-Hun Shin[2], and Jang-Young Choi[3]

  [1]Hanon Systems, Korea, [2]Chonnam National University, Korea, [3]Chungnam National University, Korea

WM_P
Poster Session 4

Session Date	June 5 (Wed.), 2024
Session Time	11:20-12:30
Session Room	Lobby
Session Chair(s)	Prof. David A. Lowther (McGill University, Canada) Prof. Han-Kyeol Yeo (The University of Suwon, Korea)

WM_P_03 11:20–12:30

Analytical Approach of Sideband Electromagnetic Vibration of PMSM Driven by Voltage Source Inverter with SVPWM Strategy

Daohan Wang[1,2], Chengqi Wang[2], Wenqiang Miao[3], Guangsheng Xu[4], Evarist P. Mwaigaga[3], and Xiuhe Wang[3]

[1]Shenzhen Research Institute of Shandong University, China, [2]Shandong Luruan Digital Technology Co., Ltd, China, [3]Shandong University, China, [4]Laiwu Power Supply Company State Grid, China

WM_P_04 11:20–12:30

High Pecision Calculation of Transformer Short-Circuit Impedance Based on Energy Method

Mingyue Wang, Jiaocui Wan, Zhanyang Yu, and Yan Li

Shenyang University of Technology, China

WM_P_06 11:20–12:30

Magnetic Force Calculation Using Virtual Air Gap Penetrating Finite Elements

Gui-Hwan Kim, Hong-Soon Choi, and Chang-Hoon Seok

Kyungpook National University, Korea

WM_P_07 11:20–12:30

A Magneto-Elastic Vector-Play Model under Rotating Fields and Multiaxial Stress States

Luiz Guilherme da Silva[1,2], Laurent Bernard[2], Laurent Daniel[1], Floran Martin[3], and Anouar Belahcen[3]

[1]Laboratory of Electrical Engineering and Electronics of Paris (GeePs), France, [2]Federal University of Santa Catarina, Brazil, [3]Aalto University, Finland

WM_P_08 11:20–12:30

Magnetostriction Model of Electrical Steel Sheet Considering Temperature Gradient

Zhen Wang[1], Zheming Fan[1], Yanli Zhang[1], Dezhi Chen[1], Ziyan Ren[1], and Chang Seop Koh[2]

[1]Shenyang University of Technology, China, [2]Chungbuk National University, Korea

WM_P_09 11:20–12:30

- **Modeling of Magnetic Properties of Silicon Steel Sheets under DC Bias Based on Multi-Scale Dynamic Jiles-Atherton Model**

Chao Feng[1], Yanli Zhang[1], Ying Jing[1], and Chang Seop Koh[2]
[1]Shenyang University of Technology, China, [2]Chungbuk National University, Korea

WM_P_10 11:20–12:30

- **Comparison of the Finite Element Method and High-Order Isogeometric Analysis for Modeling Magnetic Vector Hysteresis**

Bram Daniels[1], Mitrofan Curti[1], Timo Overboom[2], and Elena Lomonova[1]
[1]Eindhoven University of Technology, The Netherlands, [2]Royal SMIT Transformers SGB-SMIT Group, The Netherlands

WM_P_11 11:20–12:30

- **Loss Calculation of Iron Core under DC Bias and Harmonic Disturbance Conditions**

Yidan Hu[1,2], Jiawen Yu[1], Zhaoyu Zhang[1], Xuanrui Zhang[1], Junhao Li[1], and Roberto Ottoboni[2]
[1]Xi'an Jiaotong University, China, [2]Politecnico di Milano, Italy

WM_P_12 11:20–12:30

- **Adaptive-Mesh-Generation Magnetic Network Model for Analysis of Hairpin PMSMs Combining with Convolution Neural Network**

Zhangwei Yang, Xiaoyong Zhu, and Deyang Fan
Jiangsu University, China

WM_P_13 11:20–12:30

- **Moving Mesh Method for Semiconductor Device Simulations**

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

WM_P_15 11:20–12:30

- **An AC Copper Loss Calculation Scheme of Synchronous Motor with Rectangular Conductors Considering Pulse Width Modulation Harmonics**

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

WM_P_16 11:20–12:30

- **Remaining Useful Life Prediction Model for Lithium-Ion Batteries Using Transfer Learning Base on Long Short Term Memories**

  Dong Hwan Kim, Jong-Hun Lim, Je-yeong Lim, and Byoung Kuk Lee

  Sungkyunkwan University, Korea

WM_P_17 11:20–12:30

- **Novel Hybrid 3-D Shape Optimization Method Combining Parameter and Topology Optimizations: Application to Permanent Magnet Motor**

  Yoshitsugu Otomo and Takashi Abe

  Nagasaki University, Japan

WM_P_18 11:20–12:30

- **A Fast Calculation Method for Current-Carrying Capacity of Submarine Cables in J-Tube Sections**

  Zhiye Du, Gen Li, Guohua Yue, and Yu Zhan

  Wuhan University, China

WM_P_19 11:20–12:30

- **Synthesis of Boundary Conditions in Magnetics: a Neural Network Approach**

  Paolo Di Barba[1], Maria Evelina Mognaschi[1], Sami Barmada[2], Nunzia Fontana[2], and Mauro Tucci[2]

  [1]University of Pavia, Italy, [2]University of Pisa, Italy

WM_P_20 11:20–12:30

- **A Novel Hybrid Multi-Objective Optimization Algorithm and Its Application to Designs of Eletromagnetic Devices**

  Yilun Li[1], Zhengwei Xie[1], Shiyou Yang[2], and Zhuoxiang Ren[3]

  [1]Donghua University, China, [2]Zhejiang University, China, [3]Sorbonne University, France

WM_P_21 11:20–12:30

- **Simulation-Driven Machine Learning for Solving the Inverse Problem of PCB-Based Tilt-Inductive Position Sensors**

  Antonino Vacalebre, Francesco Campagna, and Ruben Specogna

  University of Udine, Italy

WM_P_22 11:20–12:30

Topology Optimization of an IPMSM Rotor Considering the Torque Profile Enhancement

Bo Ma[1], Jiaxiu Yu[1], Jing Zheng[1], Jianguo Zhu[2], and Gang Lei[3]
[1]Hunan University, China, [2]The University of Sydney, Australia, [3]University of Technology Sydney, Australia

WM_P_23 11:20–12:30

A Novel Permanent Magnet Synchronous Machine with Axial Sandwich Structure for Flux Regulating Capability

Daohan Wang[1], Cheng Xu[2], Shuang Xu[3], Jun Nie[4], Guangsheng Xu[5], and Xiuhe Wang[4]
[1]Shenzhen Research Institute of Shandong University, China, [2]Shandong Luruan Digital Technology Co., Ltd., China, [3]Qingdao Power Supply Company Shandong Electric Power Company State Grid, China, [4]Shandong University, China, [5]Laiwu Power Supply Company Shandong Electric Power Company State Grid, China

WM_P_24 11:20–12:30

Electromagnetic Parameter Design and Finite Element Analysis of a Novel Dual-Stator Electric-Thermal Output Machine

Bin Peng[1], Jiaxin Yuan[1], Nuochun Liu[2], Hao Wang[1], Weizhe Zhang[1], Jiawei Liu[1], Xuzhe Li[1], and Hang Zhou[1]
[1]Wuhan University, China, [2]State Grid Zhejiang Electric Power Company Hangzhou Power Supply Company, China

WM_P_25 11:20–12:30

Topology Optimization of Rotor Core Structure to Reduce Permanent Magnet Eddy Current Losses in Interior Permanent-Magnet Motor

Kazuki Kashiwada and Yoshifumi Okamoto
Hosei University, Japan

WM_P_27 11:20–12:30

3D FE Analysis of Magnet Segmentation for Reducing the Eddy Current of Arc Linear Servo Motor

Zuhair Abbas[1], Mudassir Raza Siddiqi[1], Houng-Joong Kim[2], and Jin Hur[1]
[1]Incheon National University, Korea, [2]KOVERY Motor Inc., Korea

WM_P_28 11:20–12:30

Comparative Analysis of Axial and Radial Flux Motors with Identical Size and Output Power

Cheol Han[1], Jang-Young Choi[2], and Jun-Won Yang[2]
[1]Hanon Systems, Korea, [2]Chungnam National University, Korea

WM_P_30 11:20–12:30

- **Topological Design of a Novel Magnetically Saturated Bridge Arm Reactor With Controllable Inductance**

  Jiaxin Yuan, Wanting Zhang, Yudong Sun, Hang Zhou, Jiawei Liu, Yu Liu, and Jiefu Tan

  Wuhan University, China

WM_P_31 11:20–12:30

- **Non-Invasive Insulation Resistance Measurement Using an Electromotive Force Excitator Allied with a Rogowski Coil Sensor**

  Songyi Dian[1], Bingchen Wang[1], Hongli Hu[2], and Kaihao Tang[1]

  [1]Sichuan University, China, [2]Xi'an Jiaotong University, China

WM_P_32 11:20–12:30

- **Design of Dual-Loop Magnetic Coil with High-Efficiency Wireless Charging and Attachment in Asymmetric Magnetic Latching System**

  Bumjin Park[1] and Dongwook Kim[2]

  [1]Samsung Electronics Co., Ltd., Korea, [2]Yeungnam University, Korea

WM_P_33 11:20–12:30

- **High Fidelity Motor Modeling Method of Vector-Controlled Induction Motor Based on Frequency-Domain FEM Considering PWM Current Harmonics**

  In-Seok Song, DoHyun Jang, Seok-Won Jung, and Sang-Yong Jung

  Sungkyunkwan University, Korea

WM_P_34 11:20–12:30

- **Inductance Derivation and Experimental Verification according to Operating Range of Interior Permanent Magnet Synchronous Motor**

  Kyeong-Won Kwak[1], Su-Min Kim[1], Sang-Hyeop 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

WM_P_35 11:20–12:30

- **Zero-Order Electromagnetic Vibration Reduction Method for Permanent Magnet Synchronous Motor with Harmonic Currents Injection**

  Bingdong Wang[1], Daohan Wang[1,2], Jun Nie[1], Wenqiang Miao[1], Chengqi Wang[1], and Xiuhe Wang[1]

  [1]Shandong University, China, [2]Shenzhen Research Institute of Shandong University, China

WM_P_36 11:20–12:30

- **A Drive-Charging Integrated System Based on a New AC Flux-Regulation Permanent Magnet Synchronous Motor**

Xiaoji Wang[1], Daohan Wang[1,2], Evarist P. Mwaigaga[1], Rongxiao Yan[1], Zhipeng Li[1], and Xiuhe Wang[1]
[1]Shandong University, China, [2]Shenzhen Research Institute of Shandong University, China

WM_P_37 11:20–12:30

- **Design of Asymmetric Consequent-Pole SPMSM for Reduction Torque Ripple**

Chaewon Jo[1], Heewon Koo[1], Hyeonbin Hong[1], Jongmin Kim[2], Changsung Jin[2], and Ju Lee[1]
[1]Hanyang University, Korea, [2]Wonkwang University, Korea

WM_P_38 11:20–12:30

- **Magnetic Field Analysis and Calculation of Slotless Axial Flux Permanent Magnet Motor with Sinusoidal Back EMF**

Chengwu Diao[1], Wenliang Zhao[1], Longxuan Li[1], Sunil Kumar[2], and Byung-Il Kwon[3]
[1]Shandong University, China, [2]Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Pakistan, [3]Hanyang University, Korea

WM_P_39 11:20–12:30

- **Fast Computation of Steady-State Performance in Line-Start Synchronous Reluctance Motor Based on Equivalent Circuit and Finite Element Analysis**

Hyunwoo Kim[1], Chaewon Jo[1], Heewon Koo[1], Hyeonbin Hong[1], Sol Kim[2], and Ju Lee[1]
[1]Hanyang University, Korea, [2]Yuhan University, Korea

WM_P_40 11:20–12:30

- **Computation of Geometric Mean Distance through Monte Carlo Simulation to Predict Inductance of Circular Coil with Arbitrary Cross-Section**

Ho Yeong Lee and Gwan Soo Park
Pusan National University, Korea

WM_P_41 11:20–12:30

- **Selection of Shared Rotors for Magnetic Geared Motor to Reduce Permanent Magent Usage**

Beom-Seok Byeon[1], Eui-Jong Park[1], Sang-Yong Jung[2], and Yong-Jae Kim[1]
[1]Chosun University, Korea, [2]Sungkyunkwan University, Korea

WM_P_42 11:20–12:30

- **Performance Prediction Process of Outer Rotor PMSM through 3-D Flux Coefficient Using Equivalent 2-D FEA**

  Moo-hyun Sung[1], Kyoung-soo Cha[2], Young-hoon Jung[3], Jae-han Sim[4], Soon-o Kwon[2], and Myung-Seop Lim[1]

  [1]Hanyang University, Korea, [2]Korea Institute of Industrial Technology, Korea, [3]Yeungnam University, Korea, [4]LG Electronics Inc., Korea

WM_P_44 11:20–12:30

- **Investigation of Machine Parameter Mismatch on Sensorless PMSM Drives**

  Wenlong Li, Jin Zhang, Baojian Ji, Jian Guo, Yutao Jiang, and Haoran Liu

  Nanjing University of Science and Technology, China

WM_P_45 11:20–12:30

- **The Design and Research Analysis of HVAC SystemThree-Phase Energy-Draining Fault Current Limiter**

  Jiawei Liu, Jiaxin Yuan, Hang Zhou, and Wanting Zhang

  Wuhan University, China

WA_P
Poster Session 5

Session Date	June 5 (Wed.), 2024
Session Time	14:00-15:30
Session Room	Lobby
Session Chair(s)	Prof. Yong-Jae Kim (Chosun University, Korea) Prof. Sun-Ki Hong (Hoseo University, Korea)

WA_P_01 14:00-15:30

Dynamic Analysis of Surface and Space Charge with Floating Conductor under Dielectric Liquid Discharge

Yonghee Kim, Hyemin Kang, and Se-Hee Lee
Kyungpook National University, Korea

WA_P_02 14:00-15:30

Parametric Model Order Reduction of Darwin Model Considering Nonlinear Magnetic Materials

Shingo Hiruma[1], Yuki Sato[2], and Tetsuji Matsuo[1]
[1]Kyoto University, Japan, [2]Aoyama Gakuin University, Japan

WA_P_03 14:00-15:30

Analytical Modeling of Inductance in Electric Thermal Storage Steam Supply System

Jiaocui Wan, Yan Li, Zhanyang Yu, Mingyue Wang, and Shun Yu
Shenyang University of Technology, China

WA_P_04 14:00-15:30

Nondestructive Inverse Estimation Method of Permanent Magnet Magnetization Using No-Load BEMF of PMSM

Hajime Suzuki and Yoshifumi Okamoto
Hosei University, Japan

WA_P_05 14:00-15:30

Numerical Analysis for Long-Term Negative Discharges in Air with Needle-Plane Electrode Configuration

Minhee Kim, Ju Jin Son, and Yong Sung Cho
Korea Electrotechnology Research Institute, Korea

WA_P_06 14:00–15:30

- **AC Iron Loss Investigation with Consideration of a DC Bias Magnetisation in Non-Grain Oriented Electrical Steel Sheets**

Christoph Dobler[1], Gilsu Choi[2], Gereon Goldbeck[1], Daniel Wöckinger[1], and Gerd Bramerdorfer[1]

[1]Johannes Kepler University Linz, Austria, [2]Inha University, Korea

WA_P_07 14:00–15:30

- **Calculation of Iron Loss in Soft Magnetic Composites Using Neural Network-Based Dynamic Hysteresis Model under SVPWM Excitation**

Ying Jing[1], Yanli Zhang[1], Dianhai Zhang[1], and Jianguo Zhu[2]

[1]Shenyang University of Technology, China, [2]University of Sydney, Australia

WA_P_08 14:00–15:30

- **Machine Learning to Predict Effective Conductivity of Composite Materials for Shielding Applications**

A. Kameni[1], D. Palessonga[1,2], Z. Semmoumy[1], and M. Bensetti[1]

[1]Laboratory of Electrical Engineering and Electronics of Paris (GeePs), France, [2]ESME Research Lab, France

WA_P_10 14:00–15:30

- **Multi-Physics Analysis and Optimal Design of an Outer Rotor Surface Mounted Permanent Magnet Synchronous Motor for Coaxial Drone**

Jae Beom Kang[1,2], Ji Heon Lee[2,3], Hyeong Jin Kim[2], and Ji Young Lee[1,2]

[1]Univerisity of Secience and Technology, Korea, [2]Korea Electrotechnology Research Institute, Korea, [3]Pusan National University, Korea

WA_P_11 14:00–15:30

- **Propagation Characteristics of End-Winding Insulation Fatigue Damage in Variable Frequency Motor under Multi-Field Coupling**

Bangwei Zhang[1], Haijun Zhang[1], Jiashun Wang[1], and Guowen Cao[2]

[1]Hubei Key Laboratory of Power System Design and Test for Electrical Vehicle Hubei University of Arts and Science, China, [2] Taiyuan University of Science and Technology, China

WA_P_12 14:00–15:30

- **Fatigue Propagation Analysis of Crack Failure in High Power IGBT Solder Based on Multiphysics Coupling Model and XFEM**

  Jiashun Wang, Haijun Zhang, Bangwei Zhang, and Haifeng Kong

  Hubei Key Laboratory of Power System Design and Test for Electrical Vehicle Hubei University of Arts and Science, China

WA_P_13 14:00–15:30

- **Study on Transformer Core Vibration Noise Based on Low-Noise Electrical Steel Sheets**

  Ziyuan Xin and Dezhi Chen

  Shenyang University of Technology, China

WA_P_15 14:00–15:30

- **A Fast Multiscale Numerical Algorithm for Coupling Dynamics of the Bubble in Insulating Oil under the Electric Field**

  Yanxin Ren[1], Nana Duan[1], Yulu Fan[1], Weijie Xu[2], and Shuhong Wang[1]

  [1]Xi'an Jiaotong University, China, [2]State Grid Shaanxi Electric Power Co., China

WA_P_16 14:00–15:30

- **Optimum Parameter Selection for Accurate FDTD Simulations in Dispersive Media**

  Theodoros T. Zygiridis[1], Stamatios Amanatiadis[1], Tadao Ohtani[2], Yasushi Kanai[3], and Nikolaos Kantartzis[4]

  [1]University of Western Macedonia, Greece, [2]Independent Researcher, Japan, [3]Niigata Institute of Technology, Japan, [4]Aristotle University of Thessaloniki, Greece

WA_P_17 14:00–15:30

- **Analysis of Fire Propagation in Electrical Cable Tray Using the FLASH-CAT Model**

  Hyun-Min Kang[1], Jaiho Lee[2], Young-Seob Moon[2], and Ho-Young Lee[1]

  [1]Changshin University, Korea, [2]Korea Institute of Nuclear Safety, Korea

WA_P_18 14:00–15:30

- **Analysis and Optimization Design of V-Type Permanent Magnet Motor with Harmonic-Injected Shaped Rotor for Improved Torque Characteristics**

  Xinyang Chen, Deyang Fan, Xiaoyong Zhu, Li Quan, Wu Shan, Hongzuo Tian, and Jun Luo

  Jiangsu University, China

WA_P_19 14:00–15:30

- **Multiple Level and Objective Optimization of Double Stator Flux Switching Permanent Magnet Motor Considering Multi-Mode Operating Conditions**

  Xiaolei Cai, Xiaoyong Zhu, Lei Xu, and Zixuan Xiang

  Jiangsu University, China

WA_P_20 14:00–15:30

- **Optimal Design of Dy-Free Permanent Magnet Motor for Irreversible Demagnetization through Experimental Design**

  Sung-Hyun Yoon, Cheol-Soon Park, Jong-Min Kim, and Chang-Sung Jin

  WonkwangUniversity, Korea

WA_P_21 14:00–15:30

- **Accelerating Coil Path Optimization via Truncated Singular Value Decomposition Coupled with Adaptive Cross-Approximation**

  Takuma Koiso[1], Kengo Sugahara[1], and Akihiro Ida[2]

  [1]Kindai University, Japan, [2]Japan Agency for Marine-Earth Science and Technology, Japan

WA_P_22 14:00–15:30

- **An Improved Multi-Objective GA for Low Frequency Metamaterial Unit Robust Optimization under Uncertainty**

  Yiying Li, Xiaowen Xu, and Shiyou Yang

  Zhejiang University, China

WA_P_23 14:00–15:30

- **Structural Optimization and Simulation Analysis of Orthogonal Controllable Reactors**

  Jiaxin Yuan, Jingwen Hou, Xianfeng Zheng, Hang Zhou, Guangchen Ma, and Xuzhe Li

  Wuhan University, China

WA_P_24 14:00–15:30

- **Real-Time Design and Characterization of Inductive Position Sensors through AI-Driven DesSS**

  Francesco Campagna, Francesco Trevisan, and Ruben Specogna

  DPIA, EMCLab University of Udine, Italy

WA_P_25 14:00–15:30

Multiphysics Deep Learning for Topology Optimization of Permanent Magnet Motor

Ryosuke Mikami, Hayaho Sato, Tamaki Kujimichi, and Hajime Igarashi
Hokkaido University, Japan

WA_P_26 14:00–15:30

Analysis and Design Of High Torque Density Robotic Joint Motors Based On Equivalent Magnetic Circuits

Daohan Wang[1], Cheng Xu[2], Shuang Xu[3], Jun Nie[4], Guangsheng Xu[5], and Xiuhe Wang[4]
[1]Shenzhen Research Institute of Shandong University, China, [2]Shandong Luruan Digital Technology Co., Ltd., China, [3]Qingdao Power Supply Company Shandong Electric Power Company State Grid, China, [4]Shandong University, China, [5]Laiwu Power Supply Company Shandong Electric Power Company State Grid, China

WA_P_27 14:00–15:30

Novel Design Optimization Strategy Using a Lumped Magnetic-Circuit Model for Surface Permenet-Magnet Machine with Step-Skewing Rotor

Jin-Seok Kim[1], Rae-Eun Kim[1], Jae-Woo Kang[1], and Jangho Seo[2]
[1]Korea Electronics Technlogy Institute, Korea, [2]Kyungpook National University, Korea

WA_P_28 14:00–15:30

Fast Estimation System of Permanent Magnet Magnetization Using 2D-Arrayed Hall Sensors Combined with Deep Neural Network

Masahide Shioyama and Yoshifumi Okamoto
Hosei University, Japan

WA_P_31 14:00–15:30

Evolution and Comparison of Two Axial-Flux PM Machines for All-Electric Aircraft Propulsion

Dingbang Long[1], Honghui Wen[1], Zhikang Shuai[1], Yafei Lu[2], and Bingjie Zhu[2]
[1]Hunan University, China, [2]National University of Defense Technology, China

WA_P_32 14:00–15:30

Comparative Research of Yokeless and Segmented Armature Axial Flux Motors with Surface-Mounted and Tangential Permanent Magnet Rotor

Wenjing Zhang[1], Yanliang Xu[1], and Feng Xin[2]
[1]Shandong University, China, [2]Shandong Institute for Product Quality Inspection, China

WA_P_33 14:00–15:30

- **Design Consideration of a Permanent Magnet Assist Synchronous Reluctance Motor Used in Oil-Submersible Electric Pump System**

  Peng Zhou, Yanliang Xu, and Yang Chu

  Shandong University, China

WA_P_34 14:00–15:30

- **Optimal Design to Maximize Efficiency Map of a Hairpin Motor with Electrical Winding Changeover Technique for EV**

  Young-Ho Hwang, Ho-Jin Oh, Hye-Won Yang, Seok-Won Jung, and Sang-Yong Jung

  Sungkyunkwan University, Korea

WA_P_35 14:00–15:30

- **Design and Research on Machine Modulation Ratio Effect for Power Factor Characteristics of the Permanent Magnet Linear Machine**

  Dingying Wu[1], Jin Xu[1,2], and Heyun Lin[1]

  [1]Southeast University, China, [2]Naval University of Engineering, China

WA_P_36 14:00–15:30

- **Investigation of Winding Power Loss in Flux Modulated Permanent Magnet Machine Considering Multi-Physics Factors**

  Shaoshuai Wang, Jianzhong Zhang, Yongbin Wu, and Ning Wang

  Southeast University, China

WA_P_37 14:00–15:30

- **Analysis of Magnetic Field Modulation Mechanism in Transverse Flux Cylindrical Linear Generator Used in Direct Drive Wave Energy Conversion**

  Minshuo Chen, Lei Huang, Yuan Li, and Shuhua Fang

  Southeast University, China

WA_P_39 14:00–15:30

- **Structural Design and Electromagnetic Performance Analysis of 50Mvar HTS Synchronous Condenser**

  Yue Liu[1], Lin Li[1], Jiahui Zhu[2], and Panpan Chen[2]

  [1]North China Electric Power University, China, [2]China Electric Power Research Institute, China

WA_P_40 14:00–15:30

- **A Magnetic Planetary Gear Permanent Magnet Machine with Double Blades for Offshore Marine Current Generation System**

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

WA_P_41 14:00–15:30

- **Analytical Modeling and Dynamic Characterization of Radial Magnetic Couplings**

Xiao Liu, Shuo Qin, Shengxi Weng, Meng Lu, and Pingting Lin
Hunan University, China

WA_P_42 14:00–15:30

- **Mechanical Field Calculation and Analysis of a High-Speed PMSM**

Jun Che[1], Fei Zhao[1], Bin Chen[2,3], Mengzhu Cao[1], Jiwei Cao[1], Qasim Ali[4], and Shahid Atiq[5]
[1]Harbin Institute of Technology, China, [2]Zhuhai GREE Electrical Appliance Co., Ltd., Guangdong Provincial Key Laboratory of High-Speed and Energy-Saving Motor System Enterprises, China, [3]Guangdong Provincial Key Laboratory of High-Speed and Energy-Saving Motor System Enterprises, China, [4]Sukkur IBA University, Pakistan, [5]Khwaja Fareed University of Engineering & Information Technology, Pakistan

WA_P_43 14:00–15:30

- **Magnetic Field Simulation and Measurement of MMC Submodule under Dual Pulse Test**

Hailin Li[1,2,3], Zhonting Chang[1], Shuhong Wang[3], Yongjie Hu[1], Zhilei Si[1], Kepeng Xia[1], Lulu Liu[1], and Kun Liu[1]
[1]XJ Electric Co. Ltd., China, [2]Zhegnzhou University of Light Industry, China, [3]Xi'an Jiaotong Univeristy, China

WA_P_45 14:00–15:30

- **Efficiency Analysis of Delta Winding Connected BLDC Motor According to Occurrence of Circulating Current**

Ho-Young Lee[1], Kyoung-Soo Cha[1], Seung-Young Yoon[1], Chang-Hoon Seok[3], Soon-O Kwon[1], and Myung-Seop Lim[2]
[1]Korea Institute of Industrial Technology, Korea, [2]Hanyang University, Korea, [3]Kyungpook University, Korea

WA_P_46 14:00–15:30

- **A Study on Reduction of AC Copper Loss According to Pole/Slot Combination of EV Traction Motor**

Jin-uk Choi[1], Ki-deok Lee[1], Jae-Kwang Lee[1], Jeong-Jong Lee[1], Myung-Hwan Yoon[1], Dong-Hoon Jeong[2], and Ju Lee[3]
[1]Korea Electronics Technology Institute, Korea, [2]Halla University, Korea, [3]Hanyang University, Korea