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TECHNICAL PROGRAM

MONDAY, 21 NOVEMBER 2016

**Session A22 – GAYA ROOM 1
(Power Electronic Applications)
13:40-17:40**

Chairs:

**Toshihisa Funabashi (Nagoya University, Japan)
Mohd Amran Mohd Radzi (Universiti Putra Malaysia, Malaysia)**

- **Three-phase Three-level Shunt Active Power Filter with Simplified Synchronous Reference Frame**
Yap Hoon (Universiti Putra Malaysia, Malaysia); Mohd Amran Mohd Radzi (Universiti Putra Malaysia, Malaysia); Mohd Khair Hassan (Universiti Putra Malaysia, Malaysia); Nashiren Farzilah Mailah (Universiti Putra Malaysia, Malaysia)
- **Output Voltage Modeling of Cascaded H Bridge Multilevel Inverters Under Open transistor Fault**
Nithin Raj (National Institute of Technology Calicut, India); Anjali Anand (National Institute of Technology Calicut, India); Jagadanand G (National Institute of Technology, Calicut, India); Saly George (National Institute of Technology Calicut, India)
- **A Single-Stage Power Factor Corrected LED Driver with Dual Half-Wave Rectifier**
Nurul Asikin Binti Zawawi (Universiti Sains Malaysia, Malaysia); Shahid Iqbal (University Sains Malaysia, Malaysia); Mohamad Kamarol Mohd Jamil (Universiti Sains Malaysia, Malaysia)
- **Asymmetrical Multilevel Inverter Topology with Reduced Power Semiconductor Devices**
M Saad Bin Arif (Universiti Teknologi Malaysia, Malaysia); Shahrin Md. Ayob (Universiti Teknologi Malaysia, Malaysia); Zainal Salam (Universiti Teknologi Malaysia, Malaysia)
- **A High Performance Primary-Side-Regulated LED Driver Based on Single-Stage SEPIC-Flyback Converter**
Shu Zhang (Harbin Institute of Technology, P.R. China); Yijie Wang (Harbin Institute of Technology, P.R. China); J. Marcos Alonso (University of Oviedo, Spain); Xiao-sheng Liu (Harbin Institute of Technology, P.R. China); Dianguo Xu (Harbin Institute of Technology, P.R. China)
- **A Novel Three Phase Cascaded Multilevel Inverter Topology**
Md. Mubashwar Hasan (Curtin University, Australia); Ahmed Abu-Siada (Curtin University, Australia)

Break(Foyer)

- **A Two-stage Quasi-Resonant Dual Buck LED Driver with Digital Control Method**
Shanshan Gao (Harbin Institute of Technology, P.R. China); Yijie Wang (Harbin Institute of Technology, P.R. China); Shu Zhang (Harbin Institute of Technology, P.R. China); Dianguo Xu (Harbin Institute of Technology, P.R. China)

- **A Nonconventional Multilevel Inverter for Active Power Filtering Using Unified Constant-Frequency Integration Control**
Hairol Jaffar (Universiti Teknologi Malaysia, Malaysia); Naziha Ahmad Azli (Universiti Teknologi Malaysia, Malaysia)
- **A High Frequency Linked Modular Cascaded Multilevel Inverter**
Md. Mubashwar Hasan (Curtin University, Australia); Ahmed Abu-Siada (Curtin University, Australia)
- **A Control System Design Method for an Islanded Mode Microgrid Composed of Inverter-interfaced DGs**
Toshihisa Funabashi (Nagoya University, Japan); Shota Igarashi (Nagoya University, Japan); Yusuke Manabe (Nagoya University, Japan); Muneaki Kurimoto (Nagoya University, Japan); Takeyoshi Kato (Nagoya University, Japan); Yasuo Suzuki (Nagoya University, Japan)
- **Hybrid Dual Phase Shift Control of DC Micr-Grid Coupled DAB DC-DC Converter for Storage Application**
Vishal Verma (Delhi Technological University, Delhi & Formerly Delhi College of Engineering, India); Arpit Gupta (Delhi Technological University, India)
- **Simulation of a Novel Half-Bridge Single-Phase AC-DC Current Injection Series Loaded Resonant Converter**
Norazam Abd Wahab (Universiti Teknologi MARA, Malaysia); Nabil Hidayat (Faculty of Electrical Engineering, Malaysia)

MONDAY, 21 NOVEMBER 2016

Session B22 – GAYA ROOM 2 (Photovoltaic & Renewable Energy)

13:40-17:40

Chairs:

Norman Mariun (Universiti Putra Malaysia, Malaysia)
Mohammad Effendy Yaacob (Universiti Putra Malaysia, Malaysia)

- **Multi-source Energy Harvesting and Storage for Floating Wireless Sensor Network Nodes**
Wai Kong Lee (Universiti Tunku Abdul Rahman, Malaysia); Martin Schubert (Ostbayerische Technische Hochschule (OTH) Regensburg, Malaysia); Stanley Jian Qin Ho (Universiti Tunku Abdul Rahman, Malaysia)
- **The Prospect of Implementing PV/Diesel Hybrid Energy Systems for Rural Electrification in Eastern Part of Malaysia**
Mahmoud Moghavvemi (University of Malaya, Malaysia); A Jong (University of Malaya, Malaysia); M Ismail (University of Malaya, Malaysia); S Moghavvemi (University of Malaya, Malaysia); Haider Abbas F. Almurib (The University of Nottingham Malaysia Campus, Malaysia); Alireza Safdari (University of Malaya, Malaysia)
- **OLTC-DVR Hybrid for Voltage Regulation and Averting Reverse Power Flow in the Micro-grid with Intermittent Renewable Energy Sources**
Vishal Verma (Delhi Technological University, Delhi & Formerly Delhi College of Engineering, India); Ritika Gour (DTU Delhi, India)

- **Field Assessment for Photovoltaic Array as Herbal Plots Based on Bioactive Compounds Analysis**
Mohammad Effendy Yaacob (Universiti Putra Malaysia & Serdang, Selangor, Malaysia); Suriani Jumali (Universiti Putra Malaysia, Malaysia); Rosnah Shamsudin (University Putra Malaysia, Malaysia); N. Fadz Linda Othman (Universiti Putra Malaysia, Malaysia)
 - **The Feasibility Study of Solar PV Lighting in UiTM Sarawak**
Nur Farahiah Ibrahim (Universiti Teknologi Mara Sarawak, Malaysia); Zahari Abu Bakar (Universiti Teknologi Mara SARAWAK, Malaysia); Wan Suhaifiza W Ibrahim (Universiti Teknologi MARA Sarawak, Malaysia)
 - **Sizing Sampling Rate of the Integrated PV Simulator**
Vishal Verma (Delhi Technological University, Delhi & Formerly Delhi College of Engineering, India); Shirish Raizada (Delhi Technological University, India)
- Break(Foyer)**
- **Techno-Commercial Analysis of Wired and Wireless Monitoring in Operational Solar PV Plants**
R n Patel (SSTC Bhilai, India)
 - **Temperature Performance of a 3-Tier Solar PV Drying Chamber**
Mohammad Effendy Yaacob (Universiti Putra Malaysia & Serdang, Selangor, Malaysia); Abdurrahman Noor Iskandar (Universiti Putra Malaysia, Malaysia)
 - **Energy Analysis of the AAB Lightweight Asymmetric Encryption Scheme on an Embedded Device**
Syed Farid Syed Adnan (Universiti Teknologi MARA & FKE, Malaysia); Mohd Anuar Mat Isa (Universiti Teknologi MARA & UITM Shah Alam, Malaysia); Habibah Hashim (Universiti Teknologi MARA, Malaysia)
 - **High Efficiency CMOS Rectifier for Energy Harvesting**
Norfishah Ab Wahab (Universiti Teknologi MARA, Malaysia); Mohd Khairul Mohd Salleh (Universiti Teknologi MARA & Applied Electromagnetic Research Group, Malaysia); Nabil Hidayat (Faculty of Electrical Engineering, Malaysia); Muhammad Farid Abdul Khalid (Universiti Teknologi MARA, Shah Alam, Malaysia); Noriza Othman (Universiti Teknologi MARA, Malaysia)
 - **Performance Evaluation of Modified Widrow-Hoff ADALINE Under Effect of Photovoltaic with Shunt Active Power Filter**
Muhammad Ammirul Atiqi Mohd Zainuri (Universiti Putra Malaysia & Faculty of Engineering UPM, Malaysia); Mohd Amran Mohd Radzi (Universiti Putra Malaysia, Malaysia); Azura Che Soh (Universiti Putra Malaysia, Malaysia); Norman Mariun (Universiti Putra Malaysia & Faculty of Engineering, Malaysia); Nasrudin Abdul Rahim (University Malaya, Malaysia)
 - **Compound Poisson Process Based Reliability Analysis Method for Performance Degradation of GaAs Space Solar Cells**
Yu Li (Beihang University, P.R. China); Bo Sun (Beihang University, P.R. China); Zili Wang (Beihang University, P.R. China); Yi Ren (Beihang University, P.R. China); Haifu Jiang (Beijing Institute of Spacecraft Environment Engineering, P.R. China)

TUESDAY, 22 NOVEMBER 2016

Session A31 – GAYA ROOM 1 (Power Electronic & Power Engineering Applications)

08:20-12:40

Chairs:

Arunima Verma (AKTU, India)

YuehRu Yang (Ming Chi University of Technology, Taiwan)

- **A Modified Electronic Load Based on Cascode Linear MOSFET Configuration**
Peyman Farhang (Mads Clausen Institute, University of Southern Denmark, Denmark);
Stefan Mátéfi-Tempfli (Mads Clausen Institute, Faculty of Engineering, University of Southern Denmark, Denmark)
- **Overvoltage Suppression of SRM Inverter for Effective Use of Regenerative Power**
Mengyi Geng (Fukuoka Institute of Technology, Japan); Kazuhiro Ohyama (Fukuoka Institute of Technology, Japan); Hiroaki Fujii (Meiwa Manufacturing Co., Ltd, Japan); Hitoshi Uehara (Meiwa Manufacturing Co., Ltd, Japan); Yasushi Hyakutake (Meiwa Manufacturing Co., Ltd, Japan)
- **A Wide Duty Cycle Range Wide Band High Frequency Isolated Gate Driver for Power Converters**
Satish Naik B (Indian Institute of Science, Bangalore, India); Shan S (Indian Institute of Science, India); Umanand Loganathan (Indian Institute of Science Bangalore, India); Subba Reddy B (Indian Institute of Science, Bangalore, India)
- **An Interleaved Boost Power Factor Corrector with Average Current Control for Off-Line Power Supplies**
YuehRu Yang (Ming Chi University of Technology, Taiwan)
- **A Fault Feature Matching-Based Fault Location for Distribution Network with DGs**
Aina Tian (Harbin Institute of Technology & Illinois Institution of Technology, P.R. China); Zhongjian Kang (China University of Petroleum, P.R. China); Weixing Li (Harbin Institute of Technology, P.R. China); Ruiying Liu (China University of Petroleum, P.R. China)
- **Real Time Wireless Condition Monitoring of Induction Motor**
Sampath kumar Sridhar (RNS Institute of Technology, India)

Break(Foyer)

- **A Method to Improve Flux Estimation Under Gaussian Noise in Sensorless Stator Flux Control of Induction Motors**
JongKwang Kim (Seoul National University of Science and Technology & Graduate School of Nano-IT Design, Korea); JangWook Lee (Centennial Secondary School, Canada); YongKeun Lee (Seoul National University of Science and Technology, Korea)
- **Trial Manufacture of SRM Drive System for Electric Vehicles**
Junwen Luo (Fukuoka Institute of Technology, Japan); Kenshiro Iwanaga (Fukuoka Institute of Technology, Japan); Kazuhiro Ohyama (Fukuoka Institute of Technology, Japan); Hiroaki Fujii (Meiwa Manufacturing Co., Ltd, Japan); Hitoshi Uehara (Meiwa Manufacturing Co., Ltd, Japan); Yasushi Hyakutake (Meiwa Manufacturing Co., Ltd, Japan)

- **Design Method of Rotor Core Shape for Improving Efficiency of Switched Reluctance Generator**
Xin Yang (Fukuoka Institute of Technology & Nanjing University of Science and Technology, Japan); Kazuhiro Ohyama (Fukuoka Institute of Technology, Japan)
- **Performance Analysis of PMSM Drive Using MPSO and MOGA Technique**
Deepti Yadav (Institute of Engineering and Technology, India); Arunima Verma (AKTU, India)
- **Improved Multi Objective Differential Evolution Algorithm for Congestion Management in Restructured Power Systems**
Suganthi Saravana Balaji (Anna University, India); Durairaj Devaraj (Kalasalingam University, India); Thilagar (Anna University, India); Krishnathevar Ramar (Multimedia university, Malaysia)
- **Integrated Fuzzy Approach for Incipient Fault Detection in Power Transformers**
R n Patel (SSTC Bhilai, India); Hitendra Thakur (SSITM Bhilai, India)

TUESDAY, 22 NOVEMBER 2016

**Session B31 – GAYA ROOM 2
(Signal & Image Processing Applications)
08:20-12:40**

Chairs:

Haider Abbas F. Almurib

**(The University of Nottingham Malaysia Campus, Malaysia)
Nooritawati Md Tahir (Universiti Teknologi MARA, Malaysia)**

- **A New Analog Implementation for the Gaussian Function**
Muhammad Taher Abuelma'atti (KFUPM, Saudi Arabia)
- **An Analysis of Malay Language Emotional Speech Corpus for Emotion Recognition System**
Nur Fariyah Apani (Universiti Teknologi MARA, Malaysia); Nursuriati Jamil (Universiti Teknologi MARA, Malaysia)
- **A Feasibility Study of Master-Slave Flipflop Design for Hexadecimal Logic**
Renyuan Zhang (Japan Advanced Institute of Science and Technology, Japan); Kaneko Mineo (Japan Advanced Institute of Science and Technology, Japan)
- **Face and Mouth Localization of Viseme**
Rosniza Roslan (Universiti Teknologi MARA, Malaysia); Nursuriati Jamil (Universiti Teknologi MARA, Malaysia); Noraini Seman (Universiti Teknologi MARA, Malaysia); Syafiqah Ain Alfida Abdul Rahim (UiTM, Malaysia)
- **Dynamic Arbitrary Shape Boundary Detection and Tracking Using Hungarian Kalman Filter**
Sirshendu Arosh (Indian Institute of Technology, Bombay, India); Surya Prakash (Indian Institute of Technology, Bombay, India); Soumitra Keshari Nayak (Indian Institute of Technology Bombay, India)

- **An Improved Pitch Contour Formulation for Malay Language Storytelling Text-to-Speech (TTS)**
Izzad Ramli (University of Technology Mara (UITM), Malaysia); Nursuriati Jamil (Universiti Teknologi MARA, Malaysia); Noraini Seman (Universiti Teknologi MARA, Malaysia); Norizah Ardi (Universiti Teknologi MARA & Academy of Language Studies, Malaysia)

Break(Foyer)

- **HPCIR: Histogram Positional Centroid for Image Retrieval**
Sadan Kumar TN (UVCE, Bangalore University, India); Anjanappa Sreenivasa Murthy (UVCE, Bangalore University, India); Rajani N (UVCE, Bangalore University, India)
- **Sinusoidal Input Describing Function Analysis for Coupled Tanks System**
Kah Wei Cheok (The University of Nottingham Malaysia Campus, Malaysia); Haider Abbas F. Almurib (The University of Nottingham Malaysia Campus, Malaysia); Samer Yahya (The University of Nottingham Malaysia Campus, Malaysia); Mahmoud Moghavvemi (University of Malaya, Malaysia)
- **A Hybrid Classification Algorithm Approach for Breast Cancer Diagnosis**
Baraa Abed (University of Anbar, Iraq); Khalid Shaker (Anbar University & Collage of Computer Science and IT, Iraq); Hamid Abdulla Jalab (Malaysia & University of Malaya, Malaysia); Hothefa Shaker (Modern College of Business and Science, Oman); Ali Mansoor (Universiti Malaya & Computer Science and IT, Malaysia); Ahmad Fouad Alwan (University of Nizwa, Oman); Ihsan Al-Gburi (Istanbul Kemerburgaz University, Malaysia)
- **Feature Extraction of Autism Gait Data Using Principal Component Analysis and Linear Discriminant Analysis**
Suryani Ilias (Politeknik Sultan Salahuddin Abdul Aziz Shah, Malaysia); Nooritawati Md Tahir (Universiti Teknologi MARA, Malaysia); Rozita Jailani (University Teknologi MARA, Malaysia)
- **Improved Architecture of the Feedforward Neural Network for Image Recognition**
Ching Loong Seow (The University of Nottingham Malaysia Campus, Malaysia); Mina A. S. Aziz (The University of Nottingham Malaysia Campus, Malaysia); Samer Yahya (The University of Nottingham Malaysia Campus, Malaysia); Haider Abbas F. Almurib (The University of Nottingham Malaysia Campus, Malaysia); Mahmoud Moghavvemi (University of Malaya, Malaysia)

TUESDAY, 22 NOVEMBER 2016

Session A32 – GAYA ROOM 1 (Automation & Computer Applications)

13:40-17:40

Chairs:

Ahm Zahirul Alam

(International Islamic University Malaysia, Malaysia)

Muhammad Nasiruddin Mahyuddin

(Universiti Sains Malaysia, Malaysia)

- **Using Actual Surgical Navigation Data to Design or Study the Workspace of Neurosurgical Manipulators**
Amir Mehbodniya (University of Malaya, Malaysia); Mahmoud Moghavvemi (University of Malaya, Malaysia); Haider Abbas F. Almurib (The University of Nottingham Malaysia Campus, Malaysia); Vicknes Waran (University of Malaya, Malaysia)
- **Network Server Load Balancing Using Consensus-based Control Algorithm**
Chin Loon Alan Tan (Intel Products (M) Corporation, Malaysia); Muhammad Nasiruddin Mahyuddin (Universiti Sains Malaysia, Malaysia)
- **Simulation of a Three-links Planar Redundant Manipulator for Obstacle Avoidance Using Neural Networks**
Choong Pui Mun (The University of Nottingham Malaysia Campus, Malaysia); Mina A. S. Aziz (The University of Nottingham Malaysia Campus, Malaysia); Samer Yahya (The University of Nottingham Malaysia Campus, Malaysia); Haider Abbas F. Almurib (The University of Nottingham Malaysia Campus, Malaysia); Mahmoud Moghavvemi (University of Malaya, Malaysia)
- **Modelling of Human Cardiovascular System in Ventricular Assist Device Simulation**
Tan Kean Eng (The University of Nottingham Malaysia Campus, Malaysia); Samer Yahya (The University of Nottingham Malaysia Campus, Malaysia); Haider Abbas F. Almurib (The University of Nottingham Malaysia Campus, Malaysia); Mahmoud Moghavvemi (University of Malaya, Malaysia)
- **Histogram Optimization with CUDA**
Keh Kok Yong (MIMOS Berhad, Malaysia); Sheera Othman Talib (Mimos Berhad, Malaysia)
- **Intelligent Car Safety System**
Tariq Ahmed (Higher Colleges of Technology, United Arab Emirates (UAE)); Khaleefa Al Hammadi (Higher Colleges of Technology, United Arab Emirates (UAE)); Mohammed Ismaeel (Higher Colleges of Technology, United Arab Emirates (UAE))

Break(Foyer)

- **Single Supply Differential Capacitive Sensor with Energy Harvester Compatibility**
Nurul Arfah Che Mustapha (International Islamic University Malaysia, Malaysia); Ahm Zahirul Alam (International Islamic University Malaysia, Malaysia); Sheraz Khan (International Islamic University Malaysia, Malaysia); Amelia Wong Azman (International Islamic University Malaysia, Malaysia)

- **An Improved Adaptive Neuro-Fuzzy Inference System as Cache Memory Replacement Policy**
Yee Ming Chung (School of Electric & Electronic Engineering, Engineering Campus, Universiti Sains Malaysia, Malaysia); Zaini Abdul Halim (Universiti Sains Malaysia, Malaysia)
- **Mechatronic Design and Development of an Autonomous Mobile Robotics System for Road Marks Painting**
Mohammed A. H. Ali (Faculty of Manufacturing & Universiti Malaysia Pahang, Malaysia); Musa Mailah (Universiti Teknologi Malaysia, Malaysia); Wan Azhar Yussoff (Faculty of Manufacturing, Malaysia)
- **Lyapunov-based Nonlinear Controller for Quadrotor Position and Attitude Tracking with GA Optimization**
 Ali Safaei (University of Tehran, Malaysia); Muhammad Nasiruddin Mahyuddin (Universiti Sains Malaysia, Malaysia)

TUESDAY, 22 NOVEMBER 2016

**Session B32 – GAYA ROOM 2
(Radio Frequency Applications)
13:40-17:40**

Chairs:

**Mohd Yazed Ahmad (University of Malaya, Malaysia)
M. Arif Khan (Charles Sturt University, Australia)**

- **Design of Multiband Parallel Strip Patch Antenna for DCS/WLAN/WIMAX and RFID Applications**
Thana Pakkiam Krishnan (Infrastructure University Kuala Lumpur & IUKL, Malaysia)
- **A Novel Antenna Array Design for Breast Cancer Detection**
M. Arif Khan (Charles Sturt University, Australia); Muhammad Aziz ul Haq (Mohammad Ali Jinnah University, Pakistan)
- **A Novel Lightweight and Low Power Tag- Reader Mutual Authentication Protocol for Portable RFID Based Security Systems**
Vijaykumar Vaithiyam Rengarajan (Anna University Regional Campus, Coimbatore, India); Roshna Reghunath (Anna University Regional Campus, Coimbatore, India); Rajasekar S (Anna University Regional Campus, Coimbatore, India); Elango S (Bannari Amman Institute of Technology, Erode, India)
- **Characterization of CPW Transmission Lines and 60GHz DBR Filters in 0.25µm BiCMOS Technology**
 Pedro Rynkiewicz (University of Toulouse - INPT - UPS, France); Anne-Laure Franc (University of Toulouse - INPT - UPS, France); Gaëtan Prigent (LAPLACE & GRE, France); Fabio Coccetti (Laboratory of Analysis and Architecture of Systems, France); Matthias Wietstruck (IHP GmbH, Germany); Mehmet Kaynak (IHP Microelectronics, Germany)
- **Design of Wideband Power Amplifier for GaN HEMT for Two-Way Radio Application**
 Wen Jun Lim (University of Malaya, Malaysia); Narendra Aridas (Universiti Malaya, Malaysia)

- **Dualband Bandpass Filter Using Side-Coupled Ring Resonator**
Mohd Iskandar Mohd Saleh (Politeknik Tuanku Syed Sirajuddin, Malaysia); Muzammil Jusoh (Universiti Malaysia Perlis & School of Computer and Communication Engineering, Malaysia); Mohd Khairul Mohd Salleh (Universiti Teknologi MARA & Applied Electromagnetic Research Group, Malaysia)

Break(Foyer)

- **Design Technique of Broadband LDMOS Cascaded RF Power Amplifier**
Lokesh Anand (University of Malaya, Malaysia); Narendra Aridas (Universiti Malaya, Malaysia)
- **A High Gain Low Noise Amplifier Design & Comparative Analysis with Other MOS-Topologies for Bluetooth Applications at 130nm CMOS**
Deepak Balodi (ANSAL Technical Campus, Lucknow-INDIA, India); Arunima Verma (AKTU, India); Pa Govindacharyulu (Vasavi College of Engineering, India)
- **Silicon BJT and pHEMPT Matrix Amplifier Design with 38dB Gain Across 650 MHz to 5.8 GHz**
Pragash Sangaran (University Malaya & Fast Semiconductor Sdn. Bhd., Malaysia); Kenneth Margon (Fast Semiconductor Sdn. Bhd., Malaysia); Narendra Aridas (Universiti Malaya, Malaysia); Jagadheswaran Rajendran (University Sains Malaysia, Malaysia)
- **Comparison of Theoretical and Experimental Analysis of P and Sn Co-implantation in Germanium**
Nur Nadhirah Mohamad Rashid (Universiti Teknologi Malaysia, Malaysia); Umar Abdul Aziz bin Abdullah Shukri (Faculty of Malaysia-Japan International Institute of Technology & Universiti Teknologi Malaysia, Malaysia); Siti Rahmah Aid (Universiti Teknologi Malaysia, Malaysia); Satoru Matsumoto (MJIT, Universiti Teknologi Malaysia, Malaysia); Anthony Centeno (Universiti Teknologi Malaysia, Malaysia); Fang Xie (Imperial College London, United Kingdom); Suwa Akira (Kyushu University, Japan); Ikenoue Hiroshi (Kyushu University, Japan)
- **Resonant Inductive Power Transfer System for Freely Moving Capsule Endoscope with Highly Uniform Magnetic Field**
Md. Rubel Basar (Faculty of Engineering, University of Malaya, Malaysia); Mohd Yazed Ahmad (University of Malaya & Faculty of Engineering, University of Malaya, Malaysia); Fatimah Ibrahim (University of Malaya, Malaysia); Jongman Cho (Inje University, Korea)