19th International Conference on the Computation of Electromagnetic Fields

Technical Program

Compumag 2013

30 June–4 July 2013, Budapest, Hungary

19th International Conference on the Computation of Electromagnetic Fields

TECHNICAL PROGRAM

Sponsors and Exhibitors

Exhibitors:

Infolytica Europe - www.infolytica.co.uk

CST-Computer Simulation Technology AG - www.cst.com

Conference Supporters:

Budapest Elektromos Művek Nyrt. - www.elmu.hu/en

Supporting Organization:

IEEE - www.ieee.org

Budapest University of Technology and Economics (BUTE) - www.bme.hu/en

Faculty of Electrical Engineering and Informatics, BUTE - www.vik.bme.hu/english

COMPUMAG 2013 Chairman's Welcome

Since it was first organized in 1976 in Oxford, COMPUMAG has always been one of the most important gatherings of researchers in the field of computational electromagnetics. The conference is aiming to provide a worldwide forum for engineers and physicists engaged in the theory and application of the numerical computation of electromagnetic fields. Thanks to the enthusiasm and efforts of those researchers, computational electromagnetics is playing an increasingly important role in the design optimization of novel electromagnetic devices and systems.

The 19th COMPUMAG Conference is held in Budapest 30 June - 4 July, 2013. The aim of the conference is to discuss recent developments and practical applications in the numerical computation of electromagnetic fields. Reflecting the new trends and rapid progress in the field, authors worldwide have been invited to submit original and previously unpublished contributions. The Conference features oral and poster presentations. The Testing Electromagnetic Analysis Methods (TEAM) Workshop is incorporated into the Conference by inviting contributions on benchmarking and code validation. 747 original and previously unpublished papers have been submitted from 41 countries of 5 continents. After the thorough review process 540 presentations are included in the final program of the conference.

The Conference is organized by the staff of the Electromagnetic Theory Group of the Department of Broadband Infocommunications and Electromagnetic Theory, Faculty of Electrical Engineering and Informatics, Budapest University of Technology and Economics. The Faculty of Electrical Engineering and Informatics carries on the traditions of the more than 230 year old University. The proof thereof is the recognition of its degrees all around the world as well as the involvement and appreciation of their professors and researchers in the international scientific scene and organizations. Almost all multinational electronics and IT corporations have established R&D laboratories and centres attached to various departments of the faculty -- *Ericsson, Morgan Stanley, Nokia, Siemens, Samsung, Huawei, HP, IBM*, just to name a few -- where students can get hands-on information on the expectations of the partner companies.

Budapest with its 2 million inhabitants is famous for its beauty and vibrant commercial and cultural life. It is the academic center of Hungary. It also boasts hundreds of theaters, concert halls and museums. Academic and business life, as well as touristic spots of amusements, attracts millions of visitors to the capital. The venue of the conference -- the Hotel Budapest Hilton located in the beautiful historical Castle District of Buda -- can perfectly serve the organization of an enjoyable and productive COMPUMAG 2013.

We wish you a very pleasant and fruitful stay in Budapest at COMPUMAG 2013!

Prof. József Pávó
Chairman, COMPUMAG 2013

Conference Organizers

The Conference is organized by the staff of the Electromagnetic Theory Group of Department of Broadband Infocommunications and Electromagnetic Theory, Faculty of Electrical Engineering and Informatics, Budapest University of Technology and Economics.

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- Diamond Congress Ltd. http://www.diamond-congress.hu

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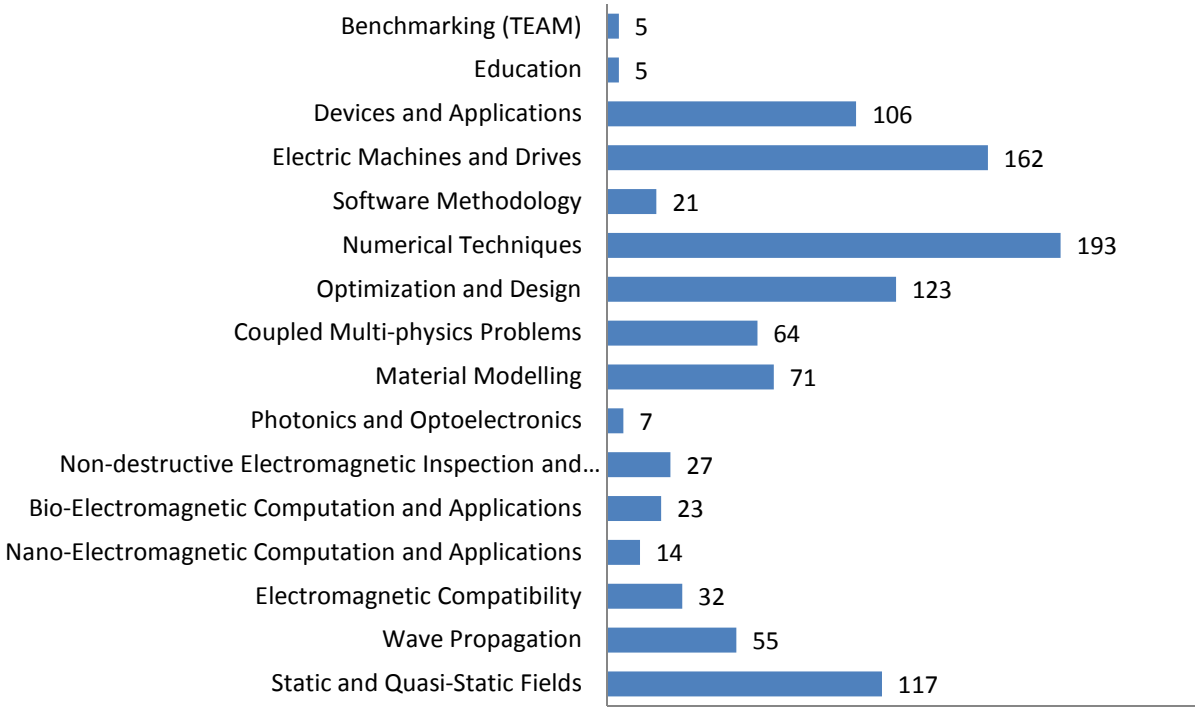
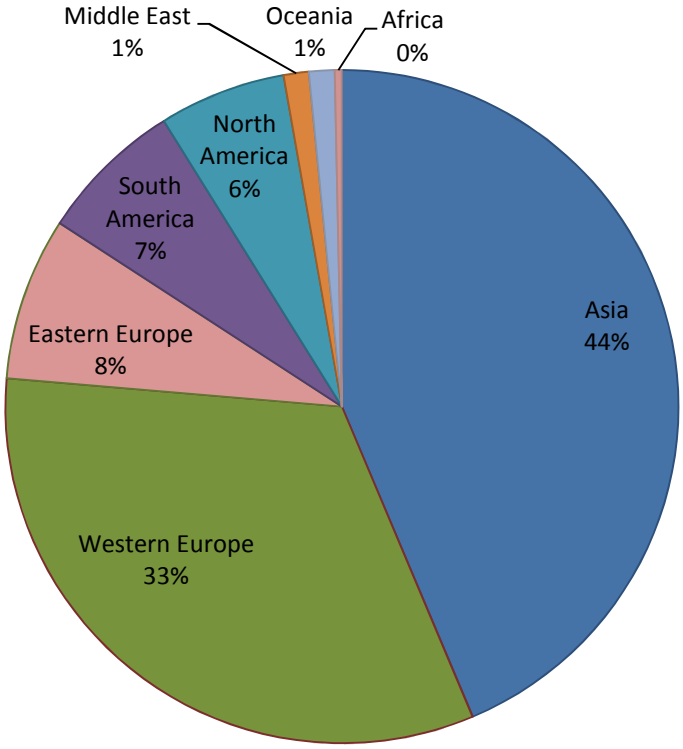
Compumag 2013 in Numbers

Accepted Papers' Distribution by Session:



Accepted Papers' Distribution by Region:

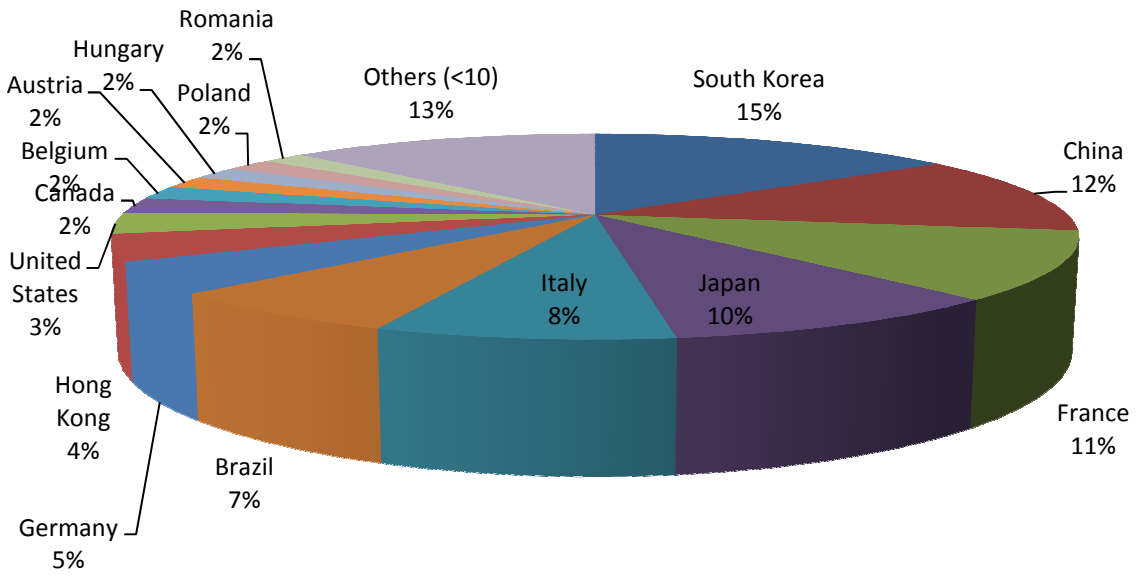


Compumag 2013 in Numbers

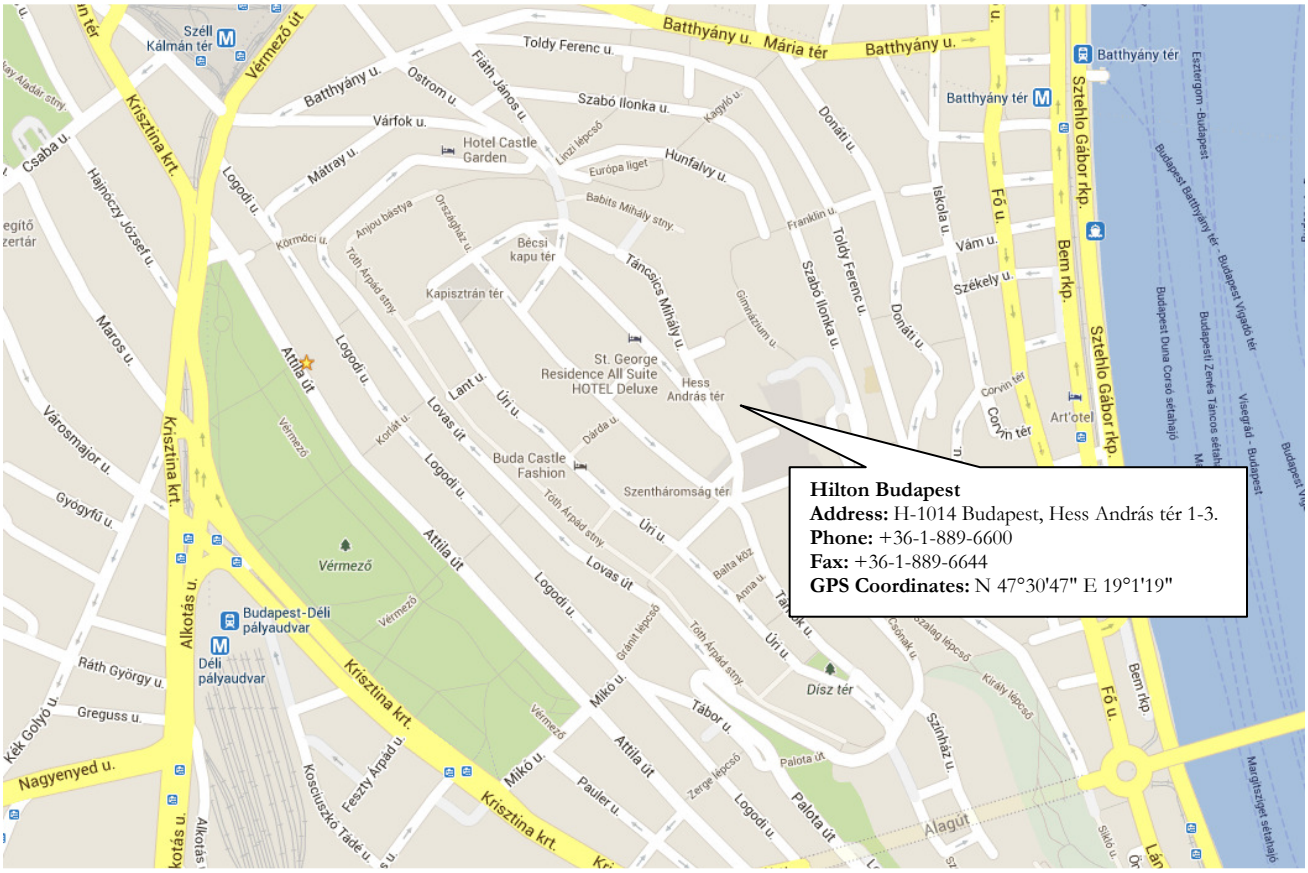
Accepted Papers' Distribution by Country:

Country	Papers
Algeria	1
Australia	7
Austria	11
Belgium	12
Brazil	40
Canada	14
China	71
Croatia	2
Czech Republic	2
Estonia	1
Finland	5
France	61
Germany	28
Greece	9
Hong Kong	24
Hungary	11
India	2
Iran	5
Italy	47

Country	Papers
Japan	56
Lebanon	2
Mexico	2
Poland	11
Romania	10
Russia	5
Serbia	1
Singapore	2
Slovenia	2
South Africa	1
South Korea	87
Spain	1
Sweden	2
Switzerland	4
Taiwan, R.O.C.	4
Thailand	5
Turkey	3
United Kingdom	5
United States	19



Conference Venue



Floorplans

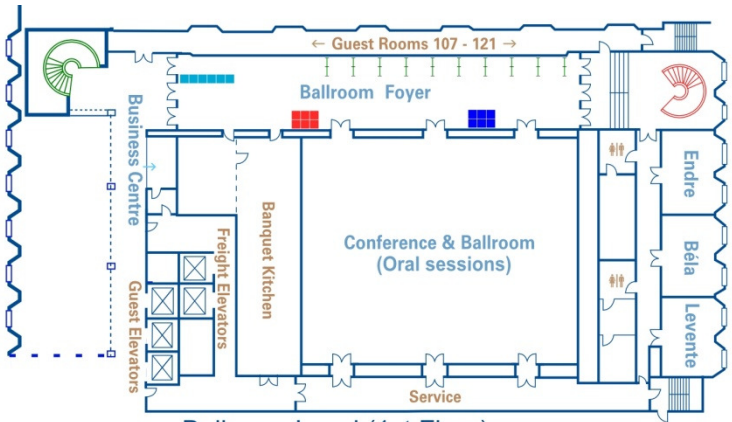
Registration desk

Poster boards
(Ballroom foyer)

Exhibitors:

Infolytica Europe

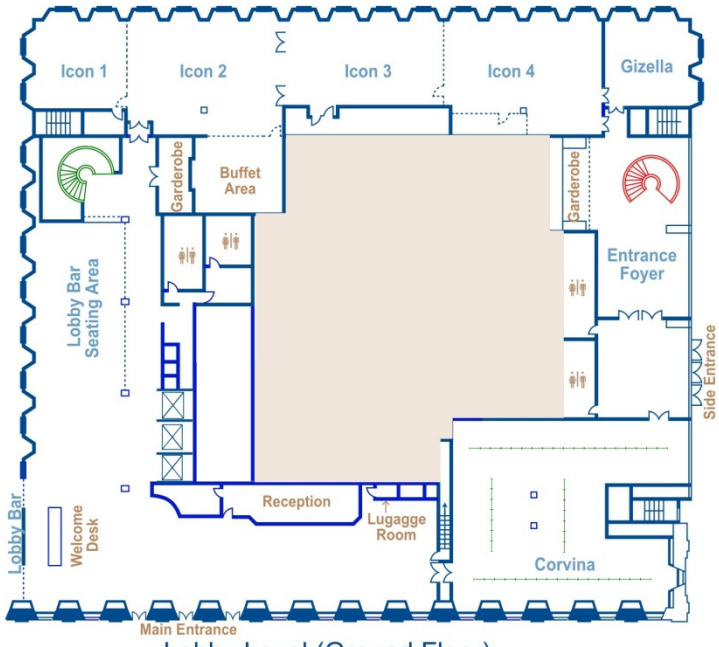
Computer Simulation Technology AG



Ballroom Level (1st Floor)

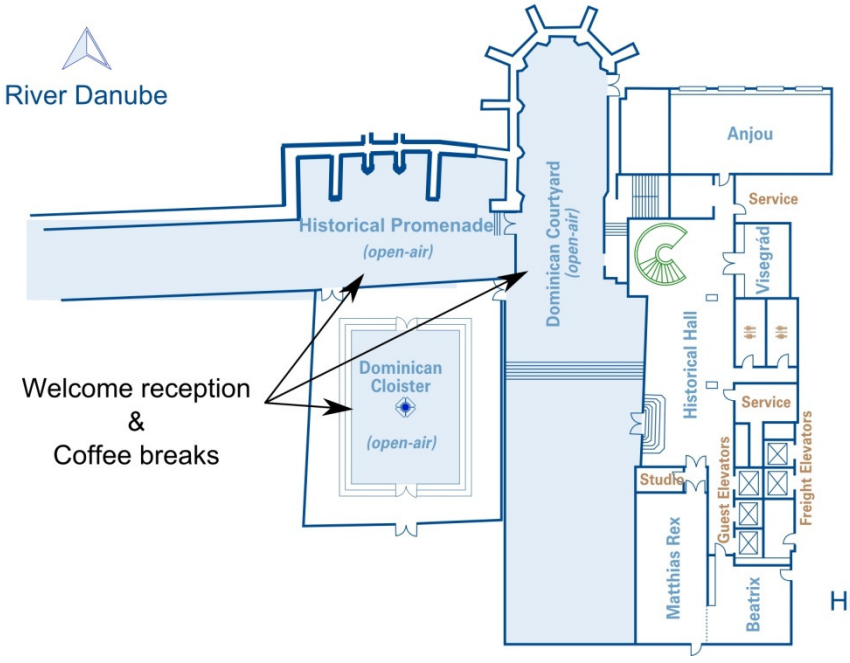
Lunch:

- Icon 1, 2, 3, 4
- Gizella



Poster boards
(Corvina)

Lobby Level (Ground Floor)



Welcome reception
&
Coffee breaks

Lunch:

- Anjou
- Visegrád
- Mátyás
- Beatrix

Historical Level (-1st Floor)

General Information

Venue:

Hilton Budapest
Address: H-1014 Budapest, Hess András tér 1-3., Hungary
Phone: +36-1-889-6600

Registration Desk:

Lobby Level (Ground Floor):
Sunday, 30 June, 2013.
3.00 pm. - 8.00 pm.

Ballroom Level (1st Floor)
Monday - Thursday, 1-4 July, 2013.
8.00 am. - 6.00 pm.

Welcome Reception

Historical Level (-1st Floor)
Dominican Courtyard, Dominican Cloister, Historical Promenade (open air)
Sunday, 30 June, 2013.
7.30 pm. - 9.00 pm.

Tea, Coffee Break Area:

Historical Level (-1st Floor)
Dominican Courtyard, Dominican Cloister
Monday - Thursday, 1-4 July, 2013.
Timing according to the detailed technical program

Lunch:

Lobby Level (Ground Floor): ICON Restaurant
Historical Level (-1st Floor): Anjou/Visegrád/Máytás/Beatrix
Monday - Thursday, 1-4 July, 2013.
Timing according to the detailed technical program

Social Events:

Hidden Treasures of Budapest
Monday, 1 July, 2013.
9.30 am. - 10.30 am. & 11.00 am. - 12.00 pm.
Photo presentation (Parliament room, 6th floor).

Concert of the "In Medias Brass" Quintet in the Dominican Courtyard of Budapest Hilton
Monday, 1 July, 2013.
8.30 pm. - 9.30 pm.

Two Hours Walk in the Castle District
Tuesday, 2 July 2013.
9.30 am. - 11.30 am. & 2.00 pm. - 4.00 pm.

Conference Dinner at the National Gallery – Building C
Wednesday, 3 July 2013.
7.00 - 11.00 pm.
within walking distance from the Conference Venue

The Registration Fee Includes:

- Access to all technical sessions an exhibitions of the conference;
- Seated buffet lunches and coffee breaks at the venue;
- Welcome reception (Sunday, 30 June 2013);
- Conference dinner (Wednesday, 3 July, 2013);
- A 2-year membership of the International COMPUMAG Society (if registered as a non-ICS member);
- Conference material;
- Concert of the "In Medias Brass" Quintet (Monday, 1 July, 2013)

The Accompanying Registration Fee Includes:

- Seated buffet lunches at the conference hotel (Hotel Hilton);
- Welcome reception (Sunday, 30 June 2013);
- Conference dinner (Wednesday, 3 July, 2013);
- Half day excursion to Szentendre
- Concert of the "In Medias Brass" Quintet (Monday, 1 July, 2013)
- Admission to sessions is not included

Extra tickets for all social program will be available also separately at the registration desk.

Author Information

The required poster size is A0 (width: 841 mm, height: 1189 mm), portrait orientation.

Locations of the posters:

Ballroom Foyer (1st Floor): PA1, PA4, PB2, PB6, PC1, PC4, PD1, PD5

Corvina Room (Lobby Level): PA2, PA3, PA5, PA6, PB1, PB3, PB4, PB5, PC2, PC3, PC5, PC6, PD2, PD3, PD4, PD6

- **PA1: Coupled Problems 1 (Ballroom Foyer, Monday, 1 July)**
- **PA2: Static & Quasi-static Fields 1 (Corvina, Monday, 1 July)**
- **PA3: Electrical Machines & Drives 1 (Corvina, Monday, 1 July)**
- **PA4: Optimization & Design 1 (Ballroom Foyer, Monday, 1 July)**
- **PA5: Static & Quasi-static Fields 2 + Non-destructive Electromagnetic Inspection and Applications (Corvina, Monday, 1 July)**
- **PA6: Devices & Applications 1 (Corvina, Monday, 1 July)**

- **PB1: Wave Propagation 2 + Nano-Electromagnetic Computation and Applications (Corvina, Tuesday, 2 July)**
- **PB2: Material Modeling 1 (Ballroom Foyer, Tuesday, 2 July)**
- **PB3: Electrical Machines & Drives 2 (Corvina, Tuesday, 2 July)**
- **PB4: Electromagnetic Compatibility + Nano-Electromagnetic Computation and Applications (Corvina, Tuesday, 2 July)**
- **PB5: Numerical Techniques 2 + Software Methodology (Corvina, Tuesday, 2 July)**
- **PB6: Devices & Applications 2 (Ballroom Foyer, Tuesday, 2 July)**

- **PC1: Bio-Electromagnetic Computation and Applications + Education (Ballroom Foyer, Wednesday, 3 July)**
- **PC2: Numerical Techniques 3 (Corvina, Wednesday, 3 July)**
- **PC3: Electrical Machines & Drives 3 (Corvina, Wednesday, 3 July)**
- **PC4: Optimization & Design 3 (Ballroom Foyer, Wednesday, 3 July)**
- **PC5: Numerical Techniques 4 (Corvina, Wednesday, 3 July)**
- **PC6: Electrical Machines & Drives 4 (Corvina, Wednesday, 3 July)**

- **PD1: Optimization & Design 4 (Ballroom Foyer, Thursday, 4 July)**
- **PD2: Numerical Techniques 6 (Corvina, Thursday, 4 July)**
- **PD3: Devices & Applications 3 (Corvina, Thursday, 4 July)**
- **PD4: Coupled Problems 3 (Corvina, Thursday, 4 July)**
- **PD5: Material Modeling 3 (Ballroom Foyer, Thursday, 4 July)**
- **PD6: Electrical Machines & Drives 5 (Corvina, Thursday, 4 July)**

Poster mounting:
for all posters presented on the day (including the afternoon sessions as well): 8.00 - 10.00 am.

Poster removal:
for all posters presented on the day: 4.00 - 6.00 pm.

Organizers will provide pins to fix the posters.

Upload of oral presentations:

All presentations of the day (including the afternoon sessions as well) have to be uploaded to the computer provided by the organisers by **8.15 am**. You can upload your presentation from **1 July (Monday), 8.00 am** at any time before this deadline above. The computer and the technical staff you have to contact will be located at the rear side of the Ballroom (where the plenary sessions take place). The computer will be equipped with readers for PDF files and PPT files.

Sponsoring the Registration of Best Student Papers

The organizers of COMPUMAG 2013 intend to encourage the participation of young scientists from countries underrepresented at previous Conferences due to financial reasons. Therefore, they are willing to promote the presentation of outstanding papers submitted by students, especially those affiliated with institutions having limited financial means. Depending on the quality of the submitted short papers, 10-15 student participants are sponsored by free participation or by significantly reduced registration fees.

Criteria and Conditions:

1. Any student who is the corresponding author of a paper can apply for the sponsorship with his/her paper.
2. In case of a successful application, the granted student must personally present the selected paper at the conference.

Procedure:

1. Students have to apply for the grant when they submit the 2-page short paper.
2. One person can apply with one paper only.
3. The ICS Board selects the granted students based on the suggestions of the Editorial Board taking into account the results of the evaluation of the 2-page short papers.

Granted students (in decreasing order of points obtained for the evaluation of the short papers)**:**

Name	Affiliation	Country	Portion of registration fee granted	Paper
Ali Akbarzadeh Sharbaf	McGill University	Canada	0,5	OC1-2
Nazari Rasteh Kenari, Moein	McGill University	Canada	0,5	PB5-7
Flisgen, Thomas	University of Rostock	Germany	0,5	OA2-3
Hülsmann, Timo	Bergische Universität Wupperta	Germany	0,5	PC5-2
Khan, Omar	Politecnico di Torino	Italy	0,5	
Blattner Martinho, Lucas	Escola Politécnica da Universidade de São Paulo	Brazil	0,5	PB6-4
Ren, Ziyan	Chungbuk National University	Korea	1	PD1-7
Afsari, Arman	Shahid Bahonar University of Kerman	Iran	1	PD2-19
Staudt, Tiago	Federal University of Santa Catarina	Brazil, France	0,5	PC6-7
Girard, Caroline	Université de Toulouse	France	0,5	PC5-16
Mach, Frantisek	University of West Bohemia	Czech Republic	1	PD4-8
Peixoto de Camargos, Ana Flavia	Escola Politécnica da Universidade de São Paulo	Brazil	0,5	PB5-21
Richter, Christian	Bergische Universität Wuppertal	Germany	0,5	PC2-14
Ovando, Roberto	Instituto Tecnologico de la Laguna	Mexico	1	PB5-19
Laza, Marcela Ioana	University of Oradea	Romania	1	PA1-16

Rita Trowbridge Award

A prize to a young researcher in memory of Rita Trowbridge

Criteria and Conditions:

1. The prize will be presented to a young researcher, who is a participant of the conference and registered as a student.
2. The paper may be co-authored, but the young researcher must have contributed significantly, the evidence of this may be demonstrated for example by the fact that he/she is listed as the first author.
3. The paper must have been presented by the young researcher in either an oral or a poster session.

Procedure:

1. A small Awards Committee will be established before each COMPUMAG conference consisting of a chairman appointed by the ICS Board (must be a member of the ICS Board), the Chair (or one of the Co-chairs) of the COMPUMAG Editorial Board (or a person nominated by the Chair of the Editorial Board), a representative of the Local Organising Committee and two other members (could be, but do not have to be, ICS Board members) nominated by the ICS Board.
2. The Local Organising Committee of the COMPUMAG conference will prepare a list of eligible papers and will make this list available to the Awards Committee ahead of the conference. The scores of the referees will be shown on that list.
3. The chair of each conference session will be asked to nominate up to one (in exceptional circumstances two) authors for the award. A special form will be used for that purpose showing which papers are eligible. Such a form, showing all eligible papers in the session, will be prepared by the Conference Organisers. The session chair will be under no obligation to make a nomination.
4. The Awards Committee will meet briefly each day after the sessions to select the candidate papers from that particular day, taking account of the session chairs' nominations, reviewers' scores and their own observations during the day.
5. The Awards Committee will meet immediately after the final eligible paper has been presented on the last day and will make the decision. Up to 6 papers will be selected as to be 'commended' and authors will be issued certificates on behalf of the ICS Board. One of these authors (in exceptional circumstances two for a joint award) will be identified as the recipient(s) of the prize to a young researcher in memory of Rita Trowbridge.
6. The main prize(s) and the other commended papers will be announced at the closing session of COMPUMAG.

Compumag 2013 – Program Outline

Date: Sunday, 30/Jun/2013	
3:00pm - 7:30pm	**Registration**
7:30pm - 9:00pm	**Welcome Reception**

Date: Monday, 01/Jul/2013			
8:30am - 9:10am	**Opening** Location: Ballroom Chair: **József Pávó**		
9:10am - 10:10am	**OA1: Numerical Techniques 1** Location: Ballroom Chairs: **Bill Trowbridge, József Pávó**		
10:10am - 10:35am	**Coffee Break**		
10:35am - 12:15pm	**PA1: Coupled Problems 1** Location: Ballroom Foyer Chairs: **Bernhard Auchmann** **Nelson Sadowski**	**PA2: Static & Quasi-static Fields 1** Location: Corvina Chairs: **Zsolt Badics** **André Buchau**	**PA3: Electrical Machines & Drives 1** Location: Corvina Chairs: **Anouar Belahcen** **Andrzej Demenko**
12:15pm - 1:45pm	**Lunch**		
1:45pm - 3:25pm	**PA4: Optimization & Design 1** Location: Ballroom Foyer Chairs: **Piergiorgio Alotto** **David Lowther**	**PA5: Static & Quasi-static Fields 2 + Non-destructive Electromagnetic Inspection and Applications** Location: Corvina Chairs: **Ioan R Ciric** **Antonello Tamburrino**	**PA6: Devices & Applications 1** Location: Corvina Chairs: **Zsolt Szabó** **Jasmin Smajic**
3:25pm - 3:50pm	**Coffee Break**		
3:50pm - 5:30pm	**OA2: Wave Propagation 1** Location: Ballroom Chairs: **Irina Munteanu, István Bardi**		
8:30pm - 9:30pm	**Concert** Location: Dominican Courtyard		

Date: Tuesday, 02/Jul/2013			
8:30am - 10:10am	**OB1: Static & Quasi-static Fields 3** Location: Ballroom Chairs: **Kay Hameyer, Raffaele Martone**		
10:10am - 10:20am	**Conference Photo** Location: Front of the Hotel		
10:20am - 10:45am	**Coffee Break**		
10:45am - 12:25pm	**PB1: Wave Propagation 2 + Nano-Electromagnetic Computation and Applications** Location: Corvina Chairs: **Mauro Feliziani** **Nathan Ida**	**PB2: Material Modeling 1** Location: Ballroom Foyer Chairs: **Youguang Guo** **Patrick Dular**	**PB3: Electrical Machines & Drives 2** Location: Corvina Chairs: **Markus Clemens** **Johan Gyselinck**
12:25pm - 1:45pm	**Lunch**		
1:45pm - 3:25pm	**PB4: Electromagnetic Compatibility + Nano-Electromagnetic Computation and Applications** Location: Corvina Chairs: **Andre Nicolet** **Werner Renhart**	**PB5: Numerical Techniques 2 + Software Methodology** Location: Corvina Chairs: **Ruth V. Sabariego** **Tetsuji Matsuo**	**PB6: Devices & Applications 2** Location: Ballroom Foyer Chairs: **Zhuoxiang Ren** **Renato Mesquita**
3:25pm - 3:50pm	**Coffee Break**		
3:50pm - 5:30pm	**OB2: Optimization & Design 2** Location: Ballroom Chairs: **Stéphane Clénet, C.S. Koh**		
5:40pm - 7:00pm	**TEAM: Benchmarking** Chair: **Oszkár Bíró**		

Date: Wednesday, 03/Jul/2013			
8:30am - 10:10am	**OC1: Material Modeling 2 (dedicated to the memory of Norio Takahashi)** Location: Ballroom Chairs: **Osama Mohammed, Hajime Igarashi**		
10:10am - 10:35am	**Coffee Break**		
10:35am - 12:15pm	**PC1: Bio-Electromagnetic Computation and Applications + Education** Location: Ballroom Foyer Chairs: **Hartmut Brauer** **Maurizio Repetto**	**PC2: Numerical Techniques 3** Location: Corvina Chairs: **Kurt Preis** **Hideki Kawaguchi**	**PC3: Electrical Machines & Drives 3** Location: Corvina Chairs: **Karl Hollaus** **Stanislaw Gratkowski**
12:15pm - 1:45pm	**Lunch**		
1:45pm - 3:25pm	**PC4: Optimization & Design 3** Location: Ballroom Foyer Chairs: **Alice Reinbacher-Köstinger** **Stephan Russenschuck**	**PC5: Numerical Techniques 4** Location: Corvina Chairs: **Dennis D. Giannacopoulos** **Stefan Kurz**	**PC6: Electrical Machines & Drives 4** Location: Corvina Chairs: **Luiz Lebensztajn** **Laurent Krahenbuhl**
3:25pm - 3:50pm	**Coffee Break**		
3:50pm - 5:30pm	**OC2: Coupled Problems 2** Location: Ballroom Chairs: **Arnulf Kost, Dexin Xie**		
7:00pm - 11:00pm	**Conference Dinner** Location: Hungarian National Gallery		

Date: Thursday, 04/Jul/2013			
8:30am - 10:10am	**OD1: Numerical Techniques 5** Location: Ballroom Chairs: **Jan Sykulski, Zhenmao Chen**		
10:10am - 10:35am	**Coffee Break**		
10:35am - 12:15pm	**PD1: Optimization & Design 4** Location: Ballroom Foyer Chairs: **Abdul-Rahman Arkadan** **Antonios G. Kladas**	**PD2: Numerical Techniques 6** Location: Corvina Chairs: **Yasuhito Takahashi** **Fabio Villone**	**PD3: Devices & Applications 3** Location: Corvina Chairs: **Theodoros Tsiboukis** **Wolfgang Rucker**
12:15pm - 1:45pm	**Lunch**		
1:45pm - 3:25pm	**PD4: Coupled Problems 3** Location: Corvina Chairs: **Ruben Specogna** **Francis Piriou**	**PD5: Material Modeling 3** Location: Ballroom Foyer Chairs: **János Füzi** **João Pedro Assumpção Bastos**	**PD6: Electrical Machines & Drives 5** Location: Corvina Chairs: **Wolfgang Rucker** **Oriano Bottauscio**
3:25pm - 3:50pm	**Coffee Break**		
3:50pm - 5:30pm	**OD2: Electrical Machines & Drives 6 + Devices & Applications 4** Location: Ballroom Chairs: **Herbert De Gersem, Yves Marechal**		
5:30pm - 5:50pm	**Closing Session** Location: Ballroom		

Compumag 2013 – Technical Program

Date: Sunday, 30/Jun/2013	
3:00pm - 7:30pm	Registration
7:30pm - 9:00pm	Welcome Reception

Date: Monday, 01/Jul/2013	
8:30am - 9:10am Ballroom	**Opening Session** **Chair:** József Pávó
	On the Shoulders of Giants Bill Trowbridge[1], Jan Sykulski[2] [1]D'Arcy's Field's, Frilford, Oxford; [2]School of ECS, University of Southampton, United Kingdom
9:10am - 10:10am Ballroom	**OA1: Numerical Techniques 1** **Session Chairs:** Bill Trowbridge, József Pávó
	OA1-1 **Computational Performances of Natural Element and Finite Element Methods** Yves Marechal, Brahim Ramdane, Diego Pereira Botelho G2Elab, Grenoble Electrical Engineering lab, France **OA1-2** **A Time-Domain Discontinuous Galerkin Trefftz Method** Fritz Kretzschmar[1], Sascha M. Schnepp[2], Igor Tsukerman[3], Thomas Weiland[4] [1]Graduate School of Computational Engineering, Technische Universitaet Darmstadt, Germany; [2]Laboratory for Electromagnetic Fields and Microwave Electronics, ETH Zurich, Switzerland; [3]The Univ of Akron, United States of America; [4]Institut fuer Theorie Elektromagnetischer Felder, Technische Universität Darmstadt, Germany **OA1-3** **Trefftz-discontinuous Galerkin and Finite Element Multi-solver Technique for Modeling Time-harmonic EM Problems with High-conductivity Regions** Zsolt Badics Tensor Research LLC, United States of America
10:10am - 10:35am	Coffee Break

10:35am - 12:15pm Ballroom Foyer	**PA1: Coupled Problems 1** **Session Chairs:** Bernhard Auchmann, Nelson Sadowski

PA1-1
Optimum Design of Transformer for Wind-Turbine Generator Considering Temperature Behavior
Yeon-Ho Oh[1], Do-Kwan Hong[1], Ki-Dong Song[1], Man Sig Lee[2], Sung Chin Hahn[3]
[1]KERI, Republic of Korea (South Korea); [2]Korea Institute of Industrial Technology; [3]Department of Electrical Engineering, Dong-A University

PA1-2
A General Arc-Segment Element for Three-Dimensional Thermal Modelling
Nick Simpson, Rafal Wrobel, Phil H. Mellor
University of Bristol, United Kingdom

PA1-3
Mixing of Liquids with a Rotating Current Density
Gerard Vinsard, Stephane Dufour, Esteban Saatdjian
LEMTA, France

PA1-4
Validation of Numerical Approaches for Simulating the Heat Transfer in Stator Ducts with Measurements
Maximilian Schrittwieser[1], Oszkár Bíró[1], Ernst Farnleitner[2], Gebhard Kastner[2]
[1]IGTE, Graz University of Technology, Austria; [2]ANDRITZ Hydro GmbH, Austria

PA1-5
An Iterative Magnetomechanical Deflection Model for a Magnetic Gear
Kiran Uppalapati, Jonathan Bird
University of North Carolina at Charlotte, United States of America

PA1-6
Finite Element Modeling of Heat Transfer in a Nanofluid Filled Transformer
Weimin Guan[1], M Jin[1], Y Fan[2], J Chen[1], P Xin[1], Y Li[3], K Dai[1], J Ruan[1]
[1]Wuhan University, People's Republic of China; [2]Wuhan NARI Co. Ltd., State Grid Electric Power Research Institute, People's Republic of China; [3]CEET PingGao Group Co. Ltd., Pingdingshan, People's Republic of China

PA1-7
An Accurate Mesh Based Equivalent Circuit Approach to Thermal Modelling
Nick Simpson, Rafal Wrobel, Phil Mellor
University of Bristol, United Kingdom

PA1-8
A Three-Dimensional Multispecies Fluid Model of Coupled Multi-physics Simulations in Electromagnetic Devices with Moving Parts
Yujiao Zhang[1], Xiongfeng Huang[1], Tao Huang[2], Jiangjun Ruan[2]
[1]China Three Gorges University, People's Republic of China; [2]Wuhan University, People's Republic of China

PA1-9
Magneto-Thermal Modeling of the Structural Components in a Single Phase Transformer
Luiz Henrique Jovelli[1], Alexandre Magno Milagre[1], Mauricio Valencia Ferreira da Luz[2], Glauco de Melo Cangane[3]
[1]ENGBRAS Software e Projetos, Brazil; [2]Federal University of Santa Catarina, Brazil; [3]Siemens Ltda/TUSA Transformers, Brazil

PA1-10
The Optimal Design of HTS Devices
Rajeev Das[1], Fernando Oliverira[2], Frederico Guimaraes[2], David Lowther[1]
[1]McGill University, Canada; [2]Federal University of Minas Gerais, Brazil

PA1-11
Flow and Electric Field in Electrostatic Precipitator Using Multiphase Continuum Flow and Charge Simulation Method
André Abelardo Tavares
SATC, Brazil

PA1-12
3D Simulation of Electrically-induced Nano-Patterning on Polymer Films
Qingzhen Yang[1,2], Ben Q. Li[2], Yucheng Ding[1]
[1]Xi'an Jiaotong University, China; [2]University of Michigan-Dearborn, United States of America

PA1-13
Numerical and Experimental Validation of Discharge Current with Generalized Energy Method and Integral Ohm's Law in Dielectric Liquid Media
Ho-Young Lee[1], Jae-Seung Jung[1], Hong-Kyu Kim[2], Il-Han Park[3], Se-Hee Lee[1]
[1]Kyungpook National University, Republic of Korea (South Korea); [2]Korea Electrotechnology Research Institute; [3]Sungkyunkwan University

PA1-14
3D Anisotropic Model for the Numerical Computation of Nonlinear Magnetostriction
Adrian Volk[1], Manfred Kaltenbacher[2], Alexander Sutor[1], Michael Ertl[3], Reinhard Lerch[1]
[1]Chair of Sensor Technology, University of Erlangen-Nuremberg, Erlangen, Germany; [2]Institute of Mechanics and Mechatronics, Vienna University of Technology, Wien, Austria; [3]Siemens Energy Sector, Nuremberg, Germany

PA1-15
Contact Temperature Prediction in Three-phase Gas Insulated Bus Bars with the Finite-element Method
Xiaowen Wu, Naiqiu Shu, Hongtao Li, Ling Li
Wuhan University, People's Republic of China

PA1-16
FEM-BEM Analysis of Radio Frequency Drying of a Moving Wood Piece
Teodor Leuca[1], Livia Bandici[1], Gabriel Cheregi[1], Oana Drosu[2], Marcela Ioana Laza[1]
[1]University of Oradea, Romania; [2]Politechnica University of Bucharest

	PA1-17 **Numerical Analysis and Experiment for Micro Particle Collector Using Dielectrophoretic Force** Myung Ki Baek[1], Gwang Jun Yu[2], Il Han Park[1] [1]Sungkyunkwan University, Republic of Korea (South Korea); [2]Samsung Electronics Co., LTD, Republic of Korea (South Korea)
10:35am - 12:15pm **Corvina**	**PA2: Static & Quasi-static Fields 1** **Session Chairs:** Zsolt Badics, André Buchau
	PA2-1 **Fast and Robust Method for Mutual Inductance Calculation of Coaxial Circular Coils with Rectangular Cross Section** Tomislav Župan, Željko Štih, Bojan Trkulja Faculty of Electrical Engineering and Computing, Croatia **PA2-2** **2D Magnetostatic Finite Element Simulation for Devices With Radial Symmetry** Dries Vanoost[2], Herbert De Gersem[2], Joan Peuteman[1], Georges Gielen[2], Davy Pissoort[1] [1]Katholieke Hogeschool Brugge Oostende, Belgium; [2]KU Leuven, Belgium **PA2-3** **Analytical Calculation of Copper Losses in Litz-Wire Windings of Gapped Inductors** Alexander Stadler, Raoul Huber, Tobias Stolzke, Christof Gulden STS Spezial-Transformatoren-Stockach GmbH & Co. KG, Germany **PA2-4** **Analysis of the Shielding Effect of Wire Mesh to Ion Flow Field from HVDC Transmission Lines** Xiangxian Zhou, Tiebing Lu, Xiang Cui North China Electric Power University, People's Republic of China **PA2-5** **Particulate Model for Magnetic Field and Force Computation** Zoltán László, Janos Füzi Wigner RCP, Hungary **PA2-6** **A Hybrid Boundary Element Method-Reluctance Network Method for Open Boundary 3D Non Linear Problems** Douglas Martins Araujo[1,2], Jean-Louis Coulomb[2], Olivier Chadebec[2] [1]Schneider Electric Industries SAS; [2]G2ELAB - Université de Grenoble, Grenoble, France **PA2-7** **Rigorous Capacitance-Extraction Method for Metamaterial Resonator Equivalent Circuits** Thodosios Karamanos, Alexandros Dimitriadis, Nikolaos Kantartzis, Theodoros Tsiboukis Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Greece

PA2-8
Equations of 3-D Electromagnetic Field with Direct Calculation of Flux and Eddy Current Densities
Witold Mazgaj
Cracow University of Technology, Poland

PA2-9
Three-dimensional Computation of Magnetic Fields in Hysteretic Media with Time-periodic Sources
Massimiliano d'Aquino[1], Guglielmo Rubinacci[2], Antonello Tamburrino[3,4], Salvatore Ventre[3]
[1]Università di Napoli "Parthenope"; [2]Università di Napoli Federico II; [3]University of Cassino, Italy; [4]Michigan State University, United States of America

PA2-10
Choice of Electrical Field Calculation Method According to the Dielectric Design Criteria
Kosjenka Capuder[1], Željko Štih[2], Goran Plišić[1]
[1]Končar Power Transformers Ltd., Croatia; [2]Faculty of Electrical Engineering and Computing., Croatia

PA2-11
Modeling and Finite Element Simulation of the Wilson–Wilson Experiment
Holger Heumann[2], Stefan Kurz[1]
[1]Tampere University of Technology, Finland; [2]Université de Nice - Sophia Antipolis, France

PA2-12
Fast Calculation of Magnetic Fields Produced by Rectangular Cross Section, Arc-Shaped Conductors
Alessio Capelluto[1], Mario Nervi[2], Paolo Molfino[2]
[1]ASG-Superconductors, Italy; [2]Deptartement of Electrical, Electronic, Telecommunications Engineering and Naval Architecture,University of Genoa, Italy

PA2-13
Nonlinear Computational Homogenization Method for the Evaluation of Eddy Currents in Soft Magnetic Composites
Innocent Niyonzima[1], Ruth V. Sabariego[1], Patrick Dular[1,2], Christophe Geuzaine[1]
[1]University of Liège, Belgium; [2]Fonds de la Recherche Scientifique, F.R.S.–FNRS, Belgium

PA2-14
Analysis of the Motion of Conducting Sheets in Magnetic Fields
Mihai Maricaru[1], Ioan R. Ciric[2], Horia Gavrila[1], George-Marian Vasilescu[1], Florea I. Hantila[1]
[1]Department of Electrical Engineering, Politehnica University of Bucharest, Romania; [2]Department of Electrical and Computer Engineering, The University of Manitoba, Canada

PA2-15
Hierarchical Block Wavelet Compression of 3-D Eddy Current Problems
Remus Banucu, Christian Scheiblich, Jan Albert, Veronika Reinauer, Wolfgang Rucker
University of Stuttgart, Germany

PA2-16
A New Neural Predictor for ELF Magnetic Field Strength
Salvatore Coco[1], Antonino Laudani[2], Francesco Riganti Fulginei[2], Alessandro Salvini[2]
[1]University of Catania, Italy; [2]University of RomaTre, Italy

PA2-17
Calculation of 3D Magnetic Fields Produced by MHD Active Control Systems in Fusion Devices
Paolo Bettini[1], Ruben Specogna[2]
[1]Università di Padova, Italy; [2]Università di Udine, Italy

PA2-18
Dual Formulations for Accurate Thin Shell Models in a Finite Element Subproblem Method
Vuong Dang Quoc[1], Patrick Dular[1,2], Ruth V. Sabariego[1], Laurent Krähenbühl[3], Christophe Geuzaine[1]
[1]University of Liege, Belgium; [2]Fonds de la Recherche Scientifique; [3]Université de Lyon, France

PA2-19
Research on Corona Characteristics of Fittings in Valve Hall of UHVDC Converter Station
Zhiye Du, Jiangjun Ruan, Ting Zhan, Shuo Jin, Longfei Hu, Guodong Huang
School of Electrical Engineering, Wuhan University, Wuhan, China

PA2-20
Modeling ECAP in Cochlear Implants using Finite Element Method and Equivalent Circuits
Charles T. M. Choi, Shao-Po Wang
National Chiao Tung University, Taiwan, ROC

PA2-21
Numerical Modelling of Axissymetrical Ferrite-Core Probes over Planar Specimens Using a Coupled FIT/Semi-Analytical Formulation
Audrey Vigneron, Anastassios Skarlatos, Christophe Reboud
CEA, LIST, France

PA2-22
Analysis of Electromagnetic Inspection Method of Opposite Side Carburizing Depth in Steel Plate Taking Account of Minor Loop
Yuji Gotoh[1], Hidekazu Tanaka[2], Norio Takahashi[3]
[1]Oita University, Japan; [2]Oita University, Japan; [3]Okayama University, Japan

PA2-23
Computing Eddy Currents in Thin Shells of Arbitrary Topology by Mesh Analysis
Federico Moro, Piergiorgio Alotto, Massimo Guarnieri, Andrea Stella
Università di Padova, Italy

10:35am - 12:15pm Corvina	**PA3: Electrical Machines & Drives 1** **Session Chairs:** Anouar Belahcen, Andrzej Demenko
	PA3-1 **Electromagnetic Design of a New Dual-magnet Magnetic-geared Machine Using Parallelogram Hysteresis Model** Chunhua Liu, K.T. Chau, Mu Chen The University of Hong Kong, Hong Kong S.A.R. (China) **PA3-2** **Static Characteristic Analysis and Force Optimization of a Short-stroke DC Planar Motor with Three Degree of Freedom** He Zhang, Baoquan Kou, Hailin Zhang, Yinxi Jin Harbin Institute of Technology, People's Republic of China **PA3-3** **Analysis of Eddy-Current Brakes（ECB） for High Speed Railway Using Meshless Method** Yang Zou[1], Yanbin Li[2], Bin Wang[1], K.R. Shao[1], Gang Lei[3], Jianguo Zhu[3] [1]State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science and Technology, Wuhan, 430074, China; [2]Zhong Yuan Institute of Technology, Zhengzhou, China; [3]Faculty of Engineering and Information Technology, University of Technology, Sydney, Australia **PA3-4** **A Design Method for Cage Induction Motors With Non-Skewed Rotor Bars** Haisen Zhao, Xiangyu Wang, Qing Wang, Xiaofang Liu, Yingli Luo North China Electric Power University, People's Republic of China **PA3-5** **Performance Analysis of an Integrated Rotary-linear Machine with Coupled Magnetic Paths** J.F. Pan[1], Norbert Cheung[2], Yu Zou[1] [1]School of Mechatronics and Control Engineering, Shenzhen University, People's Republic of China; [2]Department of Electrical Engineering, Hong Kong Polytechnic University, People's Republic of China **PA3-6** **Finite-Element Modelling of Magnetic Material Degradation Profiles due to Punching** Madeleine Bali[1], Herbert De Gersem[2], Annette Muetze[1] [1]Graz University of Technology; [2]KU Leuven, Belgium **PA3-7** **Starting Torque Optimization of High-speed Switched Reluctance Motor Based on Level Set Method** Haijun Zhang, Weijie Xu, Shuhong Wang, Youpeng HuangFu, Guolin Wang, Jianguo Zhu Xi'an Jiaotong University, People's Republic of China

PA3-8
Thermal Optimization of a High Speed Permanent Magnet Motor
Jianning Dong[1,2], Yunkai Huang[1,2], Long Jin[1,2], Heyun Lin[1,2], Hui Yang[1,2]
[1]School of Electrical Engineering, Southeast University, People's Republic of China; [2]Engineering Research Center for Motion Control of Ministry of Education, Southeast University, People's Republic of China

PA3-9
Damper Windings Performance Evaluation in Large Hydro Electrical Generators
Arezki Merkhouf
Research Institut of Hydro-Québec, IREQ, Canada

PA3-10
Characteristics of a Rotor Vibration in an IPM Motor by Using Magnetic and Structural Analyses
Doyeon Kim, Jeongyong Song, Gunhee Jang
Hanyang University, Republic of Korea (South Korea)

PA3-11
High-Torque Low-Speed Machines for In-Wheel Application: Comparative Study of Radial, Axial, and Transverse Flux Machines
Daesuk Joo, Ji-Young Lee, Do-Kwan Hong, Byung-Chul Woo, Dae-Hyun Koo
Korea Electrotechnology Research Institute, Republic of Korea (South Korea)

PA3-12
Representation of Electrical Machine Windings using *T*0 Formulation
Rafal Wojciechowski, Cezary Jedryczka
Poznan University of Technology, Poland

PA3-13
A Novel Electrical Continuously Variable Transmission System and its Numerical Model
Yulong Liu, Siu-lau Ho, Weinong Fu
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

PA3-14
Design Improvement for Cogging Torque Reduction in Axial-Flux Permanent-Magnet Machines Using Schwarz-Christoffel Transformation
Aliakbar Alipour, Mehdi Moallem
Isfahan University of Technology, Islamic Republic of Iran

PA3-15
Design of Dual Rotors Switched Reluctance Motor
Hao Chen, Tong Xu, Xiao Liu
China University of Mining & Technology, People's Republic of China

PA3-16
Stator-Teeth Design of Direct-Drive Large-Torque Transverse Flux-Type Motor with High Power Factor for Electric Ship Propulsion
Yuta Yamamoto[1], Qi Zhao[1], Yasuhiro Takada[1], Takafumi Koseki[1], Yasuaki Aoyama[2]
[1]The University of Tokyo, Japan; [2]Hitachi Research Laboratory, Japan

	PA3-17 **PM Magnetization Characteristics Analysis of a Post-Assembly Line Start Permanent Magnet Motor Using Coupled Preisach Modeling and Finite Element Method** Young Hyun Kim, Won Gee Byen, Jung Ho Lee Hanbat National University, Republic of Korea (South Korea) **PA3-18** **Effect of Pole and Slot Combination on Noise and Vibration in Induction Motor** Su-Jin Lee, Jae-Han Sim, Jae-Woo Jung, Hyeon-Jin Park, Jung-Pyo Hong Hanyang University, Republic of Korea (South Korea) **PA3-19** **Magnetic Vibration Analysis of a New DC-Excited Multitoothed Switched Reluctance Machine** Chunhua Liu, K.T. Chau, Christopher H.T. Lee, Mu Chen The University of Hong Kong, Hong Kong S.A.R. (China) **PA3-20** **Numerical Analysis and Experimental Evaluation of IPMSM Considering Time Harmonics of Switching Frequency** Subong Jang[1], Yong-Jae Kim[2], Sang-Yong Jung[1] [1]Sungkyunkwan university, Republic of Korea (South Korea); [2]Chosun University, Republic of Korea (South Korea)
12:15pm - 1:45pm	**Lunch**
1:45pm - 3:25pm **Ballroom Foyer**	**PA4: Optimization & Design 1** **Session Chairs:** Piergiorgio Alotto, David Lowther
	PA4-1 **EM-FL-PSO Design Optimization of WAD** N. Al-Aawar, R. Al-Khatib, A. A. Arkadan Rafik Hariri University, Lebanon (Lebanese Republic) **PA4-2** **Benefits of Waveform Relaxation Method and Space Mapping for the Optimization of Multirate System** Antoine Pierquin[1], Stephane Brisset[1], Thomas Henneron[2], Stephane Clenet[3] [1]EC Lille, L2EP, France; [2]Université de Lille,L2EP, France; [3]Arts et Métiers ParisTech, L2EP, France **PA4-3** **Use of an Artificial Neural Network-based Metamodel in the Optimization by Particle Swarm Optimization Method** Sheila Santisi Travessa, Walter Pereira Carpes Jr, Marcelo A. Nunes Filho Federal University of Santa Catarina, Brazil **PA4-4** **Fast Shape Optimization of Microwave Devices Based on Parametric Reduced Order Models** Stefan Burgard, Ortwin Farle, Philipp Loew, Romanus Dyczij-Edlinger Saarland University, Germany

PA4-5
Optimal Design of Single-Phase Brushless DC Motor for Reducing Cogging Torque
Young-Un Park[1], Ji-young So[1], Dong-Hwa Chung[1], Ju-Hee Cho[2], Kyung-il Woo[3], Yong-Min You[4], Dae-kyong Kim[1]
[1]Sunchon National University, Republic of Korea (South Korea); [2]Korean Electronics Technology Institute (KETI) , Republic of Korea (South Korea); [3]Pukyong National University; [4]LG Electronics, Republic of Korea (South Korea);

PA4-6
Design Optimization of a Loudspeaker Utilizing Sampling-based Sensitivity Information of a Hyper-spherical Local Window
Nak-Sun Choi[1], Dong-Wook Kim[1], K. K. Choi[2], Dong-Hun Kim[1]
[1]Kyungpook National University, Republic of Korea (South Korea); [2]Mech. and Ind. Eng., Univ. of Iowa, Iowa City, United States of America

PA4-7
A Novel Evolution Strategy and its Application to Inverse Scattering in Microwave Imaging
Lin Yang[1], Shiyou Yang[2], S.L. Ho[1], Weinong Fu[1], Lei Liu[1]
[1]The Hong Kong Polytechnic University, Hong Kong S.A.R. (China); [2]College of Electrical Engineering, Zhejiang University, People's Republic of China

PA4-8
Global Sensitivity Analysis of Magneto-electric Sensor Model Parameters
Thu Trang Nguyen[1,3], Stéphane Clenet[2], Laurent Daniel[3,4], Xavier Mininger[3], Frédéric Bouillault[3]
[1]L2EP, Univ. Lille 1, France; [2]L2EP, Arts et Métiers ParisTech, France; [3]LGEP, CNRS UMR8507; SUPELEC; UPMC Univ Paris 06; Univ Paris-Sud, France.; [4]School of Materials, University of Manchester, United Kingdom

PA4-9
Optimization of Rotor Topology in PM Synchronous Motors by Genetic Algorithm Considering Cluster of Materials and Cleaning Procedure
Takeo Ishikawa, Kyoichi Nakayama, Nobuyuki Kurita
Gunma University, Japan

PA4-10
Transformer Design Based on Diversity-Guided Generalized Extremal Optimization
Leandro dos Santos Coelho[1,2], Viviana C. Mariani[2,3], Helon V. H. Ayala[4], Mauricio V. F. Luz[5], Jean Vianei Leite[5]
[1]Industrial and Systems Engineering Grad. Program, Pontifical Catholic University of Parana, Brazil; [2]Department of Electrical Engineering, Federal University of Parana, Brazil; [3]Mechanical Engineering Graduate Program, Pontifical Catholic University of Parana, Brazil; [4]LACTEC - Institute of Technology for Development, Electrical Systems Division (DVSE), Brazil; [5]GRUCAD/EEL/UFSC, Brazil

PA4-11
Optimal Antenna Design with QPSO-QN Optimization Strategy
J. B. Liu[1,2], Zhongxiang Shen[1], Y. L. Lu[1]
[1]Nanyang Technological University, Singapore; [2]National University of Defense Technology, People's Republic of China

PA4-12
A Multi-objective Repository-based Genetic Algorithm for Ultra-wideband Antenna Optimization
Cláudio Silva, Sinara Martins
Federal University of Rio Grande do Norte (UFRN), Brazil

PA4-13
Statistical Moment-based Robust Design Optimization for Nonlinear Electromagnetic Devices
Su-gil Cho, Junyong Jang, Tae Hee Lee
Hanynag University, Republic of Korea (South Korea)

PA4-14
Meaning of the Rational Solution Obtained by Game Theory
Tomoyuki Miyamoto[1], Shinya Matsutomo[2], Fumiaki Nobuyama[1], So Noguchi[1]
[1]Hokkaido University, Japan; [2]Niihama National College of Technology, Japan

PA4-15
Optimal Rotor Structure of Surface-mounted Permanent Magnet Motor for Vibration Reduction
Sunghoon Lim, Seungjae Min, Jung-Pyo Hong
Hanyang University, Republic of Korea (South Korea)

PA4-16
A Parallel Version of the Self-Adaptive Low-High Evaluation Evolutionary-Algorithm for Electromagnetic Device Optimization
Emanuele Dilettoso, Santi Agatino Rizzo, Nunzio Salerno
DIEEI - Università di Catania, Italy

PA4-17
Embedded Multilevel Optimization for Nonlinear Time Stepping Mesh based Reluctance Network
Maya Hage Hassan, Guillaume Krebs, Ghislain Remy, Claude Marchand
Laboratoire de génie électrique de Paris, France

PA4-18
Low Cogging Torque Design of Permanent-Magnet Machine using Modified Multi-level Set Method with Total Variation Regularization
Piotr Putek[1], Piotr Paplicki[2], Ryszard Palka[2]
[1]Ghent University, Belgium; [2]West Pomeranian University of Technology, Poland

PA4-19
A Numerically Efficient Reliability-Based Robust Optimal Design Algorithm: Application to TEAM 22
Ziyan Ren, Chanhyuk Park, C.S. Koh
Chungbuk National University, Republic of Korea (South Korea)

1:45pm - 3:25pm Corvina	**PA5: Static & Quasi-static Fields 2 + Non-destructive Electromagnetic Inspection and Applications** **Session Chairs:** Ioan R Ciric, Antonello Tamburrino
	PA5-1 **Improvement of Unified Boundary Integral Equation Method in Magnetostatic Shielding Analysis** Kazuhisa Ishibashi[1,3], Takuya Yoshioka[2], Shinji Wakao[2], Yashuhito Takatashi[4], Zoran Andjelic[3], Koji Fujiwara[4] [1]Japan; [2]Waseda Univercity, Japan; [3]POLOPT Technologies Gmbh, Switzerland; [4]Doshisha University, Japan **PA5-2** **Time Domain Analysis of Transient Currents in Conductors Involving Non-Homogeneous Media** Thiago Antonio Grandi de Tolosa, Ricardo Caranicola Caleffo Mauá Institute of Technology, Brazil **PA5-3** **Inclusion of the Model of Rotational Magnetization into Equations of Magnetic Field Distribution** Witold Mazgaj, Tadeusz Sobczyk, Adam Warzecha Cracow University of Technology, Poland **PA5-4** **Eddy Currents Computation by an Integral Equation Method Using Facet Elements** Alexander Kalimov, Dmitry Lysenko St.Petersburg State Polytechnic University, Russian Federation **PA5-5** **A Shimming Scheme for Active Shielding** Andrea Gaetano Chiariello, Alessandro Formisano, Raffaele Martone Seconda Università di Napoli, Italy **PA5-6** **Linear Representation of Saturation Characteristics Associated with Eddy Currents in Ferromagnetic Materials** Jian Wang, Heyun Lin, Shuhua Fang, Yunkai Huang, Jianning Dong, Hui Yang Southeast University, People's Republic of China **PA5-7** **Improved Calculation method of Electric Field and Power loss of EHV AC Bundled Conductors** Shuo Jin, Jiangjun Ruan, Zhiye Du, Guodong Huang School of Electrical Engineering, Wuhan University, Wuhan, People's Republic of China **PA5-8** **Dual Finite Integral Technique in Ion Flow Field Calculation** Yongsheng Xu, Jinliang He, Bo Zhang Tsinghua University, People's Republic of China **PA5-9** **Imaging of Current Density within a Planar Specimen** Patrick A. Hölzl, Bernhard G. Zagar Johannes Kepler University of Linz, Austria

PA5-10
Fast Technique for Lorentz Force Calculations in Nondestructive Testing Applications
Mladen Zec, Robert P. Uhlig, Marek Ziolkowski, Hartmut Brauer
Ilmenau University of Technology, Department of Advanced Electromagnetics, Germany

PA5-11
Diagnosis of Real Cracks from Eddy Current Testing Signals using Parallel Computation
Mihai Iulian Rebican[1], Ladislav Janousek[2], Milan Smetana[2], Tatiana Strapacova[2]
[1]Faculty of Electrical Engineering, University Politehnica of Bucharest, Romania; [2]Faculty of Electrical Engineering, University of Zilina, Slovakia

PA5-12
Nonlinear Integral Formulation and Neural Networks based Solution for Reconstruction of Deep Defects with Pulse Eddy Currents
Gabriel Preda, Florea Ioan Hantila
Politehnica University of Bucharest, Romania

PA5-13
Numerical Simulation of Crack Detection in High-Temperature Superconducting Film by Using Contactless Methods
Atsushi Kamitani[1], Teruou Takayama[1], Soichiro Ikuno[2]
[1]Yamagata University, Japan; [2]Tokyo University of Technology, Japan

PA5-14
New Methods Based on Matched Coordinates for the Computation of Quasi-static Fields Induced in a Layered Conductor with a Rough Surface and a Continuous Depth Profile of Conductivity
François Caire[1], Denis Prémel[1], Gérard Granet[2]
[1]CEA LIST, France; [2]Clermont Universités, Université Blaise Pascal , Institut Pascal, UMR 6602, France

PA5-15
FEM Technique for Modelling Eddy Current Testing of Ferromagnetic Media with Low Skin Depth
Houda Zaidi[1,2], Laurent Santandrea[1], Guillaume Krebs[1], Yann Le Bihan[1], Edouard Demaldent[2]
[1]Laboratoire de Génie Electrique de Paris, France; [2]Laboratoire d'Intégration des Systèmes et des Technologies, France

PA5-16
A Modeling Approch for the Characterization of Stress in Magnetic Materials using Eddy Current Non-Destructive Evaluation
Abla Dahia[1], Eric Berthelot[1], Yann Le Bihan[1], Laurent Daniel[1,2]
[1]LGEP, France; [2]School of Materials, United Kingdom

PA5-17
Magnetic NDE for Material Deterioration and Sub-mm Size Defect in Steel
Hiroaki Kikuchi[1], Isamu Shimizu[1], Kaito Sato[1], Keiji Iwata[2]
[1]Iwate University, Japan; [2]Nippon Steel & Smitomo Metal, Japan

PA5-18
Surface Integral Equations for Electromagnetic Testing: The Low-frequency and High-contrast Case
Audrey Vigneron[1], Edouard Demaldent[1], Marc Bonnet[2]
[1]CEA, LIST, France; [2]POEMS (UMR 7231 CNRS-INRIA-ENSTA), France

PA5-19
An Efficient Numerical Scheme for Sizing of Cavity Defect in Metallic Foam from Signals of DC Potential Drop Method
Xiaojuan Wang, Shejuan Xie, Jing Zhang, Zhenmao Chen
State Key Laboratory for Strength and Vibration of Mechanical Structures, Xi'an Jiaotong University, People's Republic of China

PA5-20
Stress Zone Imaging in Steel Plates using Multi Coil Array Sensors
Markus Neumayer[1], Daniel Watzenig[1], Berhnard Brandstätter[2]
[1]Graz University of Technology, Austria; [2]Elin Motoren GmbH, Austria

PA5-21
A Study on the Estimation of the Shapes of Axially Oriented Cracks in CMFL type NDT System
Hui Min Kim, Gwan Soo Park
Pusan National University, Republic of Korea (South Korea)

PA5-22
Dynamic Modeling of an Electrodynamic Maglev Vehicle
Subhra Paul, Walter Bomela, Jonathan Bird
University of North Carolina at Charlotte, United States of America

PA5-23
A Novel Tool for Breakdown Probability Predictions on Multi-electrode Multi-voltage Systems
Paolo Bettini[1,2], Nicola Pilan[2], Ruben Specogna[3]
[1]Università di Padova, Italy; [2]Consorzio RFX, Padova, Italy; [3]Università di Udine, Italy

PA5-24
Accurate Post-Processing of Magnetic Field Gradients from Low-Order Finite-Element Solutions
Herbert De Gersem, Bert Masschaele, Toon Roggen, Ewald Janssens
KU Leuven, Belgium

1:45pm - 3:25pm Corvina	**PA6: Devices & Applications 1** **Session Chairs:** Zsolt Szabó, Jasmin Smajic

PA6-1
Proposal of Concept of Theoretical Formula for Equivalent Resistances for Zone-Control Induction Heating System and Theoretical and Numerical Examination
Teruyoshi Sasayama[1], Yusuke Yanamoto[1], Norio Takahashi[1], Naoki Uchida[2], Takahiro Ao[2], Keiji Kawanaka[2], Nobuyasu Matsunaka[2]
[1]Okayama University, Japan; [2]Mitsui Engineering & Shipbuilding Co. Ltd., Japan

PA6-2
A UWB Antenna Design with Adjustable Second Rejection Band using a SIR
Hyung-Seok Choi, Hee-Yong Hwang, Kyung Choi
Kangwon National University, Republic of Korea (South Korea)

PA6-3
Iron Losses in a Medium-Frequency Transformer Operated in a High-Power DC-DC Converter
Nils Soltau[1], Daniel Eggers[2], Kay Hameyer[2], Rik De Doncker[1]
[1]RWTH Aachen University, E.ON Energy Research Center, Institute for Power Generation and Storage Systems, Germany; [2]RWTH Aachen University, Institute for Electrical Machines, Germany

PA6-4
Electromagnetic Model of Plasma Breakdown in the JET Tokamak
Francesco Maviglia[1], Raffaele Albanese[1], Peter J. Lomas[2], Fernanda G. Rimini[2], Adrianus C.C. Sips[3,4], Peter C. De Vries[5]
[1]Assoc. EURATOM-ENEA-CREATE, Univ. di Napoli Federico II, Italy; [2]Assoc. EURATOM-CCFE Fusion Association, Culham Science Centre, United Kingdom; [3]JET-EFDA, Culham Science Centre, United Kingdom; [4]European Commission, Belgium; [5]FOM Institute DIFFER, Association EURATOM-FOM, The Netherlands

PA6-5
3D Multi-strands Inductor Modeling: Influence of Complex Geometrical Arrangements
Raphaël Scapolan, Annie Gagnoud, Yves Du Terrail
SIMaP, Grenoble INP, UJF, CNRS, France

PA6-6
3D Magnetostatic Moment Method Dedicated to Arc Interruption Process Modeling
Loic Rondot[1], Olivier Chadebec[2], Gerard Meunier[2]
[1]Schneider Electric, France; [2]G2Elab, France

PA6-7
Modal Analysis of Currents Induced by Magnetic Resonance Imaging Gradient Coils
Hector Sanchez[1], Michael Poole[3], Adnan Trakic[1], Fabio Freschi[2], Maurizio Repetto[2], Stuart Crozier[1]
[1]The University of Queensland, Australia; [2]Department of Energy Politecnico di Torino Corso Duca Degli Abruzzi, Torino, Italy; [3]Institute of Neuroscience and Medicine –Julich, Germany

PA6-8
Simplified Position Estimation Using Back-EMF for Two-DoF Linear Resonant Actuator
Takamichi Yoshimoto[1], Yasuyoshi Asai[1], Katsuhiro Hirata[1], Tomohiro Ota[2]
[1]Osaka University, Japan; [2]Panasonic Corporation, Japan

PA6-9
A Paretian Approach to Optimal Design with Uncertainties: Application in Induction Heating
Paolo Di Barba[1], Fabrizio Dughiero[2], Michele Forzan[2], Elisabetta Sieni[2]
[1]University of Pavia, Italy; [2]University of Padova, Italy

PA6-10
Evaluation of Electromagnetic Measuring Technique of Tip Position of Nasogastric Tube using Evolution Strategy
Yuji Gotoh[1], Atsushi Nakamura[2], Yoshitaka Miyazaki[3], Norio Takahashi[4]
[1]Oita University, Japan; [2]Oita University, Japan; [3]Yufuin Kouseinenkin Hospital, Japan; [4]Okayama University, Japan

PA6-11
Numerical Determination of the Effective Magnetic Path Length of a Single Sheet Tester
Markus Hofmann[1], Deniz Kahraman[2], Hans-Georg Herzog[3], Michael J. Hoffmann[2]
[1]Daimler AG, Stuttgart, Germany; [2]Institute for Applied Materials, Karlsruhe Institute of Technology, Karlsruhe, Germany; [3]Institute of Energy Conversion Technology, Technical University of Munich, Munich, Germany

PA6-12
Analysis of a High Speed Induction Machine used for the Propulsion of an Electric Vehicle
Dan-Cristian Popa, Daniel Fodorean
Technical University of Cluj-Napoca, Romania

PA6-13
Heat Transfer Coefficients Determination of Numerical Model by Using Particle Swarm Optimization
Peter Kitak, Arnel Glotic, Igor Ticar
University of Maribor, Slovenia

PA6-14
Self-consistent Simulation of Bented Channel DGMOSFETs
Andras Reichardt[1], Gabor Varga[2]
[1]Dept. of Broadband Infocomm. and Electromagnetic Theory, BUTE, Hungary; [2]Dept. of Physics, BUTE, Hungary

PA6-15
Modeling of Mechanical Effects of Short-Circuit Currents in Power Transformers
Fernando Torres Pereira da Silva[1], Mauricio Valencia Ferreira da Luz[2], Glauco de Melo Cangane[1]
[1]Siemens Ltda/TUSA Transformers, Brazil; [2]Federal University of Santa Catarina, Brazil

PA6-16
Examination on Equivalent Resistance and Coupling Coefficient of Zone-Control Induction Heating by Finite Element Method
Yusuke Yanamoto[1], Teruyoshi Sasayama[1], Norio Takahashi[1], Naoki Uchida[2], Takahiro Ao[2], Keiji Kawanaka[2], Nobuyasu Matsunaka[2]
[1]Okayama University, Japan; [2]Mitsui Engineering & Shipbuilding Co., LTD., Japan

PA6-17
An Efficient Numerical Investigation for Short-Circuit Force Prediction of Power Transformer Considering 3-D Effects
Hyun-Mo Ahn[1], Joong-Kyoung Kim[2], Jung-Woo Ha[2], Yeon-Ho Oh[3], Ki-Dong Song[3], Sung-Chin Hahn[1]
[1]Dong-A Univ., Republic of Korea (South Korea); [2]HYOSUNG Co., Republic of Korea (South Korea); [3]KERI, Republic of Korea (South Korea)

PA6-18
An Integral Model for the Computation of the Magnetic Field Emission of MV/LV oil Transformer
Davide Bavastro, Aldo Canova, Luca Giaccone, Michele Manca
Politecnico di Torino, Italy

PA6-19
Cascaded Frequency Selective Surfaces Using Dürer's Pentagon Pre-Fractals Patch Elements for Licensed 2.5 GHz and 3.5 GHz Bands
Jose Idifranse Trindade[1], Adaildo Gomes Dassuncao[2], Paulo Henrique Silva[3]
[1]Federal University of Rio Grande do Norte, Brazil; [2]Federal University of Rio Grande do Norte, Brazil; [3]Instituto Federal de Educação, Ciência e Tecnologia da Paraíba, Brazil

PA6-20
Analysis and Performance Evaluation of the Solenoid as an Injector for 2-Liter Diesel Vehicle
Daohan Wang[1], Xiuhe Wang[1], Sung-Jun Kwon[2], Sang-Yong Jung[2]
[1]School of Electrical Engineering, Shandong University, China; [2]School of Electronic and Electrical Engineering, Sungkyunkwan University, Korea

PA6-21
Electrical Loss Analysis of A.C. Electromagnet Using Parallel Computing
Tadashi Yamaguchi[1], Yoshihiro Kawase[1], Tomohito Nakano[1], Tatsuya Asano[1], Ryosuke Kawai[1], Takanori Takemoto[2]
[1]Gifu University, Japan; [2]Fuji Electric FA Components & Systems Co., Ltd., Japan

PA6-22
Study of a High Speed Motorization with Improved Performances Dedicated for an Electric Vehicle
Daniel Fodorean
Technical University of Cluj-Napoca, Romania

PA6-23
Analysis on Methods to obtain Lumped Parameters for an Inductive Coupling Device
Daniela Wolter Ferreira[1], Moisés Ferber[2], Luiz Lebensztajn[1], Renan B. Müller[1], Laurent Krähenbühl[2], Florent Morel[2], Christian Vollaire[2]
[1]Escola Politécnica da Universidade de São Paulo, Brazil; [2]cole Centrale de Lyon

3:25pm - 3:50pm	**Coffee Break**
3:50pm - 5:30pm Ballroom	**OA2: Wave Propagation 1** **Session Chairs:** Irina Munteanu, Istvan Bardi
	OA2-1 **Wide-band Electromagnetic Time Reversal: Selecting the Instant of Focus for Scatterer Localization** Mehdi Benhamouche[1,2], Laurent Bernard[1], Mohamed Serhir[2], Lionel Pichon[1], Dominique Lesselier[2] [1]LGEP, France; [2]LSS, France **OA2-2** **A 3-D Interlayer-Based FDTD/NS-FDTD Connection Technique Combined with a Stable Subgrid Model for Low-Cost Simulations** Tadao Ohtani[1], Yasushi Kanai[2], Nikolaos Kantartzis[3] [1]Asahikawa City, Japan; [2]Niigata Institute of Technology, Japan; [3]Aristotle University of Thessaloniki, Greece **OA2-3** **Time Domain Absorbing Boundary Terminations for Waveguide Ports based on State Space Models** Thomas Flisgen, Johann Heller, Ursula van Rienen University of Rostock, Germany **OA2-4** **High-frequency Multi-winding Magnetic Components: From Numerical Simulation to Equivalent Circuits with Frequency-independent RL Parameters** Zacharie De Greve[1], Olivier Deblecker[1], Jacques Lobry[1], Jean-Pierre Kéradec[2] [1]Department of Power Electrical Engineering, University of Mons, Belgium; [2]Grenoble Electrical Engineering Laboratory (G2ELab), Université Joseph Fourier de Grenoble, France **OA2-5** **Fast Frequency-Domain Modeling of Return Stroke including Influence of Lossy Ground** Lei Liu, Shiyou Yang, Guangzheng Ni Zhejiang University, People's Republic of China
8:30pm - 9:30pm Dominican Courtyard	**Concert**

Date: Tuesday, 02/Jul/2013	
8:30am - 10:10am **Ballroom**	**OB1: Static & Quasi-static Fields 3** **Session Chairs:** Kay Hameyer, Raffaele Martone
	OB1-1 **Multilevel Preconditioning for Time-harmonic Eddy Current Problems Solved with Hierarchical Finite Elements** Ali Aghabarati, Jon P. Webb McGill University, Canada **OB1-2** **Model Order Reduction of Non Linear Magneto-static Problems based on POD and DEI Methods** Thomas Henneron[1], Stephane Clenet[2] [1]Université Lille 1, France; [2]L2EP/Arts et Métiers ParisTech **OB1-3** **Dual Discrete Geometric Methods in Terms of Scalar Potential on Unstructured Mesh in Electrostatics** Zhuoxiang Ren[1,2], Xiaoyu Xu[2] [1]University of Pierre & Marie Curie, L2E, France; [2]Institute of Microelectronics, Chinese Academy of Sciences, China **OB1-4** **Perfect Conductor and Impedance Boundary Condition Corrections via a Finite Element Subproblem Method** Patrick Dular[1], Victor Péron[2], Ronan Perrussel[3], Laurent Krähenbühl[4], Christophe Geuzaine[1] [1]University of Liège, ACE, Belgium; [2]Université de Pau et des Pays de l'Adour, MAGIQUE3D, France; [3]Université de Toulouse, LAPLACE, France; [4]Université de Lyon, Ampère, France **OB1-5** **Robust Transmission Conditions of High Order for Thin Conducting Sheets in Two Dimensions** Kersten Schmidt[1], Alexey Chernov[2] [1]Technische Universität Berlin, Germany; [2]Universität Bonn, Germany
10:10am - 10:20am **Front of the Hotel**	**Conference Photo**
10:20am - 10:45am	**Coffee Break**

10:45am - 12:25pm Corvina	**PB1: Wave Propagation 2 + Nano-Electromagnetic Computation and Applications** **Session Chairs:** Mauro Feliziani, Nathan Ida

PB1-1
Approximation of Grunwald-Letnikov Fractional Derivative for FDTD Modeling of Cole-Cole Media
Ioannis T. Rekanos, Traianos V. Yioultsis
Aristotle University of Thessaloniki, Greece

PB1-2
Consistent Study of Graphene Structures Through the Direct Incorporation of Surface Conductivity
Georgios Bouzianas, Nikolaos Kantartzis, Traianos Yioultsis, Theodoros Tsiboukis
Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Greece

PB1-3
Modeling of Frequency Selective Surfaces using Impedance Type Boundary Condition
Tamás Gombor, József Pávó
Budapest University of Technology and Economics, Hungary

PB1-4
Reduction of Unphysical Wave Reflection Arising from Space-Time Finite Integration Method
Tetsuji Matsuo, Takeshi Mifune
Kyoto University, Japan

PB1-5
Attenuation Properties of Electrically Large Periodic Structures Applying FEM
Werner Renhart, Christian Tuerk, Thomas Bauernfeind, Christian A. Magele
Graz University of Technology, IGTE, Austria

PB1-6
The FEM-SRBCI Method for the Solution of Scalar Scattering Problems
Salvatore Alfonzetti[1], Giuseppe Borzì[2], Nunzio Salerno[1]
[1]University of Catania, Italy; [2]University of Mesina, Italy

PB1-7
Analysis of Microstrip Patch Antennas on Nanostructured Ceramic Substrate by an Iterative Method Based on Transversal Wave Concept
Valdemir Praxedes Silva Neto[1], Joemia Leilane Medeiros[2], Adaildo Gomes Dassuncao[3], Laercio Martins Mendonca[4], Joao Bosco Oliveira[5]
[1]Federal University of Rio Grande do Norte, Brazil; [2]Federal University of Rio Grande do Norte, Brazil; [3]Federal University of Rio Grande do Norte, Brazil; [4]Federal University of Rio Grande do Norte, Brazil; [5]Federal University of Rio Grande do Norte, Brazil

PB1-8
An Exponential Time Differencing Algorithm for the FDTD-PML Analysis of Nonlinear PBG Structures
Xu Zhuansun, Xikui Ma, Qi Liu
Xi'an Jiaotong University, People's Republic of China

PB1-9
On Proper Orthogonal Decomposition for Electromagnetic Wave Problems
Yuki Sato, Hajime Igarashi
Hokkaido University, Japan

PB1-10
Analysis of Multilayer Amplifier Structure by an Efficient Iterative Technique
Alexandre Serres[1], Georgina de Freitas Serres[1], Glauco Fontgalland[1], Raimundo Freire[1], Henri Baudrand[2]
[1]UFCG, Brazil; [2]INPT, France

PB1-11
Cutoff Wavenumbers of Circular Metallic Waveguides with Eccentricity
Aristides D. Kotsis, John A. Roumeliotis
National Technical University of Athens, Greece

PB1-12
Theoretical Calculation of Optical Transfer Functions in SiC Superlens Imaging System
Seunghwa Baek, Kyoungsik Kim
Yonsei University, Republic of Korea (South Korea)

PB1-13
Enhanced Analysis of Multiconductor Nanostructured Devices via a Compact Block FDTD/VFETD Method
Nikolaos V. Kantartzis[1], Theodoros Zygiridis[2], Theodoros Tsiboukis[1]
[1]Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Greece; [2]Department of Informatics and Telecommunications Engineering, University of Western Macedonia, Kozani, Greece

PB1-14
Temperature and Electromagnetic Field Distributions of Heat-Assisted Magnetic Recording for Bit-Patterned Media at Areal Density beyond 6 Tb/in2
Arkom Kaewrawang[1], Kotchakorn Pituso[1], Puttaphon Buatong[1], Apirat Siritaratiwat[1], Anan Kruesubthaworn[2]
[1]Khon Kaen University, Khon Kaen, Thailand; [2]Khon Kaen University, Nong Khai Campus, Thailand

PB1-15
Optical Properties of Modified Nanorod Particles for Biomedical Sensing
Renato Iovine, Luigi La Spada, Lucio Vegni
University of Roma Tre, Italy

PB1-16
Geometry of the 3D Schrodinger Problem and Comparison with Finite Elements Discretization
Ruben Specogna, Francesco Trevisan
Università di Udine, Italy

PB1-17
Symmetry Breaking in Magnetic Vortex Formation near Shaped Boundary of Ferromagnetic Film
Vladimir A. Skidanov, Petr M. Vetoshko, Fedor P. Vetosko, Alexander L. Stempkovskiy
Institute for Design Problems in Microelectronics RAS, Russian Federation

	PB1-18 **Homogenization of Periodic Structures Using the Finite Element Method** Istvan Bardi, Jeffrey Tharp, Rickard Petersson ANSYS Inc., United States of America **PB1-19** **Unconventional Photolithography with Self-Assembled Plasmonic Nanostructures** Anna Vermes, Zsolt Szabó Department of Broadband Infocommunications and Electromagnetic Theory, Budapest University of Technology and Economics, Hungary **PB1-20** **3D FEM Quasimodal Analysis of the Haroche QED Cavity** Benjamin Vial, Guillaume Demesy, Frederic Zolla, Andre Nicolet Institut Fresnel, Aix-Marseille Université, France
10:45am - 12:25pm **Ballroom Foyer**	**PB2: Material Modeling 1** **Session Chairs:** Youguang Guo, Patrick Dular
	PB2-1 **Temperature Dependent Vector Hysteresis Model for Permanent Magnets** Anders Johan Bergqvist[1], Dingsheng Lin[2], Ping Zhou[2] [1]ANSYS Inc, Sweden; [2]ANSYS Inc, United States of America **PB2-2** **Influence of Skin Effect on Homogenization of Composite Materials: Application to Shielding Effectiveness** Valentin Préault[1], Romain Corcolle[1], Laurent Daniel[1,2], Lionel Pichon[1] [1]Laboratoire de Génie Électrique de Paris, CNRS (UMR 8507)/SUPELEC/UPMC/Univ Paris-Sud, France; [2]School of Materials, University of Manchester, M1 7HS, Manchester, United Kingdom **PB2-3** **A Differential Permeability 3D Formulation for Anisotropic Vector Hysteresis Analysis** Joao Pedro Assumpcao Bastos[1], Nelson Sadowski[1], Jean Vianei Leite[1], Nelson Jhoe Batistela[1], Gerard Meunier[2], Olivier Chadebec[2] [1]GRUCAD/EEL/UFSC, Brazil; [2]G2Elab (UMR CNRS 5269, Grenoble INP, Université Joseph Fourier), Grenoble, France **PB2-4** **A FIT Formulation of Bianisotropic Materials over Polyhedral Grids** Piergiorgio Alotto[1], Lorenzo Codecasa[2] [1]Università di Padova, Italy; [2]Politecnico di Milano, Italy **PB2-5** **Calculation of Basic Domain Width Considering Lancet Domains in (110)[001]Fe3%Si** Keiji Iwata[1,2], Satoshi Arai[1], Kazushi Ishiyama[2] [1]Nippon Steel & Sumitomo Metal Corporation, Japan; [2]Research Institute of Electrical Communication, Tohoku University, Japan

PB2-6
Improved Vector Play Model and Parameter Identification for Magnetic Hysteresis Materials
Dingsheng Lin[1], Ping Zhou[1], Anders Johan Bergqvist[2]
[1]Ansys Inc., United States of America; [2]Ansys Inc., Sweden

PB2-7
Measurement and Modeling of Anisotropic Magnetostriction Characteristic of Grain-Oriented Silicon Steel Sheet under DC Bias
Yanli Zhang, Jiayin Wang, Xiaoguang Sun, Baodong Bai, Dexin Xie
Shenyang University of Technology, People's Republic of China

PB2-8
Effect of Variation of DC Bias on Loss and Flux inside GO Electrical Steel Lamination
Zhigang Zhao[1], Zhiguang Cheng[2], Norio Takahashi[3], Behzad Forghani[4], Fugui Liu[1], Yongjian Li[1], Lanrong Liu[2], Junjie Zhang[2], Weili Yan[1]
[1]Joint Key Laboratory of EFEAR, Hebei University of Technology, People's Republic of China; [2]R & D Center, Baoding Tianwei Group Co., Ltd, People's Republic of China; [3]Dept. of E.E., Okayama University, Okayama, Japan; [4]Infolytica Corporation, Canada

PB2-9
A New Algorithm to Consider the Effects of Core Losses on 3D Transient Magnetic Fields
Ping Zhou, Dingsheng Lin, Chuan Lu, Ningning Chen, Marius Rosu
ANSYS, United States of America

PB2-10
Minor Hysteresis Loop Analysis for Magnetic Granular Systems with Local Distribution
Kenichi Terashima[1], Kenji Suzuki[1], Katsuhiko Yamaguchi[1], Tetsuya Uchimoto[2], Toshiyuki Takagi[2]
[1]Fukushima University, Japan; [2]Tohoku University, Japan

PB2-11
Vector Jiles-Atherton Hysteresis Model and Its Application to Magnetizing Analysis for an Anisotropic Bonded NdFeB Magnet
Dianhai Zhang, Ziyan Ren, C.S. Koh
Chungbuk National University, Republic of Korea (South Korea)

PB2-12
Comparison of Two Nonlinear Finite-Element Homogenization Methods for Laminated Iron Cores
Ruth V. Sabariego[1], Innocent Niyonzima[1], Johan Gyselinck[2], Christophe Geuzaine[1]
[1]Dept. of Electrical Engineering and Computer Science (ACE), University of Liège, Belgium; [2]BEAMS Department, Universite´ Libre de Bruxelles (ULB), Belgium

PB2-13
Determination of the Magnetic Properties of Composites based on Reluctance Model
Julio Carlos Teixeira[1], Élio Périgo[2], Fabio Henrique Pereira[3], José Roberto Pascon[4], Sílvio Ikuyo Nabeta[4]
[1]UFABC, Brazil; [2]Instituto de Pesquisas Tecnológicas, Brazil; [3]Universidade Nove de Julho, Brazil; [4]Escola Politécnica da USP, Brazil

PB2-14
Assessement Of 3 MA Technique Potentiality for Non Destructive Evaluation of Dual-Phase Steel Using 2D Non Linear FEM and Taking Hysteretic Behavior into Account
Yasmine Gabi[1], Afef Kedous-Lebouc[2], Gerard Meunier[2], Bernd Wolter[1], Olivier Geoffroy[2], Philip Meilland[3], Patrice Labie[2], Christophe Guerin[4]
[1]IZFP Fraunhofer institute, Germany; [2]G2elab, electrical ingineering laboratory; [3]ArcelorMittal, Maizières les metz; [4]Cedrat group

PB2-15
A Study on the Deperming of Isotropic Ferromagnetic Material Using Vector M-B Preisach Model
Hyuk Won[1], Hye Sun Ju[2], Gwan Soo Park[2]
[1]Korea Marine Equipment Research Institute, Republic of Korea (South Korea); [2]School of Electrical Engineering, Pusan National University, Republic of Korea (South Korea)

PB2-16
A Jiles-Atherton based Hysteresis Model for Magnetic Materials under Complex Magneto-mechanical Loadings
Laurent Bernard, Xavier Mininger, Laurent Daniel, Jean Viane Leite, Nelson Sadowski, Nelson Jhoe Batistela
LGEP, France

PB2-17
Measurement and Modeling of Anhysteretic Curves
Seyed Ali Mousavi, Andreas Krings, Göran Engdahl, Ara Bissal
Royal Institute of Technology (KTH), Sweden

PB2-18
Vector Generalization of Uniaxial Models for Magnetomechanical Hysteresis and Magnetostriction
Paavo Rasilo[1], Deepak Singh[1], Reijo Kouhia[2], Anouar Belahcen[1], Antero Arkkio[1]
[1]Aalto University, Finland; [2]Tampere University of Technology, Finland

10:45am - 12:25pm Corvina	**PB3: Electrical Machines & Drives 2** **Session Chairs:** Markus Clemens, Johan Gyselinck
	PB3-1 **Characteristic Analysis Method of Irreversible Demagnetization in Single-phase LSPM Motor** Byeong-Hwa Lee, Jae-Woo Jung, Kyu-Sub Kim, Jung-Pyo Hong Hanyang University, Republic of Korea (South Korea) **PB3-2** **Development of Electric Machine for Robot Eyes by Using Analytical Electromagnetic Field Computation Method** Dongwoo Kang[1], Sunghong Won[2], Ho-Joon Lee[1], Ju Lee[1] [1]Hanyang University, Republic of Korea (South Korea); [2]Dong Yang Mirae University, Republic of Korea (South Korea) **PB3-3** **Optimum Design of a Switched Reluctance Motor Fed by Asymmetric Bridge Converter Using Experimental Design Method** Takeo Ishikawa, Yoshinori Hashimoto, Nobuyuki Kurita Gunma University, Japan **PB3-4** **A Novel Stator and Rotor Dual Permanent Magnet Vernier Motor with Space Vector Pulse Width Modulation** Shuangxia Niu, S. L. Ho, W. N. Fu The Hong Kong Polytechnic University, Hong Kong S.A.R. (China) **PB3-5** **Design and Analysis of Electric Controlled Permanent Magnet Excited Synchronous Machine** Ryszard Palka, Piotr Paplicki, Marcin Wardach West Pomeranian University of Technology, Poland **PB3-6** **A Noble Method for Minimization of Cogging Torque and Torque Ripple for Interior Permanent Magnet Synchronous Motor** Ki-Chan Kim Hanbat National University, Republic of Korea (South Korea) **PB3-7** **Characteristic Analysis for Concentrated Multiple-layer Winding Machine with Optimum Turn Ratio** Hae-Joong Kim[1], Do-Jin Kim[2], Joong-Pyo Hong[3] [1]Hanyang University, Republic of Korea (South Korea); [2]Hanyang University, Republic of Korea (South Korea); [3]Hanyang University, Republic of Korea (South Korea) **PB3-8** **Air-gap Magnetic Field Analysis of Wind Generator with PM Embedded Salient Poles by Analytical and Finite Element Combination Technique** Yujing Guo, Heyun Lin, Yunkai Huang, Shuhua Fang, Hui Yang, Kang Wang Engineering Research Center for Motion Control of Ministry of Education, Southeast University, Nanjin, People's Republic of China

PB3-9
Magnet Flux Focusing Design of Double Stator Permanent Magnet Vernier Machine
Fei Zhao[1], Thomas A. Lipo[2], Byung-il Kwon[1]
[1]Hanyang University, Republic of Korea (South Korea); [2]University of Wisconsin-Madison, Madison, United States of America

PB3-10
Calculation of Core Loss of a Transverse Flux Motor with SMC Stator Core and Mild Steel Rotor Yoke
Youguang Guo, Jianguo Zhu, Haiyan Lu
University of Technology Sydney, Australia

PB3-11
Comparison of Halbach and Dual-Side Veriner Permanent Magnet Machines
Dawei Li, Ronghai Qu, Zhe Zhu
Huazhong University of Science and Technology, People's Republic of China

PB3-12
Optimal Rotor Design of an 150kW-Class IPMSM through the 3D Voltage-Inductance Map Analysis Method
Tae-Chul Jeong, Mi-Jung Kim, Ki-Deok Lee, Jung-Ho Han, Hyun-Jong Park, Ju Lee
Hanyang University, Republic of Korea (South Korea)

PB3-13
Design and Characteristic Analysis of Novel Hybrid Transverse Flux Type Switched Reluctance Generator for Wind Turbine
Sun-il Kang, Jin-hee Lee, Byung-il Kwon
Hanyang Univ., Republic of Korea (South Korea)

PB3-14
Core Loss Analysis for the Planar Switched Reluctance Motor
J.F. Pan[1], F. J. Meng[1], Norbert Cheung[2]
[1]School of Mechatronics and Control Engineering, Shenzhen University, P.R.C.;
[2]Department of Electrical Engineering, Hong Kong Polytechnic University, P.R.C.

PB3-15
Zero Torque Pulsation of Surface Permanent Magnet Synchronous Motor for Ship Gyro Stabilizer by Pole/Slot Number and Air-gap Designs
Sun Kwon Lee[1,2], Gyu Hong Kang[1], Jin Hur[2], Byoung Woo Kim[2]
[1]Korea Marine Equipment Research Institute, Republic of Korea (South Korea);
[2]University of Ulsan

PB3-16
Current Harmonics Loss Analysis of a 150kW-Class Traction Interior Permanent Magnet Synchronous Motor Through Co-analysis of d-q Axis Current Control and Finite Element Method
Tae-Chul Jeong, Mi-Jung Kim, Jae-Jun Lee, Se-Young Oh, Ju Lee
Hanyang University, Republic of Korea (South Korea)

PB3-17
A New Quasi-3D Analytical Model of Axial Flux Permanent Magnets Machines
Huguette Tiegna, Yacine Amara, Georges Barakat
University of Le Havre, France

	PB3-18 **Research on the Radial Electromagnetic Forces of an Inverter-Fed Induction Machine on Different Load Conditions Using FEM** Tao Huang[1], Hailong Liu[2], Jiangjun Ruan[1], Yujiao Zhang[3], Sichao Yi[1], Hengyu Ding[1], Yuanchao Hu[1] [1]School of Electrical Engineering, Wuhan University, People's Republic of China; [2]Wuhan Institute of Marine Electric Propulsion, CSIC, People's Republic of China; [3]School of Electrical Engineering and Renewable Energy, China Three Gorges University, People's Republic of China **PB3-19** **Fast Simulations of 3D Axial Switched Reluctance Motor Drives** Konstantin Frank Porzig[1], Marek Ziolkowski[1], Hartmut Brauer[1], Tobias Kellerer[1], Sandro Purfürst[2] [1]TU Ilmenau, Germany; [2]driveXpert, Germany **PB3-20** **The Iron Loss Error Comparison of IPMSM according to Fitting Function** Yong-Tae Kim, Gyu-Won Cho, Gyu-Tak Kim changwon National University, Republic of Korea (South Korea) **PB3-21** **A Fast Diagnosis Technique of Inter-Turn Fault in BLDC Motor Using Impedance Algorithm** Chae-Lim Jeong, Jin Hur University of Ulsan, Republic of Korea (South Korea) **PB3-22** **Loss & Efficiency Comparisons of PMA-, CW-, Normal SynRMs by Coupled Preisach Models & FEM and Experiment** Young Hyun Kim, Pil Won Lee, Jung Ho Lee Hanbat National University, Republic of Korea (South Korea) **PB3-23** **Design and Analysis of a Magnetless Dual-Mode DC-Excited Multitoothed Switched Reluctance Machine** Christopher H.T. Lee, K.T. Chau, Chunhua Liu, Mu Chen The University of Hong Kong, Hong Kong S.A.R. (China) **PB3-24** **Permanent Magnet Motor Design for Turret Applications with Large Diameter** Ji-Young Lee, Dae-Suk Joo, Do-Kwan Hong, Shi-Uk Chung, Byung-Chul Woo Korea Electrotechnology Research Institute, Republic of Korea (South Korea) **PB3-25** **Numerical Design Compatibility of Induction Motor with respect to Voltage and Current Source** Jihyun Ahn[1], Cheol-Gyun Lee[2], Yong-Jae Kim[3], Hyun-kyo Jung[4], Sang-Yong Jung[1] [1]Sungkyunkwan University, Republic of Korea (South Korea); [2]Department of Electrical Engineering., Dong-Eui University, Republic of Korea (South Korea); [3]Dept.of Electrical Engineering College of Engineering, Chosun University, Republic of Korea (South Korea); [4]Seoul National University, Republic of Korea (South Korea)
12:25pm - 1:45pm	**Lunch**

1:45pm - 3:25pm Corvina	**PB4: Electromagnetic Compatibility + Nano-Electromagnetic Computation and Applications** **Session Chairs:** Andre Nicolet, Werner Renhart
	PB4-1 **Calculation of Current Distribution in the Lightning Protective System of a Residential House** Ping Wang[1], Lin Li[1], Vladimir A. Rakov[2] [1]1) State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources(North China Electric Power University), People's Republic of China; [2]Department of ECE, University of Florida, United States of America
	PB4-2 **Resultant Electic Field Reduction with Shielding Wires under Bipolar HVDC Transmission Lines** Feng Tian[1], Rong Zeng[1], Zhanqing Yu[1], Han Yin[1], Bo Zhang[1], Lei Liu[2], Min Li[2], Ruihai Li[2], Jinliang He[1] [1]Department of Electrical Engineering, Tsinghua University, People's Republic of China; [2]Electric Power Research Institute, China Southern Power Grid, People's Republic of China
	PB4-3 **Estimating Far-field Emissions from Simulated Near-field Data Using Neural Networks** Luciana Firmino[1], Adroaldo Raizer[1], Yves Marechal[2] [1]UFSC - PGEEL, Brazil; [2]G2Elab, Grenoble Electrical Engineering Laboratory, France
	PB4-4 **Electromagnetic Signature Study of a Power Inverter Connected to an Electric Motor Drive** Mohammadreza Barzegaran[1], Arash Nejadpak[2], Osama Mohammed[3] [1]Florida International University, United States of America; [2]Florida International University, United States of America; [3]Florida International University, United States of America
	PB4-5 **Modeling Approach for the Assessment of Field Distribution and Uniformity in Anechoic Chambers** Irina Munteanu[1,2], Ralf Kakerow[3] [1]CST AG, Germany; [2]Graduate School of Computational Engineering, TU Darmstadt, Germany; [3]Continental Automotive GmbH, Germany
	PB4-6 **Computational Analysis of Shielding Problems for System in Package using VEMC System** Boyuan Zhu[1], Junwei Lu[1], Ling Sun[2], Haiyan Sun[2], Lingling Yang[2], Mingcheng Zhu[3] [1]Griffith University, Australia; [2]Nantong University, China; [3]Shenzhen University, People's Republic of China
	PB4-7 **Reduction of EMI Effects in Motor Drives and Complex Power Electronic Systems** Matthew McDonough, Pourya Shamsi, Babak Fahimi The University of Texas at Dallas, United States of America

PB4-8
A Methodology for Modeling a Power Cable in Frequency Domain
Ahmed Hassan, Moawia Al-Hamid, Ralf Vick
Otto-von-Guericke University Magdeburg, Germany

PB4-9
Absorbing Surfaces using EBG Structures
Stylianos D. Assimonis, Theofano M. Kollatou, Traianos V. Yioultsis, Christos S. Antonopoulos
Aristotle University of Thessaloniki, Greece

PB4-10
Calculation of the Lightning Electromagnetic Fields Using Non-uniform FDTD Mesh with Soil Ionization
Taobin Jin, Boyuan Zhang, Yuelong Jia, Jun Zou, Jiansheng Yuan
Tsinghua University, People's Republic of China

PB4-11
Ground Effects on Electrical Fields around Power Line Carrier Channels
Francisco Rodrigues Sabino Jr., Gabriel Gonçalves Machado, Marcos Tavares de Melo, Luiz Henrique Alves de Medeiros
UFPE, Brazil

PB4-12
A Kind of Tortuosity Lightning Channel Model and Calculation of Its Radiated Fields
Yan Zhang, Youhua Wang, Fugui Liu, Rongmei Liu, Yongjian Li
Province-Ministry Joint Key Lab of Electromagnetic Field and Electrical Apparatus Reliability Hebei University of Technology, People's Republic of China

PB4-13
Near-infrared Invisibility Cloak Engineered with Two-phase Metal-dielectric Composites
Koppány István Körmöczi, Zsolt Szabó
Budapest University of Technology and Economics, Hungary

PB4-14
Computation of Effective Surface and Bulk Parameters of Electromagnetic Metamaterials
Xiaoyan Y.Z. Xiong[1], Li Jun Jiang[1], Vadim A. Markel[2], Igor Tsukerman[3]
[1]Department of Electrical and Electronic Engineering, The University of Hong Kong; [2]Departments of Radiology and Bioengineering, University of Pennsylvania; [3]The Univ. of Akron, United States of America

PB4-15
Dirichlet-to-Neumann Transparent Boundary Conditions for Photonic Crystal Wave-guides
Dirk Klindworth, Kersten Schmidt
Technische Universität Berlin, Germany

PB4-16
Statistical Study of high-Q Photonic Crystal Resonators
Bastian Bandlow, Rolf Schuhmann
TU Berlin, Germany

	PB4-17 **Parallel Finite Difference Time Domain Codes for Electromagnetic Metamaterial Calculations** Zsolt Szabó, Arnold Kalvach Department of Broadband Infocommunications and Electromagnetic Theory, Budapest University of Technology, Hungary **PB4-18** **Efficient Implementation of the CFS-PML on a Curved Two-Dimensional Domain** Alex Sander Moura[1], Rodney Rezende Saldanha[2], Élson José Silva[2], Adriano Chaves Lisboa[3], Werley Gomes Facco[4] [1]UFJF, Brazil; [2]UFMG, Brazil; [3]ENACOM, Brazil; [4]IFES, Brazil **PB4-19** **Optimization of a Thin Film Solar Cell with Metallic Nanoparticles** Giovanni Aiello[1], Salvatore Alfonzetti[1], Giuseppe Borzì[2], Viviana Chiarello[1], Nunzio Salerno[1] [1]DIEEI - University of Catania, Italy; [2]DIC - University of Messina, Italy **PB4-20** **Computation of Transient Electromagnetic Fields Surrounding Grounding Systems** Moussa Lefouili[1], Ilhem Hafsaoui[1], Kamal Kerroum[2], Khalil Elkhamlichi Drissi[2] [1]LAMEL Laboratory, Jijel University, Algeria; [2]Institut Pascal, Blaise Pascal Université, France
1:45pm - 3:25pm **Corvina**	**PB5: Numerical Techniques 2 + Software Methodology** **Session Chairs:** Ruth V. Sabariego, Tetsuji Matsuo
	PB5-1 **Lazy Cohomology Generators: A Breakthrough in (Co)Homology Computations for CEM** Pawel Dlotko[2], Ruben Specogna[1] [1]Università di Udine, Italy; [2]Jagiellonian University in Krakow, Poland **PB5-2** **Finite Element Analysis of Three-Phase Three-Limb Power Transformers under DC Bias** Oszkár Bíró[1], Gergely Koczka[2], Gerald Leber[2], Kurt Preis[1], Bernhard Wagner[2] [1]IGTE/TU Graz, Austria; [2]Siemens AG Austria - Transformers Weiz **PB5-3** **Adaptive Discontinuous Galerkin Method for Transient Analysis of Eddy Current Fields in High-speed Rotating Solid Rotors** S. L. Ho, Yanpu Zhao, W. N. Fu The Hong Kong Polytechnic University, Hong Kong S.A.R. (China) **PB5-4** **A Split Step Precise Integration Time Domain Method and its Numerical Dispersion** Qi Liu, Xikui Ma, Xu Zhuansun Xi'an Jiaotong University, People's Republic of China

PB5-5
Parallel Multigrid Acceleration for the Finite Element Gaussian Belief Propagation Algorithm
Yousef El-Kurdi, Warren Gross, Dennis Giannacopoulos
McGill University, Canada

PB5-6
Stochastic Finite Integration Technique Formulation for Electrokinetics
Lorenzo Codecasa, Luca Di Rienzo
Politecnico di Milano, Italy

PB5-7
Computed Basis Functions and the Nonconforming Voxel Finite Element Method
Moein Nazari, Jon P. Webb
McGill University, Canada

PB5-8
Initial Value Problem Formulation of 3D Time Domain Boundary Element Method
Hideki Kawaguchi[1], Seiya Itasaka[1], Thomas Weiland[2]
[1]Muroran Institute of Technology, Japan; [2]Technische Universitaet Darmstadt, Germany

PB5-9
Fast Multipole Method Accelerated Meshfree Post-Processing in 3D Boundary Element Methods
André Buchau, Wolfgang M. Rucker
Universität Stuttgart, Institut für Theorie der Elektrotechnik, Germany

PB5-10
Efficient Numerical Integration for Post-processing and Matrix Assembly of Finite Element Subdomains
Ryan Galagusz, Steve McFee
McGill University, Canada

PB5-11
Energetic Galerkin Projection of Electromagnetic Fields between Different Meshes
Zifu Wang[1], Zuqi Tang[2], Thomas Henneron[2], Francis Piriou[2], Jean-Claude Mipo[1]
[1]Valeo, France; [2]L2EP, University of Lille 1, France

PB5-12
Temporal Length for Sub-Domain Models in Multi-Physics and System Analysis
Aron Antal Szucs
ABB OY, Motors and Generators, Finland

PB5-13
A Novel Hybrid Method Combining DGTD and TDIE for Wire Antenna-Dielectric Interaction
S. P. Gao[1,2], Y. L. Lu[1], Q. S. Cao[2]
[1]Nanyang Technological University, Singapore; [2]Nanjing University of Aeronautics and Astronautics, China

PB5-14
Spherical Harmonics Coefficients of All Magnetic Field Components Generated by Iron Piece
So Noguchi[1], SeokBeom Kim[2]
[1]Hokkaido University, Japan; [2]Okayama University, Japan

PB5-15
Modeling of Inductors Printed on Flexible Substrates Including the Edge Effect
Nikola Jeranče
Faculty of Technical Sciences Novi Sad, Serbia

PB5-16
Galerkin Finite Element Method for Calculating 3D Ion Flow Field
Yongzan Zhen, Xiang Cui, Tiebing Lu, Xuebao Li, Xiangxian Zhou
North China Electric Power University, People's Republic of China

PB5-17
A Distributed Parallel Approach using the Conjugate Gradient Method and the N-Scheme on FEM cases
Juliana Eyng[1], João Pedro Assumpção Bastos[1], Mário Antônio Ribeiro Dantas[1], Maginot Júnior[1], Marcos Fischborn[2]
[1]Universidade Federal de Santa Catarina, Brazil; [2]Universidade Tecnológica Federal do Paraná, Brazil

PB5-18
Homogenization Techniques of Conductive and Non-magnetic Components Taking Account of Eddy Currents in Magnetic Field Analysis
Lin Cheng, Kenji Ikenaga, Yanhui Gao, Hiroshi Dozono, Kazuhiro Muramatsu
Saga University, Japan

PB5-19
A Finite-Resistance-Network Based Method to Determine the Equivalent DC Resistance of a Conducting Region
Marco Arjona, Roberto B.B. Ovando-Martinez, Coni Hernandez
Instituto Tecnologico de la Laguna, Mexico

PB5-20
The Natural Element Method Applied to Solve Electromagnetic Scattering Problem
Marcio Matias Afonso[1], Brahim Ramdane[2], Yves Marechal[2], Benoit Delinchant[2], Marco Aurélio de Oliveira Schroeder[1], Ursula do Carmo Resende[1]
[1]CEFET-MG, Brazil; [2]G2ELAB, France

PB5-21
Efficient Preconditioned Conjugate Gradient Parallelization on GPU
Ana Flávia Peixoto de Camargos[1,2], Viviane C. Silva[1]
[1]Escola Politécnica da Universidade de São Paulo, Brazil; [2]Instituto Federal de Educação, Ciência e Tecnologia de Minas Gerais (IFMG) – Departamento de Engenharia

PB5-22
Computation Code of Software Component for the Design by Optimization of Electromagnetical Devices
Hoa Nguyen Xuan, Laurent Gerbaud, Lauric Gabuio, Frédéric Wurtz
Grenoble Electrical Engineering Laboratory (Grenoble INP-UJF, CNRS UMR 5529), France

PB5-23
Improving a Time Domain Spherical Multipole Near-to-far-field Transformation Algorithm
Glaucio Lopes Ramos[1], Cássio Gonçalves Rego[2], Alexandre Ramos Fonseca[3]
[1]UFSJ, Brazil; [2]UFMG, Brazil; [3]UFVJM, Brazil

	PB5-24 **A New and Simple Technique for Vectorization of Finite Element Method in Electromagnetics** Carlos Henrique Veloso[1], Antonio Manoel Frasson[2], Kleber Zuza Nobrega[1] [1]Instituto Federal do Maranhao, Brazil; [2]Universidade Federal do Espirito Santo
1:45pm - 3:25pm **Ballroom Foyer**	**PB6: Devices & Applications 2** **Session Chairs:** Zhuoxiang Ren, Renato Mesquita
	PB6-1 **Modeling Coreless Transformers with Relative Large Wire Gauge using an Optimization Method** Renan Bergonsi Muller, Daniela Wolter Ferreira, Luiz Lebensztajn Universidade de São Paulo, Brazil **PB6-2** **Simulation Based Design of HF-Resonators for Damping of Very Fast Transients in GIS** Jasmin Smajic, Abdolhamid Shoory, Simon Burow, Walter Holaus, Uwe Riechert, Stefan Tenbohlen University of Applied Sciences of Eastern Switzerland, Switzerland **PB6-3** **Aspect Independent Spherical Target Recognition Using Structural Features of Scattered Signals** Alper Selver[1], Yesim Zoral[2], Suat Dorak[3] [1]Dokuz Eylul University, Turkey; [2]Dokuz Eylul University, Turkey; [3]Dokuz Eylul University, Turkey **PB6-4** **3D Finite Element Analysis of Conductive Coupling Problems in Transmission Line Rights of Way** Lucas Blattner Martinho[1], Viviane Cristine Silva[1], Mário Leite Pereira Filho[2], Marcelo Facio Palin[3], Sérgio Luis Lopes Verardi[3], José Roberto Cardoso[1] [1]Escola Politécnica da Universidade de São Paulo, Brazil; [2]Instituto de Pesquisas Tecnológicas, Brazil; [3]InSciTi Consultoria e Desenvolvimento de Software, Brazil **PB6-5** **Forward Model Computation of Quasi-static Magnetic Fields inside Electric Vehicles** Olivier Pinaud[1], Olivier Chadebec[1], Laure Line Rouve[1], Jean Michel Guichon[1], Andrea Vassilev[2] [1]G2Elab, UMR CNRS, Grenoble INP, Université Joseph Fourier Grenoble, France; [2]CEA-Leti MINATEC Grenoble, France **PB6-6** **Static Characteristics of Novel Air-cored Linear and Rotary Halbach Permanent Magnet Actuator** Ping Jin Hohai University, People's Republic of China

PB6-7
Design Analyses of a Hybrid Suspension System for Scooter Application
Cheng-Tsung Liu[1], Wei-Ping Lin[1], Chang-Chou Hwang[2]
[1]National Sun Yat-Sen University, Taiwan, Republic of China; [2]Feng Chia University, Taiwan, Republic of China

PB6-8
Analysis and Performance Evaluation of a Novel High Reliability Linear Switch Reluctance Machine for Low Cost Conveyor Applications
Daohan Wang[1], Xiuhe Wang[1], Sang-Yong Jung[2]
[1]Shandong University, People's Republic of China; [2]Sungkyunkwan University, Republic of Korea (South Korea)

PB6-9
Design of Wireless Power Transmission for a Charge while Driving System
Davide Bavastro, Aldo Canova, Vincenzo Cirimele, Fabio Freschi, Luca Giaccone, Paolo Guglielmi, Maurizio Repetto
Politecnico di Torino, Italy

PB6-10
FEM-Simulation of Magnetic Shape Memory Actuators
Thomas Schiepp[1], Manuel Maier[1], Emmanouel Pagounis[1], Andreas Schlüter[2], Markus Laufenberg[1]
[1]ETO MAGNATIC GmbH, Germany; [2]University of Applied Sciences Munich

PB6-11
A Study on Novel Slotless Design of Variable Reluctance Resolver
Ki-Chan Kim
Hanbat National University, Republic of Korea (South Korea)

PB6-12
A Design Proposal for Optimal Transcutaneous Energy Transmitters
Daniela Wolter Ferreira[1], Luiz Lebensztajn[1], Laurent Krähenbühl[2], Florent Morel[2], Christian Vollaire[2]
[1]Escola Politécnica da Universidade de São Paulo, Brazil; [2]École Centrale de Lyon, France

PB6-13
An Optimal Design of Compact Ring-slot type Rectenna with Numerical Manipulation
Koon-Tae Kim[2], Hyeong-Seok Kim[2], Kyung Choi[1]
[1]Kangwon National University, Republic of Korea (South Korea); [2]Chung-Ang University, Republic of Korea (South Korea)

PB6-14
A 3D Electromagnetic Analysis and Circuit Modeling for Wireless Charging of Electrical Vehicles
Mohammad Fawwaz Ibrahim, Lionel Pichon, Laurent Bernard, Adel Razek
Laboratory of Electrical Engineering of Paris (LGEP), France

PB6-15
Design Cycle of Electromechanical Actuator Based on VHDL-AMS Modeling
Abir Rezgui[1], Benoit Delinchant[1], Laurent Gerbaud[1], Julien Henri-Rousseau[2], Roger Franchino[2]
[1]G2ELAB, Grenoble Electrical Engineering lab, Grenoble University, France; [2]Schneider Electric, France

	PB6-16 **Modeling and Simulation of Medium Voltage Cable in Time Domain Using Fitting Method** Ming Tang[1], Jianyang Sun[2], Jianzhao Guo[2], Hong-Jie Li[1], Wei Zhang[1], Deliang Liang[1] [1]State Key Laboratory of Electrical Insulation and Power Equipment, School of Electrical Engineering Xian JiaoTong University, People's Republic of China; [2]Quanzhou Power Supply Ltd., People's Republic of China
3:25pm - 3:50pm	**Coffee Break**
3:50pm - 5:30pm **Ballroom**	**OB2: Optimization & Design 2** **Session Chairs:** Stéphane Clénet, C.S. Koh
	OB2-1 **Novel Topology Optimization Based on On-Off Method and Level Set Approach** Yuki Hidaka, Takahiro Sato, Hajime Igarashi Graduate School of Information Science and Technology, Japan **OB2-2** **A Multiobjective Approach of Differential Evolution Optimization Applied to Electromagnetic Problems** Luiz Lebensztajn, Gustavo Caravaggi Tenaglia Escola Politécnica da Universidade de São Paulo, Brazil **OB2-3** **An Architecture for Emedding Knowledge in the Design of Electromagnetic Devices** David Lowther, Ernest Freeman, Jon Webb Infolytica Corporation, Canada **OB2-4** **Axial-Flux Generator Robust Design Aided by Numerical Electromagnetic Field Computation** Claret Laurente Sabioni, Selênio Rocha Silva, João Antônio Vasconcelos Federal University of Minas Gerais, Brazil **OB2-5** **Bouc-Wen Hysteresis Model Identification by the Metric-Topological–Evolutionary Optimization** Antonino Laudani, Francesco Riganti Fulginei, Alessandro Salvini University of RomaTre, Italy
5:40pm - 7:00pm	**TEAM: Benchmarking** **Session Chair:** Oszkár Bíró
	TEAM-1 **A Benchmark Problem for Eddy Current Nondestructive Evaluation** Theodoros Theodoulidis[1], John Martinos[1], Nikolaos Poulakis[2], Antonello Tamburrino[3] [1]University of Western Macedonia, Greece; [2]Technological Education Institute of Western Macedonia, Greece; [3]University of Cassino, Italy **TEAM-2** **A Benchmark CAD Mobile Phone Model for Specific Absorption Rate Calculations** Vikass Monebhurrun[1], Yannis Braux[2], Harald Devos[3], Mikhail Kozlov[4], Winfried Simon[5], Tilmann Wittig[6] [1]SUPELEC, France; [2]CST, France; [3]Agilent, Belgium; [4]Max Planck Institute, Germany; [5]IMST, Germany; [6]CST, Germany **TEAM-3** **A Benchmark Problem of Vector Magnetic Hysteresis for Numerical Models** Ermanno Cardelli, Antonio Faba Department of Industrial Engineering, University of Perugia, Perugia, Italy

Date: Wednesday, 03/Jul/2013	
8:30am - 10:10am **Ballroom**	**OC1: Material Modeling 2 (dedicated to the memory of Norio Takahashi)** **Session Chairs:** Osama Mohammed, Hajime Igarashi
	OC1-1 **Iron Loss Calculation in Steel Laminations at High Frequencies** François Henrotte[1], Simon Steentjes[2], Christophe Geuzaine[3], Kay Hameyer[2] [1]UCL, Belgium; [2]IEM RWTH-Aachen, Germany; [3]ACE, ULg **OC1-2** **Convolution-Free Modelling of Dispersive Media in the Time-Domain Finite-Element Solution of the Vector Wave Equation** Ali Akbarzadeh Sharbaf, Dennis D. Giannacopoulos McGill University, Canada **OC1-3** **Numerical Modeling of Hysteresis in Si-Fe Steels** Ermanno Cardelli[1], Edward Della Torre[2], Antonio Faba[1] [1]Department of Industrial Engineering, University of Perugia, Perugia, Italy; [2]The George Washington University, United States of America **OC1-4** **Complex-Variable Vector Magnetic Characteristic Analysis considering Residual Stress Effect** Shingo Zeze, Yuichiro Kai, Takashi Todaka, Masato Enokizono Oita University, Faculty of Engineering, Japan
10:10am - 10:35am	**Coffee Break**
10:35am - 12:15pm **Ballroom Foyer**	**PC1: Bio-Electromagnetic Computation and Applications + Education** **Session Chairs:** Hartmut Brauer, Maurizio Repetto
	PC1-1 **A Novel Inversion Technique for Imaging Thrombus Volume in Microchannels Fusing Optical and Impedance Data** Antonio Affanni[1], Giovanni Chiorboli[2], Lorenzo Codecasa[3], Maria Rita Cozzi[4], Luigi De Marco[4], Mario Mazzucato[4], Carlo Morandi[2], Ruben Specogna[1], Marco Tartagni[5], Francesco Trevisan[1] [1]Università di Udine, Italy; [2]Università di Parma, Italy; [3]Politecnico di Milano, Italy; [4]National Cancer Institute CRO-IRCCS, Aviano (PN), Italy; [5]Università di Bologna, Italy **PC1-2** **Electromagnetic Actuation System using Helmholtz Pairs for Micro-robot Locomotion** Chan Park[1], Jeonghoon Yoo[2], Jinsoo Kim[3], Seung-Jong Kim[4] [1]Graduate School of Mechanical Engineering, Yonsei University, Republic of Korea (South Korea); [2]School of Mechanical Engineering, Yonsei Univeristy, Republic of Korea (South Korea); [3]Center for Bionics, Korea Institute of Science and Technology, Republic of Korea (South Korea); [4]Center for Bionics, Korea Institute of Science and Technology, Republic of Korea (South Korea)

PC1-3
Induced Current Calculation in Detailed 3D Adult and Child Model for the WPT Frequency Range
Hye-Jin Song[1], Hansu Shin[1], Hyang-Beom Lee[1], Jae-Hun Yoon[2], Jin-Kyu Byun[1]
[1]Soongsil University, Republic of Korea (South Korea); [2]Electronics and Telecommunications Research Institute, Republic of Korea (South Korea)

PC1-4
A Strategy for the Combined Estimation of Tissues Properties and Brain Sources in EEG-MEG Analysis
Fabrizio Ferraioli, Alessandro Formisano, Raffaele Martone
Seconda Università di Napoli, Italy

PC1-5
Comparison between Electric Field Analysis Methods Induced in Human Body by ELF Magnetic Field
Yasuhito Takahashi[1], Akira Ahagon[2], Koji Fujiwara[1], Takeshi Iwashita[3], Hiroshi Nakashima[3]
[1]Doshisha University, Japan; [2]Science Solutions International Laboratory, Inc., Japan; [3]Kyoto University, Japan

PC1-6
Deep Brain Stimulation Models Incorporating Electrode-Tissue Interfaces
Charles T. M. Choi, Yi-Lin Tsou
National Chiao Tung University, Taiwan, China

PC1-7
Analysis of Magnetic Disturbance due to Paramagnetic Metallic Implant in Magnetic Resonance Imaging
Yanhui Gao[1], Yui Esaki[1], Hiroshi Dozono[1], Kazuhiro Muramatsu[1], Toru Yamamoto[2]
[1]Saga University, Japan; [2]Hokkaido University, Japan

PC1-8
A Numerical Computation Model of Electrical Impedance Tomography Forward Problem Based on Generalized Finite Element Method
Xueying Zhang, Guizhi Xu, Shuai Zhang, Youhua Wang, Weili Yan, Yongjian Li, Yonguang Guo
Hebei University of Technology, People's Republic of China

PC1-9
Electromagnetic Field Computation in Human Body Exposed to Wireless Inductive Charging System
Ping-Ping Ding, Lionel Pichon, Laurent Bernard, Adel Razek
Laboratoire de Génie Electrique de Paris (LGEP), UMR8507 CNRS/SUPELEC/Univ. Paris Sud/Univ. Pierre et Marie Curie, France

PC1-10
Error Estimation in the Computation of Induced Current of Human Body in the Case of Low Frequency Magnetic Field Excitation
Thomas Lelong[1], Zuqi Tang[2], Riccardo Scorretti[3], Pierre Thomas[1], Yvonnick Le Menach[2], Emmanuel Creusé[4], Francis Piriou[2], Noel Burais[3], Cécile Miry[1], Isabelle Magne[1]
[1]EDR R&D, France; [2]L2EP, Université Lille 1, France; [3]Ampère-Lab UMR 5005 CNRS, Université Lyon 1, France; [4]LPP UMR 8524 and INRIA Lille Nord Europe, France

PC1-11
Evaluation of Electromagnetic Phenomena Induced by Transcranial Magnetic Stimulation
Oriano Bottauscio[1], Mario Champi[2], Luca Zilberti[1], Mauro Zucca[1]
[1]Istituto Nazionale di Ricerca Metrologica, Italy; [2]Dip. Energia, Politecnico di Torino, Italy

PC1-12
Massively Parallelized Boundary Element Simulation of Voxel-based Human Models Exposed to MRI fields
Oriano Bottauscio[1], Mario Chiampi[2], Luca Zilberti[1]
[1]Istituto Nazionale di Ricerca Metrologica, Torino, Italy; [2]Politecnico di Torino, Italy

PC1-13
A Note on Faraday Paradoxes
Bernhard Auchmann[1], Stefan Kurz[2], Stephan Russenschuck[1]
[1]CERN, Switzerland; [2]TUT, Finland

PC1-14
Approximate and Proper Electromagnetic Modeling in Moving Conductors
Sándor Bilicz, Szabolcs Gyimóthy
Budapest University of Technology and Economics, Hungary

PC1-15
A New 3-D Visualization System of Magnetic Field with Augmented Reality Technology for Education
Shinya Matsutomo[1], Kenta Mitsufuji[1], Yuta Hiasa[1], Fumiaki Nobuyama[2], So Noguchi[2]
[1]Niihama National College of Technology, Japan; [2]Graduate School of Information Science and Technology, Hokkaido University, Japan

PC1-16
Combined Use of Measurements, Simulation and Numerical Computation of Magnetic Fields for Power Electronics Teaching
Rosa Ana Salas, Jorge Pleite
Universidad Carlos III de Madrid, Spain

PC1-17
Large-scale Analyses of Electromagnetic Fields Using Numerical Human Body Models
Amane Takei[1], Kouhei Murotani[2], Shin-ichiro Sugimoto[2], Masao Ogino[3], Shinobu Yoshimura[2]
[1]Tomakomai National College of Technology, Japan; [2]The University of Tokyo; [3]Nagoya University

10:35am - 12:15pm Corvina	**PC2: Numerical Techniques 3** **Session Chairs:** Kurt Preis, Hideki Kawaguchi

PC2-1
Acceleration of Dynamic Bubble Mesh Generation for Large-Scale Model
Fumiaki Nobuyama, So Noguchi, Hajime Igarashi
Hokkaido University, Japan

PC2-2
Adaptive Cross Approximation Technique for Volume Integral Method Applied to Nonlinear Magnetostatic Problems
Bertrand Bannwarth[1], Anthony Carpentier[1], Vinh Le-Van[1], Olivier Chadebec[1,2], Gérard Meunier[1], Jean-Michel Guichon[1]
[1]G2ELAB, Grenoble, France; [2]GRUCAD/EEL/CTC/UFSC, Florianópolis, Brazil

PC2-3
Modeling of Trichel Pulses in the Negative Corona on a Line-to-plane Geometry
Han Yin, Bo Zhang, Jinliang He, Chijie Zhuang
Tsinghua University, People's Republic of China

PC2-4
A Posteriori Error Bounds for Krylov-based Fast Frequency Sweeps of Finite Element Systems
Yves Konkel, Ortwin Farle, Romanus Dyczij-Edlinger
Chair for Electromagnetic Theory, Saarland University, Germany

PC2-5
A Fast Frequency-domain Parameter Extraction Method Using Time-domain Finite-element Method
W. N. Fu, Xiu Zhang, S. L. Ho
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

PC2-6
GPU-Accelerated Efficient Implementation of FDTD Methods with Optimum Time-Step Selection
Theodoros Zygiridis[1], Nikolaos Kantartzis[2], Theodoros Tsiboukis[2]
[1]Univ. of Western Macedonia, Greece; [2]Aristotle Univ. of Thessaloniki, Greece

PC2-7
Extended Finite Element Method for Electric Field Analysis
Nana Duan[1], Guolin Wang[1], Weijie Xu[1], Shuhong Wang[1], Jie Qiu[1], Jian Guo Zhu[2]
[1]Xi'an Jiaotong University, People's Republic of China; [2]University of Technology, Sydney, NSW 2007, Australia

PC2-8
Isogeometric Finite Elements with Surface Impedance Boundary Conditions
Rafael Vazquez[1], Annalisa Buffa[1], Luca Di Rienzo[2], Dongwei Li[3]
[1]Istituto di Matematica Applicata e Tecnologie Informatiche del CNR; [2]Politecnico di Milano, Italy; [3]Ohio State University, United States of America

PC2-9
Circuit-Oriented Solution of Drude Dispersion Relation by the FD2TD
Silvano Cruciani[1], Valerio De Santis[2], Francesca Maradei[3], Mauro Feliziani[1]
[1]University of L'Aquila, Italy; [2]IT'IS Foundation; [3]Sapienza University of Rome, Italy

PC2-10
Compatible h-p Adaptive Refinement Strategies for Finite Element Electromagnetic Analysis in High Performance Parallel Computing Environments
Steve McFee, Dennis Giannacopoulos
McGill University, Canada

PC2-11
Comparison of Non-Overlapping Domain Decomposition Methods for the Parallel Solution of Magnetic Field Problems
Dániel Marcsa, Miklós Kuczmann
Széchenyi István University, Hungary

PC2-12
To Smooth Vertices in Field Analysis Problems, or Not to Smooth
Eugenio Costamagna
Univerity of Pavia, Department of Industrial and Information Engineering (Retired), Italy

PC2-13
Efficient Numerical Algorythms on Large Scale Magnetic Field Problems Using an Iterative Domain Decomposition Method
Daisuke Tagami
Kyushu University, Japan

PC2-14
Using AMG to Accelerate Finite Differences by GPUs in Electromagnetic/Thermal Field Simulations
Christian Richter[1], Sebastian Schöps[2], Markus Clemens[1]
[1]Bergische Universität Wuppertal, Germany; [2]Technische Universitaet Darmstadt, Germany

PC2-15
Acceleration Technique for Extended Boundary Node Method
Ayumu Saitoh[1], Taku Itoh[2], Nobuyuki Matsui[1], Atsushi Kamitani[3]
[1]University of Hyogo, Japan; [2]Tokyo University of Technology, Japan; [3]Yamagata University, Japan

PC2-16
Asymptotic Boundary Element Methods for Thin Conducting Sheets in Two Dimensions
Kersten Schmidt[1], Ralf Hiptmair[2]
[1]Technische Universität Berlin, Germany; [2]ETH Zurich, Switzerland

PC2-17
Multiply Connected 3D Transient Problem with Rigid Motion Associated with T- Ω Formulation
Chuan Lu, Ping Zhou, Dingsheng Lin, Bo He, Dinkow Sun
Ansys Inc., United States of America

PC2-18
An Iterative Algorithm for the Fast Analysis of Anisotropic Magnetic Shields
Luca Giaccone, Carlo Ragusa
Politecnico di Torino, Italy

PC2-19
Reducing the Cost of Mesh–to–mesh Data Transfer
Antoine Journeaux[1], Frederic Bouillault[1], Jean-Yves Roger[2]
[1]Laboratoire de Genie Electrique de Paris, France; [2]EDF R&D, Clamart France

	PC2-20 **Evaluation of Singular Integral Equation in MoM Analysis of Arbitrary Wire Structures** Maicon Vaz Moreira, Ursula do Carmo Resende, Marcio Matias Afonso Federal Center for Technological Education of Minas Gerais, Brazil **PC2-21** **A Novel Approach to Deal with Rotationally Symmetrical Conditions for 3D Eddy Current Field Problems** S. L. Ho[1], Shiyou Yang[2] [1]The Hong Kong Polytechnic University, Hong Kong; [2]Zhejiang University, People's Republic of China **PC2-22** **Domain Decomposition Method used in Reducing Error near Boundaries Based on Combined RBF Collocation** Yang Zou[1], K. R. Shao[1], Xiaoming Chen[1], Gang Lei[2], Youguang Guo[2], Jianguo Zhu[2] [1]College of Electrical and Electronic Engineering, Huazhong University of Science and Technology, China; [2]Faculty of Engineering and information technology, University of Technology, Australia
10:35am - 12:15pm **Corvina**	**PC3: Electrical Machines & Drives 3** **Session Chairs:** Karl Hollaus, Stanislaw Gratkowski
	PC3-1 **Design of Saliency-based Sensorless Controlled IPMSM with Concentrated Winding for EV Traction** Myung Seop Lim[1], Seung Hee Chai[1], Byeong Hwa Lee[1], Jung Pyo Hong[1], Jung Ik Ha[2] [1]Hanyang university, Republic of Korea (South Korea); [2]Seoul National univeristy, Republic of Korea (South Korea) **PC3-2** **A Novel Calculation Method on the Current Information of Vector Inverter for Interior Permanent Magnet Synchronous Motor for Electric Vehicle** Ki-Chan Kim Hanbat National University, Republic of Korea (South Korea) **PC3-3** **Improvement of Convergence Behavior for Steady-State Analysis of Permanent Magnet Synchronous Motor** Hirokatsu Katagiri, Yoshihiro Kawase, Tadashi Yamaguchi Gifu University, Japan **PC3-4** **Airgap Reluctance Identification for the Magnetic Equivalent Circuit Modelling of Induction Machines** Johan Gyselinck[1], Ruth V. Sabariego[2] [1]Université Libre de Bruxelles (ULB), Belgium; [2]Université de Liège (ULg), Belgium **PC3-5** **Pole-Changing of DC-Excited Dual-Memory Machines** Fuhua Li, K.T. Chau, Chunhua Liu, Christopher H.T. Lee, Mu Chen The University of Hong Kong, Hong Kong S.A.R. (China)

PC3-6
Dynamic Modeling of the Demagnetization in Halbach Array Permanent Magnet Machine
Ants Kallaste[1], Anouar Belahcen[1,2], Toomas Vaimann[1]
[1]Tallinn University of Technology, Estonia; [2]Aalto University, Finland

PC3-7
Research on Shape Design to reduce Torque Ripple in IPMSM for High-voltage Electric Oil Pump based on Numerical Analysis
Youngmin Kim[1], Sung-Jun Kwon[1], Cheol-Gyun Lee[2], Jong-Wook Kim[3], Sang-Yong Jung[1]
[1]Sungkyunkwan University, Republic of Korea (South Korea); [2]Dong-Eui University, Republic of Korea (South Korea); [3]Dong-A University, Republic of Korea (South Korea)

PC3-8
Finite Element Based Circuit Model Approach for Skewed Electrical Machines
Martin Mohr[1], Oszkár Bíró[1], Andrej Stermecki[1], Franz Diwoky[2]
[1]Christian Doppler Laboratory for Multiphysical Simulation, Analysis and Design of Electrical Machines, Institute for Fundamentals and Theory in Electrical Engineering, Austria; [2]AVL List GmbH, Austria

PC3-9
Design and Control of a Novel Axial Flux Permanent Magnet In-Wheel Machine for HEVs
S. L. Ho, Shuangxia Niu, W. N. Fu
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

PC3-10
Calculation of Iron Loss in Solid Rotor Induction Machine using FEM
Mircea Fratila[1], Abdelkader Benabou[1], Abdelmounaïm Tounzi[1], Maxime Dessoude[2]
[1]L2EP-Lamel, Université Lille1, France; [2]EDF R&D, France

PC3-11
A Novel FEA Algorithm for SRM Simulations
Tanvir Rahman, Derek Dyck, David Lowther
INFOLYTICA Corporation, Canada

PC3-12
Eddy Current Losses in Permanent Magnets of Permanent Magnet Synchronous Machines - Comparison between Finite Element and Analytical Calculation Methods
Erich Schmidt, Manfred Kaltenbacher, Anton Wolfschluckner
Vienna University of Technology, Austria

PC3-13
Steady-State Time-Stepping Analysis of a Single-Phase PMSG with Capacitors for Voltage Regulation
Adolfo Gonzalez, Coni Hernandez, Marco Arjona
Instituto Tecnologico de la Laguna, Mexico

PC3-14
Analysis of Environmental Effect on Temperature Distribution of Power Converter for Switched Reluctance Motor Drive
Hao Chen, Yang Xu, Zhentao Hu
China University of Mining & Technology, People's Republic of China

PC3-15
Computation and Analysis of Iron Loss in Permanent Magnet-Inductor Hybrid Excitation Synchronous Generator
Xinghe Fu, Xiangjun Li, Da Xu, Mingyao Lin
Southeast University, People's Republic of China

PC3-16
Design of IPMSM Rotor Shape for Magnet Eddy-Current Loss
Se-Young Oh, Ho-Jun Lee, Kwang-Hyung Ryu, Ju Lee
Hanyang University, Republic of Korea (South Korea)

PC3-17
Equivalent Circuit Parameters Calculation of Induction Motor by Finite Element Analysis
Zaixun Ling, Libing Zhou, Siyuan Guo, Yi Zhang
Huazhong University of Science and Technology, People's Republic of China

PC3-18
A Self-tuning Regulator for the Voice Coil Motor
J.F. Pan[1], B.B. Yang[1], Norbert Cheung[2]
[1]School of Mechatronics and Control Engineering, Shenzhen University.; [2]Department of Electrical Engineering, Hong Kong Polytechnic University.

PC3-19
Optimum LIM Interval Selection of Vector Controlled Moving Secondary Plate Conveyor System Using FEM & SUMT for Constant Speed Control
Young Hyun Kim, Young Gak Rha, Jung Ho Lee
Hanbat National University, Republic of Korea (South Korea)

PC3-20
Study of Cogging Torque in Axial Flux Permanent-Magnet Machines Using an Analytical Model
Huguette Tiegna, Yacine Amara, Georges Barakat
University of Le Havre (France), France

PC3-21
Detection of the Fault Type under Eccentricity and Inter-Turn Fault using Fault Frequency of Stator Input Current in IPM-type BLDC motor
Jun-Kyu Park, Il-Man Seo, Jin Hur
University of Ulsan, Republic of Korea (South Korea)

PC3-22
Comparison of Two Different Rotor Topologies for 44Pole-48Slot Fractional Slot Concentrated Winding Permanent Magnet Synchronous Machine
Shi-Uk Chung, Yon-Do Chun, Byung-Chul Woo, Do-Kwan Hong, Ji-Young Lee
KERI, Republic of Korea (South Korea)

	PC3-23 **Numerical Simulation of the Interactions between Low Voltage Network, Miniature Circuit Breaker and Mounting Technique** Liviu Neamt, Dumitru Pop, Olivian Chiver, Cristian Barz Technical University of Cluj-Napoca, Romania **PC3-24** **Harmonics reduction with Pulse Width Modulation Method for Flux Concentration Interior PM Motors** Sisuda Chaithongsuk[1], Pramuk Unahalekhaka[1], Noureddine Takorabet[2], Babak Nahid-Mobarakeh[2], Farid Meibody-Tabar[2] [1]Rajamangala University of Technology Suvarnabhumi, Thailand; [2]University of Lorraine, Green, France **PC3-25** **Analysis of a Novel Switched-Flux Memory Motor Employing Time-Divisional Magnetization Strategy** Hui Yang, Heyun Lin, Jianning Dong, Jianhu Yan, Yunkai Huang, Shuhua Fang Southeast University, Nanjing, Jiangsu Province, People's Republic of China **PC3-26** **Cost-Effectiveness Comparison of Coaxial Magnetic Gears with Different Magnet Materials** Mu Chen, K.T. Chau, Wenlong Li, Chunhua Liu The University of Hong Kong, Hong Kong S.A.R. (China)
12:15pm - 1:45pm	**Lunch**
1:45pm - 3:25pm **Ballroom Foyer**	**PC4: Optimization & Design 3** **Session Chairs:** Alice Reinbacher-Köstinger, Stephan Russenschuck
	PC4-1 **Multiobjective Topology Optimization with Ant Colony Systems in Applied Electromagnetics** João B. Q. Zuliani[1], Lucas S. Batista[1], Frederico G. Guimarães[1], Miri W. Cohen[2], Min Li[3], David A. Lowther[3] [1]Universidade Federal de Minas Gerais, Belo Horizonte, Brazil; [2]ORT Braude College of Engineering, Karmiel, Israel; [3]McGill University, Montreal, Canada **PC4-2** **Enhanced Invasive Weed Optimization Algorithm Applied to Electromagnetic Optimization** Leandro Dos Santos Coelho[2], Viviana Mariani[3], Helon Ayala[2], Piergiorgio Alotto[1] [1]Università di Padova, Italy; [2]Pontifical Catholic University of Parana, Curitiba, Brazil; [3]Federal University of Parana, Curitiba, Brazil **PC4-3** **Composite First-Order Reliability Method for Efficient Reliability-based Optimization of Electromagnetic Design Problems** Dong-Wook Kim, Nak-Sun Choi, Gi-Woo Jeung, Dong-Hun Kim Kyungpook National University, Republic of Korea (South Korea)

PC4-4
An Automated Robust Optimization Approach Based on Robust Constraints and Objective Function
Laura Picheral[1], Issam Mazhoud[2], Khaled Hadj-Hamou[1], Jean Bigeon[1], Patrice Joyeux[2]
[1]G-SCOP - CNRS, Grenoble-INP-UJF, France; [2]Hager Electro SAS, France

PC4-5
Non Linear Multiphysics Analysis and Multiobjective Optimization in Electro-Heating Applications
Paolo Di Barba[1,2], Ivo Dolezel[3], Maria Evelina Mognaschi[1], Antonio Savini[1], Pavel Karban[4]
[1]University of Pavia, Italy; [2]University of Padua, Italy; [3]Academy of Sciences of the Czech Republic, Czech Republic; [4]University of West Bohemia

PC4-6
Robust Global Optimization of Electromagnetic Designs Utilizing Gradient Indices and Kriging
Song Xiao, Mihai Rotaru, Jan Sykulski
University of Southampton, United Kingdom

PC4-7
Worst Case Scenario Robust Optimization Utilizing Dynamic Kriging and Differential Evolution Algorithm
Ziyan Ren, Bin Xia, Nyambayar Baatar, Chang-Seop Koh
Chungbuk National University, Republic of Korea (South Korea)

PC4-8
Multi-objective Evolutionary Optimization of a Surface Mounted PM Actuator for Aerospace Applications
Minos E. Beniakar, Athanasios G. Sarigiannidis, Evangelos M. Tsampouris, Antonios G. Kladas
National Technical University of Athens, Greece

PC4-9
Characteristics Analysis & Optimum Design of Axially Lamianated Anisotropic Rotor Synchronous Reluctance Motor Using Coupled Finite Element Method & Response Surface Methodology
Young Hyun Kim, Won Gee Byen, Jung Ho Lee
Hanbat National University, Republic of Korea (South Korea)

PC4-10
Multilevel Design and Optimization of a FSPMM Drive System by Using Sequential Subspace Optimization Method
Gang Lei, Wei Xu, Jianguo Zhu, Youguang Guo
University of Technology, Sydney, Australia

PC4-11
Multiobjective Optimization of Transformer Design using a Chaotic Evolutionary Approach
Leandro dos Santos Coelho[1,2], Viviana C. Mariani[2,3], Fabio A. Guerra[4], Mauricio V. F. Luz[5], Jean Vianei Leite[5]
[1]Industrial and Systems Engineering Graduate Program, Pontifical Catholic University of Parana, Curitiba, Brazil; [2]Department of Electrical Engineering, Federal University of Parana, Curitiba, Brazil; [3]Mechanical Engineering Graduate Program, Pontifical Catholic University of Parana, Curitiba, Brazil; [4]LACTEC - Institute of Technology for Development, Electrical Systems Division (DVSE), Curitiba, Brazil; [5]GRUCAD/EEL/UFSC, Brazil

PC4-12
Shape Optimal Design of a Powder-Aligning-Fixture of Four-pole Anisotropic Bonded NdFeB Ring Magnet
Dianhai Zhang[1], Hyojun Kim[2], C.S. Koh[1]
[1]Chungbuk National University, Republic of Korea (South Korea); [2]R&D Center of Jahwa Electronics Co. Ltd., Republic of Korea (South Korea)

PC4-13
Utilizing Kriging Surrogate Models for Multi-objective Robust Optimization of Electromagnetic Devices
Bin Xia, Kwang-Young Jeong, C.S. Koh
Chungbuk National University, Republic of Korea (South Korea)

PC4-14
Topology Optimization Using Material Density Based on Sigmoid Function by Means of Sequential Linear Programming
Yoshifumi Okamoto[1], Yusuke Tominaga[1], Shinji Wakao[2], Shuji Sato[1]
[1]Utsunomiya University, Japan; [2]Waseda University, Japan

PC4-15
NE-Map Based Design of IPM Synchronous Motor for Traction of EV
Won-Ho Kim[1], Mi-Jung Kim[2], Ki-Doek Lee[2], Jae-Jun Lee[2], Ju Lee[2], Hyun-Jong Park[2]
[1]Material & Device Research Center, Samsung Advanced Institute of Technology, Republic of Korea (South Korea); [2]Department of Electrical Engineering, Hanyang University, Republic of Korea (South Korea)

PC4-16
HEV - AI Based Real Time Control Strategy
N Al-Aawar, A. A. Arkadan
Rafik Hariri University, Lebanon (Lebanese Republic)

PC4-17
A Robust Metaheuristic Based on Clonal Colony Optimization and Population Based Incremental Learning Methods
S. L. Ho[1], Shiyou Yang[2], Yanan Bai[2]
[1]The Hong Kong Polytechnic University, Hong Kong; [2]Zhejiang University, People's Republic of China

PC4-18
Optimization of a Contactless Displacement Sensor Using Finite-element Analysis
Christoph Weissinger, Stefan Lobmeyer, Peter Huck, Hans-Georg Herzog
Technische Univeristät München, Germany

1:45pm - 3:25pm Corvina	**PC5: Numerical Techniques 4** **Session Chairs:** Dennis D. Giannacopoulos, Stefan Kurz

PC5-1
Accurate Determination of Thousands of Eigenvalues for Large-Scale Eigenvalue Problems
Todorka Banova[1,2], Wolfgang Ackermann[2], Thomas Weiland[2]
[1]Graduate School of Computational Engineering, TU Darmstadt, Germany; [2]Institut für Theorie Elektromagnetischer Felder (TEMF), TU Darmstadt, Germany

PC5-2
Influence of Measurement Errors on Transformer Inrush Currents Using Different Material Models
Timo Hülsmann[1], Andreas Bartel[1], Jan Kühn[1], Roland Pulch[1], Sebastian Schöps[2]
[1]Bergische Universität Wuppertal, Chair of Applied Mathematics and Numerical Analysis, Germany; [2]Technische Universität Darmstadt, Graduate School Computational Engineering, Germany

PC5-3
Fast Halo Currents Computation in Fusion Reactors by Electrokinetic Complementary Formulations
Paolo Bettini[1], Ruben Specogna[2]
[1]Consorzio RFX, EURATOM-ENEA Association, Italy; [2]Università di Udine, Italy

PC5-4
Convergence of a Stabilized Subpixel Smoothing Scheme for the Finite Integration Technique
Rolf Schuhmann
Technische Universität Berlin, Germany

PC5-5
Hybrid Parallel Meshless Algorithm for Electromagnetic Applications
Eduardo Henrique da Rocha Coppoli[1], Ursula do Carmo Resende[1], Márcio Matias Affonso[1], Renato Cardoso Mesquita[2], João Paulo Gervásio[1], Biharck M. Araújo[1]
[1]Centro Federal de Educação Tecnológica de Minas Gerais, Brazil; [2]Universidade Federal de Minas Gerais, Brazil

PC5-6
A Modified Meshless Local Petrov-Galerkin Applied to Electromagnetic Axisymmetric Problems
Ramon Dornelas Soares[1], Fernando José da Silva Moreira[1], Renato Cardoso Mesquita[1], David Alister Lowther[2], Naísses Zoia Lima[1]
[1]Federal University of Minas Gerais, Brazil; [2]McGill University, Canada

PC5-7
3D Modeling of Thin Resistive Sheets in the Discontinuous Galerkin Method for Transient Scattering Analysis
Mohamed Boubekeur[1], Abelin Kameni[1], Laurent Bernard[1], Axel Modave[2], Lionel Pichon[1]
[1]Laboratoire de Genie Electrique de Paris, France; [2]Montefiore Institute, Belgium

PC5-8
The Transmission Line Modeling Method to Represent the Soil Ionization Phenomenon in Grounding Systems
Daniel da Silva Gazzana[1], Arturo Suman Bretas[1], Guilherme A. D. Dias[1], Marcos Telló[2]
[1]Federal University of Rio Grande do Sul - UFRGS, Brazil; [2]State Company of Electrical Energy CEEE-D

PC5-9
An Alternative Way to Impose Essential Boundary Conditions in EFG Method
Ursula do Carmo Resende, Eduardo Henrique da Rocha Coppoli, Tadeu de Brito Oliveira Porto, Marcio Matias Afonso
Federal Center for Technological Education of Minas Gerais, Brazil

PC5-10
A Singularity Expansion Method for Analysis of Wireless Power Transfer System
Lei Liu, S.L. Ho, W.N. Fu
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

PC5-11
An Efficient Interpolation for Calculation of the Response of Composite Layered Material and its Implementation in MUSIC Imaging
Giacomo Rodeghiero[1], Yu Zhong[2], Dominique Lesselier[1], Marc Lambert[1], Xudong Chen[2]
[1]CNRS-SUPELEC-Université Paris Sud; [2]National University of Singapore

PC5-12
Performance Improvement of Three-Dimensional Tiled FDTD Kernel Based on Automatic Parameter Tuning
Takeshi Minami, Motoharu Hibino, Tasuku Hiraishi, Takeshi Iwashita, Hiroshi Nakashima
Kyoto University, Japan

PC5-13
Force Calculation from the Finite Element Solution Avoiding Nonzero Local Forces in the Air Region
Takeshi Mifune
Kyoto University, Japan

PC5-14
Coupling of Different Dimensions in Finite Element Analysis for Solving Laplace and Poisson Equations
Tommi Sakari Peussa, Anouar Belahcen
Aalto University, Finland

PC5-15
Flexible BiCGStab to solve the Discretized EFIE in Scattering Computations
Giovanni Angiulli, Matteo Cacciola, Salvatore Calcagno, Domenico De Carlo, Francesco Carlo Morabito, Annalisa Sgrò, Mario Versaci
"Mediterranea" University of Reggio Calabria, Italy

PC5-16
Coupling of a Method of Moments Adapted to Planar Circuit and Volumic Methods
Caroline Girard[1,2], Stéphane Lanteri[2], Ronan Perrussel[1], Nathalie Raveu[1]
[1]Université de Toulouse ; INPT, UPS ; CNRS ; LAPLACE ; ENSEEIHT, Toulouse, France; [2]NACHOS project-team, INRIA Sophia Antipolis-Méditerranée, Sophia Antipolis, France

	PC5-17 **Refoundation of the Cell Method by Means of Augmented Dual Grids** Lorenzo Codecasa Politecnico di Milano, Italy **PC5-18** **A Multi-Layer Finite Element Method Algorithm for Three-Dimensional Magnetic Force Computation** S. L. Ho, Shuangxia Niu, W. N. Fu The Hong Kong Polytechnic University, Hong Kong S.A.R. (China) **PC5-19** **Application of the ACA Compression Technique for the Scattering of Periodic Surfaces** Benjamin Alzaix, Ronan Perrussel, Jean-René Poirier LAPLACE/GRE, France **PC5-20** **High Order Finite Elements in T-Ω Method Considering Multiply-Connected Regions** Bo He, Ping Zhou, Dingsheng Lin, Chuan Lu Ansys, United States of America **PC5-21** **Comparison of Residual and Hierarchical Finite Element Error Estimators in Eddy Current Problems** Zuqi Tang[1], Patrick Dular[2], Yvonnick Le Ménach[3], Emmanuel Creusé[1], Francis Piriou[3] [1]Université Lille 1, LPP, France; [2]University of Liège, ACE, Belgium; [3]Université Lille1, L2EP, France
1:45pm - 3:25pm **Corvina**	**PC6: Electrical Machines & Drives 4** **Session Chairs:** Luiz Lebensztajn, Laurent Krahenbuhl
	PC6-1 **Characteristic Analysis & Optimum Design Standard Evaluation of Permanent Magnet Assisted Synchronous Reluctance Motor for Power Improvement** Young Hyun Kim, Jung Woo Kim, Jung Ho Lee Hanbat National University, Republic of Korea (South Korea) **PC6-2** **Iron Loss Analysis of Turbo Generators Considering Eddy Currents in Duct Spacers and End Plates** Katsumi Yamazaki[1], Takuya Sekine[1], Yoko Furukawa[2] [1]Chiba Institute of Technology, Japan; [2]Hitachi, Ltd., Japan **PC6-3** **Thermal Analysis of Permanent Magnet Motor with Water-Jacket Cooling for Electric Vehicles** Meng Hu[1], Ben Q. Li[2,3], Changhong Liu[1] [1]ShangHai JiaoTong University/China, People's Republic of China; [2]University of Michigan-Dearborn/Dearborn, United States of America; [3]Xi'an Jiaotong University/Shaanxi, People's Republic of China

PC6-4
Estimation of Acoustic Noise and Vibration in an Induction Machine considering Rotor Eccentricity
Do-Jin Kim, Hae-Joong Kim, Jung-Pyo Hong, Chul-Jun Park, Jin-Tai Chung
Hanyang University, Republic of Korea (South Korea)

PC6-5
Nonlinear Dynamic Characteristic Analysis of Linear Actuator for Compressor
Sung-An Kim, Sang-Geon Lee, Yun-Hyun Cho
Dong-A University, Republic of Korea (South Korea)

PC6-6
Design of Hybrid Hysteresis Motor Rotor by Means of FE Model and Decision Process
Mariusz Jagiela, Tomasz Garbiec, Marcin Kowol
Opole University of Technology, Poland

PC6-7
Brushless Doubly-Fed Reluctance Machine Optimization using Reluctance Networks
Tiago Staudt[1,2], Lisa Scanu[1,2], Frédéric Wurtz[2], Nelson Jhoe Batistela[1], Patrick Kuo-Peng[1], Nelson Sadowski[1]
[1]Federal University of Santa Catarina (GRUCAD-UFSC), Brazil; [2]Grenoble INP-UJF, CNRS UMR 5529 (G2ELAB), France

PC6-8
Internally Consistent Nonlinear Behavioural Model of a PM Synchronous Machine for Hardware-in-the-Loop simulation
Derek N. Dyck[1], Tanvir Rahman[1], Christian Dufour[2]
[1]Infolytica Corp., Montreal; [2]2Opal-RT Technologies Inc., Montreal, Canada

PC6-9
Electromagnetic Performance Analysis of Axial Field Flux-Switching Permanent Magnet Machine Using Equivalent Magnetic Circuit Method
Da Xu[1,2], Mingyao Lin[1,2], Xinghe Fu[1,2], Li Hao[1,2], Xuming Zhao[3]
[1]School of Electrical Engineering, Southeast University, Nanjing, People's Republic of China; [2]Engineering Research Center for Motion Control of MOE, Southeast University, Nanjing, People's Republic of China; [3]Jiangsu Electric Power Maintenance Branch Company, Nanjing, People's Republic of China

PC6-10
Permanent Magnet Eddy Current Comparison of Surface Permanent Magnet Synchronous Motors with Different Permanent Magnet Shapes
Sun Kwon Lee[1,2], Gyu Hong Kang[1], Jin Hur[2], Byoung Woo Kim[2]
[1]Korea Marine Equipment Research Institute, Republic of Korea (South Korea); [2]University of Ulsan, Republic of Korea (South Korea)

PC6-11
Torque-Slip Characteristic of Squirrel Cage Induction Motor by New FEA Technique
Olivian Chiver, Liviu Neamt, Cristian Barz, Dumitru Pop
Technical Univerity of Cluj Napoca, Romania

PC6-12
Novel Rotor Design to Improve Dynamic Performance of Axial Flux Hysteresis Motors
Mohammad Modarres, Byung-Il Kwon
Hanyang University, Republic of Korea (South Korea)

PC6-13
Cut Out Bars FEM Simulation of Large Hydro Generator
Ana Beatriz Martins Aguiar[1,2], Arezki Merkhouf[2], Kamal Al-Haddad[1]
[1]Ecole de Technologie Superieure, Canada; [2]IREQ, Canada

PC6-14
On the Geometric Uncertainties of an Electrical Machine: Stochastic Modeling and Impact on the Performances
Hung Mac[1], Stéphane Clénet[1], Shaoqu Zheng[2], Thierry Coorevits[2], Jean-Claude Mipo[3]
[1]L2EP/Arts et Métiers ParisTech, France; [2]LML/Arts et Métiers ParisTech, France; [3]VALEO, France

PC6-15
Design Optimization of an Interior PMSM for Electric Vehicle Application
Hussein Dogan, Hoa Nguyen-Xuan, Frederic Wurtz, Lauric Garbuio, Albert Foggia
INPG, France

PC6-16
Comparison between Cage-Rotor Induction Motor and Matrix-Rotor Induction Motor Using 3-D Finite Element Method
Yoshihiro Kawase[1], Tadashi Yamaguchi[1], Masaki Otsubo[1], Naotaka Toida[2], Koichi Sato[2]
[1]Gifu University, Japan; [2]Toyota Industries Corporation, Japan

PC6-17
Design and Simulation of a Double Stator Type Axial Magnetically Levitated Motor
Nobuyuki Kurita[1], Takeo Ishikawa[1], Hiromu Takada[1], Toru Masuzawa[2]
[1]Gunma University, Japan; [2]Ibaraki University, Japan

PC6-18
Efficient Approach for Angular Modelling of Electrical Machine by Reluctance Network
Hoa Nguyen Xuan, Hussein Dogan, Laurent Gerbaud, Lauric Gabuio, Frédéric Wurtz
Grenoble Electrical Engineering Laboratory,France

PC6-19
Reduction of Eddy-Current Losses by Circumferential and Radial PM Segmentation in Axial Flux Permanent Magnet Machines with Fractional-Slot Winding
Jian Li, Yun-Hyun Cho, Ronghai Qu
State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science and Technology, People's Republic of China

PC6-20
Design and Optimization of Neodymium Free Spoke Type Motor with Segmented Wing Shape PM
Mohammad Mizanoor Rahman, Kyung-Tae Kim, Jin Hur
University of Ulsan, Republic of Korea (South Korea)

	PC6-21 **End Edge Force Analysis in Stationary Discontinuous Armature concentrated-winding PMLSM with the shape of Novel Auxiliary Teeth** Sung-Jin Kim[1], Yong-Jae Kim[1], Sang-Yong Jung[2] [1]Chosun University, Republic of Korea (South Korea); [2]Sungkyunkwan University, Republic of Korea (South Korea) **PC6-22** **Micro-Analysis of Electromagnetic Force Distribution in a Simple Actuator** Mohammad Adib Ghadamyari[1], Mehdi Moallem[1], Babak Fahimi[2], Matthew McDonough[2] [1]Isfahan University of Technology, Islamic Republic of Iran; [2]University of Texas at Dallas, United States of America **PC6-23** **Design and Analysis of a New Double-stator Dual-magnet Linear Magnetic-geared Machine** Chunhua Liu, K.T. Chau, Mu Chen The University of Hong Kong, Hong Kong S.A.R. (China) **PC6-24** **Numerical Analysis and Optimal Design of Double Squirrel Cage Induction Motor for Electric Vehicle** Subong Jang[1], Kyung-Won Jeon[1], Yong-Jae Kim[2], Sang-Yong Jung[1] [1]Sungkyunkwan University, Republic of Korea (South Korea); [2]Chosun University,Republic of Korea (South Korea) **PC6-25** **Field-circuit Modeling of the 12-pole Magnetic Bearing Characteristics** Bronislaw Tomczuk, Jan Zimon, Dawid Wajnert Opole University of Technology, Poland
3:25pm - 3:50pm	**Coffee Break**
3:50pm - 5:30pm **Ballroom**	**OC2: Coupled Problems 2** **Session Chairs:** Arnulf Kost, Dexin Xie
	OC2-1 **Modeling of Magneto-Mechanical Coupling with Magnetic Volume Integral and Mechanical Finite Element Methods** Anthony Carpentier[1], Nicolas Galopin[1], Olivier Chadebec[1,2], Gérard Meunier[1] [1]G2elab, Grenoble, France; [2]GRUCAD/EEL/CTC/UFSC, Florianopolis, Brazil **OC2-2** **On Forces in Magnetized Matter** Alain Bossavit LGEP, CNRS, France **OC2-3** **Magneto-mechanical Coupling: Applied to the Prediction of Deformation of a FeSi Based Transformers** Florent Ganet[1,2], Olivier Hubert[2], Xavier Mininger[1], Frederic Bouillault[1], Laurent Bernard[1] [1]LGEP, France; [2]LMT, France

	OC2-4 **Nonlinear Evolution of Axisymmetric Fusion Plasmas with Three-dimensional Volumetric Conductors** Fabio Villone, Lucio Barbato, Stefano Mastrostefano, Salvatore Ventre Università di Cassino e del Lazio Meridionale, Italy **OC2-5** **Coupled Electromagnetic-Mechanical Dynamic Analysis of Generator Circuit Breakers** Jasmin Smajic, Cornelius Jäger, Severin Neubauer, Astrid Bauer, Daniel Jun Cheng, Markus Widenhorn University of Applied Sciences of Eastern Switzerland, Switzerland
7:00pm - 11:00pm **Hungarian National Gallery**	**Conference Dinner**

Date: Thursday, 04/Jul/2013	
8:30am - 10:10am **Ballroom**	**OD1: Numerical Techniques 5** **Session Chairs:** Jan Sykulski, Zhenmao Chen
	OD1-1 **Second Moment Perturbation Analysis of the Nonlinear Eddy Current Model with Material Uncertainties** Ulrich Römer, Sebastian Schöps, Thomas Weiland Technische Universität Darmstadt, Germany **OD1-2** **An Overlapping Non-matching Grid Mortar Element Method for Maxwell's Equations** Alexandra Christophe[1], Laurent Santandrea[1], Francesca Rapetti[2], Guillaume Krebs[1], Yann Le Bihan[1] [1]LGEP, France; [2]Lab. J.-A Dieudonné, France **OD1-3** **GPU-optimized Parallel Preconditioners for the Element-by-element Finite Element Method** Imre Kiss[1], Zsolt Badics[2], Szabolcs Gyimóthy[1] [1]Budapest University of Technology and Economics, Hungary; [2]Tensor Research LLC, Andover, MA, United States of America **OD1-4** **Linear Subspace Reduction for Quasistatic Field Simulations** Daniel Schmidthäusler[1], Sebastian Schöps[2], Markus Clemens[1] [1]Bergische Universität Wuppertal, Germany; [2]Technische Universitaet Darmstadt, Germany **OD1-5** **Two-Scale Homogenization of the Nonlinear Eddy Current Problem with FEM** Karl Hollaus[1], Antti Hannukainen[2], Joachim Schöberl[1] [1]Vienna University of Technology, Austria; [2]Aalto University, Finland
10:10am - 10:35am	**Coffee Break**
10:35am - 12:15pm **Ballroom Foyer**	**PD1: Optimization & Design 4** **Session Chairs:** Abdul-Rahman Arkadan, Antonios G. Kladas
	PD1-1 **Enhanced Identification of Hidden Conductive Objects with Deterministic and Stochastic Methods** Alice Reinbacher-Köstinger[1], Piergiorgio Alotto[2], Christian Magele[1], Werner Renhart[1] [1]Graz University of Technology, Austria; [2]University of Padova, Italy **PD1-2** **Stochastic Methods for Parameter Estimation of Multiphysics Models of Fuel Cells** Piergiorgio Alotto, Massimo Guarnieri Università di Padova, Italy **PD1-3** **A Novel Superconducting MRI Magnet and Its Optimum Design Using Adaptive Optimization Strategy** Yanli Zhang Shenyang University of Technology, People's Republic of China

PD1-4
Topology Optimization Based on ON/OFF Method with Surface Smoothing
Kota Watanabe[1], Hajime Igarashi[2]
[1]Muroran Institute of Technology, Japan; [2]Hokkaido University

PD1-5
A Modification of Artificial Bee Colony Algorithm Applied to Loudspeaker Design Problem
Xin Zhang[2], Xiu Zhang[1], S. L. Ho[1], W. N. Fu[1]
[1]The Hong Kong Polytechnic University, Hong Kong S.A.R. (China); [2]City University of Hong Kong, Hong Kong S.A.R. (China)

PD1-6
Level Set-based Topology Optimization for the Design of Light Trapping Structures
Masaki Otomori[1], Takayuki Yamada[1], Kazuhiro Izui[1], Shinji Nishiwaki[1], Nozomu Kogiso[2]
[1]Kyoto University, Japan; [2]Osaka Prefecture University, Japan

PD1-7
Comparative Study of Reliability Evaluation Methods for Reliability-based Design Optimization of Electromagnetic Devices under Uncertainty
Ziyan Ren, Chang-Seop Koh
Chungbuk National University, Republic of Korea (South Korea)

PD1-8
Multi-objective Optimization Approach to Reliability-based Optimal Design of Electromagnetic Problems
Ziyan Ren, Dianhai Zhang, Chang-Seop Koh
Chungbuk National University, Republic of Korea (South Korea)

PD1-9
A Two-level Genetic Algorithm for Large Electromagnetic Optimization Problems
Fabio Henrique Pereira[1,2], Wonder Alexandre Luz Alves[1], Lucas Koleff[2], Silvio Ikuyo Nabeta[2]
[1]Nove de Julho University, Brazil; [2]São Paulo University, Brazil

PD1-10
Reliability-Based Optimum Tolerance Design for Industrial Electromagnetic Devices
Su-gil Cho[1], Junyong Jang[1], Su-Jin Lee[1], Kyu-Seob Kim[1], Jung-Pyo Hong[1], Woo-Kyo Jang[2], Tae Hee Lee[1]
[1]Hanynag University, Republic of Korea (South Korea); [2]Keyang Electric Machinery Co., Ltd., Republic of Korea (South Korea)

PD1-11
Evolutionary Algorithm-based Multi-criteria Optimization of Triboelectrostatic Separator
Frantisek Mach[1], Lukas Adam[1], Pavel Kus[1], Pavel Karban[1], Ivo Dolezel[2]
[1]University of West Bohemia, Faculty of Electrical Engineering, Czech Republic; [2]Academy of Sciences of the Czech Republic, Institute of Thermomechanics, Czech Republic

PD1-12
Adaptive Parameter Controlling Non-dominated Ranking Differential Evolution for Multi-objective Optimization of Electromagnetic Problems
Nyambayar Baatar, Kwang-Young Jeong, C.S. Koh
Chungbuk National University, Republic of Korea (South Korea)

PD1-13
Waveguide Design at Infrared Wavelength with Asymmetric Dielectric Surface Gratings
Dongyeal Lim[1], Heeseung Lim[1], Jae Seok Choi[2], Jeonghoon Yoo[3]
[1]Graduate School of Mechanical Engineering, Yonsei University, Republic of Korea (South Korea); [2]Samsung Electronics Co. Ltd.; [3]School of Mechanical Engineering, Yonsei Univeristy, Republic of Korea (South Korea)

PD1-14
Topology Optimization of an IPM Motor Flux Barrier Based on Current Phase Angle Using a Multistep Evolutionary Algorithm
Yoshifumi Okamoto[1], Yusuke Tominaga[1], Shinji Wakao[2], Shuji Sato[1]
[1]Utsunomiya University, Japan; [2]Waseda University, Japan

PD1-15
Vector Design Optimizations using an Improved Cross-Entropy Method
Siguang An[1], Wei Wang[1], Shiyou Yang[2]
[1]China Jiliang University, China; [2]Zhejiang University, People's Republic of China

PD1-16
Shape Optimization of Dielectric Material Using Continuum Sensitivity and Adaptive Level Set Method
Kang Hyouk Lee[1], Seung Geon Hong[1], Myung Ki Baek[1], Hong Soon Choi[2], Il Han Park[1]
[1]Sungkyunkwan University, Republic of Korea (South Korea); [2]Kyungpook National University, Republic of Korea (South Korea)

PD1-17
Magnetizer Design Based on a Quasi-Oppositional Gravitational Search Algorithm
Leandro Dos Santos Coelho[2], Viviana Mariani[3], Nedim Tutkun[4], Piergiorgio Alotto[1]
[1]Università di Padova, Italy; [2]Pontifical Catholic University of Parana, Curitiba, Brazil; [3]Federal University of Parana, Curitiba, Brazil; [4]University of Zonguldak, Turkey

PD1-18
An Automatic Pareto Classifier for the Multiobjective Optimization of an Electrostimulative Acetabular Revision System
Ulf Zimmermann, Ursula van Rienen
University of Rostock, Germany

PD1-19
A Novel Approach of Sensitivity Analysis in Finite Element Method and Its Application
Lin Yang, S. L. Ho, W. N. Fu, Lei Liu
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

PD1-20
Multiobjective Design Optimization of PM-SMC Motors for Six Sigma Quality Manufacturing
Gang Lei, Jianguo Zhu, Youguang Guo
University of Technology, Sydney, Australia

10:35am - 12:15pm Corvina	**PD2: Numerical Techniques 6** **Session Chairs:** Yasuhito Takahashi, Fabio Villone

PD2-1
MPI Parallel Scheme of 3D Time Domain Boundary Element Method with CRS Matrix Compression
Kazunori Maeda, Hiroshi Shibata, Hideki Kawaguchi, Seiya Itasaka
Muroran Institute of Technology, Japan

PD2-2
Time-Domain Simulation of Tower with Grounding Device under Lightning Strikes
Bo Zhang, Jinpeng Wu, Jinliang He, Chijie Zhuang, Han Yin
Tsinghua University, People's Republic of China

PD2-3
Electromagnetic Wave Propagation Simulation in Complex Shaped Domain using Hybrid Method of FDTD and MTDM
Taku Itoh, Yoshihisa Fujita, Soichiro Ikuno
Tokyo University of Technology, Japan

PD2-4
Computation of Magnetic Contact Forces
Jangho Seo, Hong Soon Choi
Kyungpook National University, Republic of Korea (South Korea)

PD2-5
An Integral Formulation for the Computation of 3D Eddy Current Using Facet Elements
Thanh Trung Nguyen, Gerard Meunier, Jean-Michel Guichon, Olivier Chadebec
Grenoble Electrical Engineering Laboratory, France

PD2-6
The Face-Based Gradient Smoothing Point Interpolation Method Applied to 3D Electromagnetics
Naísses Zoia Lima, Renato Cardoso Mesquita
Federal University of Minas Gerais, Brazil

PD2-7
Low-Frequency Time-Domain On-Surface Radiation Boundary Condition for Scattering Applications
Subramaniya Hariharan, Jianyang Zeng, Nathan Ida
The University of Akron, United States of America

PD2-8
Non-Asymptotic Homogenization of Electromagnetic Metamaterials via Discrete Hodge Operators with Trefftz Calibration
Ralf Hiptmair[1], Igor Tsukerman[2]
[1]Seminar of Applied Mathematics, ETHZ Zuerich, Switzerland; [2]The Univ of Akron, United States of America

PD2-9
A Posteriori Error Estimation in Stochastic Static Problems
Duy Hung Mac, Stéphane Clenet
Arts et Métiers ParisTech Centre de Lille, France

PD2-10
Reduced Basis Generation for Maxwell's Equations by Rigorous Error Estimation
Martin W. Hess, Peter Benner
MPI Magdeburg, Germany

PD2-11
A New Numerical Scheme for the Simulation of Corona Fields
Jacques Lobry
Université de Mons, Belgium

PD2-12
Parallel Implementation for Mortar Finite Element Method in Electrostatic Problems
Caibo Liao, Jiangjun Ruan, Zhiye Du, Dong Wang, Shoubao Liu, Chao Liu
Wuhan University, People's Republic of China

PD2-13
Convergence Characteristics of Preconditioned Linear Solvers Based on Minimum Residual for Complex Symmetric Linear Systems
Tomonori Tsuburaya[1], Yoshifumi Okamoto[1], Koji Fujiwara[2], Shuji Sato[1]
[1]Utsunomiya University, Japan; [2]Doshisha University, Japan

PD2-14
Eddy Current Analysis of Large-scale Constructions in Railway System by Infinite Edge Elements
Shogo Yasukawa[1], Yoshihiro Tawada[1], Takuya Yoshioka[1], Shinji Wakao[1], Tamio Okutani[2]
[1]Waseda University, Japan; [2]Railway Engineering Co., Ltd., Japan

PD2-15
Asymptotic Boundary Conditions for Finite Element Analysis of 2D and 3D Electrical Field Problems
Stanislaw Gratkowski, Krzysztof Stawicki, Marcin Ziolkowski
West Pomeranian University of Technology, Szczecin, Poland

PD2-16
Thin Conducting Sheet (TCS) in Non-destructive Testing Simulations: Implementation in Code_Carmel3D and Validation
Toufic Abboud[1], François Béreux[1], Natacha Marie Béreux[2], Valentin Costan[2]
[1]IMACS, France; [2]EDF R&D, France

PD2-17
Solution of Large Complex BEM Systems Derived from High-Resolution Human Models
Giuseppe Borzi[2], Oriano Bottauscio[3], Mario Chiampi[1], Luca Zilberti[3]
[1]Politecnico di Torino, Italy; [2]Università di Messina, Italy; [3]Instituto Nazionale di Ricerca Metrologica, Torino, Italy

PD2-18
An Accurate Multi-layer Magnetic Force Computation Method by Using Adaptive Parameterized Mesh Technique
Yanpu Zhao, S. L. Ho, W. N. Fu
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

	PD2-19 **A New Basis Function for Fast Computation of Electromagnetic Fields in Meshless Frames** Arman Afsari, Masoud Movahhedi Shahid Bahonar University of Kerman, Krman, Islamic Republic of Iran **PD2-20** **A Path Toward Stable Higher Order Discretization of Constitutive Equations in FIT** Lorenzo Codecasa Politecnico di Milano, Italy **PD2-21** **Shared Memory Parallelism and Low-rank Approximation Techniques Applied to Direct Solvers in FEM Simulation** Patrick Amestoy[1], Alfredo Buttari[2], Guillaume Joslin[4], Jean-Yves L'Excellent[3], Mohamed Sid-Lakhdar[5], Clement Weisbecker[1], Michele Forzan[6], Cristian Pozza[6], Remy Perrin[7], Valene Pellissier[7] [1]INPT-IRIT; [2]CNRS-IRIT; [3]INRIA-ENS Lyon; [4]CERFACS; [5]ENS Lyon; [6]University of Padova; [7]Cedrat Group
10:35am - 12:15pm **Corvina**	**PD3: Devices & Applications 3** **Session Chairs:** Theodoros Tsiboukis, Wolfgang Rucker
	PD3-1 **A Fast Method for the Design of Azimuth Radiation Characteristics of Shaped Beam Rectangular Waveguide Slot Antennas** Peter Tamas Benko[1,2], Bela Ladanyi-Turoczy[2], Jozsef Pavo[1] [1]Budapest University of Technology and Economics, Hungary; [2]GRANTE Antenna Development and Production Corporation, Hungary **PD3-2** **Temperature-dependent Demagnetisation of Segmented Halbach Arrays** Oliver Winter[1], Hannes Lacher[1], Christian Kral[1], Erich Schmidt[2] [1]AIT Austrian Institute of Technology, Austria; [2]Vienna University of Technology, Institute of Energy Systems and Electrical Drives, Austria **PD3-3** **Three-dimensional Analysis with a Two-dimensional Source for Dielectric Characteristic in High Voltage Gas Circuit Breaker** Yeon-Ho Oh[1], Ki-Dong Song[1], Hong-Kyu Kim[1], Changho Yeo[2], Sung Chin Hahn[3] [1]KERI, Republic of Korea (South Korea); [2]Hyosung Corporation; [3]Department of Electrical Engineering, Dong-A University **PD3-4** **Emulation Process Designs and Experimental Assessments of a Refined DC Magnetron Sputter** Cheng-Tsung Liu, Wei-Ping Lin, Chih-Wen Chang National Sun Yat-Sen University, Taiwan, Republic of China **PD3-5** **Characterization of Deformed Magnets from External Magnetic Measurements** Alessandro Bonito Oliva[1], Eva Boter[1], Alessandro Formisano[2], Raffaele Martone[2], Alfredo Portone[1], Pietro Testoni[1] [1]Seconda Università di Napoli, Italy; [2]Fusion for Energy, Spain

PD3-6
Modeling of Transformer Core Joints via a Subproblem FEM and a Homogenization Technique
Mauricio Valencia Ferreira da Luz[1], Patrick Dular[2], Jean Vianei Leite[1], Patrick Kuo-Peng[1]
[1]Federal University of Santa Catarina, Brazil; [2]University of Liège, Dept. of Electrical Engineering and Computer Science, ACE, Belgium / FNRS, Belgium

PD3-7
3D Modeling of Integrated Magnetics in High Frequency LLC Resonant Converters
Wayne Water, Junwei Lu
Griffith University, Australia

PD3-8
An Optimization Method for the Control of Efficiency in Two-ports Microwave Ovens
Fernando Bressan[1], Marco Bullo[1], Paolo Di Barba[2], Fabrizio Dughiero[1]
[1]University of Padova, Italy; [2]University of Pavia, Italy

PD3-9
Air Core Reactor Analysis Based on RNM Method
Anderson Santos Nunes[1,2], Patrick Kuo-Peng[2], Marcelo Grafulha Vanti[3]
[1]WEG T& -PD&I, Brazil; [2]GRUCAD/EEL/UFSC, Brazil; [3]DEET/FURB, Brazil

PD3-10
Homogenization Methods in Simulations of Transcutaneous Energy Transmitters
Daniela Wolter Ferreira[1], Ruth V. Sabariego[2], Luiz Lebensztajn[1], Laurent Krähenbühl[3], Florent Morel[3], Christian Vollaire[3]
[1]Escola Politécnica da Universidade de São Paulo, Brazil; [2]University of Liège; [3]École Centrale de Lyon, France

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Design and Analysis of Axial Hybrid Magnetic Bearing with Asymmetric Axial Air Gaps
Kang Wang[1], Dong Wang[2], Heyun Lin[1], Xianbiao Zhang[2], Yi Feng[1], Hui Yang[1]
[1]Southeast University, People's Republic of China; [2]China Navy University of Engineering, Wuhan, People's Republic of China

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Simulation and Measurement of Lightning-impulse Voltage Distributions over Transformer Windings
Jasmin Smajic, Martin Rüegg, Zeljko Tanasic, Roman Obrist, Jens Tepper, Benjamin Weber, Martin Carlen
University of Applied Sciences of Eastern Switzerland, Switzerland

PD3-13
A New Method to Evaluate Residual Flux Thanks to Leakage Flux. Application to a Transformer
Didier Cavallera[1], Vinicius Oiring[2], Jean-Louis Coulomb[1], Olivier Chadebec[1], Bruno Caillault[2], François Zgainski[2]
[1]G2ELab, France; [2]EDF, France

	PD3-14 **The Numerical Calculation of Short Circuit Resistance of Transformers of Inverter Power Source Welding Machines** Liudmila Sakhno, Olga Sakhno, Denis Likhachev, William Kashimu St.Petersburg State Polytechnic University, Russian Federation **PD3-15** **Current Induced Spin Transfer Noise in CPP-GMR Based Heusler Alloy** Pirat Khunkitti[1], Apirat Siritaratiwat[1], Arkom Kaewrawang[1], Chayada Surawanitkun[1], Anan Kruesubthaworn[2] [1]Department of Electrical Engineering, Khon Kaen University, Thailand; [2]Faculty of Applied Science and Engineering, Khon Kaen University, Thailand **PD3-16** **VHDL-AMS Electromagnetic Automatic Modeling for System Simulation and Design** Abir Rezgui, Benoit Delinchant, Laurent Gerbaud G2ELAB, France **PD3-17** **Impedance Analysis of a Domestic Induction Appliance with Energy-Efficient Cookware** Federico Moro, Piergiorgio Alotto, Massimo Guarnieri, Andrea Stella Università di Padova, Italy
12:15pm - 1:45pm	**Lunch**
1:45pm - 3:25pm **Corvina**	**PD4: Coupled Problems 3** **Session Chairs:** Ruben Specogna, Francis Piriou
	PD4-1 **Finite Element Analysis of Thermal Problems in Gas Insulated Power Apparatus with Multiple Species Transport Technique** Xiaowen Wu, Naiqiu Shu, Hongtao Li, Hui Peng, Ling Li Wuhan University, People's Republic of China **PD4-2** **Harmonic Pressure Optimization on Numerical Electric Motor Model** Jaafar Hallal[1], Pierre Pellerey[1], Fabrice Marion[2], Frederic Druesne[1], Vincent Lanfranchi[1] [1]université de technologie de Compiègne, France; [2]Cedrat, France **PD4-3** **Numerical Investigations of the Effects of a High Magnetic Field on a Diamagnetic Yield Stress Fluid Flow -- Opportunities of a Solid-gel Transition** Laurent Heyrendt, Denis Netter Groupe de Recherche en Électrotechnique et Électronique de Nancy - GREEN, Université de Lorraine, France **PD4-4** **Comparison of Mechanical Vibration in a Double-Stator Switched Reluctance Machine and a Conventional Switched Reluctance Machine** Arash Hassanpour Isfahani, Babak Fahimi, Matthew McDonough University of Texas at Dallas, United States of America

PD4-5
Adaptive Mesh Morphing Method for Numerical Analysis of Electromagneto-mechanical Coupling using Lagrangian Approach
Weixin Li, Zhensheng Yuan, Zhenmao Chen
State Key Laboratory for Strength and Vibration of Mechanical Structures, Xi'an Jiaotong University, People's Republic of China

PD4-6
3D Field Calculations of the Modular Transformer Heating under High Frequency Operation
Bronislaw Tomczuk, Dariusz Koteras, Andrzej Waindok
Opole University of Technology, Poland

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Estimation Method for Heating Efficiency of Induction Heating Cooker by Finite Element Analysis
Daigo Yonetsu, Yasushi Yamamoto
Kansai University, Japan

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Model of Induction Heating of Rotating Nonmagnetic Billets and its Experimental Verification
Frantisek Mach[1], Pavel Karban[1], Ivo Dolezel[1], Petr Sima[2], Zdenek Jelinek[2]
[1]University of West Bohemia, Faculty of Electrical Engineering, Czech Republic; [2]ETD Transformatory, a.s., Czech Republic

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A WENO Scheme for Streamer Discharge Simulations
Chijie Zhuang, Rong Zeng, Bo Zhang
Tsinghua University, People's Republic of China

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Coupled Analysis of Vibration Energy Harvesters Based on Nonconforming Voxel FEM
Takahiro Sato[1], Kota Watanabe[2], Hajime Igarashi[1]
[1]Hokkaido University, Japan; [2]Muroran Institute of Technology

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Simultaneous Design Approach to Transient Electromagnetic and Thermal Problems Based on a Black-Box Modeling Concept
Nak-Sun Choi[1], Dong-Wook Kim[1], Gi-Woo Jeung[1], K. K. Choi[2], Dong-Hun Kim[1]
[1]Kyungpook National University, Republic of Korea (South Korea); [2]Mech. and Ind. Eng., Univ. of Iowa, Iowa City, United States of America

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Slawomir Golak, Roman Przylucki
Silesian University of Technology, Poland

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Ik-Sang Jang[1], Sang-Hwan Ham[2], Chang-Sung Jin[1], Won-Ho Kim[3], Se-Young Oh[4], Ju Lee[4]
[1]Mechatronics Group, Defence Program R&D Center, Samsung Techwin Co. , Republic of Korea (South Korea); [2]Dept. of Electrical Control Engineering, Suncheon First College, Republic of Korea (South Korea); [3]Material&Device Research Center, SAIT, Samsung Electronics Co. , Republic of Korea (South Korea); [4]Dept. of Electric Engineering, Hanyang University, Republic of Korea (South Korea)

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Hassan Ebrahimi, Yanhui Gao, Hiroshi Dozono, Kazuhiro Muramatsu
Saga University, Japan

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Haïfa Mechmeche[1,2], Guillaume Fritz[2], Frédéric Gillon[1], Abdelmounaïm Tounzi[1], Michel Hecquet[1]
[1]Laboratoire d'Electrotechnique et d'Electronique de Puissance, France; [2]RENAULT, France

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Hongtao Li, Naiqiu Shu, Xiaowen Wu, Hui Peng, Zipin Li
Wuhan University, People's Republic of China

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Amine Mira[1], Christophe Espanet[1], Thierry de Larochelambert[1], Stefan Giurgea[2], Philippe Nika[1]
[1]University of Franche-Comté, France; [2]University of Technology Belfort-Montbéliard, France

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Turbo Generators End Windings Magneto-mechanical Analysis Using a Fully Analytic Magnetic Model
Antoine Journeaux[1], Frédéric Bouillault[1], Olivier Moreau[2]
[1]Laboratoire de Genie Electrique de Paris, France; [2]EDF R&D Clamart, France

PD4-19
Modeling and Numerical Analysis for Motional Effects of Dielectric Barrier on Electric Discharge and Surface Charge Accumulation
Myung Ki Baek, Il Han Park
Sungkyunkwan University, Republic of Korea (South Korea)

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Stephane Dufour, Gerard Vinsard, Esteban Saatdjian
LEMTA, France

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An Experimentally Based Mortar Cell Method Model for Electrical Interconnects
Federico Moro, Piergiorgio Alotto, Massimo Guarnieri, Giovanni Meneghetti, Andrea Stella
Universtià di Padova, Italy

1:45pm - 3:25pm Ballroom Foyer	**PD5: Material Modeling 3** **Session Chairs:** Janos Füzi, João Pedro Assumpção Bastos
	PD5-1 **Construction of Magnetic Hysteresis Loops from the Normal BH Curve and Intrinsic Coercivity** Dingsheng Lin, Ping Zhou, Chuan Lu, Ningning Chen Ansys Inc., United States of America **PD5-2** **Hysteresis Losses Evaluation in Electromagnetic Devices under Non Sinusoidal Induction Waveforms** Diego C. S. do Prado, Patrick Kuo-Peng, Nelson Sadowski, Nelson J. Batistela GRUCAD/EEL/CTC/UFSC, Brazil **PD5-3** **Thermal Behavior of Iron-Nickel-Chromium Alloys and Correlation with Magnetic and Physical Properties- Part A: Static Effects Modeling** Oualid Messal[1], Fabien Sixdenier[2], Laurent Morel[3], Noël Burais[4] [1]Laboratoire AMPERE, Université Claude Bernard Lyon1, France; [2]Laboratoire AMPERE, Université Claude Bernard Lyon1, France; [3]Laboratoire AMPERE, Université Claude Bernard Lyon1, France; [4]Laboratoire AMPERE, Université Claude Bernard Lyon1, France **PD5-4** **A Complex-Valued Rotating Magnetic Property Model and its Application to Iron Core Loss Calculationof Transformer Iron Core** Yanli Zhang, Dexin Xie Shenyang University of Technology, People's Republic of China **PD5-5** **Nonlinear Magnetization Loss in Sintered NdFeB Magnet due to Eddy Current Heat Dissipation** Radu Fratila[1,2], Abdelkader Benabou[1], Abdelmounaïm Tounzi[1], Jean-Claude Mipo[2] [1]L2EP/Université Lille1, France; [2]Valeo Equipements Electriques Moteur, France **PD5-6** **On the Modeling of Dynamic Hysteresis Using JA and Field Separation Theories** Ajay P. Singh Baghel, S. V. Kulkarni Indian Institute of Technology Bombay, India **PD5-7** **Development of Vector Hysteresis Model using a Magnetic Flip Model** Atsushi Furuya[1], Jun Fujisaki[1], Yuji Uehara[1], Koichi Shimizu[1], Hirotaka Oshima[2], Tetsuji Matsuo[3] [1]Fujitsu, Japan; [2]Fujitsu Laboratories Ltd.; [3]Kyoto University **PD5-8** **Non Linear 2D Time Domain Eddy Current Calculation for Laminated Iron Cores** Wagane Faye[1,2], Gérard Meunier[1], Brahim Ramdane[1], Christophe Guérin[2], Marlène Faure[2], Delphine Dupuy[2], Patrice Labie[1] [1]G2ELAB (Grenoble Electrical Engineering Lab), France; [2]Cedrat, France

PD5-9
A 3D Semi Implicit Method for Computing Current Density in Bulk Superconductors
Abelin Kameni[1], Mohamed Boubekeur[1], Lotfi Alloui[1], Jonathan Lambrechts[2], Frederic Bouillault[1], Christophe Geuzaine[3]
[1]Laboratoire de Génie Electrique de Paris, France; [2]Centre for Systems Engineering and Applied Mechanics, Louvain-la-Neuve, Belgium; [3]Dept of Electrical Engineering and Computer Science, Montefiore Institute, Liège, Belgium

PD5-10
Parameters for Expressing an Analytical Magnetization Curve Obtained Using a Genetic Algorithm
Marko Jesenik, Anton Hamler, Peter Kitak, Mladen Trlep
University of Maribor, Slovenia

PD5-11
Comparison between Modeling Methods of Two-Dimensional Magnetic Properties in Magnetic Field Analysis of Synchronous Machines
Shingo Higuchi[1], Yasuhito Takahashi[1], Tadashi Tokumasu[2], Koji Fujiwara[1]
[1]Department of Electrical Engineering, Doshisha University, Japan; [2]Toshiba Mitsubishi-Electric Industrial Systems Corporation, Japan

PD5-12
Improvement and Application of the Viscous-Type Frequency-Dependent Preisach Model
Miklós Kuczmann
Szechenyi Istvan University, Hungary

PD5-13
Loss Calculation Method Considering Hysteretic Property with Play Model in Finite Element Magnetic Field Analysis
Junji Kitao[1], Yoshimi Takeda[1], Yasuhito Takahashi[1], Koji Fujiwara[1], Akira Ahagon[2], Tetsuji Matsuo[3]
[1]Doshisha University, Japan; [2]Science Solutions International Laboratory, Inc., Japan; [3]Kyoto University, Japan

PD5-14
Comparison Between Different Approaches in Homogenization: Mean-field Approach vs Full-field Approaches
Romain Corcolle
Laboratoire de Génie Electrique de Paris (LGEP), France

PD5-15
Thermal Behavior of Iron-Nickel-Chromium Alloys and Correlation with Magnetic and Physical Properties-Part B: Dynamic Modeling
Oualid Messal, Fabien Sixdenier, Laurent Morel, Noël Burais
Laboratoire AMPERE, Université Claude Bernard Lyon1, France

PD5-16
Comparison of Iron Loss Prediction Formulae
Tanvir Rahman[1], Jemimah Akiror[2], Pragasen Pillay[2], David Lowther[1]
[1]Infolytica Corporation, Canada; [2]Concordia University, Canada

	PD5-17 **Modelling of Several Concentric Layers of Superconducting Filaments** Thitipong Satiramatekul[1], Frederic Bouillault[2] [1]Kasetsart University, Thailand; [2]LGEP, France **PD5-18** **Homogenized Magnetostatic Analysis of Periodic Structure with Anisotropy** Yasuhisa Ito, Hajime Igarashi Graduate School of Information Science and Technology, Hokkaido University, Japan **PD5-19** **Modeling of a Novel Three-Dimensional Magnetization Structure for Laminated Silicon Steel** Yongjian Li[1], Qingxin Yang[2], Jianguo Zhu[3], Zhigang Zhao[1], Xiaojing Liu[1], Changgeng Zhang[1] [1]Hebei University of Technology, People's Republic of China; [2]Tianjin Polytechnic University, People's Republic of China; [3]University of Technology, Sydney, Australia **PD5-20** **Prediction of Hysteresis Characteristics Using Stress-Dependent Preisach Model and FEM** Jae-han Sim, Jae-woo Jung, Byeong-hwa Lee, Seung-hee Chai, Jung-pyo Hong Hanyang University, Republic of Korea (South Korea)
1:45pm - 3:25pm **Corvina**	**PD6: Electrical Machines & Drives 5** **Session Chairs:** Wolfgang Rucker, Oriano Bottauscio
	PD6-1 **Comparative Study of E-Core Axial Field Flux-Switching Permanent Magnet Machines** Wei Zhang[1,2], Mingyao Lin[1], Li Hao[1], Jilong Zhao[1], DA Xu[1], Xinghe Fu[1] [1]School of Electrical Engineering, Southeast University, People's Republic of China; [2]School of Electrical Engineering, Nantong University, People's Republic of China **PD6-2** **Commutation Analysis for High-Speed Universal Motors** Kazumi Kurihara[1], Mamoru Kokubo[1], Takahiro Ito[2] [1]Ibaraki University, Japan; [2]Hitachi Appliances, Inc., Japan **PD6-3** **Diagnosis Technique Using Detection Coil in BLDC Motor with Inter-Turn Fault** Kyung-Tae Kim, Seung-Tae Lee, Jin Hur University of Ulsan, Republic of Korea (South Korea) **PD6-4** **Development of Axial Gap Generators for Mycro-hydro System Utilizing Magnetic Material Attached Magnetic Flux Concentrated Permanent Magnets** Shiota Katsuyuki, Takashi Todaka, Masato Enokizono Oita University, Faculty of Engineering, Japan

PD6-5
Transient Analysis of Single-Phase Induction Motor by Using Field-Circuit Coupled Finite Element Method
Youpeng HuangFu, Shuhong Wang, Jie Qiu, Haijun Zhang, Guolin Wang, Jianguo Zhu
Xi'an Jiaotong University, People's Republic of China

PD6-6
Magnetic Force Comparison of Permanent Magnet Linear Synchronous Motor with Different Topology Structures
Sang-Geon Lee, Sung-An Kim, Sang-In Byun, Yun-Hyun Cho
Dong-A University, Republic of Korea (South Korea)

PD6-7
Fast Computation of Torque - Load Angle Characteristics of Synchronous Machines Using Time-Domain Finite Element Method
S. L. Ho, Xiu Zhang, W. N. Fu
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

PD6-8
An Improved Analytical Method for Calculation of PMEM Cogging Torque
Gene Guo, Riming Shao, Liuchen Chang
University of New Brunswick, Canada

PD6-9
Research on Cogging Torque Calculation for Interior Permanent Magnet Machine based on Lumped-Circuit Parameters
Jangho Seo, Hong Soon Choi
Kyungpook National University, Republic of Korea (South Korea)

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A Permanent Magnet Synchronous Machine with Motor and Generator Functionalities in Single Stator Core
Erkan Mese[1], Murat Ayaz[2], Murat Tezcan[1], Kadir Yilmaz[2], Engin Ozdemir[2]
[1]Yildiz Technical University, Turkey; [2]Kocaeli University, Turkey

PD6-11
Numerical Analysis and Design of Large Capacity Interior Permanent Magnet Synchronous Generator under Mechanical Stress
Dongsu Lee[1], Cheol-Gyun Lee[2], Jong-Wook Kim[3], Sang-Yong Jung[4]
[1]Sungkyunkwan University, Republic of Korea (South Korea); [2]Dong-Eui University, Republic of Korea (South Korea); [3]Dong-A University, Republic of Korea (South Korea); [4]Sungkyunkwan University, Republic of Korea (South Korea)

PD6-12
The Shape Design for Vibration Reduction of IPM Type BLDC Motor
Tae-Seok Jeong, Gyu-Won Cho, Gyu-Tak Kim
changwon National University, Republic of Korea (South Korea)

PD6-13
Electromagnetic Analysis of a Novel Switched-Flux Memory Machine Employing a Parallelogram Hysteresis Model
Hui Yang, Heyun Lin, Jianning Dong, Jianhu Yan, Yunkai Huang, Shuhua Fang
Southeast University, Nanjing, Jiangsu Province, People's Republic of China

	PD6-14 **Numerical and Experimental Design Validation for Optimal Efficiency Distribution Compatible to Frequent Operating Range of Interior PMSM** Hochang Jung[1], Jihyun Ahn[2], Deokjin Kim[1], Sang-Yong Jung[2] [1]Korea Automotive Technology Institute(KATECH), Republic of Korea (South Korea); [2]Sungkyunkwan University, Republic of Korea (South Korea) **PD6-15** **Design of a BLDC Motor for Low Cost and Low Noise Application** Sangkla Kreuawan[1], Nattapon Chayopitak[1], Prasit Champa[1], Pakasit Somsiri[1], Sisuda Chaithongsuk[2] [1]National Electronics and Computer Technology Center; [2]Rajamangala University of Technology Suvarnabhumi **PD6-16** **Design of a Vernier Machine with Permanent Magnet on both sides of Rotor and Stator** Ho min Shin, Dae Kyu Jang, Jung Hwan Chang Dong-A University, Republic of Korea (South Korea) **PD6-17** **Influences of Isotropic and Anisotropic Magnetostriction on Three-Phase Transformer with Highly Grain-Oriented Electrical Steel Sheet** Heesung Yoon, C.S. Koh Chungbuk National University, Republic of Korea (South Korea) **PD6-18** **Finite-Element Analysis of Demagnetization of IPM-type BLDC Motor with Stator Turn Fault** Yoon-Seok Lee, Jin Hur University of Ulsan, Republic of Korea (South Korea) **PD6-19** **A study on IPMSM Design for Sensorless Control with High-Frequency Voltage Signal Injection** Seung-Hee Chai[1], Myung-Seop Lim[1], Jae-Woo Jung[1], Jung-Pyo Hong[1], Seung-Ki Sul[2] [1]Hanyang University, Republic of Korea (South Korea); [2]Seoul National University, Republic of Korea (South Korea) **PD6-20** **Analytical Model of Induction Motor for Performance Calculation** Ankit Dalal, Mohammed Nasir Ansari, Praveen Kumar Indian Institute of Technology, Guwahati., India **PD6-21** **Analysis of Temperature Distribution on Power Switches Arrangements in Power Converter for Switched Reluctance Motor Drive** Hao Chen, Yang Xu China University of Mining & Technology, People's Republic of China
3:25pm - 3:50pm	**Coffee Break**

3:50pm - 5:30pm Ballroom	**OD2: Electrical Machines & Drives 6 + Devices & Applications 4** **Session Chairs:** Herbert De Gersem, Yves Marechal
	OD2-1 **Frequency Domain Decomposition of 3-D Eddy Current Problems in Steel Laminations of Induction Machines** Paul Handgruber[1], Andrej Stermecki[1], Oszkar Biro[1], Georg Ofner[2] [1]IGTE, Graz University of Technology, Austria; [2]ELIN Motoren GmbH, Austria **OD2-2** **Segregation of Iron Losses from Rotational Field Measurements and Application to Electrical Machine** Anouar Belahcen[1,2], Paavo Rasilo[1], Antero Arkkio[1] [1]Aalto University, Finland; [2]Tallinn University of Technology, Estonia **OD2-3** **Iron Loss Analysis of Interior Permanent Magnet Synchronous Motors by Considering Mechanical Stress and Deformation of Stators and Rotors** Katsumi Yamazaki, Yusuke Kato Chiba Institute of Technology, Japan **OD2-4** **2D versus 3D Electromagnetic Field Modelling in Electromechanical Energy Converters** Andrzej Demenko[2], Jan Sykulski[1], Rafal Wojciechowski[2] [1]University of Southampton, United Kingdom; [2]Poznań University of Technology, Poland **OD2-5** **A Parametrical Determination of the Influence Region of Holes in Electromagnetic Devices by the Compensation Theorem** Alessandro Formisano[1], Raffaele Fresa[2], Raffaele Martone[1] [1]Seconda Università di Napoli, Italy; [2]Assoc. EURATOM/ENEA/CREATE; Univ. della Basilicata, Italy
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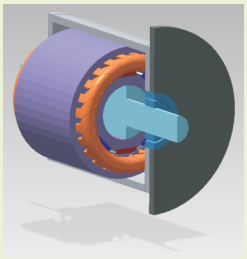
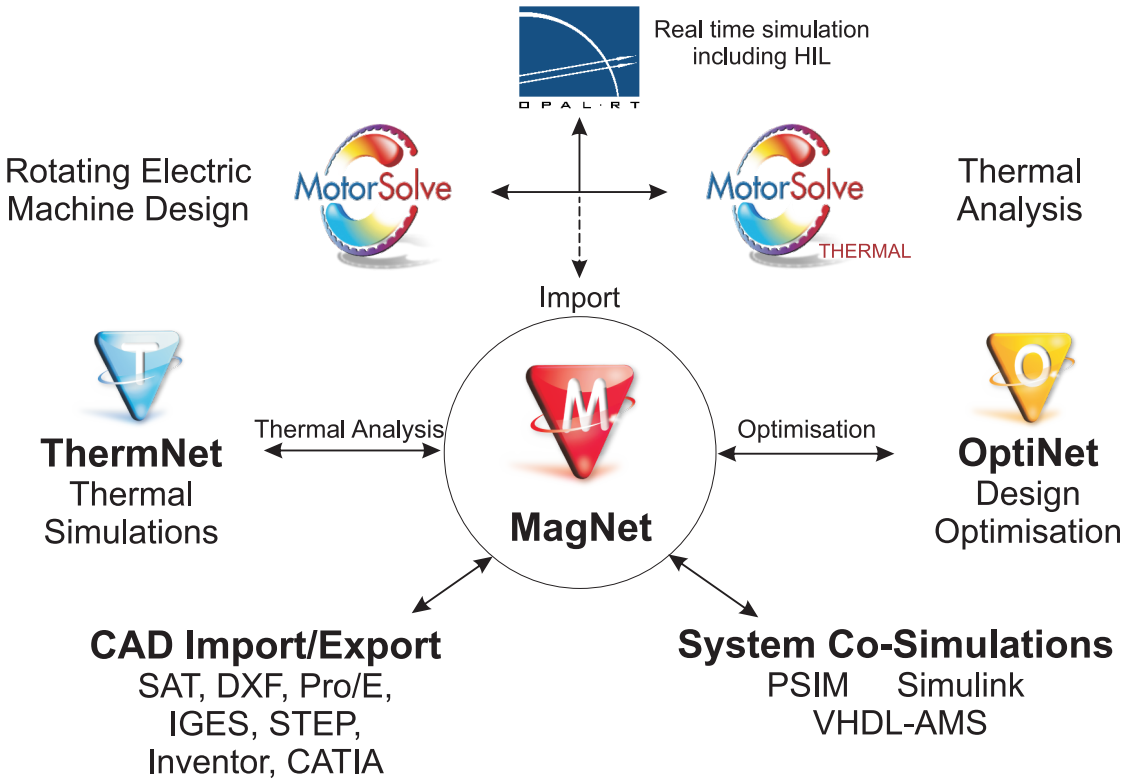


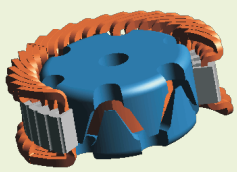
MotorSolve is the highly accurate electric machine design software for SRM, IM, brushed and brushless DC machines, which combines an easy to use template-based interface with an automated FEA solver.

Integrated into the single design environment is MotorSolve Thermal – a 3D automated FEA analysis module that analyses the effects of heating and different cooling methods on machine performance.



MagNet 7 - Magnetic Design Software

MagNet is a general purpose 2D & 3D FE analysis software for applications such as electromechanical devices, non-destructive testing (NDT), induction heating, power electronics, sensors, and industrial transformers. MagNet can be coupled to ThermNet for thermal analysis, OptiNet for optimisation, and 3rd party software tools such as PSIM and Simulink, Microsoft Office, etc.



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