



**EMF 2009 program**

**Wednesday 27<sup>th</sup> May 2009**

**8h45-9h : Opening Session**

**9h-10h15 : Session OA1 : Formulations 1**

- 94** Magnetoelasticity: A uniform edge-element approach  
Alain Bossavit
- 92** Advanced Simulation Methods for Components in High-Voltage Systems Using Nonlinear Electric Field Stress Grading Materials  
Markus Clemens, Thorsten Steinmetz, Daniel Weida
- 43** Frequency-domain homogenisation for periodical electromagnetic structure  
Gerard Meunier, Christophe Guerin, Vincent Charmoille, Patrice Labie
- 84** Formulations for numerical dosimetry of currents induced in the human body by ELF magnetic fields  
Riccardo Scorretti, Ronan Perrussel, Noel Burais, Laurent Nicolas
- 66** Stochastic Finite Element Analysis for Parasitic Extraction of Interconnects with Material Parameter Variations  
Xiaoyu Xu, Li Kong, Zhuoxiang Ren

10h15-10h45 : Coffee break

**10h45-12h15 : Session OA2 : Material modelling**

- 2** Hysteresis loss in vector Preisach models  
Edward Della Torre, Ermanno Cardelli, Lawrence H. Bennett
- 83** A Modified Elliptic Model of Anisotropy in Nonlinear Magnetic Materials  
Oszkar Biro, Stefan Ausserhofer
- 50** A Posteriori Iron Loss Computation With a Vector Hysteresis Model  
Anouar Belahcen, Emad Dlala, Katarzyna Fonteyn, Monear Belkasim
- 62** Energetic Model of Ferromagnetic Hysteresis  
Paul Fulmek, Peter Haumer
- 102** FE Application to the Microscopic Structure of Soft Magnetic Materials to Predict the Magnetization Curve  
Charles Cyr, Philippe Viarouge, Stéphane Clénet, Jérôme Cros
- 76** 3D Finite Element Analyses of a Hybrid Magnetic Bearing with Various Eccentric Rotor Positions  
Erich Schmidt, Matthias Hofer

**12h15-14h15 : Lunch**



**14h15-15h45 : Poster session PA**

**Applications**

- 60** A numerical evaluation of Electromagnetic fields exposure on real human body models until 100 kHz  
Fabrizio Dughiero, Michele Forzan, Elisabetta Sieni
- 63** 3D Finite Element Analysis of Magnetic Micro Actuator with Taking Account of Non-Linearity Magnetization: Application to Biological Pumping Fluids  
BENSAIDANE Hakim, OUAZIR Youcef, HADJOUT Larbi
- 86** FEM Analysis of Fast Ramped Superconducting Synchrotron Magnets and Comparison to Experimental Results  
Anna Mierau, Egbert Fischer, Pavel Akishin, Roman Kurnyshov, Bernhard Schnizer, Pierre Schnizer, Petr Shcherbakov
- 22** Simulation of Current Traces on a Nonlinear Element of Varistor Model  
Zbigniew Waclawek, Maciej Jaroszewski, Paweł Kostyła
- 46** Ionizing electric field in the ozone generating tube  
France Pavlovic, David Nedeljkovic
- 45** Reduction of the Impact of External Magnetic Fields on Magnetic Sensor Arrays Working as Current Transducers  
Zichi Zhang, Luca Di Rienzo
- 106** Optimal Design of Detection System in Active Magnetic Shielding  
Alessandro Formisano, Maria Carmina Lupoli, Raffaele Martone
- 59** Lightning-Induced Overvoltages Protection Schemes Assessment on a EHV/HV Substation  
Federico Delfino, Giorgio Molinari, Renato Procopio, Mansueto Rossi
- 104** A novel circuit model of a proton exchange membrane fuel cell  
Massimo Guarneri, Federico Moro
- 24** Feasibility analysis and conceptual design of an inductive MHD generator  
Roberto Pintus, Augusto Montisci
- 19** Calculation and Measuring of Quasi-Static Electromagnetic Field in Electric Facilities  
Hidajet Salkic, Vlado Madzarevic, Mario Klaric, Nerdina Mehinovic

**Applications – High frequency**

- 54** Optimization of Meander Line Antenna on Dielectric Substrate for UHF-band RFID  
Hidetoshi Makimura, Kota Watanabe, Hajime Igarashi
- 12** FSS Approach for Power Transmission Enhancement through Electrically Small Apertures  
Luca Scorrano, Filiberto Bilotti, Lucio Vegni
- 69** The Numerical Modelling of the Electromagnetic Field in the Drying Processes in a Microwave Field  
Soproni Vasile Darie, Bandici Livia, Hathazi Francisc Ioan, Molnar Carmen Otilia, Arion Mircea Nicolae
- 49** Numerical parameter extraction of 45-nm devices  
Giambattista Grusso, Angelo brambilla, giancarlo storti gajani



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- 37** Assessment of Magnetic Fluid Losses with Calorimetric Measurement  
Miloš Bekovic, Anton Anton Hamler

**Optimization and inverse problems**

- 111** Niching Evolution Strategies and Multiple Objective Functions for Finding Global and Pareto Optimal Solutions  
Christian Magele, Michael Jandl, Alice Köstinger, Werner Renhart, Bogdan Cranganu-Cretu, Jasmin Smajic
- 101** Interlaced Resolution Scheme for the Simultaneous Analysis of Brain Electric Activity and Conductivity with Combined EEG/MEG Diagnostics  
Ida Maria Vincenza Caminiti, Fabrizio Ferraioli, Alessandro Formisano, Raffaele Martone
- 85** Optimization Algorithm in a Three Phase TPM-LiG Modeling for Marine Applications  
Andrea Pirisi, Marco Mussetta, Giambattista Grusso, Riccardo E. Zich

**Forces**

- 8** High gradient magnetic separation of pollutant from waste waters  
Giacomo Mariani, Massimo Fabbri, Pier Luigi Ribani, Francesco Negrini

**15h45-16h15 : coffee break**

**16h15-17h15 : Session OA3 : Electrical machines**

- 91** Accounting of axial component field in double exited motors using 2D-FEM  
Guillaume Krebs, Claude Marchand
- 9** A Study on Slotless Brushless DC Motor with Hexagonal Windings  
Jung-Moo Seo, Se-Hyun Rhyu, Jun-Hyuk Choi, Young-Kyun Kim, In-Soung Jung
- 34** Shaft voltage diagnosis of inter-turn field faults in a synchronous generator aided by FEM models  
Daniel de Canha, Willie Cronje, Alan Meyer
- 31** Convolution Approach for Analysis of Magnetic Forces in Electrical Machines  
Richard Rothe, Michael van der Giet, Kay Hameyer

**17h45 : Departure for dinner in Vicoforte (meeting point Piazza Repubblica)**



**Thursday 28<sup>th</sup> May 2009**

**8h45-9h30 : Invited lecture : Discontinuous Galerkin FEM Methods for Full Maxwells Equations  
Markus Clemens**

**9h30-10h30 : Session OB1 : Formulations – High frequency**

- 93** Electromagnetic Scattering Problem Solving by an Integral Meshless-Based Approach  
Williams Nicomedes, Renato Mesquita, Fernando Moreira
- 64** FDTD Analysis of UHF-band RFID Considering Dielectric Effects  
Yuta WATANABE, Kota WATANABE, Hajime IGARASHI
- 57** Generalized Cloaking and Optical Polyjuice  
Andre Nicolet, Frederic Zolla, Christophe Geuzaine
- 100** Iterative finite element solution of multiple-scattering problems at high frequencies  
Christophe Geuzaine, Patrick Dular, Roman Gaignaire, Ruth Sabariego

**10h30-11h : coffee break**

**11h-12h : Session OB2 : Optimization and Data structures**

- 79** Generic formulation of Optimisation problems for Energy management: solving difficulties, practical and mathematical analysis  
Ghaith warkozek, Mireille Jacomino, Stephane Ploix, Frédérique Wurtz
- 3** A Strategy-Driven Algorithm for Multi-Objective Optimization Problems  
Sara Carcangiu, Alessandra Fanni, Augusto Montisci
- 95** A Robust Optimization Method Based on Adjoint Variable Method  
Takayuki Maruyama, Kota Watanabe, Hajime Igarashi
- 110** Data structures for mesh-based electromagnetic simulation codes  
Piergiorgio Alotto

**12h-12h30 : Session OB3 : Applications**

- 5** Evaluation of a Printed Circuit Board Coaxial Transformer  
David Pentz, Ivan Hofsajer
- 48** Finite-Element Analysis of a Shielded Pulsed-Current Induction Heater - Experimental Validation of a Time-Domain Thin-Shell Approach  
Ruth V. Sabariego, Peter Sergeant, Johan Gyselinck, Patrick Dular, Luc Dupré, Christophe Geuzaine

**12h30-14h30 : lunch (13h45 International Scientific Committee meeting)**

**14h30-16h : Poster Session PB**

**Formulations**

- 65** A formulation of the volume integral equation method for 3D non linear magnetostatics by means of the reduced magnetic scalar potential  
Antonio Morandi, Massimo Fabbri, Pier Luigi Ribani



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- 38** Extended Magnetic Equivalent Circuit Method That Accounts for Leakage Flux Using Schwarz-Christoffel Mapping and the Separation of MMF Sources  
Christopher Lines, Willie Cronje, Brian Wigdorowitz
- 75** Fixed-Point Method for Solving Nonlinear Periodic Eddy Current Problems with T,  $\Phi$ - $\Phi$  Formulation  
Gergely Koczka, Oszkár Bíró
- 112** Direct Inclusion of Proximity-Effect Losses in Two-Dimensional Time-Domain Finite-Element Simulation of Electrical Machines  
Johan Gyselinck, Patrick Dular, Christophe Geuzaine, Ruth V. Sabariego
- 74** Introduction of Linear Magnetic and non Conductive Materials in PEEC Method Using a Coupling with an Integral Volume Equation  
Tung LE DUC, Olivier CHADEBEC, Jean-Michel GUICHON, Gérard MEUNIER
- 82** Equivalent Source model and Parallel Neural Networks hybrid approach for ELF magnetic field in indoor environment  
Salvatore Coco, Antonio Laudani, Francesco Riganti Fulginei, Alessandro Salvini
- 11** Multilayer Dielectric System Determination by Using Equivalent Charges  
Nebojsa Raicevic, Slavoljub Aleksic, Goran Krivacevic
- 88** Axisymmetric FE-BE Method by Using Non-Standard Boundary Elements  
Giovanni Aiello, Salvatore Alfonzetti, Nunzio Salerno
- 16** BEM-based FEM  
Marvin Fleck
- 99** An efficient method for electromagnetic field evaluation using different numerical models  
Luigi Valbonesi, Riccardo E. Zich

**Material modelling**

- 47** A new formula for dynamic loss in soft magnetic materials  
Krzysztof Chwastek, Jan Szczyglowski
- 61** Magnetic Accommodation in NiZn-Ferrite  
Paul Fulmek, Gert Holler, Hannes Wegleiter, Bernhard Schweighofer, Peter Haumer

**Mesh**

- 18** On Delaunay refinement for curved geometries  
Adriano Lisboa, Rodney Saldanha, Ricardo Takahashi, Renato Mesquita

**Electrical machines**

- 23** Characteristic Analysis of Pole Changing Type Writen-Pole Motor considering Magnetization of Permanent Magnet  
Seung-Bin Lim, Se Hyun Rhy, In-Soung Jung, Dae-Kyong Kim
- 30** Stability and Performance Improvement in Interior Permanent-Magnet Synchronous Motor with High Magnetic-Saturation  
Young-Kyoun Kim, Bon-Gwan Gu, In-Soung Jung



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- 35** Dynamic FEM Modelling and Laboratory Verification of a 3-Phase Squirrel Cage Induction Machine  
Jarrad Wright, Willie Cronje, Alan Meyer
- 17** Optimisation of rotor tooth and stator pole geometry in reluctance stepper motor  
Jakub Kolota, Jakub Bernat, Slawomir Stepień, Grzegorz Szymanski
- 77** Analytical Solution for the Stray Field of Large Power Transformers  
Erich Schmidt, Michael Strobach, Peter Hamberger

**Formulations – High frequency**

- 13** Improved Biological Sensing through Electromagnetic Cloaking  
Simone Tricarico, Filiberto Bilotti, Lucio Vegni
- 25** PEEC Antenna Modeling of Rectangular Spiral Inductors for RFID Systems  
Peter Scholz, Wolfgang Ackermann, Thomas Weiland

**Applications**

- 27** Magnetic field in the nucleation and crystallization of sucrose.  
Guillermo Ribeaux, Adolfo Fernández, Oscar Ares, Federico Falcon

**16h45 : Departure for dinner in Pollenzo (Langa & Roero) (meeting point Piazza Repubblica)**



**Friday 29th May 2009**

**8h45-10h15 : Session OC3 : Formulations 2**

- 78** A p-multigrid spectral element method on simplicial meshes: application to high frequency electromagnetic problems  
Richard Pasquetti, Francesca Rapetti
- 109** A method to solve FEM statics cases without assembling a matrix system: application to 3D edge elements  
João Pedro Bastos, Nelson Sadowski
- 73** Equivalent Formulas for Electromagnetic Force Calculation Using Edge Element Method  
Andrzej Demenko, Wieslaw Lyskawinski, Rafal Wojciechowski
- 90** Comparison between Overlapping method and Lagrange multipliers approach applied to a movement  
Thomas Henneron, Guillaume Krebs, Mathieu Aubertin, Stéphane Clénet, Francis Piriou
- 14** Calculation of the Parallel Finite Plate Capacitance and the Electrical Fields using the Method of Moments and the Haar Wavelets  
Aldo Belardi, José Cardoso, Carlos Sartori
- 81** EMC analysis of static converters by the extraction of a complete equivalent circuit via a dedicated PEEC method  
Vincent Ardon, Jérémie Aimé, Edith Clavel, Olivier Chadebec, Enrico Vialardi, Jean-Michel Guichon, Patrice Labie

10h15-10h45 : coffee break

**10h45-12h : Session OC2 : Non-destructive testing**

- 26** Adaptive Database for Eddy-Current Testing in Metal Tubes  
Gabriele Franceschini, Marc Lambert, Dominique Lesselier
- 80** A fast numerical model for predicting magnetic flux leakage signals due to defects in a steel pipe by using an integral equation approach  
Emna Amira Fnaiech, Denis Prémel, Claude Marchand, Bernard Bisiaux
- 67** A non-destructive testing application solved with A—X geometric eddy-current formulation  
Lorenzo Codecasa, Patrick Dular, Ruben Specogna, Francesco Trevisan
- 105** Virtual Positioning and Shaping of Source Fields for ECT of Tubes  
Fabrizio Ferraioli, Alessandro Formisano, Francesco Iacotucci, Raffaele Martone
- 103** 3D Magnetostatic Analysis of Magneto-inductive devices for NDT  
Aldo Canova, Fabio Freschi, Bruno Vusini

12h-14h : Lunch

**14h-15h30 : Session OC1 : Coupled problems**

- 44** Adaptation in Multi-nature Problems  
Christos Vokas, Manfred Kasper
- 89** Combining Time-Harmonic Eddy-Current and Transient Thermal Analyses  
Giovanni Aiello, Salvatore Alfonzetti, Emanuele Dilettoso, Nunzio Salerno



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- 107** Experimental Validation of a Numerical Multiphysics Technique for Electro-Thermo-Mechanical Problem  
Cristiana Delprete, Fabio Freschi, Maurizio Repetto, Carlo Rosso
  - 98** Thermal behavior of High Magnetic Coupling Passive Loop  
Aldo Canova, Luca Giaccone
  - 56** 3D modeling of a molten glass heated by direct induction in a cold crucible melter  
Etienne Rousset, Emilien Sauvage, Steven Daix, Patrice Brun, Armand Bonnetier, Jacques Lacombe, Gilles Cauffet, Jean-Marc Dedulle
  - 58** Comparison of pull-in voltage in MEMS using 3D FEM and analytical approach  
Francisc Bölöni, Abdelkader Benabou, Abdelmounaïm Tounzi
- 16h : Bus to airport departure (meeting point Piazza Repubblica)**