
Contents

Part I Coupled Problems

Comparison of Model Reduction Methods with Applications to Circuit Simulation

Roxana Ionutiu, Sanda Lefteriu, Athanasios C. Antoulas 3

Transient Field-Circuit Coupled Models with Switching Elements for the Simulation of Electric Energy Transducers

Herbert De Gersem, Galina Benderskaya, Thomas Weiland 25

Technology and Device Modeling in Micro and Nano-electronics: Current and Future Challenges

Andrea Marmiroli, Gianpietro Carnevale, Andrea Ghetti 41

New Algorithm for the Retrieval of Aerosol's Optical Parameters by LIDAR Data Inversion

Camelia Talianu, Doina Nicolae, C. P. Cristescu, Jeni Ciuciu, Anca Nemuc, Emil Carstea, Livio Belegante, Mircea Ciobanu 55

A Demonstrator Platform for Coupled Multiscale Simulation

Carlo de Falco, Georg Denk, Reinhart Schultz 63

Upon the Interaction between Magnetic Field and Electric Arc in Low Voltage Vacuum Circuit Breakers

Smaranda Nitu, Dan Pavelescu, Constantin Nitu, Gheorghe Dumitrescu, Paula Anghelita 73

Accurate Modeling of Complete Functional RF Blocks: CHAMELEON RF

H.H.J.M. Janssen, J. Niehof and W.H.A. Schilders 81

Finite Element Analysis of Generation and Detection of Lamb Waves Using Piezoelectric Transducers

Sorohan St., Constantin N., Anghel V., Gavan M. 89

Optimization of a Switching Strategy for a Synchronous Motor Fed by a Current Inverter Using Finite Element Analysis <i>Vasile Manoliu</i>	97
Finite Volume Method Applied to Symmetrical Structures in Coupled Problems <i>Ioana - Gabriela Sîrbu</i>	107
Scattering Matrix Analysis of Cascaded Periodic Surfaces <i>Adriana Savin, Raimond Grimberg, Rozina Steigmann</i>	115
<hr/> Part II Circuit Simulation and Design <hr/>	
Overview of Circuit-Simulation Activities at TKK CTL <i>Janne Roos</i>	127
Outstanding Issues in Model Order Reduction <i>João M. S. Silva, Jorge Fernández Villena, Paulo Flores, L. Miguel Silveira</i> ..	139
Positive Real Balancing for Nonlinear Systems <i>Tudor C. Ionescu, Jacquélien M. A. Scherpen</i>	153
Efficient Initialization of Artificial Neural Network Weights for Electrical Component Models <i>Tuomo Kujanpää and Janne Roos</i>	161
Trajectory Piecewise Linear Approach for Nonlinear Differential-Algebraic Equations in circuit simulation <i>T. Voß, R. Pulch, E.J.W. ter Maten, A. El Guennouni</i>	167
Model Order Reduction of Large Scale ODE Systems: MOR for ANSYS versus ROM Workbench <i>A.J. Vollebregt, T. Bechtold, A. Verhoeven, E.J.W. ter Maten</i>	175
Adjoint Transient Sensitivity Analysis in Circuit Simulation <i>Z. Ilievski, H. Xu, A. Verhoeven, E.J.W. ter Maten, W.H.A. Schilders and R.M.M. Mattheij</i>	183
Index Reduction by Element-Replacement for Electrical Circuits <i>Simone Bächle and Falk Ebert</i>	191
Application of 2D Nonuniform Fast Fourier Transforms Technique to Analysis of Shielded Microstrip Circuits <i>Raimond Grimberg, Adriana Savin, Sorin Leitoiu</i>	199
A Filter Design Framework with Multicriteria Optimization Based on a Genetic Algorithm <i>Neag Marius, Marina Topa, Liviu Nedelea, Lelia Festila, Vasile Topa</i>	207

Thermal Network Method in the Design of Power Equipment <i>C. Gramsch, A. Blaszczyk, H. Löbl, S. Grossmann</i>	213
Hierarchical Mixed Multirating in Circuit Simulation <i>Michael Striebel and Michael Günther</i>	221
Automatic Partitioning for Multirate Methods <i>A. Verhoeven, B. Tasić, T.G.J. Beelen, E.J.W. ter Maten, R.M.M. Mattheij</i>	229
Simulation of Quasiperiodic Signals via Warped MPDAEs Using Houben's Approach <i>Julia Greb, Roland Pulch</i>	237
<hr/>	
Part III Computational Electromagnetics	
<hr/>	
RF & Microwave Simulation with the Finite Integration Technique – From Component to System Design <i>I. Munteanu, T. Weiland</i>	247
The Energy Viewpoint in Computational Electromagnetics <i>Francois Henrotte, Kay Hameyer</i>	261
Newton and Approximate Newton Methods in Combination with the Orthogonal Finite Integration Technique <i>H. De Gersem, I. Munteanu, T. Weiland</i>	275
Transient Simulation of a Linear Actuator Discretized by the Finite Integration Technique <i>Mariana Funieru, Herbert De Gersem, Thomas Weiland</i>	281
Reduced Order Electromagnetic Models for On-Chip Passives Based on Dual Finite Integrals Technique <i>Gabriela Ciuprina, Daniel Ioan, Diana Mihalache</i>	287
Techniques to Reduce the Equivalent Parallel Capacitance for EMI Filters Integration <i>Adina Racasan, Calin Munteanu, Vasile Topa, Claudia Racasan</i>	295
Buffered Block Forward Backward (BBFB) Method Applied to EM Wave Scattering from Homogeneous Dielectric Bodies <i>Conor Brennan, Diana Bogusevschi</i>	301
Symmetric Coupling of the Finite-Element and the Boundary-Element Method for Electro-Quasistatic Field Simulations <i>T. Steinmetz, N. Gödel, G. Wimmer, M. Clemens, S. Kurz, M. Bebendorf, S. Rjasanow</i>	309

Computational Errors in Hysteresis Preisach Modelling <i>Valentin Ionita, Lucian Petrescu</i>	317
<hr/>	
Part IV Mathematical and Computational Methods	
<hr/>	
Manifold Mapping for Multilevel Optimization <i>Pieter W. Hemker, David Echeverría</i>	325
Software Package for Multi-Objective Optimal Design of Electromagnetic Devices <i>Calin Munteanu, Gheorghe Mates, Vasile Topa</i>	331
Optimal Design of Monolithic ESBT® Device carried out by Multiobjective Optimization. <i>Salvatore Spinella, Vincenzo Enea, Daniele Kroell, Michele Messina, Cesare Ronsisvalle</i>	339
On Fast Optimal Control for Energy-Transport-based Semiconductor Design <i>C. R. Drago</i>	347
Extended Hydrodynamical Models for Charge Transport in Si <i>Roberto Beneduci, Giovanni Mascali, Vittorio Romano</i>	357
On the Implementation of a Delaunay-based 3-dimensional Mesh Generator <i>K.J. van der Kolk, N.P. van der Meijs</i>	365
Coupled FETI/BETI Solvers for Nonlinear Potential Problems in (Un)Bounded Domains <i>Ulrich Langer, Clemens Pechstein</i>	371
A Hierarchical Preconditioner within Edge Based BE-FE Coupling in Electromagnetism <i>K. Straube, I. Ibragimov, V. Rischmüller, S. Rjasanow</i>	379
Solution of Band Linear Systems in Model Reduction for VSLI Circuits <i>Alfredo Remón, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí</i>	387
MOESP Algorithm for Converting One-dimensional Maxwell Equation into a Linear System <i>E. F. Yetkin, H. Dağ, W. H. A. Schilders</i>	395
Adaptive Methods for Transient Noise Analysis <i>Thorsten Sickenberger, Renate Winkler</i>	403
Efficient Execution of Loosely Coupled Tasks in Grid Platforms <i>Felicia Ionescu, Stefan Diaconescu, Alexandru Gheregă, Gabriel Dimitriu</i>	411

Contents XIII

Colour Figures 417

Index 463

<http://www.springer.com/978-3-540-71979-3>

Scientific Computing in Electrical Engineering

Ciuprina, G.; Ioan, D. (Eds.)

2007, XXII, 464 p. 343 illus., 112 illus. in color.,

Hardcover

ISBN: 978-3-540-71979-3