

1. Record Nr.	UNINA9910842286203321
Autore	van Beurden Martijn
Titolo	Scientific Computing in Electrical Engineering : SCEE 2022, Amsterdam, the Netherlands, July 2022
Pubbl/distr/stampa	Cham : , : Springer, , 2024 ©2024
ISBN	3-031-54517-6
Edizione	[1st ed.]
Descrizione fisica	1 online resource (239 pages)
Collana	Mathematics in Industry Series ; ; v.43
Altri autori (Persone)	BudkoNeil V CiuprinaGabriela SchildersWil BansalHarshit BarbulescuRuxandra
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Organization -- Acknowledgement -- Contents -- Circuit Simulation and Design -- Harmonic Balance with Small Signal Perturbation -- 1 Introduction -- 2 Small Signal Distortion of a Periodic Steady State -- 3 Real-Valued Signals -- 4 Discretization -- 5 Relation to Two-Tone Harmonic Balance (HB) -- 6 Extraction of X-Parameter Models -- 7 Numerical Test -- 8 Conclusion -- References -- A Projective-Based Formalism for Symmetric Modeling of Electrical Circuits -- 1 Introduction -- 2 Nodal Models -- 3 Index Analysis -- 4 Other Applications of Homogeneous Models -- 5 Concluding Remarks -- References -- A Port-Hamiltonian, Index 1, Structurally Amenable Electrical Circuit Formulation -- 1 Summary -- 2 Constituents -- 3 Circuit Equations -- 4 Graph Linear Algebra -- 5 The Compact port-Hamiltonian DAE -- 6 Conclusion -- Appendix -- References -- Device Simulation -- Simulation of a GNR-FET -- 1 Introduction -- 2 Mathematical Model -- 3 Numerical Results -- References -- Computational Electromagnetics -- Solution of Time-Harmonic Maxwell's Equations by a Domain Decomposition Method Based on PML Transmission Conditions -- 1 Introduction -- 2 Mathematical Model --

2.1 PML Formulation -- 2.2 Domain Decomposition Preconditioner -- 3
Numerical Results -- 4 Conclusions -- References -- Validation-
Oriented Modelling of Electrical Stimulation Chambers for Cartilage
Tissue Engineering -- 1 Introduction -- 2 Materials and Methods -- 3
Results and Discussion -- 4 Conclusion -- References -- Matrix-Free
Parallel Preconditioned Iterative Solvers for the 2D Helmholtz Equation
Discretized with Finite Differences -- 1 Introduction -- 2 Mathematical
Model -- 3 Numerical Methods -- 3.1 Discretization -- 3.2
Preconditioned Krylov Subspace Methods -- 3.3 Matrix-Free Parallel
Implementation -- 4 Numerical Experiments -- 5 Conclusions --
References.
Implementation and Validation of the Dual Full-Wave E and H
Formulations with Electric Circuit Element Boundary Conditions -- 1
Introduction -- 2 H-Based Formulation for ECE and Frequency Domain
FW Field -- 3 MQS Test - Conducting Cylinder -- 4 FW Test - Coaxial
Cable -- 5 Conclusions -- References -- A Yee-Like Finite Element
Scheme for Maxwell's Equations on Hybrid Grids with Mass-Lumping --
1 Introduction -- 2 Description of the Problem -- 3 A Finite Element
Method with Mass-Lumping -- 4 Main Results -- 5 Implementation --
6 Numerical Illustration -- References -- Time-Domain
Electromagnetic Modeling and Simulation of a Nonlinear Electro-Optical
Mixer -- 1 Introduction -- 2 Physical Model and Theory -- 3 Results --
4 Conclusion -- References -- Iterative Charge-Update Schemes for
Electro-quasistatic Problems -- 1 Introduction -- 2 Problem
Description -- 3 The Iterative Charge-Update Scheme -- 4 Numerical
Explorations -- 4.1 Reference Simulation -- 4.2 The Case of Perfect
Electric Conductors -- 4.3 Numerical Convergence Study -- 5
Conclusions -- References -- Electrostatic Forces on Conductors with
Boundary Element Methods in 3D -- 1 Introduction -- 1.1 Floating
Potential Model Problem -- 2 Forces via Shape Differentiation -- 3
Numerical Experiments -- 3.1 Implementation -- 3.2 Force and Torque
Convergence Results -- 4 Conclusion -- References -- 25 Years
Computational Electromagnetics @ SCEE -- 1 General Introduction --
1.1 Finite Element Method -- 1.2 Finite Integration Technique -- 2
Exemplary Contributions from the Previous Conferences -- 3
Conclusion -- References -- Mathematical and Computational Methods
-- Machine Learning Techniques to Model Highly Nonlinear Multi-field
Dynamics -- 1 Introduction -- 2 The Bridge Benchmark Dynamics -- 3
Neural Networks Models -- 4 Results -- 5 Conclusions -- References.
Port-Hamiltonian Systems' Modelling in Electrical Engineering -- 1
Port-Hamiltonian Systems Modelling in a Nutshell -- 2 pH-DAE
Systems -- 3 Electrical Networks -- 4 Electromagnetic Devices -- 5
Coupled EM/circuit System -- 6 Simulation Strategies -- 7 Conclusions
-- References -- Large-Scale H2 Optimization for Thermo-Mechanical
Reliability of Electronics -- 1 Introduction -- 2 Reduction in the H2
Norm -- 3 General H2 Optimization -- 3.1 Gradient-Based
Optimization -- 3.2 Approximating the Gradient -- 4 Numerical
Comparison -- 5 Conclusions -- References -- Data-Driven Model
Order Reduction of Parameterized Dissipative Linear Time-Invariant
Systems -- 1 Introduction -- 2 Background and Notation -- 2.1
Problem Statement -- 2.2 Model Structure -- 3 Model Dissipativity
Conditions -- 4 Model Generation -- 5 A Test Case -- 6 Conclusions
-- References -- Splitting Methods for Linear Coupled Field-Circuit
DAEs -- 1 Introduction -- 2 Coupled Field-Circuit Modeling -- 2.1
Coupled Index Analysis -- 3 Operator Splitting Approach -- 3.1
Subsystem Properties -- 3.2 Convergence Analysis -- 4 Numerical
Results -- 5 Conclusions and Outlook -- References -- Structure-
Preserving Identification of Port-Hamiltonian Systems-A Sensitivity-

Based Approach -- 1 Introduction -- 2 Sensitivity Approach -- 3
Gradient-Descent Algorithm -- 4 Proof of Concept -- 5 Numerical
Results -- 6 Conclusion and Outlook -- References -- BG

Approximations of Multiphysics pH Distributed Systems with Finite
Number of Ports -- 1 Introduction -- 2 Devices with ECE BC -- 3
Interconnection of the pH Systems -- 4 Discrete Models of Distributed
PH-ECE Systems -- 5 Conclusions -- References -- Bilinear Realization
from I/O Data with NNs -- 1 Introduction -- 2 The Bilinear Realization
Framework -- 2.1 The Bilinear Markov Parameters -- 2.2 The Bilinear
Hankel Matrix -- 2.3 Bilinear Realization Algorithm.

3 From a Single Data Sequence to Bilinear Realization -- 4 Conclusion
-- References -- Coupling FMUs to Electric Circuits in Multiphysical
System Simulation Software for the Development of Electric Vehicles --
1 Introduction -- 2 Multiphysical System Formulation -- 3 Functional
Mock-Up Units (FMUs) -- 4 Co-simulation for Coupled Network DAEs
-- 5 Numerical Example -- 6 Conclusion and Outlook -- References --
Battery Module Simulation Based on Model Exchange FMU Cell Models
and Its Application in Multi-physical System Simulation Software -- 1
Introduction -- 2 Mathematical Model -- 3 Hierarchical Approach -- 4
Numerical Example -- 5 Conclusion -- References -- Sensitivity
Analysis of Random Linear Dynamical Models Using System Norms -- 1
Introduction -- 2 Random Linear Dynamical Systems -- 3 Stochastic
Galerkin Systems and Norms -- 4 Sensitivity Measures -- 5 Illustrative
Example -- 6 Summary -- References -- Compact Modelling of Wafer
Level Chip-Scale Package via Parametric Model Order Reduction -- 1
Introduction -- 2 Case Study: Wafer Level Chip-Scale Package -- 3
Parametric Model Order Reduction -- 3.1 Arising Parametric System --
3.2 Moment Matching and Subspace Definition -- 4 Numerical Results
-- 5 Conclusion and Outlook -- References -- Author Index.
