1. Record Nr. UNISA990003433020203316

Titolo	Multicultural literature in contemporary Italy / edited by Marie Orton and Graziella Parati
Pubbl/distr/stampa	Madison ; Teaneck : Farleigh Dickinson university press, copy
ISBN	978-0-8386-4162-0
Descrizione fisica	204 p. ; 24 cm
Disciplina	850.809355
Soggetti	Scrittori stranieri - Letteratura italiana - Sec. 21
Collocazione	VI.3.F. 171
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

2. Record Nr. UNINA9910648493303321

Autore	Sevgi Levent
Titolo	Electromagnetic modeling and simulation [[electronic resource] /] / Levent Sevgi
Pubbl/distr/stampa	Hoboken, New Jersey : , : John Wiley & Sons, Inc., , [2014] [Piscataqay, New Jersey] : , : IEEE Xplore, , [2014]
ISBN	1-118-87711-X 1-118-71644-2 9781118716410
Descrizione fisica	1 online resource (666 pages)
Collana	IEEE Press series on electromagnetic wave theory
Classificazione	SCI022000
Disciplina	621.380285/53
Soggetti	Electromagnetism - Computer simulation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Preface xvii -- About the Author xxvii -- Acknowledgments xxix -- 1

Introduction to MODSIM 1 -- 1.1 Models and Modeling, 2 -- 1.2 Validation, Verifi cation, and Calibration, 5 -- 1.3 Available Core Models, 7 -- 1.4 Model Selection Criteria, 9 -- 1.5 Graduate Level EM MODSIM Course, 11 -- 1.5.1 Course Description and Plan, 11 -- 1.5.2 Available Virtual EM Tools, 12 -- 1.6 EM-MODSIM Lecture Flow, 12 -- 1.7 Two Level EM Guided Wave Lecture, 17 -- 1.8 Conclusions, 19 -- References, 19 -- 2 Engineers Speak with Numbers 23 -- 2.1 Introduction, 23 -- 2.2 Measurement, Calculation, and Error Analysis, 24 -- 2.3 Significant Digits, Truncation, and Round-Off Errors, 27 -- 2.4 Error Propagation, 28 -- 2.5 Error and Confi dence Level, 29 -- 2.5.1 Predicting the Population's Confidence Interval, 33 -- 2.6 Hypothesis Testing, 36 -- 2.6.1 Testing Population Mean, 38 -- 2.6.2 Testing Population Proportion, 39 -- 2.6.3 Testing Two Population Averages, 39 -- 2.6.4 Testing Two Population Proportions, 39 -- 2.6.5 Testing Paired Data, 40 -- 2.7 Hypothetical Tests on Cell Phones, 41 -- 2.8 Conclusions, 45 -- References, 45 -- 3 Numerical Analysis in Electromagnetics 47 -- 3.1 Taylor's Expansion and Numerical Differentiation, 47 -- 3.1.1 Taylor's Expansion and Ordinary Differential Equations, 50 -- 3.1.2 Poisson and Laplace Equations, 52 -- 3.1.3 An Iterative (Finite-Difference) Solution, 53 -- 3.2 Numerical Integration, 58 -- 3.2.1 Rectangular Method, 58 -- 3.3 Nonlinear Equations and Root Search, 62 -- 3.4 Linear Systems of Equations, 64 -- References, 69 -- 4 Fourier Transform and Fourier Series 71 -- 4.1 Introduction, 71 -- 4.2 Fourier Transform, 72 -- 4.2.1 Fourier Transform (FT), 72 -- 4.2.2 Discrete Fourier Transform (DFT), 74 -- 4.2.3 Fast Fourier Transform (FFT), 76 -- 4.2.4 Aliasing, Spectral Leakage, and Scalloping Loss, 77 -- 4.2.5 Windowing and Window Functions, 80 -- 4.3 Basic Discretization Requirements, 81 -- 4.4 Fourier Series Representation, 85 -- 4.5 Rectangular Pulse and Its Harmonics, 92.
4.6 Conclusions, 92 -- References, 94 -- 5 Stochastic Modeling in Electromagnetics 95 -- 5.1 Introduction, 95 -- 5.2 Radar Signal Environment, 98 -- 5.2.1 Random Number Generation, 98 -- 5.2.2 Noise Generation, 101 -- 5.2.3 Signal Generation, 108 -- 5.2.4 Clutter Generation, 108 -- 5.3 Total Radar Signal, 111 -- 5.4 Decision Making and Detection, 114 -- 5.4.1 Hypothesis Operating Characteristics (HOCs), 115 -- 5.4.2 A Communication/Radar Receiver, 119 -- 5.5 Conclusions, 129 -- References, 130 -- 6 Electromagnetic Theory: Basic Review 133 -- 6.1 Maxwell Equations and Reduction, 133 -- 6.2 Waveguiding Structures, 134 -- 6.3 Radiation Problems and Vector Potentials, 136 -- 6.4 The Delta Dirac Function, 138 -- 6.5 Coordinate Systems and Basic Operators, 139 -- 6.6 The Point Source Representation, 141 -- 6.7 Field Representation of a Point/Line Source, 142 -- 6.8 Alternative Field Representations, 143 -- 6.9 Transverse Electric/Magnetic Fields, 145 -- 6.9.1 The 3D TE/TM Waves, 145 -- 6.9.2 The 2D TE/TM Waves, 146 -- 6.10 The TE/TM Source Injection, 151 -- 6.11 Second-Order EM Differential Equations, 154 -- 6.12 EM Wave-Transmission Line Analogy, 155 -- 6.13 Time Dependence in Maxwell Equations, 157 -- 6.14 Physical Fundamentals, 158 -- References, 158 -- 7 Sturm-Liouville Equation: The Bridge between Eigenvalue and Green's Function Problems 161 -- 7.1 Introduction, 161 -- 7.2 Guided Wave Scenarios, 162 -- 7.3 The Sturm-Liouville Equation, 165 -- 7.3.1 The Eigenvalue Problem, 167 -- 7.3.2 The Green's Function (GF) Problem, 168 -- 7.3.3 Finite z-Domain Problem, 169 -- 7.3.4 Infi nite z-Domain Problem, 170 -- 7.3.5 Relation between Eigenvalue and Green's Function Problems, 171 -- 7.4 Conclusions, 172 -- References, 173 -- 8 The 2D Nonpenetrable Parallel Plate Waveguide 175 -- 8.1 Introduction, 176 -- 8.2

Propagation Inside a 2D-PEC Parallel Plate Waveguide, 177 -- 8.2.1 Formulation of the TE- and TM-Type Problems, 178 -- 8.2.2 The Green's Function Problem, 181 -- 8.2.3 Accessing the Spectral Domain: Separation of Variables, 182.
8.2.4 Spectral Representations: Eigenvalue Problems, 183 -- 8.2.5 Spectral Representations: 1D Characteristic Green's Functions, 184 -- 8.2.6 The 2D Green's Function Problem: Alternative Representations, 185 -- 8.3 Alternative Representation: Eigenray Solution, 187 -- 8.3.1 Relation between Eigenmode and Eigenray Representations, 191 -- 8.3.2 2D GF and Hybrid Ray-Mode Decomposition, 192 -- 8.4 A 2D-PEC Parallel Plate Waveguide Simulator, 194 -- 8.4.1 Representations Used for Mode, Ray, and Hybrid Solutions, 195 -- 8.4.2 MATLAB Packages: RayMode and Hybrid, 207 -- 8.4.3 Numerical Examples, 210 -- 8.5 Eigenvalue Extraction from Propagation Characteristics, 215 -- 8.5.1 Longitudinal Correlation Function, 215 -- 8.5.2 Numerical Illustrations, 217 -- 8.6 Tilted Beam Excitation, 221 -- 8.7 Conclusions, 223 -- References, 225 -- 9 Wedge Waveguide with Nonpenetrable Boundaries 227 -- 9.1 Introduction, 228 -- 9.2 Statement of the Problem: Physical Configuration and Ray-Asymptotic Guided Wave Schematizations, 229 -- 9.3 Source-Free Solutions, 230 -- 9.3.1 Separable Coordinates: Conventional NM, 230 -- 9.3.2 Weakly Nonseparable Coordinates: AM, 231 -- 9.3.3 Uniformizing the AM Near Caustics: IM, 232 -- 9.4 Test Problem: The 2D Line-Source-Excited Nonpenetrable Wedge Waveguide, 234 -- 9.4.1 Exact Solution in Cylindrical Coordinate, 234 -- 9.4.2 Approximate Solutions in Rectangular Coordinates, 241 -- 9.4.3 IM Spectral Representation, 244 -- 9.5 The MATLAB Package “WedgeGUIDE,” 247 -- 9.6 Numerical Tests and Illustrations, 249 -- 9.7 Conclusions, 256 -- Appendix 9A: Formation of the Spectral IM Integral in Section 9.3.3, 257 -- References, 262 -- 10 High Frequency Asymptotics: The 2D Wedge Diffraction Problem 265 -- 10.1 Introduction, 266 -- 10.2 Plane Wave Illumination and HFA Models, 268 -- 10.2.1 Exact Solution by Series Summation, 268 -- 10.2.2 The Physical Optics (PO) Solution, 270 -- 10.2.3 The PTD Solution, 272 -- 10.2.4 The UTD Solution, 273 -- 10.2.5 The Parabolic Equation (PE) Solution, 275.
10.3 HFA Models under Line Source (LS) Excitations, 275 -- 10.3.1 Exact Solution by Series Summation, 276 -- 10.3.2 Exact Solution by Integral, 277 -- 10.3.3 The Parabolic Equation (PE) Solution, 277 -- 10.4 Basic MATLAB Scripts, 278 -- 10.5 The WedgeGUI Virtual Tool and Some Examples, 291 -- 10.6 Conclusions, 297 -- References, 298 -- 11 Antennas: Isotropic Radiators and Beam Forming/Beam Steering 301 -- 11.1 Introduction, 301 -- 11.2 Arrays of Isotropic Radiators, 303 -- 11.3 The ARRAY Package, 306 -- 11.4 Beam Forming/Steering Examples, 310 -- 11.5 Conclusions, 317 -- References, 318 -- 12 Simple Propagation Models and Ray Solutions 319 -- 12.1 Introduction, 320 -- 12.2 Ray-Tracing Approaches, 321 -- 12.3 A Ray-Shooting MATLAB Package, 323 -- 12.4 Characteristic Examples, 329 -- 12.5 Flat-Earth Problem and 2Ray Model, 333 -- 12.6 Knife-Edge Problem and 4Ray Model, 338 -- 12.7 Ray Plus Diffraction Models, 348 -- 12.8 Conclusions, 351 -- References, 351 -- 13 Method of Moments 353 -- 13.1 Introduction, 353 -- 13.2 Approximating a Periodic Function by Other Functions: Fourier Series Representation, 354 -- 13.3 Introduction to the MoM, 359 -- 13.4 Simple Applications of MoM, 361 -- 13.4.1 An Ordinary Differential Equation, 361 -- 13.4.2 The Parallel Plate Capacitor, 364 -- 13.4.3 Propagation over PEC Flat Earth, 366 -- 13.5 MoM Applied to Radiation and Scattering Problems, 372 -- 13.5.1 A Complex Antenna Structure, 372 -- 13.5.2 Ground Wave Propagation Modeling, 373 -- 13.5.3 EM Scattering from Infinitely Long Cylinder,

376 -- 13.5.4 3D RCS Modeling, 381 -- 13.6 MoM Applied to Wedge Diffraction Problem, 386 -- 13.7 MoM Applied to Wedge Waveguide Problem, 397 -- 13.8 Conclusions, 402 -- References, 402 -- 14 Finite-Difference Time-Domain Method 407 -- 14.1 FDTD Representation of EM Plane Waves, 407 -- 14.1.1 Maxwell Equations and Plane Waves, 408 -- 14.1.2 FDTD and Discretization, 410 -- 14.1.3 A One-Dimensional FDTD MATLAB Script, 417 -- 14.1.4 MATLAB-Based FDTD1D Package, 417.
14.2 Transmission Lines and Time-Domain Reflectometer, 429 -- 14.2.1 Transmission Line (TL) Theory, 430 -- 14.2.2 Plane Wave-Transmission Line Analogy, 434 -- 14.2.3 FDTD Representation of TL Equations, 437 -- 14.2.4 MATLAB-Based TDRMeter Package, 447 -- 14.2.5 Fourier Analysis and Reflection Characteristics, 454 -- 14.2.6 Laplace Analysis and Fault Identification, 456 -- 14.2.7 Step Response, 464 -- 14.3 1D FDTD with Second-Order Differential Equations, 468 -- 14.4 Two-Dimensional (2D) FDTD Modeling, 472 -- 14.4.1 Field Components and FDTD Equations, 476 -- 14.4.2 FDTD-Based Virtual Tool: MGL2D Package, 477 -- 14.4.3 Characteristic Examples, 479 -- 14.5 Canonical 2D Wedge Scattering Problem, 494 -- 14.5.1 Problem Postulation, 494 -- 14.5.2 Review of Analytical Models, 496 -- 14.5.3 The FDTD Model, 499 -- 14.5.4 Discretization and Dey-Mittra Approach, 502 -- 14.5.5 The WedgeFDTD Package and Examples, 505 -- 14.5.6 Wedge Diffraction and FDTD versus MoM, 510 -- 14.6 Conclusions, 512 -- References, 512 -- 15 Parabolic Equation Method 515 -- 15.1 Introduction, 516 -- 15.2 The Parabolic Equation (PE) Model, 518 -- 15.3 The Split-Step Parabolic Equation (SSPE) Propagation Tool, 520 -- 15.4 The Finite Element Method-Based PE Propagation Tool, 528 -- 15.5 Atmospheric Refractivity Effects, 531 -- 15.6 A 2D Surface Duct Scenario and Reference Solutions, 533 -- 15.7 LINPE Algorithm and Canonical Tests/Comparisons, 538 -- 15.8 The GrSSPE Package, 558 -- 15.9 The Single-Knife-Edge Problem, 566 -- 15.10 Accurate Source Modeling, 571 -- 15.11 Dielectric Slab Waveguide, 580 -- 15.11.1 Even and Odd Symmetric Solutions, 582 -- 15.11.2 The SSPE Propagator and Eigenvalue Extraction, 584 -- 15.11.3 The Matlab-Based DiSLAB Package, 585 -- 15.12 Conclusions, 591 -- References, 591 -- 16 Parallel Plate Waveguide Problem 595 -- 16.1 Introduction, 595 -- 16.2 Problem Postulation and Analytical Solutions: Revisited, 599 -- 16.2.1 Green's Function in Terms of Mode Summation, 602 -- 16.2.2 Mode Summation for a Tilted/Directive Antenna, 604.
16.2.3 Eigenray Representation, 606 -- 16.2.4 Hybrid Ray + Image Method, 613 -- 16.3 Numerical Models, 613 -- 16.3.1 Split Step Parabolic Equation Model, 613 -- 16.3.2 Finite-Difference Time-Domain Model, 617 -- 16.3.3 Method of Moments (MoM), 622 -- 16.4 Conclusions, 638 -- References, 639 -- Appendix A Introduction to MATLAB 643 -- Appendix B Suggested References 653 -- Appendix C Suggested Tutorials and Feature Articles 655 -- Index 659.

Sommario/riassunto

"Electromagnetic modeling is essential to the design and modeling of antenna, radar, satellite, medical imaging, and other applications. In Electromagnetic Modeling and Simulation, author Levent Sevgi explains techniques for solving real-time complex physical problems using MATLAB-based short scripts and comprehensive virtual tools. The book thoroughly covers the physics, mathematical background, analytical solutions, and code development of electromagnetic modeling. Access to online MATLAB scripts and coding tools render this book an ideal resource for electrical engineers and researchers"--
"Provides the reader with first steps in EM MODSIM as well as tools for medium and high-level code developers and users"--