
Contents

Preface	ix
List of Contributors	xiii
1 Error Bounds for L^1 Galerkin Approximations of Weakly Singular Integral Operators	
<i>M. Ahues, F.D. d'Almeida, and R. Fernandes</i>	1
2 Construction of Solutions of the Hamburger–Löwner Mixed Interpolation Problem for Nevanlinna Class Functions	
<i>J.A. Alcober, I.M. Tkachenko, M. Urrea</i>	11
3 A Three-Dimensional Eutrophication Model: Analysis and Control	
<i>L.J. Alvarez-Vázquez, F.J. Fernández, and R. Muñoz-Sola</i>	21
4 An Analytical Solution for the Transient Two-Dimensional Advection–Diffusion Equation with Non-Fickian Closure in Cartesian Geometry by the Generalized Integral Transform Technique	
<i>D. Buske, M.T. Vilhena, D. Moreira, and T. Tirabassi</i>	33
5 A Numerical Solution of the Dispersion Equation of Guided Wave Propagation in N-Layered Media	
<i>J. Cardona, P. Tabuenca, and A. Samartín</i>	41
6 Discretization of Coefficient Control Problems with a Nonlinear Cost in the Gradient	
<i>J. Casado-Díaz, J. Couce-Calvo, M. Luna-Laynez, J.D. Martín-Gómez</i>	55
7 Optimal Control and Vanishing Viscosity for the Burgers Equation	
<i>C. Castro, F. Palacios, and E. Zuazua</i>	65

8 A High-Order Finite Volume Method for Nonconservative Problems and Its Application to Model Submarine Avalanches <i>M.J. Castro Díaz, E.D. Fernández-Nieto, J.M. González-Vida, A. Mangeney, and C. Parés</i>	91
9 Convolution Quadrature Galerkin Method for the Exterior Neumann Problem of the Wave Equation <i>D.J. Chappell</i>	103
10 Solution Estimates in Classical Bending of Plates <i>I. Chudinovich, C. Constanda, D. Doty, and A. Koshchii</i>	113
11 Modified Newton's Methods for Systems of Nonlinear Equations <i>A. Cordero, J.R. Torregrosa</i>	121
12 Classification of Some Penalty Methods <i>A. Correia, J. Matias, P. Mestre, and C. Serôdio</i>	131
13 A Closed-Form Formulation for Pollutant Dispersion in the Atmosphere <i>C.P. Costa, M.T. Vilhena, and T. Tirabassi</i>	141
14 High-Order Methods for Weakly Singular Volterra Integro-Differential Equations <i>T. Diogo, M. Kolk, P. Lima, and A. Pedas</i>	151
15 Numerical Solution of a Class of Integral Equations Arising in a Biological Laboratory Procedure <i>D.A. French, C.W. Groetsch</i>	161
16 A Mixed Two-Grid Method Applied to a Fredholm Equation of the Second Kind <i>L. Grammont</i>	173
17 Homogenized Models of Radiation Transfer in Multiphase Media <i>A.V. Gusarov, I. Smurov</i>	183
18 A Porous Finite Element Model of the Motion of the Spinal Cord <i>P.J. Harris, C. Hardwidge</i>	193
19 Boundary Hybrid Galerkin Method for Elliptic and Wave Propagation Problems in $\mathbb{R}^3$ over Planar Structures <i>C. Jerez-Hanckes, J.-C. Nédélec</i>	203

20 Boundary Integral Solution of the Time-Fractional Diffusion Equation <i>J. Kemppainen, K. Ruotsalainen</i>	213
21 Boundary Element Collocation Method for Time-Fractional Diffusion Equations <i>J. Kemppainen, K. Ruotsalainen</i>	223
22 Wavelet-Based Hölder Regularity Analysis in Condition Monitoring <i>V. Kotila, S. Lahdelma, K. Ruotsalainen</i>	233
23 Integral Equation Technique for Finding the Current Distribution of Strip Antennas in a Gyrotropic Medium <i>A.V. Kudrin, E.Yu. Petrov, and T.M. Zaboronkova</i>	243
24 A Two-Grid Method for a Second Kind Integral Equation with Green's Kernel <i>R.P. Kulkarni</i>	253
25 A Brief Overview of Plate Finite Element Methods <i>C. Lovadina</i>	261
26 Influence of a Weak Aerodynamics/Structure Interaction on the Aerodynamical Global Optimization of Shape <i>A. Nastase</i>	281
27 Multiscale Investigation of Solutions of the Wave Equation <i>M. Perel, M. Sidorenko, and E. Gorodnitskiy</i>	291
28 The Laplace Transform Method for the Albedo Boundary Conditions in Neutron Diffusion Eigenvalue Problems <i>C.Z. Petersen, M.T. Vilhena, D. Moreira, and R.C. Barros</i>	301
29 Solution of the Fokker–Planck Pencil Beam Equation for Electrons by the Laplace Transform Technique <i>B. Rodriguez, M.T. Vilhena</i>	311
30 Nonlinear Functional Parabolic Equations <i>L. Simon</i>	321
31 Grid Computing for Multi-Spectral Tomographic Reconstruction of Chlorophyll Concentration in Ocean Water <i>R.P. Souto, H.F. de Campos Velho, F.F. Paes, S. Stephany, P.O.A. Navaux, A.S. Charão, and J.K. Vizzotto</i>	327
32 Long-Time Solution of the Wave Equation Using Nonlinear Dissipative Structures <i>J. Steinhoff, S. Chitta</i>	339

33 High-Performance Computing for Spectral Approximations
P.B. Vasconcelos, O. Marques, and J.E. Roman 351

**34 An Analytical Solution for the General Perturbed
Diffusion Equation by an Integral Transform Technique**
M.T. Vilhena, B.E.J. Bodmann, I.R. Heinen 361

Index 369