

CONTENTS

PREFACE	v
Part I: INITIAL VALUE PROBLEMS FOR ODE'S AND PARABOLIC PDE'S	1
1. Algorithms for Semiconductor Device Simulation R.E. BANK*, W. FICHTNER, D.J. ROSE, R.K. SMITH	3
2. Hierarchical Bases in the Numerical Solution of Parabolic Problems H. YSERENTANT	22
3. Extrapolation Integrators for Quasilinear Implicit ODE's P. DEUFLHARD, U. NOWAK*	37
4. Numerical Problems Arising from the Simulation of Combustion Phenomena J. WARNATZ	51
5. Numerical Computation of Stiff Systems for Nonequilibrium FU HONG-YUAN*, CHEN GUAN-NAN	75
6. Finite Element Simulation of Saturated-Unsaturated Flow Through Porous Media P. KNABNER	83
Part II: BOUNDARY VALUE PROBLEMS FOR ODE'S AND ELLIPTIC PDE'S	95
7. Numerical Pathfollowing Beyond Critical Points in ODE Models P. DEUFLHARD*, B. FIEDLER, P. KUNKEL	97
8. Computing Bifurcation Diagrams for Large Nonlinear Variational Problems H. JARAUSCH*, W. MACKENS	114
9. Extinction Limits for Premixed Laminar Flames in a Stagnation Point Flow V. GIOVANGIGLI, M.D. SMOOKE*	138
10. A Numerical Method for Calculating Complete Theoretical Seismograms in Vertically Varying Media U. ASCHER*, P. SPUDICH	159
11. On a New Boundary Element Spectral Method F.K. HEBEKER	180

(* indicates speaker among several authors)

Part III: HYPERBOLIC PDE'S	195
12. A High Order Non-Oscillatory Shock Capturing Method	197
B. ENGQUIST*, A. HARTEN, S. OSHER	
13. Vortex Dynamics Studied by Large-Scale Solutions to the Euler Equations	209
A. RIZZI	
Part IV: INVERSE PROBLEMS	233
14. Numerical Backprojection in the Inverse 3D Radon Transform	235
A.K. LOUIS*, R.M. LEWITT	
15. A Direct Algebraic Algorithm in Computerized Tomography	245
H. KRUSE*, F. NATTERER	
16. A Two-Grid Approach to Identification and Control Problems for Partial Differential Equations	257
V. FRIEDRICH*, B. HOFMANN	
Part V: OPTIMIZATION AND OPTIMAL CONTROL PROBLEMS	269
17. Solving Large-Scale Integer Optimization Problems	271
K. SPIELBERG, U.H. SUHL	
18. Numerical Treatment of State & Control Constraints in the Computation of Feedback Laws for Nonlinear Control Problems	287
P. KRÄMER-EIS*, H.G. BOCK	
19. Optimal Production Scheme for the Gosau Hydro Power Plant System	307
W. BAUER, H. FRERER, E. LINDNER, A. SCHWARZ, H.J. WACKER	
Part VI: ALGORITHM ADAPTATION ON SUPERCOMPUTERS	329
20. The Use of Vector and Parallel Computers in the Solution of Large Sparse Linear Equations	331
I.S. DUFF	
21. Local Uniform Mesh Refinement on Vector and Parallel Processors	349
W.D. GROPP	
22. Using Supercomputer to Model Heat Transfer in Biomedical Applications	368
L.J. HAYES	

SPEAKERS