

# CONTENTS

## PART I: SYSTEMATIC INTRODUCTORY PAPERS

*K. Stüben and U. Trottenberg*

Multigrid Methods: Fundamental Algorithms, Model  
Problem Analysis and Applications.....1

*W. Hackbusch*

Multi-grid Convergence Theory.....177

*A. Brandt*

Guide to Multigrid Development.....220

---

## PART II: SPECIFIC CONTRIBUTIONS

*E.J. van Asselt*

The Multi Grid Method and Artificial Viscosity.....313

*W. Auzinger and H.J. Stetter*

Defect Corrections and Multigrid Iterations.....327

*O. Axelsson*

On Multigrid Methods of the Two-level Type.....352

*D. Braess*

The Convergence Rate of a Multigrid Method with  
Gauss-Seidel Relaxation for the Poisson Equation.....368

*H. Deconinck and C. Hirsch*

A Multigrid Finite Element Method for the Transonic  
Potential Equation.....387

*I.S. Duff*

Sparse Matrix Software for Elliptic PDE's.....410

*H. Foerster, K. Witsch*

Multigrid software for the solution of elliptic problems  
on rectangular domains: MGOO (Release 1).....427

<i>W. Hackbusch</i>	
On Multi-grid Iterations with Defect Correction.....	461
<i>G.W. Hedstrom and G.H. Rodrique</i>	
Adaptive-grid Methods for Time-dependent Partial Differential Equations.....	474
<i>P.W. Hemker</i>	
Mixed Defect Correction Iteration for the Accurate Solution of the Convection Diffusion Equation.....	485
<i>R. Kettler</i>	
Analysis and Comparison of Relaxation Schemes in Robust Multigrid and Preconditioned Conjugate Gradient Methods.....	502
<i>J.F. Maitre and F. Musy</i>	
The Contraction Number of a Class of Two-level Methods; an Exact Evaluation for some Finite Element Subspaces and Model Problems.....	535
<i>Th. Meis, H. Lehmann and H. Michael</i>	
Application of the Multigrid Method to a Nonlinear Indefinite Problem.....	545
<i>H.D. Mittelmann</i>	
Multi-grid Methods for Simple Bifurcation Problems.....	558
<i>Z.P. Nowak</i>	
Use of the Multigrid Method for Laplacian Problems in Three Dimensions.....	576
<i>W. Schmidt and A. Jameson</i>	
Applications of Multi-grid Methods for Transonic Flow Calculations.....	599

*P. Wesseling*

A Robust and Efficient Multigrid Method.....614

---

*K. Brand*

Multigrid Bibliography.....631

---

*Participants*.....651