

Table of Contents

Invited Contributions	1
Multigrid Strategies for CFD Problems on Non-Structured Meshes	1
<i>G. Carré, G. Carte, H. Guillard, S. Lanteri</i>	
Detection of Strong Coupling in Algebraic Multigrid Solvers	11
<i>T.F. Chan, P. Vanek</i>	
Steady Euler Solutions in $O(N)$ Operations	24
<i>B. van Leer, D. Darmofal</i>	
The Acceleration of Multigrid Convergence by Recombination Techniques	34
<i>C.W. Oosterlee, R. Wienands, T. Washio, F.J. Gaspar</i>	
Other Contributions	44
Turbomachinery Computations on Parallel Computers Using a Multi- grid Method	44
<i>A. Arnone, P. Boncinelli, M. Marconcini</i>	
Approximate Schur Complement Multilevel Methods for General Sparse Systems	52
<i>M. Benzi, M. DeLong</i>	
A Multigrid Approach to the Optimal Control of Solid Fuel Ignition Problems	59
<i>A. Borzi, K. Kunisch, M. Vanmaele</i>	
Convergent Adaptive Wavelet Methods for the Stokes Problem	66
<i>S. Dahlke, R. Hochmuth, K. Urban</i>	
A Finite-Element/Equivalent-Circuit Two-Level Method for Magnetic Field Simulations	73
<i>H. De Gersem, S. Vandewalle, K. Hameyer</i>	
Some Aspects of Multigrid for Mixed Discretizations	80
<i>J.E. Dendy, Jr., J.D. Moulton</i>	
Fixed and Adaptive Cache Aware Algorithms for Multigrid Methods ..	87
<i>C.C. Douglas, J. Hu, W. Karl, M. Kowarschik, U. Rüde, C. Weiß</i>	
An Adaptive-Smoothing Multigrid Method for the Navier-Stokes Equa- tions	94
<i>D. Drikakis, O. Iliev, D. Vassileva</i>	

Multigrid on Massively Parallel Architectures	101
<i>R.D. Falgout, J.E. Jones</i>	
Experiences with Multigrid-Prolongation for Two-Equation Turbulence Models in Flows with High Reynolds Numbers	108
<i>J. Fassbender</i>	
Additive Aspects of Hybrid Multigrid/Domain Decomposition Solution of Fluid Flow Problems on Parallel Computers	115
<i>L. Fournier, S. Lanteri</i>	
Bi-harmonic and Bi-Helmholtz Type Scattered Data Interpolation using Quad-trees and Multigrid Technique	122
<i>C. Gáspár</i>	
Algebraic Multigrid for Solving Electromechanical Problems	129
<i>M. Kaltenbacher, S. Reitzinger</i>	
Multigrid Methods for Mortar Finite Elements	136
<i>R.H. Krause, B.I. Wohlmuth</i>	
The Sparse-Grid Combination Technique Applied to Time-Dependent Advection Problems	143
<i>B. Lastdrager, B. Koren, J. Verwer</i>	
Multigrid Acceleration in a 3D Navier-Stokes Solver Using Unstructured Hexahedral Meshes with Adaptation	150
<i>B. Leonard, A. Patel, C. Hirsch</i>	
Analysis of Several Multigrid Implicit Algorithms for the Solution of the Euler Equations on Unstructured Meshes	157
<i>I. Lepot, P. Geuzaine, F. Meers, J.A. Essers, J.M. Vaassen</i>	
Efficient Large-Eddy Simulations of Compressible Flows Using Multigrid	164
<i>B. Lessani, S. Smirnov, C. Lacor, T. Baelmans, J. Meyers</i>	
Application of Multigrid in Two-Equation Turbulence Modelling	171
<i>B. Merci, J. Steelant, E. Dick</i>	
Evaluation of Multigrid as a Solver for Stress Analysis Problems in Semiconductor Process Simulation	179
<i>S. Mijalković</i>	
Multilevel Techniques for the Solution of the Inverse Problem of Electrocardiography	186
<i>M. Mohr, U. Råde</i>	

Robust Multigrid Algorithms for 3D Elliptic Equations on Structured Grids	193
<i>R.S. Montero, M. Prieto, I.M. Llorente, F. Tirado</i>	
A Multigrid Newton-Krylov Solver for Non-linear Systems	200
<i>V.A. Mousseau, D.A. Knoll, W.J. Rider</i>	
Estimation of the Condition Number of Additive Preconditioners on Tensor Product Grids	207
<i>C. Pflaum</i>	
Multigrid Algorithms for the Tracking of Electron Beams	214
<i>G. Pöplau, U. van Rienen</i>	
Stable Semi-Iterative Smoother for Cascadic and Multigrid Algorithms	221
<i>V.V. Shaidurov, G. Timmermann</i>	
Scalability of Parallel Multigrid Adaption	228
<i>J. Stiller, W.E. Nagel, U. Fladrich</i>	
From Molecular Dynamics to Continuum Models	235
<i>S. Ta'asan</i>	
Multigrid With an Immersed Interface	242
<i>J.M. Thijssen</i>	
Analysis of a Non-Standard Multigrid Preconditioner by Spectral Por- trait Computation	249
<i>X. Vasseur</i>	
Treatment of All Speed Flows and High Aspect Ratios in CFD Appli- cations	256
<i>J. Vierendeels, K. Rienslagh, B. Merci, E. Dick</i>	
On the Algebraic Construction of Multilevel Transfer Operators (for Convection-Diffusion-Reaction Equations)	264
<i>C. Wagner</i>	
Upwind Prolongations for a Highly-Unstructured Euler Solver	271
<i>K. Warendorf, U. Küster, R. Rühle</i>	
Fourier Analysis for Krylov Subspace Acceleration of Multigrid with Application to 3D Anisotropic Problems	278
<i>R. Wienands, C.W. Oosterlee</i>	
Parallel Adaptively Refined Sparse Grids	285
<i>G. Zumbusch, M. Griebel</i>	
Author Index	286