

Contents

I Fluid Flow

On the Realistic Performance of Linear Algebra Components in Iterative Solvers	3
<i>M. Altieri, Chr. Becker, S. Turek</i>	
Applying the Checkpointing Routine <code>treeverse</code> to Discretizations of Burgers' Equation.....	13
<i>A. Walther, A. Griewank</i>	
Adaptive Grids for Time Dependent Conservation Laws: Theory and Applications in CFD	25
<i>A. Egelja, D. Kröner, R. Schwörer</i>	
Numerical Bifurcation Analysis of Premixed Combustion in Porous Inert Media	39
<i>M. de Neef, P. Knabner, G. Summ</i>	
Multigrid Solution of the Incompressible Navier-Stokes Equations and its Application to Parallel Computers.....	51
<i>B. Huurdeman, S. Nägele, V. Reichenberger, H. Rentz-Reichert</i>	
Simulation of Internal and Free Turbulent Flows	61
<i>M. Meinke, Th. Rister, F. Rütten, A. Schvorak</i>	
Application of Parallel Numerical Flow Solvers Invoking Advanced Turbulence-Transport Models to Aircraft Components	81
<i>M. Franke, Th. Rung, L. Xue, F. Thiele</i>	
Solution of Coupled Problems by Parallel Multigrid	91
<i>U. Becker-Lemgau, M. G. Hackenberg, W. Joppich, S. Mijalković, B. Steckel, Th. Sontowski, R. Tilch</i>	
Coupled Numerical Computations of the Fluid Damped Oscillations of a Lamina	103
<i>H. Dütsch, A. Melling, F. Durst</i>	
Efficient Treatment of Complicated Geometries and Moving Interfaces for CFD Problems	113
<i>H.-J. Bungartz, A. Frank, F. Meier, T. Neunhoeffler, S. Schulte</i>	

II Dynamic Systems and Optimal Control

Very Low Thrust Trajectory Optimization	127
<i>J. T. Betts</i>	
Mechanical Multibody Systems with Deformable Components	143
<i>P. Rentrop, O. Scherf, B. Simeon</i>	
Real Time Simulation and Online Control for Virtual Test Drives of Cars	157
<i>C. Chucholowski, M. Vögel, O. von Stryk, T.-M. Wolter</i>	
Numerical Simulation of Vibrations for the Design of a Rear Axle	167
<i>D. Tscharnutter</i>	
Flight Tests with Computer Generated Synthetic Vision	177
<i>G. Sachs, P. Hermle, W. Klöckner</i>	
Flight Path Optimization with a New Homotopy Method for Reducing Safety Hazards in Microbursts	189
<i>E. Grigat, G. Sachs</i>	
Integrated User Environment for the Numerical Solution of Optimal Control Problems	199
<i>R. Mehlhorn, G. Sachs</i>	
Simulation and Optimization of Logistic Processes Involving Sloshing Media	209
<i>H. Leonpacher, S. S. Douglas, N. H. Woolley, D. Kraft</i>	
Numerical Simulation and Optimal Control of Air Separation Plants ..	221
<i>G. Engl, A. Kröner, Th. Kronseder, O. von Stryk</i>	
Advanced Extrapolation Methods for Large Scale Differential Algebraic Problems	233
<i>R. Ehrig, U. Nowak, L. Oeverdieck, P. Deufhard</i>	

III Melting, Coating, and Crystal Growth

On the Generation and Spreading of 'Finger' Instabilities in Film Coat- ing Processes	245
<i>K.-H. Hoffmann, B. Wagner, A. Münch</i>	
CrysVUN++, a Powerful Computer Code for Global Thermal Mod- elling of Industrial Crystal Growth Processes	255
<i>M. Kurz, A. Pusztai, G. Müller</i>	

3D Adaptive Unstructured Grid Solver: Application to Flow and GaAs Deposition in the Planetary Reactor TM	267
<i>Yu. E. Egorov, A. O. Galyukov, A. I. Zhmakin</i>	

Direct Navier-Stokes Simulations of Turbulent Czochralski Flows.....	279
<i>C. Wagner</i>	

IV Semiconductors and Circuits

Advanced Models, Applications, and Software Systems for High Per- formance Computing – Application in Microelectronics	291
<i>E. Langer, S. Selberherr</i>	

Numerical Simulation of Microstructured Semiconductor Devices, Trans- ducers, and Systems	309
<i>St. Dürndorfer, V. Gradinaru, R.H.W. Hoppe, E.-R. König, G. Schräg, G. Wachutka</i>	

Parallel Multigrid Methods for the Continuity Equations in Semicon- ductor Device Simulation	325
<i>K. Gärtner, O. Schenk, W. Fichtner</i>	

Partitioning Strategies in Circuit Simulation.....	343
<i>M. Günther, M. Hoschek</i>	

A New Stochastic Integration Scheme for the Efficient Solution of Ran- domly Disturbed Circuits	353
<i>Chr. Penski, G. Denk</i>	

Eigenvalue Solvers for Electromagnetic Fields in Cavities.....	363
<i>P. Arbenz, R. Geus</i>	

Remarks on the Convex Analysis of the Energy Model of Semiconductor Devices	375
<i>G. Albinus</i>	

Analysis of Electromechanical Microdevices Using Coupled FEM-BEM Based on the TP2000 CAD Platform	387
<i>E.-R. König, P. Groth, G. Wachutka</i>	

Numerical Analysis of Distributed Inductive Parasitics in High Power Bus Bars.....	397
<i>P. Böhm, E. Falck, J. Sigg, G. Wachutka</i>	

Low Pressure Discharges in Plasma Reactors: Modelling and Computer-Aided Diagnostics	405
<i>M. Kratzer, R. P. Brinkmann, P. Scheubert, P. Awakowicz, G. Wachutka</i>	

V HPSC in Physics and Chemistry

Numerical Fluid Dynamics in Astrophysics with Smoothed Particle Hydrodynamics	417
<i>R. Speith, H. Riffert, H. Ruder</i>	

Parallel Computation of Multi-Dimensional Neutron and Photon Transport in Inhomogeneous Media	431
<i>G. Kanschat</i>	

Quantum Chemistry on Parallel Computers: Concepts and Results of a Density Functional Method	441
<i>Th. Belling, Th. Grauschopf, S. Krüger, M. Mayer, F. Nörtemann, M. Staufer, C. Zenger, N. Rösch</i>	

Future Trends in HPSC

Technological Trends and their Impact on the Future of Supercomputers	459
<i>U. Rüde</i>	

High Performance Scientific and Engineering Computing
Proceedings of the International FORTWIHR Conference
on HPSEC, Munich, March 16-18, 1998

Bungartz, H.-J.; Durst, F.; Zenger, C. (Eds.)

1999, X, 471 p. 75 illus., 44 illus. in color., Softcover

ISBN: 978-3-540-65730-9