Contents

Laudatio on Owe Axelsson 7

Bolzano Medal awarded to Owe Axelsson 10

P. Arbenz, S. Margenov:
Parallel MIC(0) preconditioning of 3D nonconforming FEM systems 12

M. Arioli, D. Ruiz:
A Chebyshev-based two-stage iterative method as an alternative to the direct solution of linear systems 16

E. Bängtsson, M. Neytcheva:
Numerical simulation of glacial rebound using preconditioned iterative solution methods 20

R. Beauwens, S. Van Criekingen, E. Lewis:
Mixed hybrid finite element methods for the linear transport equation 24

B. Bejanov, J.-L. Guermond, P. D. Minev:
A locally div-free projection scheme for the incompressible Navier-Stokes equations 25

S. Beuchler:
A fast DD-preconditioner for p-FEM in two dimensions 26

R. Blaheta, P. Byczanski, O. Jakl, R. Kohut, A. Kolcun, K. Krečmer, J. Starý:
Challenging applications of iterative solvers in geotechnics 30

R. Blaheta, S. Margenov, M. Neytcheva:
Robust optimal multilevel preconditioners for non-conforming finite element systems 34

I. Bock, J. Lovíšek:
On a contact problem for a viscoelastic plate with geometric nonlinearities 38

Z. Dostál, D. Horák:
A scalable algorithm for numerical solution of variational inequalities based on FETI and semi-monotonic augmented Lagrangians 42

V. Eijkhout:
Non-numeric support for numerical decision-making 46

V. A. Garanzha:
Well-posed variational problem for construction of bi-Lipschitz surface parameterizations 47

K. Georgiev:
Domain decomposition approach to a system of convection–diffusion–reaction equations 49

L. Giraud, J. Langou, M. Rozložník:
On the numerical stability of the Gram-Schmidt algorithm 53

L. Giraud, D. Ruiz, A. Touhami:
Combining various iterative solvers with partial spectral factorization for the solution of SPD linear systems 55

R. Glowinski, J. He, A. Lozinski, J. Rappaz, J. Wagner:
Approximation of multi-scale elliptic problems using patches of finite elements . . 60

A. Greenbaum, Z. Strakoš:
Polynomial Numerical Hulls of Convection Diffusion Matrices and the Convergence of GMRES 64

P. Hejda, M. Reshetnyak:
Convergence of a SIMPLE-based finite-volume algorithm for the thermal convection in a rotating spherical shell 67

T. Inoue, T. Nodera:
The Composition of Reduced System and its Preconditioning 70

D. Janovská, G. Opfer:
Quaternion valued Givens' transformation 74

V. Janovský:
Continuation of invariant subspaces: a stability exchange indicator 78

J. Karátson:
On the mesh independence of the superlinear convergence of the CGM 80

J. Kienesberger, U. Langer, J. Valdman:
On a robust multigrid-preconditioned solver for incremental plasticity problems . 84

T. Kojecký, P. Mayer:
A modification of a class of IAD methods 88

J. K. Kraus:
Multilevel preconditioning based on element agglomeration 93

L. A. Krukier, L. G. Chikina, T. V. Belokon, B. L. Krukier:
Two-parameters product triangular iterative solvers for positive real linear equation systems with dominant skew-symmetric part 97

R. Kučera:
A fast method for solving saddle-point linear systems with singular blocks 101

A. Kurganov, G. Petrova, B. Popov:
Central-upwind schemes for hyperbolic conservation laws 105

J. Liesen, Z. Strakoš:
GMRES Convergence Analysis for a Convection-Diffusion Model Problem 109

J. Liesen, P. Tichý:
The worst-case GMRES for normal matrices 113

D. Loghin, D. Ruiz, A. Touhami:
Adaptive preconditioners for Newton-Krylov methods 117

L. Marcinkowski, X.-C. Cai, P. S. Vassilevski:
Nonlinear Additive Schwarz Preconditioned Newton Method for Unstructured Meshes 121

G. V. Muratova:
Multigrid Method for the Convection-Diffusion Problems with Dominant Convection 125

J. Nedoma:
On solution methods for solving coupled thermo-mechanical problems as arizing in applied tectonophysics 129

Y. Notay:
Algebraic multigrid and algebraic multilevel methods: a theoretical comparison . 133

I. Pultarová:
The strengthened C.B.S. inequality constant for hierarchical bilinear finite element functions 135

M. H. van Raalte, P. W. Hemker:
Analysis of Multigrid Iteration for the Convection-Diffusion Equation Discretized by the Discontinuous Galerkin Method 139

M. B. Reed:
An element-by-element iterative algorithm for finite element analyses 143

D. Stefanica:
A Balancing Algorithm for Mortar Finite Elements 148

Z. Strakoš:
Spectral information and behaviour of Krylov subspace methods 149

A. I. Tolstykh:
Arbitrary-order multioperators-based approximations and schemes 151

P. S. Vassilevski:
Two-level and two-grid preconditioners 155

V. Vondrák, Z. Dostál, J. Dobiáš, S. Pták:
Duality based solution of contact problems with large displacements 159

J. Zítko:
Convergence condition for a restarted GMRES method augmented with invariant subspace 163

W. Zulehner:
Uzawa-type Methods for Block-Structured Indefinite Problems 167

List of authors and participants 168