LIST OF PUBLICATIONS
Maya G. Neytcheva

Published in scientific journals:

J1 Owe Axelsson, Ivo Dravins, Maya Neytcheva, Stage-parallel preconditioners for implicit Runge-Kutta methods of arbitrarily high order, linear problems, *Numerical Linear Algebra with Applications*, 2023. In print.

J2 Ivo Dravins, Maya Neytcheva, Preconditioning of discrete state- and control-constrained optimal control convection-diffusion problems, *Calcolo*, 2023. In print.

J3 Peter Munch, Ivo Dravins, Maya Neytcheva, Martin Kronbichler, Stage-parallel fully implicit Runge-Kutta implementations with optimal multilevel preconditioners at the scaling limit, *SIAM Journal on Scientific Computing*, 2023, S71-S96, DOI `https://doi.org/10.1137/22M1503270`

J4 Michael Weiss, Maya Neytcheva, Thomas Kalscheuer, Iterative solution methods for 3D controlled-source electromagnetic forward modelling of geophysical exploration scenarios, *Computational Geosciences*, 27 (2023), 81–102.

J5 Yang Cao, Maya Neytcheva, Cell-by-cell approximate Schur complement technique in preconditioning of meshfree discretized piezoelectric equations, *Numerical Linear Algebra with Applications*, 28 (2021). Published Online: 2021-02-08. DOI `https://doi.org/10.1002/nla.2362`

J6 Owe Axelsson, Maya Neytcheva, Anders Ström, An efficient preconditioning method for state box-constrained optimal control problems, *Journal of Numerical Mathematics* 26 (2018), 185-207. Published Online: 2018-10-31. DOI `https://doi.org/10.1515/jnma-2017-0047`

J7 Owe Axelsson, Maya Neytcheva, Zhao-Zheng Liang, Parallel solution methods and preconditioners for evolution equations. *Mathematical Modelling and Analysis*, 23 (2018), 287–308.

J8 Zhao-Zheng Liang, Owe Axelsson, Maya Neytcheva, A robust structured preconditioner for time-harmonic parabolic optimal control problems, *Numerical Algorithms*, 79 (2018), 575-596. DOI `https://doi.org/10.1007/s11075-017-0451-5`.

J9 M. Donatelli, A. Dorostkar, M. Mazza, M. Neytcheva, S. Serra-Cappizano, Function-based block multigrid strategy for a two-dimensional linear elasticity-type problem, *Computers and Mathematics with Applications*, 74 (2017), 1015-1028.

J10 Ali Dorostkar, Maya Neytcheva, Stefano Serra-Capizzano, Spectral analysis of coupled PDEs and of their Schur complements via the notion of Generalized Locally Toeplitz sequences, *Computer Methods in Applied Mechanics and Engineering*, 309 (2016), 74-105.

J 11 Owe Axelsson, Shiraz Farouq, Maya Neytcheva, A preconditioner for optimal control problems, constrained by Stokes equation with a time-harmonic control. *Computational and Applied Mathematics*. 310 (2017), 5-18. DOI: 10.1016/j.cam.2016.05.029. 2016.

J 12 Owe Axelsson, Shiraz Farouq, Maya Neytcheva, Comparison of preconditioned Krylov subspace iteration methods for PDE-constrained optimization problems: Stokes control. *Numerical Algorithms*. 74 (2017), 19-37. DOI: 10.1007/s11075-016-0136-5. 2016.

J 13 Owe Axelsson, Shiraz Farouq, Maya Neytcheva, Comparison of preconditioned Krylov subspace iteration methods for PDE-constrained optimization problems. Poisson and convection-diffusion control. *Numerical Algorithms*. 73 (2016), 631-663. DOI: 10.1007/s11075-016-0111-1. 2016.

J 14 Lars Ailo Bongo, Raimondas Ciegis, Neki Frasheri, Jing Gong, Dragi Kimovski, Peter Kropf, Svetozar Margenov, Milan Mihajlovic, Maya Neytcheva, Thomas Rauber, Gudula Runger, Roman Trobec, Roel Wuyts, Roman Wyrzykowski, Applications for Ultrascale Computing, *Supercomputing Frontiers and Innovations*, 2 (2015), 19-48.
doi: 10.14529/jsfi150102

J 15 Ali Dorostkar, Maya Neytcheva, Bjrn Lund, Numerical and computational aspects of some block-preconditioners for saddle point systems, *Parallel Computing*, 49 (2015), 164–178.
doi:10.1016/j.parco.2015.06.003

J 16 Owe Axelsson, Xin He, Maya Neytcheva, Numerical solution of the time-dependent Navier–Stokes equation for variable density–variable viscosity: Part I. *Mathematical Modelling and Analysis*, 20 (2015), 232–260.

J 17 Xin He, Maya Neytcheva, Kees Vuik, On preconditioning of incompressible non-Newtonian flow problems, *Journal of Computational Mathematics*, 30 (2015), 33-58.
doi: 10.4208/jcm.1407-m4486

J 18 P. Boyanova, M. Neytcheva, Efficient numerical solution of discrete multi-component Cahn-Hilliard systems *Computers and Mathematics with Applications*, 67 (2014), 106–121. doi: 10.1016/j.camwa.2013.10.013

J 19 Owe Axelsson, Maya Neytcheva, Bashir Ahmad, A comparison of iterative methods to solve complex valued linear algebraic systems, *Numerical Algorithms*, 66 (2014), 811–841. doi: 10.1007/s11075-013-9764-1.

J 20 O. Axelsson, P. Boyanova, M. Kronbichler, M. Neytcheva, X. Wu. Numerical and computational efficiency of solvers for two-phase problems, *Computers and Mathematics with Applications*, 65 (2013), 301–314. doi: 10.1016/j.camwa.2012.05.020,

J 21 Owe Axelsson and Maya Neytcheva. A general approach to analyse preconditioners for two-by-two block matrices, *Numerical Linear Algebra with Applications*, 20 (2013), 723–742.

J 22 Xin He, Maya Neytcheva. Preconditioning the Incompressible Navier-Stokes Equations with Variable Viscosity. *Journal of Computational Mathematics*, 30 (2012), 461–482.

J 23 P. Boyanova, M. Do-Quang, M. Neytcheva. Efficient preconditioners for large scale binary Cahn-Hilliard models, *Computational Methods in Applied Mathematics*, 12 (2012), 1–22. doi: 10.2478/cmam-2012-0001.

J 24 M. Donatelli, M. Neytcheva, S. Serra Capizzano, Canonical eigenvalue distribution of multilevel block Toeplitz sequences with non-Hermitian symbols. *Operator Theory: Advances and Applications*,Spectral Theory, Mathematical System Theory, Evolution Equations, Differential and Difference Equations, 221 (2012), 269–292, Birkhauser Verlag.

J 25 Xin He, Maya Neytcheva, and Stefano Serra Capizzano. On an augmented Lagrangian-based preconditioning of Oseen type problems *BIT Numerical Analysis*, 51 (2011), 865-888.

J 26 M. Neytcheva, E. Bängtsson, E. Linnér. Finite-element based sparse approximate inverses for block-factorized preconditioners. Special issue on "Numerical and Applied Linear Algebra" of the journal *Advances in Computational Mathematics*, 35 (2011), 323–355.

J 27 Maya Neytcheva, On element-by-element Schur complement approximations, *Linear Algebra and Its Applications*, 434 (2011), 2308-2324.

J 28 Petia Boyanova, Svetozar Margenov, Maya Neytcheva, Robust AMLI Methods for Parabolic Crouzeix-Raviart FEM Systems, Editors: A. Havasi, I. Farago, S. Margenov, Z. Zlatev. Special Issue "Advanced Computational Algorithms", *Journal of Computational and Applied Mathematics (JCAM)*, 235 (2010), 2010, 380–390.

J 29 Kateryna Mishchenko and Maya Neytcheva, New algorithms for the evaluating the log-likelyhood function derivatives in the AI-REML method, LSSP: Communications in Statistics - Simulation and Computation, 38 (2009), Issue 6, 1348–1364.

J 30 O. Axelsson, R. Blaheta, M. Neytcheva. Preconditioning for boundary value problems using elementwise Schur complements. *SIAM Journal on Matrix Analysis and Applications*, 31 (2009), 767–789.

J 31 M. Neytcheva, E. Bängtsson, Preconditioning of nonsymmetric saddle point systems as arising in modelling of visco-elastic problems, *ETNA*, 29 (2008), 193–211.

J 32 R. Blaheta, R. Kohut, M. Neytcheva, J. Stary. Schwarz methods for discrete elliptic and parabolic problems with an application to nuclear waste repository modelling, *Mathematics and Computers in Simulation*, 76 (2007), 18–27.

J 33 O. Axelsson, M. Neytcheva, Eigenvalue estimates for preconditioned saddle point matrices. *Numerical Linear Algebra with Applications* 13(4), 2006, 339–360.

J 34 E. Bängtsson, M. Neytcheva. Numerical simulations of glacial rebound using preconditioned iterative solution methods. *Applications of Mathematics*, 50(3), 2005, 183–201.

J 35 R. Blaheta, S. Margenov, M. Neytcheva. Robust optimal multilevel preconditioners for non-conforming FE systems. *Numerical Linear Algebra with Applications*, 12(5-6), 2005, 495–514.

J 36 E. Bängtsson, M. Neytcheva. Algebraic preconditioning versus direct solvers for dense linear systems as arising in crack propagation problems. *Communications in Numerical methods in Engineering*, 21(2), 2005, 73–81.

J 37 R. Blaheta, S. Margenov, M. Neytcheva. Uniform estimate of the constant in the strengthened CBS inequality for anisotropic non-conforming FEM systems. *Numerical Linear Algebra with Applications* 11 (2004), 309–326. Technical Report 2002-039, November 2002. Department of Information technology, Uppsala University.

J 38 O. Axelsson, M. Neytcheva, Preconditioning methods for linear systems arising in constrained optimization problems, *Numerical Linear Algebra with Applications*, 10 (2003), 3–31.

J 39 O. Axelsson, V.A. Barker, M. Neytcheva and B. Polman, Solving the Stokes Problem on a Massively Parallel Computer, *Mathematical Modelling and Analysis*, 6 (2001), 7–27.

J 40 M. Neytcheva and P. Vassilevski, Preconditioning of Indefinite and Almost Singular Finite Element Elliptic Equations, *SIAM Journal on Scientific Computing*, 19 (1998), 1471–1485.

J 41 O.Axelsson, M.Neytcheva, Some Basic Facts for Efficient Massively Parallel Computation. *CWI Quarterly*, Vol 9, March/June 1996, 9–17.

J 42 O.Axelsson, M.Neytcheva, B.Polman, The bordering method as a preconditioning method, *Vestnik Moskovskogo Universiteta, Seria 15, V'chisl. Math. Cybern.*, 1 (1996), 3–25.

J 43 O.Axelsson, M.Neytcheva, Scalable Parallel Algorithms in CFD Computations. In M. Hafez and K. Oshima (eds.), *Computational Fluid Dynamics Review* 1995, 837–857.

J 44 O.Axelsson, M.Neytcheva, Scalable Algorithms for the solution of Navier's Equations of Elasticity, *J. Comput. Appl. Math.*, 63 (1995), 149–178.
Report 9450, December 1994, Department of Mathematics, University of Nijmegen, The Netherlands.

J 45 M. Neytcheva, Experience in Implementing the Algebraic Multilevel Iteration Method on a SIMD-type Computer, *Appl. Num. Math.*, 19 (1995), 71–90.
In H. te Riele and H. van der Vorst (eds.), *Proceedings of the CWI-RUU Symposia on Massively Parallel Computing and Applications*, 1995.

J 46 O.Axelsson, M.Neytcheva, Algebraic multilevel iteration method for Stieltjes matrices, *Num. Lin. Alg. Appl.*, 1 (1994), 213–236.

Chapter in a book:

B 1 Owe Axelsson, Janos Karatson, Maya Neytcheva, Preconditioned iterative solution methods for linear systems arising in PDE-constrained optimization. Chapter in *Robust and Constrained Optimization: Methods and Applications*, Editor Dewey Clark, Series: Mathematics Research Developments, NOVA Science Publishers, ISBN: 978-1-53614-835-0. BISAC: MAT042000, 2019.

B 2 D. Lukarski, M. Neytcheva, On the impact of the heterogeneous multi- and many-core platforms on iterative solution methods and preconditioning techniques. Chapter 1, 11–32. In book: *High-Performance Computing on Complex Environments*, Editors: Emmanuel Jeannot, Julius Zilinskas. John Wiley & Sons, Inc., ISBN 978-1-118-71205-4, 2014.

Editor in Conference Proceedings volumes and Special issues:

CP 1 Z.-Z. Bai, M. Neytcheva, L. Reichel, Special issue on Novel methods and theories in numerical algebra with interdisciplinary applications. *Numer. Linear Algebra Appl.* 25 (2018), 4.

CP 2 J. Carretero, J. Garcia Blas, M. Neytcheva, International Journal of Computers & Electrical Engineering Special issue on 'Optimization of Parallel Scientific Applications with Accelerated HPC', 2015

CP 3 O Axelsson, R Blaheta, M Neytcheva, I Pultarov, *Numerical Linear Algebra with Applications*, Special issue on Preconditioning of iterative methods - theory and applications, 22 (2015).

CP 4 G. Kreiss, P. Ltstedt, A. Mlqvist, and M. Neytcheva. Numerical Mathematics and Advanced Applications 2009: Proceedings of ENUMATH 2009, the 8th European Conference on Numerical Mathematics and Advanced Applications, Uppsala, July 2009, Springer, 2010. ISBN 987-642-11794-7, e-ISBN 978-3-642-11795-4

CP 5 O. Axelsson, M. Neytcheva and B. Polman (eds), *Proceedings of the Conference on Preconditioned Iterative Solution Methods for Large Scale Problems in Scientific Computations (PRISM'97*, Nijmegen, May 27–29, 1997.

Published in Conference Proceedings:

C 1 O. Axelsson, R. Kohut, M. Neytcheva, An implementation of a coarse-fine mesh stabilized Schwarz method for a three-space dimensional PDE-problem. In Lirkov I., Margenov S. (Eds), *International Conference on Large-Scale Scientific Computing*, Springer LSSC 2023, LNCS. In print.

C 2 O. Axelsson, D. Lukáš, M. Neytcheva, An Exact Schur Complement Method for Time-Harmonic Optimal Control Problems. In Lirkov I., Margenov S. (Eds), *International Conference on Large-Scale Scientific Computing*, Springer LSSC 2021, LNCS Vol. 13127, pp 91-100, DOI `https://doi.org/10.1007/978-3-030-97549-4_10`

C 3 O. Axelsson, M. Neytcheva, Numerical solution methods for implicit Runge-Kutta methods of arbitrarily high order In P. Frolkovič, K. Mikula, D. Ševčovič, Proceedings of the conference *Algoritmy 2020*, (2020), pp 11-20. `http://www.iam.fmph.uniba.sk/amuc/ojs/index.php/algoritmy/article/view/1593/842`

C 4 I. Dravins, M. Neytcheva, PDE-Constrained Optimization: Optimal control with L1 - Regularization, State and Control Box Constraints. In F. J. Vermolen, C. Vuik (eds.), *Numerical Mathematics and Advanced Applications* ENUMATH 2019, Lecture Notes in Computational Science and Engineering 139, 2021, 323-331.

C 5 I. Dravins, M. Neytcheva, PDE-Constrained Optimization: Matrix Structures and Preconditioners. In Lirkov I., Margenov S. (Eds), *Large-Scale Scientific Computing 2019*, Springer LSSC 2019, LNCS Vol. 11958, 2020, pp 315-323.

C 6 J.R. Bull, A. Dorostkar, S. Holmgren, A. Kruichinina, M. Neytcheva, D. Nikitenko, N. Popova, P. Shvets, A. Teplov, V. Voevodin, V. Voevodin, Multidimensional performance and scalability analysis for diverse applications based on system monitoring data, In *Parallel Processing and Applied Mathematics*, R. Wyrzykowski, J. Dongarra, E. Deelman K. Karczewiski (Eds.), Proceedings of PPAM 2017, Springer LNCS, Vol. 10777, 417-431.

C 7 A. Dorostkar, M. Neytcheva, S. Serra-Capizzano, Schur complement matrix and its (elementwise) approximation: A spectral analysis based on GLT sequences. In *Proceedings of the 10th International Conference on Large Scale Scientific Computations (LSSC'15)*, June 2015, Sozopol, Bulgaria, Springer *Lecture notes in Computer Science* 9374, 419–426. doi: 10.1007/978-3-319-26520-9_47

C 8 A. Dorostkar, D. Lukarski, B. Lund, M. Neytcheva, Y. Notay, P. Schmidt, Parallel performance study of block-preconditioned iterative methods on multicore computer systems, 8805 LNCS, (Part 1), 12–23, 2014.

C 9 X. He, M. Holm, M. Neytcheva, Efficient implementations of the inverse Sherman-Morrison algorithm. Pekka Manninen Per ster (Eds.) *Applied Parallel and Scientific Computing 11th International Conference, PARA 2012*, Helsinki, Finland, June 10-13, 2012. Revised Selected Papers. LNCS Sublibrary: SL 1, Theoretical Computer Science and General Issues. Lecture Notes in Computer Science 7782 LNCS, 206–219. 2013. Refereed. doi 10.1007/978-3-642-36803-5

C 10 P. Boyanova, M. Do-Quang, M. Neytcheva. Block-preconditioners for conforming and non-conforming FEM discretizations of the Cahn-Hilliard equation. *Large-Scale Scientific Computing 2011*, Springer LNCS 7116: 549–557, 2012. Refereed.

C 11 M. Neytcheva, Minh Do-Quang, He Xin. Element-by-Element Schur Complement Approximations for General Nonsymmetric Matrices of Two-by-Two Block Form. In I. Lirkov, S. Margenov, J. Was'niewski (Eds.): Lecture Notes in Computer Science Vol. 5910, LSSC 2009, 108–115. Springer, Heidelberg (2010). Refereed.

C 12 E. Bängtsson, M. Neytcheva. An agglomerate multilevel preconditioner for linear isostacy saddle point problems. In S. Margenov, I. Lirkov, J. Wasnievski (editors) *Proceedings of the Fifth International Conference on Large Scale Scientific Computations (LSSC'05)*, June 2005, Sozopol, Bulgaria, Springer *Lecture notes in Computer Science*, Vol. 3743, 2006, 113–120. Refereed.

C 13 R. Blaheta, S. Margenov, M. Neytcheva, Aggregation-based multilevel preconditioning of non-conforming FEM elasticity problems. In J. Dongarra, K. Madsen, J. Wasniewski (editors), *Proceedings of the PARA'04 Workshop on state-of-the-art in Scientific Computing* June 20-23, 2004, The Technical University of Denmark, Lyngby. *Lecture Notes in Computer Science* Springer, **LNCS 3732**, 2006, 847–856. (Refereed.)

C 14 O.Axelsson, M.Neytcheva, Robust preconditioners for saddle point problems. in I. Dimov, I. Lirkov, S. Margenov, Z. Zlatev (editors), *Proceedings of the Fifth International Conference on Numerical Methods and Applications (NM&A'02)*, Borovets, Bulgaria, August 20 - 24, 2002, Springer Lecture Notes in Computer Science 2542, 2003, 158–166. (Refereed.)

C 15 M. Neytcheva, O.Axelsson, On a Schur complement approach for solving two-level finite element systems. In S. Margenov, J. Waśniewski, P. Yalamov eds., *Large-Scale Scientific Computations*, Third International Conference LSSC 2001, Sozopol, Bulgaria, June 2001, *Lecture Notes in Computer Science*, Vol 2179, Springer, 2001, 113–121. (Refereed.)

C 16 O.Axelsson, M.Neytcheva, An iterative solution method for Schur complement systems with inexact inner solver. In O. Iliev, M. Kaschiev, S. Margenov, Bl. Sendov, P.S. Vassilevski eds., *Recent Advances in Numerical Methods and Applications II*, World Scientific, 1999, 795–803. (Refereed.)

C 17 A. Georgiev, S. Margenov, M. Neytcheva, Multilevel Algorithms for 3D Simulations of Nonlinear Elasticity Problems. In *Proceedings of the First IMACS Conference on Mathematical Modelling and Computational Methods in Mechanics and Geomechanics (MODELLING'98)*, Prague, July 7–11, 1998, *Mathematics and Computers in Simulation*, 50 (1999), 175–182. (Refereed.)

C 18 M. Neytcheva, O. Axelsson and K. Georgiev, An application of the AMLI method for solving convection-diffusion problems with potential velocity field. In O. Axelsson and B. Polman (eds.), *Proceedings of the conference on Algebraic Multilevel Iteration Methods with Applications*, Nijmegen, June 13-15, 1996, 197–210.

C 19 O.Axelsson, M.Neytcheva, Scalable Algorithms for the Solution of Navier's Equations of Elasticity. In *Proceedings of the International Symposium on Mathematical Modelling and*

Computational Methods, organized on the occasion of Prof. Owe Axelsson's and Prof. Miloš Zlámal's life jubilees, August 29–September 2, 1994, Prague, Czech Republic, *J. Comp. Appl. Math*, 63 (1995), 149–178. (Refereed.)

C 20 O.Axelsson, M.Neytcheva, Parallel implementations of the Algebraic Multilevel Iteration Method. In J.G. Lewis (ed.), *Proceedings of the Fifth SIAM Conference on Applied Linear Algebra*, SIAM Philadelphia, 1994, 372–376. (Refereed.)

C 21 M. Neytcheva, The short Length AMLI method. II. Computational and Communication Complexity. In I.T.Dimov, Bl.Sendov and P.S.Vassilevski (eds), *Proceedings of the Third International Conference on Numerical Methods and Applications NM&A - $O(h^3)$*, August 21-26, 1994, Sofia, Bulgaria, 162–169.

C 22 O.Axelsson, K.Georgiev, M.Neytcheva, Symmetric Numerical Scheme for Some Convection-Diffusion Problems. In S. Markov (ed.), *Proceedings of the Internationale Conference on Mathematical Modelling and Scientific Computation*, Sozopol, Bulgaria, September 14-18, 1993. Datecs Publishing, Sofia, 55–58. (Refereed.)

C 23 O.Axelsson, M.Neytcheva, The Algebraic Multilevel Iteration Methods - theory and applications. In Bainov, D. (ed.) et al., *Proceedings of the Second International Colloquium on Numerical Analysis*, August 13-17, 1993, Plovdiv, Bulgaria, Utrecht: VSP. 13–23 (1994).

C 24 O.Axelsson, M.Neytcheva, B.Polman, An Application of the Bordering Method for Solving Nearly Singular Systems. In *Proceedings of the seminar "Numerical Mathematics in Theory and Practice"*, Plzeň, Chech Republic, January 25-26, 1993, 28–54.

C 25 O.Axelsson, M.Neytcheva, Finding Eigenvalues in an Interval Using Parallelizable Algorithms. In *Proceedings of the Workshop on Parallel Algorithms (WPA'92)*, Bankja, Bulgaria, August 18-22, 1992, 11–21.

Internal reports and work in progress:

I 1 Owe Axelsson, Maya Neytcheva, Preconditioners for two-by-two block matrices with square blocks, TR 2018-010 May 2018, Department of Information Technology, Uppsala University, `http://www.it.uu.se/research/publications/reports/2018-010/.`

I 2 Owe Axelsson, Zhao-Zheng Liang, Maya Neytcheva, Parallel solution methods and preconditioners for evolution equations. TR 2017-017 August 2017, Department of Information Technology, Uppsala University, `http://www.it.uu.se/research/publications/reports/2017-017/.` (*Published.*)

I 3 Zhao-Zheng Liang, Owe Axelsson, Maya Neytcheva, A robust structured preconditioner for time-harmonic parabolic optimal control problems. TR 2017-014 August 2017, `http://www.it.uu.se/research/publications/reports/2017-014/.` (*Published.*)

I 4 Owe Axelsson, Maya Neytcheva and Anders Ström, An efficient preconditioning method for state box-constrained optimal control problems. TR 2018-008, May 2018, `http://www.it.uu.se/research/publications/reports/2018-008/` (*Published.*)

I 5 Marco Donatelli, Ali Dorostkar, Mariarosa Mazza, Maya Neytcheva, Stefano Serra-Capizzano, A block multigrid strategy for two-dimensional coupled PDEs.TR 2016-001, Department of Information Technology, Uppsala University, (*Published.*)

I 6 Owe Axelsson, Shiraz Farouq, Maya Neytcheva, A preconditioner for optimal control problems, constrained by Stokes equation with a time-harmonic control. TR 2015-036, Department of Information Technology, Uppsala University, December 2015. (*Published.*)

I 7 Owe Axelsson, Shiraz Farouq, Maya Neytcheva, Preconditioning techniques for discrete PDE-constrained optimization problems. Stokes control. TR 2015-030, Department of Information Technology, Uppsala University, September 2015. (*Published.*)

I 8 Owe Axelsson, Shiraz Farouq, Maya Neytcheva, Comparison of preconditioned Krylov subspace iteration methods for PDE-constrained optimization problems. Poisson and convection-diffusion control. TR 2015-024, Department of Information Technology, Uppsala University, August 2015. (*Published.*)

I 9 Ali Dorostkar, Maya Neytcheva, Stefano Serra-Capizzano, Schur complement matrix and its (elementwise) approximation: A spectral analysis based on GLT . TR 2015-011, Department of Information Technology, Uppsala University, February 2015. (*Published.*)

I 10 Ali Dorostkar, Maya Neytcheva, Stefano Serra-Capizzano, Spectral analysis of coupled PDEs and of their Schur complements via the notion of Generalized Locally Toeplitz sequences, TR 2015-008, Department of Information Technology, Uppsala University, February 2015. (*Published.*)

I 11 Ali Dorostkar, Bjrn Lund, Maya Neytcheva, On some block-preconditioners for saddle point systems and their CPU-GPU performance, TR 2015-003, Department of Information Technology, Uppsala University, January 2015. (*Published.*)

I 12 Ali Dorostkar, Dimitar Lukarski, Bjrn Lund, Maya Neytcheva, Yvan Notay, Peter Schmidt, Performance study of block-preconditioned iterative methods on multicore computer systems and GPU. TR 2014-007, Department of Information Technology, Uppsala University, March 2014.

I 13 Owe Axelsson, Maya Neytcheva, Bashir Ahmad, A comparison of iterative methods to solve complex valued linear algebraic systems. TR 2013-005, Department of Information Technology, Uppsala University, March 2013. (*Published.*)

I 14 Xin He, Marcus Holm, Maya Neytcheva, Efficient implementations of the inverse Sherman-Morrison algorithm. TR 2012-017, Department of Information Technology, Uppsala University,August 2012. (*Published.*)

I 15 Owe Axelsson, Xin He, Maya Neytcheva, Numerical solution of the time-dependent Navier-Stokes equation for variable density-variable viscosity. TR 2012-019, Department of Information Technology, Uppsala University, August 2012.

I 16 Petia Boyanova, Maya Neytcheva. Efficient preconditioners for large scale ternary Cahn-Hilliard models. TR 2012-009, Department of Information Technology, Uppsala University, April 2012. (*Published.*)

I 17 O. Axelsson, P. Boyanova, M. Kronbichler, M. Neytcheva, X. Wu, Numerical and computational efficiency of solvers for two-phase problems TR 2012-002, Department of Information Technology, Uppsala University, January 2012. (*Published.*)

I 18 Owe Axelsson, Maya Neytcheva, An incremental load approach to solve nonlinear equations with and application for the Cahn-Hilliard equation. Under preparation.

I 19 Petia Boyanova, Minh Do-Quang, Maya Neytcheva. Efficient preconditioners for large scale binary Cahn-Hilliard models, TR 2011-011, Department of Information Technology, Uppsala University, April 2011. (*Published.*)

I 20 Owe Axelsson, Maya Neytcheva, Operator splittings for solving nonlinear, coupled multiphysics problems with an application to the numerical solution of an interface problem. TR 2011-009, Department of Information Technology, Uppsala University, April 2011.

I 21 Petia Boyanova, Minh Do-Quang, Maya Neytcheva. Solution methods for the Cahn-Hilliard equation discretized by conforming and non-conforming finite elements, TR 2011-004, Department of Information Technology, Uppsala University, March 2011. (*Published.*)

I 22 Owe Axelsson and Maya Neytcheva. A general approach to analyse preconditioners for two-by-two block matrices TR 2010-029, Department of Information Technology, Uppsala University, November 2010. (*Published.*)

I 23 Xin He, Maya Neytcheva, and Stefano Serra Capizzano. On an Augmented Lagrangian-based preconditioning of Oseen type problems TR 2010-026, Department of Information Technology, Uppsala University, November 2010. (*Published.*)

I 24 M. Neytcheva, E. Bängtsson, E. Linnér. Finite-element based sparse approximate inverses for block-factorized preconditioners. TR 2010-010, Department of Information Technology, Uppsala University, March 2010. (*Published.*)

I 25 O. Axelsson, R. Blaheta, M. Neytcheva. A black–box generalized conjugate gradient minimum residual method based on variable preconditioners and local element approximations. TR 2007-033, Department of Information Technology, Uppsala University, December 2007. (*Published.*)

I 26 E. Bängtsson, M. Neytcheva, Finite element block-factorized preconditioners. Technical Report 2007-008, March 2007, Department of Information Technology, Uppsala University. (*Published.*)

I 27 O. Axelsson, M. Neytcheva. Eigenvalue estimates for preconditioned saddle point matrices. Technical Report 2004-019, May 2004, Department of Information Technology, Uppsala University. (*Published.*)

I 28 M. Neytcheva, E. Bängtsson, B. Lund. Numerical solution methods for glacial rebound models. Technical Report 2004-016, April 2004. Department of Information Technology, Uppsala University. (*Published.*)

I 29 E. Bängtsson, M. Neytcheva. Approaches to reduce the computational cost when solving linear systems of equations arising in Boundary Element Method discretizations. Technical Report 2003-053, November 2003. Department of Information Technology, Uppsala University. (*Published.*)

I 30 R. Blaheta, S. Margenov, M. Neytcheva. Robust optimal multilevel preconditioners for nonconforming FE systems. Technical Report, Center of Excellence BIS-21 grant ICA1-2000-70016, 2003. (*Published.*)

I 31 O. Axelsson, M. Neytcheva. Preconditioning methods for for constrained optimization problems with applications for the linear elasticity equations Report 0302, January 2003, Department of Mathematics, University of Nijmegen, The Netherlands. (*Published.*)

I 32 A. Padiy and M. Neytcheva, On a parallel solver for boundary electric current computations, Report 9726, December 1997, Department of Mathematics, University of Nijmegen, The Netherlands.

I 33 M. Neytcheva, A. Padiy, M. Mellaard, K. Georgiev and O. Axelsson, Scalable and optimal iterative solvers for linear and nonlinear problems. Report No. 9613 (March 1996), Department of Mathematics, University of Nijmegen, The Netherlands.

I 34 O.Axelsson, M.Neytcheva, Some basic facts for efficient massively parallel computation. Report No. 9607, March 1996, Department of Mathematics, University of Nijmegen, The Netherlands. (*Published.*)

I 35 O.Axelsson, M.Neytcheva, The Short Length AMLI Method. I. Report 9417, April 1994, Department of Mathematics, University of Nijmegen, The Netherlands. (*Published.*)

I 36 O.Axelsson, M.Neytcheva, B.Polman, The Bordering method as a preconditioning method, Report 9348, December 1993, Department of Mathematics, University of Nijmegen, The Netherlands. (*Published.*)

I 37 M.G. Neytcheva, Implementing the AMLI algorithm on the Connection Machine, Report UNIC-93-15, December 1993, UNI•C, The Technical University of Denmark.

I 38 S. D. Margenov, P. S. Vassilevski, M. G. Neytcheva, Optimal order algebraic multilevel preconditioners for finite element 2-D elasticity equations. Report 9021, Department of Mathematics, University of Nijmegen, The Netherlands, 1990.

Popular Schence contributions:

PSci 1 M. Neytcheva, *Don't be phased*. In *International Innovation*, June 2012. Publisher: Research Media Ltd, `www.researchmedia.eu`.

Other publications and written material:

O 1 M. Neytcheva, *Iterative solution methods for nonlinear problems*, Uppsala, Compendium for a graduate course (by December 2003 contains 66 pages).

O 2 O. Axelsson and M. Neytcheva, Lecture notes on *Supercomputers and Numerical Linear Algebra* (By December 15, 1996 contains 350 pages.)

O 3 M. Neytcheva, Arithmetic and Communication Complexity of Preconditioning Methods. Ph.D. thesis, September 1995, Nijmegen. (Contains 245 pages.)