

# List of Publications for Sverker Holmgren

Updated 2010-05-24

## Peer-Reviewed Articles in Scientific Journals

1. Barany, S. Holmgren, The spatial temperature distribution of an intense electron beam in an electron cooling device, *Physica Scripta* Vol T22, pp. 286-289, 1988
2. S. Holmgren, K. Otto, Iterative solution methods and preconditioners for block-tridiagonal systems of equations, *SIAM J. Matrix Anal. Appl.* Vol. 13, No. 3, pp. 863-886, 1992.
3. S. Holmgren, K. Otto, Semicirculant preconditioners for first-order PDE, *SIAM J. Sci. Comput.* Vol. 15, No. 2, pp. 385-407, 1994.
4. S. Holmgren, K. Otto, Semicirculant solvers and boundary corrections for first-order PDE, *SIAM J. Sci. Comput.* Vol. 17, No. 3, pp. 613-630.
5. S. Holmgren, K. Otto, A framework for polynomial preconditioners based on fast transforms I: Theory, *BIT* Vol. 38, No. 3, pp. 544-559, 1998.
6. S. Holmgren, K. Otto, A framework for polynomial preconditioners based on fast transforms II: PDE application. *BIT* Vol. 38, No. 4, pp. 721-736, 1998.
7. H. Brandén, S. Holmgren, Convergence acceleration for hyperbolic systems using semicirculant approximations, *J. Sci Comput.* Vol 14, No. 4, 1999.
8. S. Holmgren, H. Brandén, E. Sterner, Convergence acceleration for the Navier-Stokes equations using optimal semicirculant approximations, *SIAM J. Sci. Comput.* Vol. 21, No. 4, pp. 1524-1550, 2000.
9. K. Ljungberg, S. Holmgren, Ö. Carlborg, Efficient algorithms for quantitative trait loci mapping problems, *J. Comp. Biology* Vol. 9, No. 6, pp 793-804, 2002.
10. H. Karlsson, S. Holmgren, Cross-correlation functions via Lanczos algorithms without diagonalization, *J. Chem. Phys.* Vol 117, No. 20, pp 9116-9123, 2002.
11. S. Holmgren, M. Nordén, J. Rantakokko, D. Wallin, Performance of PDE solvers on a self-optimizing NUMA architecture. *Parallel Alg. Appl.* Vol. 17, No. 4, pp 285-299, 2002.
12. H. Brandén, S. Holmgren, Convergence acceleration for the steady state Euler equations. *Computers and Fluids* vol. 32, No 8, pp 1075-1092, 2003.
13. E. Larsson, S. Holmgren, Parallel solution of the Helmholtz equation in a multilayer domain, *BIT* Vol. 43, No. 2, pp. 387-411, 2003.
14. S. Holmgren, A. Ynnerman, The Swedish National Graduate School in Scientific Computing (NGSSC). *Future Generation Computer Systems*, No. 1019, pp 1-9, 2003. (Special issue on Education in the Computational Sciences).
15. K. Ljungberg, S. Holmgren, Ö. Carlborg, Simultaneous search for multiple QTL using the global optimization method DIRECT, *Bioinformatics* Vol. 20, pp 1887-1895, 2004.
16. M. Nordén, S. Holmgren, M. Thuné, OpenMP versus MPI for PDE solvers based on regular sparse numerical operators, *Future Generation Computer Systems* Vol. 22, pp 194-203, 2006.
17. S. Holmgren, S. Serra-Capizzano, P. Sundqvist, Can one hear the composition of a drum?, *Mediterranean Journal of Mathematics* Vol. 3, No 2, pp. 227-249, 2006.
18. H. Brandén, S. Holmgren, P. Sundqvist, Discrete fundamental solution preconditioning for hyperbolic systems of PDE, *J. Sci. Comput.* Vol 30, pp. 35-60, 2007.
19. L. Rönnegård, K. Mischenko, S. Holmgren, Ö. Carlborg, Increasing the efficiency of variance component quantitative trait loci analysis by using reduced-rank identity-by-descent matrices, *Genetics* Vol 176, pp.1935-1938, 2007.
20. M. Nordén, H. Löf, J. Rantakokko, S. Holmgren, Dynamic data migration for structured AMR solvers, *Int. J. Parallel Programming* Vol. 35, pp. 477-491, 2007.
21. K. Mishchenko, S. Holmgren, L. Rönnegård, Newton-type methods for REML estimation in genetic analysis of quantitative traits. *Comput. Meth. in Science and Engineering* Vol. 8, pp. 53-67, 2008.

22. K. Kormann, S. Holmgren, H. Karlsson, Accurate time-propagation for the Schrödinger equation with an explicitly time-dependent Hamiltonian. *J. Chem. Phys.* Vol 128, 184101, 2008.
23. D. Wallin, H. Löf, E. Hagersten, S. Holmgren, Reconsidering algorithms for iterative solvers in the multicore era. *Int. J. Computational Science and Engineering*, Vol. 4, pp. 270-282, 2009.
24. K. Mishchenko, L. Rönnegård, S. Holmgren, V. Mishchenko, Assessing a multiple QTL search using the variance component model. *Comp. Biol. Chem.*, Vol. 34, pp 34-41, 2010.
25. K. Ljungberg, K. Mishchenko, S. Holmgren, Efficient algorithms for multi-dimensional global optimization in genetic mapping of complex traits. Accepted for publication in *Advances and Applications in Bioinformatics and Chemistry*.
26. K. Kormann, S. Holmgren, H.O. Karlsson, A Fourier-Coefficient based Solution of an Optimal Control Problem in Quantum Chemistry. Accepted for publication in *J. Optim. Theor. Appl.*

## Peer-Reviewed Articles in Conference Proceedings

1. S. Holmgren, K. Otto, L. Frändén, Parallelization of iterative solution methods and preconditioners for non-diagonally dominant, block-tridiagonal systems of equations, In *Hypercube and distributed computers* (André and Verjus, eds.), North-Holland, 1989
2. S. Holmgren, H. Brandén, E. Sterner, Convergence acceleration for the Navier-Stokes equations, In *Proceedings of the seventh international symposium on computational fluid dynamics* (F.G. Zhuang, ed.), International Academic Publishers, 1997.
3. S. Holmgren, D. Wallin, Performance of a pseudo-spectral PDE solver on a self-optimizing NUMA architecture, *Proc. of EUROPAR 2001*, LNCS Vol. 2150, pp 602-610, Springer-Verlag.
4. D. Wallin, H. Johansson, S. Holmgren, Cache memory behavior of state-of-the-art PDE solvers, *Proc. of Parallel Computing 2003 (ParCo2003)*, *Advances in Parallel Computing* Vol.13, pp. 475-482, Elsevier.
5. S. Holmgren, C. Peterson, H. Karlsson, Time-marching methods for the time-dependent Schrödinger equation, *Proc. of the International Conference on Computational and Mathematical Methods in Science and Engineering 2004 (CMMSE 2004)*, pp. 53-56, 2004.
6. H. Johansson, D. Wallin, S. Holmgren, Analyzing advanced PDE solvers through simulation, *Proc. of PARA 2004*, LNCS Vol. 3732, pp-893-900, Springer-Verlag.
7. H. Löf, M. Nordén, S. Holmgren, Improving geographical locality of data for shared memory implementations of PDE solvers, *Proc. of the International Conference of Computational Science (ICCS 2004)*, LNCS Vol. 3037, part II, pp 9-16, Springer-Verlag.
8. H. Löf, S. Holmgren, affinity-on-next-touch: Increasing the performance of an industrial PDE solver on a cc-NUMA system, *Proc. of the 19<sup>th</sup> ACM International Conference on Supercomputing (ICS 2005)*, pp.387-392, ACM.
9. D. Wallin, H. Löf, E. Hagersten, S. Holmgren, Multigrid and Gauss-Seidel smoothers revisited: Parallelization on chip multiprocessors, *Proc. of the 20<sup>th</sup> ACM International Conference on Supercomputing (ICS 2006)*, pp 145-155, ACM.
10. M. Nordén, H. Löf, J. Rantakokko, S. Holmgren, Geographical locality and dynamic data migration for OpenMP implementations of adaptive PDE solvers, *Proc. of the 2<sup>nd</sup>*.
11. M. Jayawardena, K. Ljungberg, S. Holmgren, The use of grid computing for QTL data analysis, *Proc. Workshop on State-of-the-art in Scientific and Parallel Computing (PARA 2006)*, LNCS Vol. 4699, pp 627-636, Springer-Verlag.
12. M. Jayawardena and Sverker Holmgren, Grid-Enabling an Efficient Algorithm for Demanding Global Optimization Problems in Genetic Analysis. *Proc. 3<sup>rd</sup> IEEE International Conference on e-Science and Grid Computing (e-Science 2007)*, IEEE Conference Proceedings 10.1109, pp 205-212, IEEE Computer Society.
13. M. Jayawardena, H. Löf, S. Holmgren, Efficient optimization algorithms and implementations for genetic analysis of complex traits on a grid system with multicore

- nodes. Accepted for publication in Proc. Workshop on State-of-the-art in Scientific and Parallel Computing (PARA 2008).
14. E. Elmroth, S. Holmgren, J. Lindemann, S. Toor and P.-O. Östberg, Empowering a flexible application portal with a SOA-based grid job management framework. Accepted for publication in Proc. Workshop on State-of-the-art in Scientific and Parallel Computing (PARA 2008).
  15. C. Nettelblad, S. Holmgren, L. Crooks and Ö. Carlborg, cnF2freq: Efficient determination of genotype and haplotype probabilities in outbred populations using Markov models. Proc. International Conference on Bioinformatics and Computational Biology (BICoB 2009), LNBI Vol. 5462, pp 307-319, Springer-Verlag.
  16. M. Jayawardena, S. Toor, S. Holmgren, A grid portal for genetic analysis of complex traits. Proc. Conference on Grid and Visualization Systems (GVS 09), Opatija, Croatia, 2009.
  17. A Grid-Enabled Problem Solving Environment for QTL Analysis in R. Proc. International Conference on Bioinformatics and Computational Biology (BICoB 2010).

## Articles under Review

1. P. Sundqvist, H. Brandén, S. Holmgren, Boundary summation equations, Submitted to Numer. Alg.
2. P. Sundqvist, S. Holmgren, Navier-Stokes equations for low Mach number flows solved by boundary summation. Submitted to Comput. Meth. Appl. Math.
3. K. Kormann, S. Holmgren, H.O. Karlsson, Global Error Control of the Time Propagation for the Schrödinger Equation with a Time-Dependent Hamiltonian. Submitted to J. Comput. Appl. Math.

## Presentations at International Conferences and Workshops

- Workshop and Symposium on the Physics of Low-Energy Stored and Trapped Particles, June 14-18 1987 in Stockholm, Sweden. (poster)
- The Second International Conference on Vector and Parallel Computing Issues in Applied Research and Development, June 6-10 1988 in Tromsø, Norway. (poster)
- Second Annual Meeting of SIAM Nordic Section, August 28-29 1989 in Espoo, Finland. (speaker)
- 1st European Workshop on Hypercube and Distributed Computers, October 4-6 1989 in Rennes, France. (poster)
- Copper Mountain Conference on Iterative Methods, April 1-5 1990 in Copper Mountain, USA. The report was awarded third place in the student paper competition. (speaker)
- Householder Symposium X1, June 18-22 1990, Tylösand, Sweden (some work was included in a presentation by L. Eldén)
- Supercomputers in Engineering, October 18-19 1990 in Linköping, Sweden.
- Copper Mountain Conference on Iterative Methods, April 9-14 1992 in Copper Mountain, USA.
- Industrial Mathematics Week, August 17-21 1992 in Trondheim, Norway. (speaker)
- 1993 Householder Symposium, June 13-18 1993 in Lake Arrowhead, USA. (speaker)
- Conference on Parallel High-Performance Applications, December 16-17 in Stockholm, Sweden. (speaker)
- Colorado Conference on Iterative Methods, April 5-9 1994 in Breckenridge, USA.
- Conference on Numerical Analysis in Honor of Germund Dahlquist's 70th birthday, January 11-13 1995 in Stockholm, Sweden. (speaker)
- 6th International Symposium on CFD, September 4-8 1995 in Lake Tahoe, USA. (speaker)
- Copper Mountain Conference on Iterative Methods, April 9-13 1996 in Copper Mountain, USA. (speaker)
- Invited minisymposium presentation at the SIAM annual meeting, July 14-18 1997 at Stanford University, USA. (speaker)
- 7th International Symposium on CFD, September 15-19 1997 in Beijing, China. (speaker)

- 7th International Conference on Hyperbolic Problems, February 9-13 1998 in Zurich, Switzerland. (speaker)
- Supercomputing 98, November 7-13 1998 in Orlando, USA. (poster)
- 1999 International Conference on Preconditioning Techniques for Large Sparse Matrix Problems in Industrial Applications, June 10-12 1999 in Minneapolis, USA. (poster)
- Copper Mountain Conference on Iterative Methods, April 3-7 2000 in Copper Mountain, USA. (speaker)
- Copper Mountain Conference on Iterative Methods, April 3-7 2000 in Copper Mountain, USA. (co-author of a second presentation)
- 2000 SIAM Annual Meeting, July 10-14 2000, Rio Grande, Puerto Rico. Organizer of minisymposium. (speaker)
- Invited minisymposium presentation at the 1st SIAM Conference on Computational Science and Engineering, September 21-23 2000, Washington DC, USA.
- Symposium on Iterative Methods in Linear Algebra, May 4 2001, Stanford, USA
- EUROPAR 2001
- International Conference on Spectral and High Order Methods (ICOSAHOM 01), June 11-15 2001, Uppsala, Sweden (speaker)
- 1st SIAM Conference on the Life Sciences, March 6-8 2002, Boston, USA (poster)
- 2002 International Conference on Computational Science, April 21-24 2002, Amsterdam, The Netherlands.
- 8th Quantitative Trait Locus Mapping and Marker-Assisted Selection Workshop, May 9-10 2003, Helsinki, Finland.
- 4th International Conference on Large-Scale Scientific Computations, June 4-8 2003, Sozopol, Bulgaria. (speaker)
- Workshop on Nonlinear Approximations in Numerical Analysis, June 22-25 2003, Moscow, Russia. (speaker)
- Complex Trait Consortium Meeting, July 1-3 2003, Oxford, UK.
- Parallel Computing 2003 (ParCo2003)
- Copper Mountain Conference on Iterative Methods, March 28- April 2 2004, Copper Mountain, USA.
- International Conference on Computational and Mathematical Methods in Science and Engineering 2004 (CMMSE 2004)
- PARA04 - Workshop on State-of-the-art in Scientific and Parallel Computing.
- 2nd SIAM Conference on Computational Science and Engineering, February 2005, Orlando, FL, USA. (speaker)
- SIAM Conference on Optimization, May 2005, Stockholm, Sweden.
- 19<sup>th</sup> ACM International Conference on Supercomputing (ICS 2005)
- International Conference on Matrix Methods and Operator Equations, June 2005, Moscow, Russia.
- Complex Trait Consortium Meeting, June 2005, Groningen, the Netherlands (poster)
- 6<sup>th</sup> Annual Workshop on Linux Clusters for Supercomputing, October 2005, Linköping, Sweden (invited speaker)
- PARA06 - Workshop on State-of-the-art in Scientific and Parallel Computing, June 2006, Umeå University. (Organizer of minisymposium on Biocomputing and Bioinformatics)
- 2<sup>nd</sup> International workshop on OpenMP (IWOMP 2006), June 2006.
- 20<sup>th</sup> ACM International Conference on Supercomputing (ICS 2006), June 2006, Cairns, Australia
- HPC-Europe Workshop, September 2006, Oxford, England (speaker)
- 7<sup>th</sup> Annual Workshop on Linux Clusters for Supercomputing, October 2006, Linköping, Sweden (invited speaker)
- IFIP Workshop on Software Issues in Computational Science and Engineering, August 2007, Uppsala, Sweden (keynote speaker)
- Non-convex programming: Local and Global Approaches - Theory, Algorithms and Applications, December 2007, Rouen, France

- 3<sup>rd</sup> IEEE International Conference on e-Science and Grid Computing (e-Science 2007), December 2007, Bangalore, India (speaker)
- SIAM Conference on Parallel Processing for Scientific Computing, March 2008, Atlanta, GA, USA.
- NORDUnet2008 Conference, April 2008, Helsinki, Finland (invited speaker)
- PARA08 - Workshop on State-of-the-art in Scientific and Parallel Computing, May 2008, Trondheim, Norway
- PARA08 - Workshop on State-of-the-art in Scientific and Parallel Computing, May 2008, Trondheim, Norway (co-author of a second presentation)
- SICS (Swedish Institute of Computer Science) Multicore Days, September 2008, Kista, Sweden (invited Speaker)
- 4th SIAM Conference on Computational Science and Engineering, March 2009, Miami, FL, USA. Organizer of minisymposium on Numerical Methods for Quantum Dynamics (speaker).
- 13th Quantitative Trait Locus Mapping and Marker-Assisted Selection Workshop (QTLMAS), April 2009, Wageningen, The Netherlands.
- 1<sup>st</sup> International Conference on Bioinformatics and Computational Biology (BICoB 2009), April 2009, New Orleans, LA, USA.
- MIPRO 2009, Grid and Visualization Systems, May 2009, Opatija, Croatia.
- 8th European Conference on Numerical Mathematics and Advanced Applications (ENUMATH 2009), June 2009, Uppsala, Sweden (two presentations).
- 2<sup>nd</sup> International Conference on Bioinformatics and Computational Biology (BICoB 2010), March 2010, Honolulu, HI, USA.
- NOTUR 2010, May 2010, Bergen, Norway (invited speaker)