# Curriculum Vitae

updated: 2020-04-01

Jan Nordström

date of birth: November 16, 1953
Married, 4 children

## Degrees

| | |
|---|---|
| 1980 | Master of Science in Aeronautics, The Royal Institute of Technology (KTH) Stockholm, Sweden |
| 1993 | PhD in Numerical Analysis, The Department of Scientific Computing Uppsala University (UU), Uppsala, Sweden |
| 1999 | Docent (Habilitation) in Numerical Analysis, UU |

## Current positions

| | |
|---|---|
| 2010 - | Professor in Scientific Computing, Department of Mathematics, Linköping University (LiU), Sweden |
| 2012 - | Head of Division in Computational Mathematics, LiU, Sweden |
| 2020 - | Distinguished Visiting Professor, Department of Mathematics and Applied Mathematics, University of Johannesburg (UJ), South Africa |

## Honorary affiliations

| | |
|---|---|
| 2009 - 2010 | Senior Research Fellow, Center for Turbulence Research (CTR), Stanford University (SU), USA |
| 2010 - 2013 | Honorary Professor, School of Computational and Applied Mathematics, University of the Witwatersrand (WITS), South Africa |
| 2018 - | Honorary Professor in Computational Mathematics, Department of Mechanical Engineering, University of Cape Town (UCT), South Africa |

## Board work

| | |
|---|---|
| 2012 - | Member of the board of Linköping Institute of Technology (LiTH) |
| 2012 - | Member of Advisory group for research/graduate education LiTH |
| 2013 - | Editorial board (associate editor) of BIT Numerical Mathematics |
| 2014 - 2018 | Member of the board of the National Supercomputer Centre (NSC) |
| 2016 - | Editorial board (associate editor) of Journal of Computational Physics |

## Previous positions and affiliations

| | |
|---|---|
| 1980 - 1995 | Research Scientist, The Aeronautical Research Institute of Sweden (FFA) |
| 1986 - 1991 | Acting head at the Viscous Flow Branch, FFA |
| 1995 - 2001 | Senior Scientist, FFA |
| 1995 - 1999 | Research leader for the Unsteady Aerodynamics group at FFA |
| 1999 - 2001 | Research leader for the Wave Propagation group at FFA |
| 1999 - 2001 | Research leader for the Numerical Methods group at FFA |
| 2001 - 2002 | Senior Scientist, The Swedish Defense Research Agency (FOI) |
| 2001 - 2004 | Adjunct Professor, Numerical Analysis (Adjungerad), UU |
| 2002 - 2010 | Director of Research (Forskningschef) in Numerical Analysis, FOI |
| 2006 - 2009 | Adjunct Professor, Numerical Analysis, UU |
| 2007 - 2009 | Visiting Professor, 6 months, Department of Mechanical Engineering, Stanford University (SU), USA |
| 2009 - 2010 | Adjunct Professor, Scientific Computing, UU |
| 2009 - 2010 | Professor in Aeronautical Engineering, School of Mechanical, Industrial and Aeronautical Engineering, University of the Witwatersrand (WITS), South Africa |
| 2009 - 2010 | Head of Division of Aeronautical Engineering, School of Mechanical, Industrial and Aeronautical Engineering, WITS, South Africa |
| 2010 - 2013 | Visiting Professor, School of Electrical and Information Technology, WITS, South Africa |
| 2011 - 2011 | Visiting Professor, 3 months, Department of Mechanical Engineering, Stanford University, USA |

## Research visits and Consultant positions

| | |
|---|---|
| 1987 | Visiting Scientist, 3 months, NASA Ames, USA |
| 1996 - 1997 | Visiting Scientist, 2 months, ICASE, USA |
| 1998 - 2002 | 7 months as ICASE (Institute of Computer Applications in Science and Engineering) Consultant |
| 2003 - 2005 | Visiting Scientist, 3 months, National Institute of Aerospace (NIA), USA |
| 2003 - 2005 | Consultant, 3 months, Appl. Math., Brown University, USA |
| 2005 - 2007 | Senior Visiting Fellow, 3 months, Center for Turbulence Research, SU, USA |
| 2006 - 2008 | Consultant 2 months/year for the Dept. of Vehicle |

| | |
|---|---|
| | and Aeronautical Engineering, KTH, Sweden |
| 2010 | Visiting Scientist, 1 month, NIA, USA |
| 2011 | Visiting Scientist, 1 week, Caltech, USA |
| 2013 | Visiting Scientist, 1 week, Caltech, USA |
| 2014 | Seniour Visiting Fellow, 1 week, CTR, Stanford University, USA |
| 2014 | Visiting Scientist, 1 week, University of Zurich, Switzerland |
| 2015 | Visiting Scientist, 1 week, Florida State University, USA |
| 2015 | Visiting Scientist, 1 month, NIA, USA |
| 2015 | Seniour Visiting Fellow, 1 week, CTR, Stanford University, USA |
| 2015 | Visiting Scientist, 1 week, University of Zurich, Switzerland |
| 2016 | Visiting Scholar, 1 month, Department of Mechanical Engineering, Stanford University, USA |
| 2017 | Visiting Scholar, 1 month, Department of Mechanical Engineering, Stanford University, USA |
| 2017 | Visiting Academic, 2 weeks, Department of Mechanical Engineering, University of Cape Town, South Africa |
| 2018 | Visiting Scientist, 1 week, Caltech, USA |
| 2018 | Visiting Scientist, 1 week, Department of Mechanical Engineering, Technion - Israel Institute of Technology, Israel |
| 2018 | Visiting Scientist, 1 week, National Institute of Aerospace (NIA), USA |
| 2018 | Visiting Academic, 2 weeks, Department of Mechanical Engineering, University of Cape Town, South Africa |
| 2019 | Visiting Scientist, 1 week, Department of Computing + Mathematical Sciences (CMS), Caltech, USA |
| 2019 | Visiting Scientist, 1 week, National Institute of Aerospace (NIA), USA |
| 2019 | Visiting Scholar, 2 weeks, Department of Mechanical Engineering, Technion - Israel Institute of Technology, Israel |
| 2019 | Visiting Academic, 3 weeks, Department of Mechanical Engineering, University of Cape Town, South Africa |
| 2020 | Visiting Academic, 2 weeks, Department of Mathematics and Applied Mathematics, University of johannesburg, South Africa |

### Evaluation and committee work

| | |
|---|---|
| 2004 | Independent Expert, EU 6th framework program, EST |
| 2004 | Independent Expert, EU 6th framework program, OIF |
| 2004 | Independent Expert, EU 6th framework program, IIF |

| | |
|---|---|
| 2004 | Member PhD Thesis evaluation committee |
| 2004 | Scientific reviewer for the Swedish Research Council |
| 2005 | Member PhD Thesis evaluation committee |
| 2006 | Independent Expert, EU 6th framework program, TOK |
| 2007 - 2009 | Scientific reviewer for the Georgian Research Council |
| 2008 | Member International Scientific Committee for Africomp2009 |
| 2009 | Expert opinion for a succesful promotion at Stanford University |
| 2009 | Expert opinion for a succesfull application for the PECASE (Presidential Early Career Award for Scientists and Engineers) award |
| 2010 | Member International Scientific Committee for Africomp2011 |
| 2011 | Scientific evaluator for the Cyprus Research Promotion Foundation |
| 2011 | Member PhD Thesis evaluation committee |
| 2011 | Scientific reviewer for National Science Foundation, Georgia |
| 2011 | Expert opinion for a succesful application to a faculty position at the U.S. Naval Post Graduate School in Monterey |
| 2012 | Member of two Docent evaluation committees |
| 2012 | Member International Scientific Committee for Africomp2013 |
| 2012 | Member PhD Thesis evaluation committee |
| 2013 | Chairman, Numerical Treatment of Boundary Conditions, 21st AIAA CFD conference, San Diego, USA. |
| 2013 | Member PhD Thesis evaluation committee |
| 2014 | Member Evaluation Panel, Mathematical Sciences, Swedish Research Council |
| 2014 | Chairman for the Applied Mathematics panel, Academy of Finland |
| 2014 | Reviewer for the Mathematics panel, Swiss National Science Foundation |
| 2014 | Member PhD Thesis evaluation committee |
| 2014 | Member of three Docent evaluation committees |
| 2014 | Member International Scientific Committee for Africomp2015 |
| 2014 | Member Organizing Committee for 3rd International Workshop on High-Order CFD Methods |
| 2014 | Expert opinion for a succesful promotion at Stanford University |
| 2015 | Member PhD Thesis evaluation committee |
| 2015 | Member of two Docent evaluation committees |
| 2015 | Member Organizing Committee for 4th International Workshop on High-Order CFD Methods |
| 2016 | Member PhD Thesis evaluation committee |
| 2016 | Member of Docent evaluation committee |
| 2016 | Member Scientific Committee for 6th EASN International Conference on Innovation in European Aeronautics Research |

| | |
|---|---|
| 2017 | Member Organizing Committee for 5th International Workshop on High-Order CFD Methods |
| 2017 | Member PhD Thesis evaluation committee |
| 2017 | Member Scientific Committee for 7th EASN International Conference on Innovation in European Aeronautics Research |
| 2017 | Expert opinion for a succesful promotion at Rensselaer Polytechnic Institute |
| 2018 | Member PhD Thesis evaluation committee |
| 2019 | Member PhD Thesis evaluation committee |

**Invited talks**

| | |
|---|---|
| 2007 | American Mathematical Society, Mathematical and Computational aspects of Compressible Flow, Albuquerque, USA |
| 2008 | SIAM Annual meeting, Computational Methods for Compressible Flow, San Diego, USA |
| 2010 | SACAM10, Keynote talk, Weak Boundary and Interface Conditions with Multi-physics Applications, Pretoria, South Africa |
| 2010 | SIAM Annual Meeting, Nonlinear Boundary Conditions for Wave Propagation Problems, Pittsburgh, USA |
| 2011 | Africomp2011, Keynote talk, Initial Boundary Value Problems, Summation-by-parts Operators and Weak Boundary Conditions, Cape Town, South Africa |
| 2011 | The Popular Applied Mathematics seminar (PAM), Initial Boundary Value Problems, Summation-by-parts Operators and Weak Boundary Conditions, Uppsala, Sweden |
| 2011 | ICIAM 2011, Initial Boundary Value Problems, Summation-by-parts Operators and Weak Boundary Conditions, Vancouver, Canada |
| 2012 | Linear and Nonlinear Boundary and Interface Problems, Oberwolfach workshop, Germany |
| 2012 | Initial Boundary Value Problems and Boundary/Interface Conditions with Multi-Physics Applications, AIM workshop, Palo Alto, USA |
| 2012 | CTR Seminar: New Developments for Finite Difference Approximations of Initial Boundary Value Problems: Time Integration and Dual Consistency, Stanford, USA |
| 2013 | Stable High Order Finite Difference Methods for Wave Propagation Problems, SIAM CSE Meeting, Boston, USA |
| 2013 | SANUM 2013, Plenary talk, Initial Boundary Value Problems, Summation-by-parts Operators and Weak Boundary Conditions, |

| | |
|---|---|
| | Stellenbosch, South Africa |
| 2013 | Flamengro conference 2013, Initial Boundary Value Problems and Boundary/Interface Conditions with Multi-Physics Applications, Pretoria, South Africa |
| 2014 | SANUM 2014, Plenary talk, High Order Finite Difference Approximations of Multi-Physics Problems, Johannesburg, South Africa |
| 2015 | Well Posed Problems and Boundary Conditions in Computational Fluid Dynamics, Aviation 2015, Dallas Texas, USA. |
| 2015 | Well Posed Problems and Boundary Conditions in Computational Fluid Dynamics, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany. |
| 2015 | Plenary talk at 28th Nordic Seminar on Computational Mechanics: New Developments for Initial Boundary Value Problems involving Multi-physics at Linköping University, Tallin, Estonia. |
| 2016 | An Investigation of Uncertainty Effects in Mixed Hyperbolic-Parabolic Problems due to Stochastically Varying Geometry, SIAM UQ 2016, Lausanne, Switzerland. |
| 2016 | A Roadmap to Well Posed and Stable Problems in Computational Physics, Stanford University, Stanford, USA |
| 2016 | New Developments for Initial Boundary Value Problems involving Multi-physics at Linköping University, 6th EASN International Conference, Porto, Portugal |
| 2017 | Improved Numerical Performance Using the SBP-SAT Technique As the Main Building Block, SIAM CSE 17, Atlanta, USA |
| 2018 | Energy Stable Boundary Conditions for the Nonlinear Incompressible Navier-Stokes Equations, CFD IMPACT 2018, Haifa, Israel |
| 2018 | Energy Stable Boundary Conditions for the Nonlinear Incompressible Navier-Stokes Equations, NASA Langley Research Center, Hampton, USA |
| 2018 | Energy Stable Boundary Conditions for the Nonlinear Incompressible Navier-Stokes Equations, Old Dominion University, Norfolk, USA |
| 2018 | Energy Stable Boundary Conditions for the Nonlinear Incompressible Navier-Stokes Equations, BCAM - Basque Center for Applied Mathematics, Bilbao, Spain |
| 2019 | New Developments for Initial Boundary Value Problems involving Multi-physics at Linköping University, SDSU, |

| | |
|---|---|
| | San Diego, USA |
| 2019 | New Developments for Initial Boundary Value Problems involving Multi-physics at Linköping University, Caltech, Pasadena, USA |
| 2019 | Stable and accurate filtering procedures, NASA Langley Research Center, Hampton, USA |
| 2019 | The spatial operator in the incompressible Navier-Stokes, Oseen and Stokes equations, CFD IMPACT 2019, Haifa, Israel |
| 2019 | The spatial operator in the incompressible Navier-Stokes, Oseen and Stokes equations, ICIAM 2019, Valencia, Spain |
| 2019 | New Developments for Initial Boundary Value Problems involving Multi-physics at Linköping University, Lawrence Livermore National Lab, Livermore, USA |
| 2019 | New Developments for Initial Boundary Value Problems involving Multi-physics at Linköping University, University of Cape Town, Cape Town, South Africa |
| 2020 | New Developments for Initial Boundary Value Problems at Linköping University, University of Stavanger, Norway |
| 2020 | New Developments for Initial Boundary Value Problems at Linköping University, University of Johannesburg, South Africa |

**Invited to the following workshops and programs**

| | |
|---|---|
| 2012 | Mathematisches Forschungsinstitut Oberwolfach: Recent Developments in the Numerics of Nonlinear Hyperbolic Conservation Laws and their Use in Science and Engineering |
| 2012 | American Institute of Mathematic (AIM): Nonlinear solvers for high-intensity focused ultrasound with application to cancer treatment. |
| 2015 | Mathematisches Forschungsinstitut Oberwolfach: Recent Developments in the Numerics of Nonlinear Hyperbolic Conservation Laws and their Use in Science and Engineering |
| 2016 | The Center for Turbulence Research, CTR summer program, Stanford University |
| 2018 | Institut de Mathmatiques de Toulouse: NABUCO (NumericAl BoUndaries and COupling) |
| 2018 | Advances in PDEs: Theory, Computation and Application to CFD ICERM, Brown University |

| | |
|---|---|
| 2019 | The CFDLAB summer scholar-in-residence program, Technion - Israel Institute of Technology, Haifa, Israel |
| 2020 | The Center for Turbulence Research, CTR summer program, Stanford University |

**PhD Student supervision**

| | |
|---|---|
| 1997 - 2003 | Ken Mattsson, Thesis title: Summation-by-Parts Operators for High Order Finite Difference Methods |
| 1999 - 2004 | Magnus Svärd, Thesis title: Stable High Order Finite Difference Methods for Aerodynamics |
| 2003 - 2007 | Jing Gong, Thesis title: Hybrid Methods for Unsteady Fluid Flow Problems in Complex Geometries |
| 2006 - 2011 | Qaiser Abbas, Thesis title: Weak Boundary and Interface Procedures for Wave and Flow Problems |
| 2006 - 2016 | Sven-Erik Ekström, (Licenciate) Project: ADIGMA, A Vertex-Centered Dual Discontinuous Galerkin Method for Hyperbolic Problems, Martin Berggren UMU 1st advisor |
| 2007 - 2012 | Sofia Eriksson, Project: Stable Numerical Methods with Boundary and Interface Treatment for Applications in Aerodynamics |
| 2007 - 2012 | Kenneth Duru, Thesis title: Perfectly Matched Layers and High Order Difference Methods for Wave Equations, Gunilla Kreiss UU 1st advisor |
| 2008 - 2013 | Jens Berg, Project: Stable and High-Order Finite Difference Methods for Multiphysics Flow Problems |
| 2008 - 2013 | Per Pettersson, Project: Unceartainty Quantification and Numerical Methods for Conservation Laws, jointly with Gianluca Iaccarino, SU |
| 2011 - 2016 | Tomas Lundquist, Project: High Order Summation-by-Parts Methods in Time and Space |
| 2011 - 2016 | Samira Nikkar, Project: Stable High Order Finite Difference Methods for Wave Propagation and Flow Problems on Deforming Domains |
| 2011 - 2016 | Ossian O'Reilly, Project: High Order Accurate Numerical Methods in Geophysics, jointly with Eric Dunham SU |
| 2012 - 2017 | Hannes Frenander, Project: High-order finite difference approximations for hyperbolic problems: multiple penalties and non-reflecting boundary conditions |
| 2012 - 2017 | Cristina La Cognata, Project: High order summation-by-parts |

| | |
|---|---|
| | based approximations for discontinuous and nonlinear problems |
| 2012 - 2017 | Viktor Linders, Project: Error analysis of summation-by-parts formulations: Dispersion, transmission and accuracy |
| 2013 - 2018 | Markus Wahlsten, Project: Uncertainty quantification for wave propagation and flow problems with random data |
| 2014 - 2019 | Fatemeh Ghasemi, Project: Stability, dual consistency and conservation of summation-by-parts formulations for multiphysics problems |
| 2014 - 2019 | Andrea Ruggio, Project: Eigenvalue analysis and convergence acceleration techniques for summation-by-parts approximations |
| 2016 - | Oskar Ålund, Project: High order methods on general grids |
| 2017 - | Fredrik Lauren, Project: The influence of boundary and interface conditions on numerical schemes |

**Postdoc supervision**

| | |
|---|---|
| 2011 - 2014 | Marco Kupiainen, Project: InDustrIalisation of Higher Order Methods (IDIHOM) |

**Teaching experience**

| | |
|---|---|
| 2001 | Graduate course in Computational Aeroacoustics (UU) |
| 2004 | Graduate course in Artificial Boundary Conditions (UU) |
| 2007 | Undergraduate course in Scientific Computing (UU) |
| 2007 | Undergraduate course in Analysis of Numerical Methods (UU) |
| 2008 | Undergraduate course in Computational Fluid Dynamics (KTH) |
| 2008 | Graduate course in Initial Boundary Value Problems (UU) |
| 2009 | Graduate course in Numerical Methods for Initial Boundary Value Problems, Institute of Computational Mathematics in Engineering (iCME), Stanford University |
| 2011 | Graduate course in Numerical Methods for Initial Boundary Value Problems, Institute of Computational Mathematics in Engineering (iCME), Stanford University |
| 2011 | Graduate course in Numerical Methods for Initial Boundary Value Problems, Linköping University (LiU) |
| 2013 | Short course in Numerical Solution of Initial Boundary Value Problems, Council for Scientific and Industrial Research (CSIR), Pretoria, South Africa |
| 2013 | SeSE Graduate course in Numerical Solution of Initial Boundary |

| | |
|---|---|
| | Value Problems, (LiU) |
| 2014 | Graduate course, Selected articles on well posed problems and numerical approximations, (LiU) |
| 2016 | SeSE Graduate course in Stochastic Galerkin Methods for Partial Differential Equations, (LiU) |
| 2017 | SeSE Graduate course in Numerical Solution of Initial Boundary Value Problems, (LiU) |
| 2017 | SeSE Graduate course in Numerical Solution of Initial Boundary Value Problems, University of Cape Town |
| 2019 | SeSE Graduate course: Combining Partial Differential Equations, Machine Learning and Measurements for Increased Prediction Capability, (LiU) |

**Review and editorial work**

| | |
|---|---|
| 1993 - | Journal of Computational Physics |
| 1995 - | Applied Numerical Mathematics |
| 1999 - | Journal of Scientific Computing |
| 1999 - | SIAM, Journal of Numerical Analysis |
| 1999 - | SIAM, Journal of Scientific Computing |
| 2008 - 2011 | Editorial board of International Journal of Mechanics and MEMS |
| 2009 - | AIAA Journal |
| 2010 - | Journal of Mathematical Modeling and Numerical Analysis |
| 2010 - | Communications in Computational Physics (CiCP) |
| 2010 - | Computer Methods in Applied Mechanics and Engineering |
| 2011 - | Journal of Aerospace Engineering |
| 2011 - | BIT Numerical Mathematics |
| 2012 - | Applied Mathematics and Computation |
| 2012 - | Journal of Fluid Mechanics |
| 2012 - | International Journal of Numerical Methods for Heat and Fluid Flow |
| 2012 - | International Journal of Computational Fluid Dynamics |
| 2013 - | Physics of Fluids |
| 2013 - | International Journal of Nonlinear Sciences and Numerical Simulation |
| 2013 - | Editorial board of BIT Numerical Mathematics |
| 2014 - | Ocean Modelling |
| 2015 - | Bulletin of the Iranian Mathematical Society |
| 2016 - | Editorial board of Journal of Computational Physics (JCP) |

**Recent projects**

| | |
|---|---|
| 1996 - 2010 | High order finite difference approximations, collaboration with ICASE, NIA and NASA, USA |
| 1998 - 2010 | Accelerating coordinate systems, collaboration with CSIR, South Africa |
| 2004 - 2010 | Unsteady Supersonic Aerodynamics, collaboration with WITS, South Africa |
| 2005 - 2009 | Hybrid Methods for Unsteady Aerodynamics, collaboration with CTR, the Centre for Turbulence Research, SU, USA |
| 2007 - 2013 | Uncertainties in Aerodynamics, collaboration with the Department of Mechanical Engineering, SU, USA |
| 2008 - 2012 | Computational methods for heat transfer in micro-mechanical systems, collaboration with Nanospace AB, Swedish Space Corporation Group, Sweden |
| 2009 - 2011 | Nonlinear generation of internal waves in the deep ocean by tides, collaboration with MISU, Stockholm University |
| 2009 - 2016 | Computational Methods for Earthquake Simulations, collaboration with the Department of Geophysics, SU, USA |
| 2010 - 2013 | The European Union, FP7: IDIHOM Industrialisation of High-Order Methods, 181564 euro in 3 years |
| 2012 - 2017 | The SeRC FLOW Community. Stable High-Order Boundary Conditions for In- and Outgoing Waves for Fluid Flow Problems |
| 2012 - 2017 | Swedish Meterological and Hydrological Institute (SMHI). Numerical methods for Climate Problems |
| 2012 - 2015 | The Swedish Research Council: Summation-By-Parts Operators and Weak Initial Conditions for Time Discretisation of Initial Boundary Value Problems |
| 2013 - 2016 | The European Union, FP7: UMRIDA Uncertainty Management for Robust Industrial Design in Aeronautics |
| 2013 - 2017 | VINNOVA-NFFP project: Methods for Improved Accuracy in Unsteady CFD (MIAU) |
| 2014 - 2019 | The research school in interdisciplinary mathematics at MAI, Linköping University, Duality Based Boundary Conditions for the Navier-Stokes and Elastic Wave Equations |
| 2019 - | The Swedish Research Council: Artificial Neural Networks, Thin Layers and Approximate Solutions to Partial Differential Equations |
| 2019 - | The SeRC FLOW Community. ExABL, Atmospheric Boundary Layers for Climate Simulations |

## Grants

| | |
|---|---|
| 1995 | VINNOVA-NFFP project: Unsteady aerodynamics of compressible flow, colaboration between FFA and SAAB, 1500.000 SEK in two years |
| 1999 | FFA internal funds: Stable High Order Finite Difference Methods for Aerodynamics, colaboration with UU, 1000.000 SEK in two years |
| 2004 | The Swedish Research Council: Unsteady aerodynamics of compressible flow, colaboration with WITS South Africa, planning grant, 75.000 SEK |
| 2005 | The Swedish Research Council: Generation and propagation of vortices in aerodynamic applications, colaboration with WITS South Africa, 450.000 SEK in 3 years |
| 2007 | The Swedish Governmental Agency for Innovation Systems: Numerical methods for micromechanical systems in space, colaboration with Nanospace AB, 1600.000 SEK in 4 years |
| 2009 | The Swedish Research Council: Nonlinear generation of internal waves in the deep ocean by tides, collaboration with MISU, Stockholm University, 1600.000 SEK in 3 years |
| 2010 | Professor Career Contract for research, 2200.000 SEK/year in 5 years issued by Linköping University |
| 2010 | Startup Grant, 8000.000 SEK in 5 years from Linköping University |
| 2010 | The European Union, FP7: IDIHOM Industrialisation of High-Order Methods, 181564 euro in 3 years |
| 2012 | The SeRC FLOW Community. Stable High-Order Boundary Conditions for In- and Outgoing Waves for Fluid Flow Problems, 2400.000 SEK in 4 years |
| 2012 | Swedish Meteorological and Hydrological Institute (SMHI). Numerical methods for Climate Problems, 1900.000 SEK in 4 years |
| 2012 | The Swedish Research Council: Summation-By-Parts Operators and Weak Initial Conditions for Time Discretisation of Initial Boundary Value Problems, 1800.000 SEK in 3 years |
| 2013 | The European Union, FP7: UMRIDA Uncertainty Management for Robust Industrial Design in Aeronautics, 200000 euro in 3 years |
| 2013 | VINNOVA-NFFP project: Methods for Improved Accuracy in Unsteady CFD (MIAU), 1800.000 SEK in 3 years |
| 2014 | The research school in interdisciplinary mathematics at MAI, Linköping University, Duality Based Boundary Conditions for the Navier-Stokes and Elastic Wave Equations, 1300.000 SEK in 5 years |
| 2015 - | Professor Career Contract for research, 2000.000 SEK/year |

| | |
|---|---|
| | issued by Linköping University |
| 2019 - | The Swedish Research Council: Artificial Neural Networks, Thin Layers and Approximate Solutions to Partial Differential Equations, 2475.000 SEK in 3 years |
| 2019 | The SeRC FLOW Community. ExABL, Atmospheric Boundary Layers for Climate Simulations, 1600.000 SEK in 4 years |

**Main advisor for the following PhD thesis**

1. K. Mattsson, Summation-by-Parts Operators for High Order Finite Difference Methods, Acta Univ. Ups. Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology 828. 23 pp. Uppsala ISBN 91-554-5596-4. 2003.

2. M. Svärd, Stable High Order Finite Difference Methods for Aerodynamics, Acta Univ. Ups. Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology 1026. 25 pp. Uppsala ISBN 91-554-6063-1. 2004.

3. J. Gong, Hybrid Methods for Unsteady Fluid Flow Problems in Complex Geometries, Acta Univ. Ups. Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology 374. 28 pp. Uppsala ISBN 978-91-554-7046-3, 2007.

4. Q. Abbas, Weak Boundary and Interface Procedures for Wave and Flow Problems, Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology, ISSN 1651-6214; 862, 2011.

5. S. Eriksson, Stable Numerical Methods with Boundary and Interface Treatment for Applications in Aerodynamics, Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology, ISSN 1651-6214; 985 2012.

6. J. Berg, Stable and High-Order Finite Difference Methods for Multiphysics Flow Problems, Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology, ISSN 1651-6214; 1004, 2013.

7. P. Pettersson, Uncertainty Quantification and Numerical Methods for Conservation Laws, Digital Comprehensive Summaries of

Uppsala Dissertations from the Faculty of Science and Technology, ISSN 1651-6214; 1008, 2013.

8. T. Lundquist, High order summation-by-parts methods in time and space, Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524; 1740, 2016.

9. S. Nikkar, Stable High Order Finite Difference Methods for Wave Propagation and Flow Problems on Deforming Domains, Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524, 1774, 2016.

10. O. O'reilly, Numerical methods for wave propagation in solids containing faults and fluid-filled fractures, Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524, 1806, 2016.

11. H. Frenander, High-order finite difference approximations for hyperbolic problems: multiple penalties and non-reflecting boundary conditions, Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524, 1824, 2017.

12. C. La Cognata, High order summation-by-parts based approximations for discontinuous and nonlinear problems, Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524, 1880, 2017.

13. V. Linders, Error analysis of summation-by-parts formulations: Dispersion, transmission and accuracy, Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524, 1886, 2017.

14. M. Wahlsten, Uncertainty quantification for wave propagation and flow problems with random data, Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524, 1921, 2018.

15. F. Ghasemi, Stability, dual consistency and conservation of summation-by-parts formulations for multiphysics problems, Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524, 1988, 2019.

16. A. A. Ruggiu, Eigenvalue analysis and convergence acceleration techniques for summation-by-parts approximations Linköping Studies in Science and Technology. Dissertations, ISSN 0345-7524, 2002, 2019.

**Main advisor for the following Masters thesis**

1. A. Bengtsson & E. Ziakouli, The Influence of Open Boundary Conditions and Difference Operators on the Time-integration of the Burgers Equation, FFA TN 1988-57, Stockholm 1988.

2. N. Nordin, The Fringe Region Technique Used in the Direct Numerical Simulation of the Incompressible Navier-Stokes Equations, FFA TN 1995-04, Stockholm 1995.

3. F. Jansson, Boundary Conditions for the Compressible Navier-Stokes Equations at a Subsonic Outflow Boundary, FFA TN 1995-05, Stockholm 1995.

4. N. Lindberg, (jointly with Gunilla Efraimsson, FFA) Numerical Investigation of Extrapolation Boundary Conditions for the Euler Equations, FFA TN 1998-03, Stockholm 1998.

5. I. Karlsson, Boundary Conditions in the $\kappa-\omega$ and $\kappa-\epsilon$ Turbulence Models, FFA TN 1998-49, Stockholm 1998.

6. E. Petrini, (jointly with Gunilla Efraimsson, FFA) A Numerical Study of the Introduction and Propagation of a 2-D Vortex, FFA TN 1998-66, Stockholm 1998.

7. Rickard Lindkvist, Boundary Conditions for the Euler Equations, FFA TN 1999-31, Stockholm 1999.

8. Martin Björck, Finite Volume Approximations and Strict Stability for Hyperbolic Problems, FFA TN 2000-35, Stockholm 2000.

9. Björn Bretz, (jointly with Karl Forsberg, FFA) High Order Finite Difference Approximations of Hyperbolic Problems, FFA TN 2000-09, Stockholm 2000.

10. J. Persson, Discrete Approximations of Electromagnetic Problems, Scientific Report FOI-R–0119-SE, Stockholm 2001.

11. R. Gustafsson, High Order Finite Difference Approximations of Electromagnetic Wave Propagation Close to Material Discontinuities, Scientific Report FOI-R–0120-SE, Stockholm 2001.

12. C. Adamsson, (jointly with Karl Forsberg, FFA), Finite Volume Methods, Unstructured Meshes and Strict Stability, Scientific Report FOI-R–0121-SE, Stockholm 2001.

13. O. Fogelklou, Investigation of Time and Frequency Domain Based Methods for Radar Cross Section Calculations, Scientific Report FOI-R–0149-SE, Stockholm 2001.

14. A. Carlsson, Conservative Difference Formulations, Energy Estimates and Artificial Dissipation, Scientific Report FOI-R–0509-SE, Stockholm 2002.

15. S. Eriksson, (jointly with Magnus Svärd, Stanford University), Simulation of Ground Effects on Wake Vortices at Runways, Report ISSN: 1401-5757, UPTEC F07062, May 2007.

16. J. Lundberg, (jointly with Magnus Svärd, Stanford University), A Computational Study of Wing-Vortex Interaction Using a High Order Accurate Finite Difference Method, Report ISSN: 1401-5757, UPTEC F07089, May 2007.

17. P. Pettersson, (jointly with Gianluca Iaccarino, Stanford University), Numerical Analysis of Burgers' Equation with Uncertain Boundary Conditions Using the Stochastic Galerkin Method, UPTEC STS08011, March 2008.

18. N. Forsberg, (jointly with Gunilla Efraimsson, KTH), Simulation of Acoustic Waves in a Turbofan Engine Air Intake, UPTEC F09028, March 2009.

19. B. Lönn, Energy decay in vortices, UPTEC F11031, ISSN 1401-5757, June 2011.

20. O. O'Reilly, (jointly with E. M. Dunham, Stanford University), Coupled Finite Difference and Finite Volume Methods for Earthquake Rupture Dynamics in Complex Geometries. UPTEC F11040, August 2011.

21. C-F. Arndt, Energy estimates and variance estimation for hyperbolic stochastic partial differential equations, LiTH-MAT-EX–2011/18–SE, September 2011.

22. T. Lundquist, Stability of SBP schemes on overlapping domains, LiTH-MAT-EX–2011/17–SE, September 2011.

23. D. M. Changfoot, (Jointly with A. Malan, University of Cape Town) Towards a Hybrid CFD Platform for Investigating Aircraft Trailing Vortices, University of Cape Town, November 2017. (https://open.uct.ac.za/handle/11427/26905?show=full)

24. A. Göransson, Stability and accuracy of difference methods using asynchronous processors, LiTH-MAT-EX–2018/03–SE, February 2018.

25. M. Olsson, Vortex Formation in Free Space, LiTH-MAT-EX–2018/12–SE, December 2018.

**5 most cited publications**

(Google Scholar, Scopus, Web of Science)

1. M. H. Carpenter, J. Nordström & D. Gottlieb, A Stable and Conservative Interface Treatment of Arbitrary Spatial Accuracy, Journal of Computational Physics, Vol. 148 No. 2, pp. 341-365, 1999. Number of citations: (431, 317, 236)

2. K. Mattson & J. Nordström, Summation by parts operators for finite difference approximations of second derivatives, Journal of Computational Physics, Vol. 199, pp. 503-540, 2004. Number of citations: (321, 223, 178)

3. M. Svärd & J. Nordström, Review of Summation-By-Parts Schemes for Initial-Boundary-Value Problems, Journal of Computational Physics, Volume 268, pp. 17-38, 2014. Number of citations: (263, 179, 145)

4. M. Svärd, M. H. Carpenter & J. Nordström, A Stable High-Order Finite Difference Scheme for the Compressible Navier-Stokes Equations, far-field boundary conditions, Journal of Computational Physics, Volume 225, Issue 1, Pages 1020-1038, 2007. Number of citations: (205, 156, 105)

5. M. Svärd & J. Nordström, On the Order of Accuracy for Difference Approximations of Initial-Boundary Value Problems, Journal of Computational Physics, Vol. 218, pp. 333-352, 2006. Number of citations: (196, 126, 113)

**h index**

(Google Scholar: 37, Scopus: 30, Web of Science: 26)

**Articles**

1. J. Nordström, The Influence of Open Boundary Conditions on the Convergence to Steady State of the Navier-Stokes Equation, Journal of Computational Physics Vol. 85, No. 1, pp. 210-244, 1989.

2. J. Nordström, Extrapolation Procedures for the Navier-Stokes Equations, AIAA-journal Vol. 30, No. 6, pp. 1654-1656, 1992.

3. J. Nordström, The Use of Characteristic Boundary Conditions for the Navier-Stokes Equations, Computers & Fluids, Vol. 24, No.5, pp. 609-623, 1995.

4. J. Nordström, Accurate Solutions of the Navier-Stokes Equations Despite Unknown Outflow Boundary Data, Journal of Computational Physics Vol. 120, pp. 184-205, 1995.

5. J. Nordström, On Extrapolation Procedures at Artificial Outflow Boundaries for the Time-Dependent Navier-Stokes Equations, Applied Numerical Mathematics, Vol. 23, pp. 457-468, 1997.

6. J. Nordström, N. Nordin & D. Henningson, The Fringe Region Technique and the Fourier-method Used in the Direct Numerical Simulation of Spatially Evolving Viscous Flows, SIAM Journal of Scientific Computing, Vol. 20, No. 4, pp.1365-1393, 1999.

7. J. Nordström, On Flux-extrapolation at Supersonic Outflow Boundaries, Applied Numerical Mathematics, Vol. 30, Issue 4, pp. 447-457, 1999.

8. M. H. Carpenter, J. Nordström & D. Gottlieb, A Stable and Conservative Interface Treatment of Arbitrary Spatial Accuracy, Journal of Computational Physics, Vol 148 No. 2, pp. 341-365, 1999.

9. J. Nordström & M. H. Carpenter, Boundary and Interface Conditions for High Order Finite Difference Methods Applied to the

Euler and Navier Stokes Equations, Journal of Computational Physics, Vol 148 No. 2, pp. 621-645, 1999.

10. S. Tsynkov, S. Abarbanel, J. Nordström, V. Ryaben'kii & V. Vatsa, Global Artificial Boundary Conditions for Computation of External Flow Problems with Jets, AIAA Journal, vol. 38, no. 11, Nov. 2000, pp. 2014-2022.

11. G. Kreiss, G. Efraimsson & J. Nordström, Elimination of First Order Errors in Shock Calculations, SIAM Journal of Numerical Analysis, Vol. 38, No. 6, pp. 1986-1998, 2001.

12. J. Nordström & Martin Björck, Finite Volume Approximations and Strict Stability for Hyperbolic Problems, Applied Numerical Mathematics, Volume 38, Issue 3, pp. 237-255, 2001.

13. J. Nordström & M. H. Carpenter, High Order Finite Difference Methods, Multidimensional Linear Problems and Curvilinear Coordintes, Journal of Computational Physics, Vol 173, pp. 149-174, 2001.

14. T Hagstrom & J. Nordström, Analysis of Extrapolation Boundary Conditions for the Linearized Euler Equations, Applied Numerical Mathematics, Volume 44, pp. 95-108, 2003.

15. J. Nordström & R. Gustafsson, High Order Finite Difference Approximations of Electromagnetic Wave Propagation Close to Material Discontinuities, Journal of Scientific Computing, Vol 18, No 2, 2003.

16. J. Nordström, K. Forsberg, C. Adamsson & P. Eliasson, Finite Volume Methods, Unstructured Meshes and Strict Stability, Applied Numerical Mathematics, Volume 48, pp. 453-473, 2003.

17. K. Mattsson M. Svärd and J. Nordström, Stable and Accurate Artificial Dissipation, Journal of Scientific Computing, Volume 21, No. 1, pp. 57-79, 2004.

18. M. Svärd and J. Nordström, Stability of Finite Volume Approximations for the Laplacian Operator on Quadrilateral and Triangular Grids, Applied Numerical Mathematics, Volume 51, pp. 101-124, 2004.

19. K. Mattson & J. Nordström, Summation by parts operators for finite difference approximations of second derivatives, Journal of Computational Physics, Vol. 199, pp. 503-540, 2004.

20. M. Svärd, K. Mattsson & J. Nordström, Steady State Computations Using Summation-By-Parts Operators, Journal of Scientific Computing, Volume 24, No. 1, pp. 79-95, 2005.

21. J. Nordström & J. Gong, A Stable and Efficient Hybrid Method for Aeroacoustic Sound Generation and Propagation, Comptes Rendus Mecanique 333, pp. 713-718, 2005.

22. J. Nordström & M. Svärd, Well Posed Boundary Conditions for the Navier-Stokes Equation, SIAM Journal on Numerical Analysis, Vol. 43, No. 3, pp. 1231-1255, 2005.

23. J. Nordström & J. Gong, A Stable Hybrid Method for Hyperbolic Problems, Journal of Computational Physics, Vol. 212, pp. 436-453, 2006.

24. M. Svärd, J. Gong & J. Nordström, Stable Artificial Dissipation Operators for Finite Volume Schemes on Unstructured Grids, Applied Numerical Mathematics, Volume 56, pp. 1481-1490, 2006.

25. M. Svärd & J. Nordström, On the Order of Accuracy for Difference Approximations of Initial-Boundary Value Problems, Journal of Computational Physics, Vol. 218, pp. 333-352, 2006.

26. K. Mattson & J. Nordström, High Order Finite Difference Methods for Wave Propagation in Discontinuous Media, Journal of Computational Physics, Vol. 220, pp. 249-269, 2006.

27. J. Nordström, Conservative Finite Difference Formulations, Variable Coefficients, Energy Estimates and Artificial Dissipation, Journal of Scientific Computing, Vol. 29, pp. 375-404, 2006.

28. K. Mattson, M. Svärd, M. H. Carpenter & J. Nordström, Highly Accurate Computations for Unsteady Aerodynamics, Computers & Fluids, Volume 36, Issue 3, Pages 636-649, 2007.

29. J. Nordström, K. Mattsson & Charles Swanson, Boundary Conditions for a Divergence Free Velocity-Pressure Formulation of the Navier-Stokes Equations, Journal of Computational Physics, Volume 225, Issue 1, Pages 874-8901, 2007.

30. M. Svärd, M. H. Carpenter & J. Nordström, A Stable High-Order Finite Difference Scheme for the Compressible Navier-Stokes Equations, far-field boundary conditions, Journal of Computational Physics, Volume 225, Issue 1, Pages 1020-1038, 2007.

31. J. Nordström, Error Bounded Schemes for Time-dependent Hyperbolic Problems, SIAM Journal of Scientific Computing, Volume 30, Pages 46-59, 2007.

32. J. Gong & J. Nordström, A Stable and Efficient Hybrid Scheme for Viscous Problems in Complex Geometries, Journal of Computational Physics, Volume 226, Pages 1291-1309, 2007.

33. M. Svärd, J. Gong & J. Nordström, An Accuracy Evaluation of Unstructured Node-Centered Finite Volume Methods, Applied Numerical Mathematics, Vol 58, pp 1142-1158, 2008.

34. M. Svärd & J. Nordström, A Stable High-Order Finite Difference Scheme for the Compressible Navier-Stokes Equations: Wall Boundary Conditions, Journal of Computational Physics, Vol. 227, pp. 4805-4824, 2008.

35. M. Berggren, S.E. Ekström and J. Nordström, A discontinuous Galerkin extension of the vertex-centered edge-based finite volume method, Communications in Computational Physics (CiCP), Vol. 5, pp 456-468, 2009.

36. J. Nordström, S. Eriksson, C. Law & J. Gong, Shock and Vortex Calculations Using a Very High Order Accurate Euler and Navier-Stokes Solver, International Journal of Mechanics and MEMS (JMM), Volume 1, No. 1, 2009.

37. J. Nordström, F. Ham, M Shoeybi, E. van der Weide, M. Svärd, K. Mattsson, G. Iaccarino & J. Gong, A Hybrid Method for Unsteady Inviscid Fluid Flow, Computers & Fluids, Vol. 38, pp. 875-882, 2009.

38. I. M. A. Gledhill, K. Forsberg, P. Eliasson, J. Baloyi & J. Nordström, Investigation of acceleration effects on missile aerodynamics using Computational Fluid Dynamics, Aerospace Science & Technology, Volume 13, Issues 4-5, pp. 197-203, June-July 2009.

39. S. Eriksson & J. Nordström, Analysis of the Order of Accuracy for Node-centered Finite Volume Schemes, Applied Numerical Mathematics Volume 59, Issue 10, pp. 2659-2676, October 2009.

40. P. Pettersson, G. Iaccarino & J. Nordström, Numerical analysis of the Burger's equation in the presence of uncertainty, Journal of Computational Physics, Vol. 228, pp. 8394-8412, 2009.

41. J. Nordström, J. Gong, E. van der Weide and M. Svärd, A Stable and Conservative High Order Multi-block Method for the Compressible Navier-Stokes Equations, Journal of Computational Physics, Vol. 228, pp. 9020-9035, 2009.

42. Q. Abbas and J. Nordström, Weak Versus Strong No-slip Boundary Conditions for the Navier-Stokes Equation, Engineering Applications of Computational Fluid Mechanics, Vol. 4, No. 1, pp. 29-38, 2010.

43. P. Pettersson, J. Nordström & G. Iaccarino, Boundary Procedures for the Time-dependent Burgers' Equation under Uncertainty, Acta Mathematica Scientia, 30B(2):539-550, 2010.

44. M. H. Carpenter, J. Nordström & D. Gottlieb, Revisiting and Extending Interface Penalties for Multi-Domain Summation-By-Parts Operators, Journal of Scientific Computing, Vol. 45, pp. 118-150, 2010.

45. J. Nordström and S. Eriksson, Fluid Structure Interaction Problems: the Necessity of a Well Posed, Stable and Accurate Formulation, Communications in Computational Physics (CiCP), Vol. 8, pp. 1111-1138, 2010.

46. M. Svärd, J. Lundberg & J. Nordström, A Computational Study of Wing-Vortex Interaction Using High Order Finite Difference Methods, Computers & Fluids, Vol. 39, pp. 1267-1274, 2010.

47. J. Lindström & J. Nordström, A Stable and High Order Accurate Conjugate Heat Transfer Problem, Journal of Computational Physics, Vol. 229, pp. 5440-5456, 2010.

48. S. Eriksson, Q. Abbas and J. Nordström, A stable and conservative method of locally adapting the design order of finite difference

schemes. Journal of Computational Physics 230, pp. 42164231, 2011.

49. J. Berg & J. Nordström, Stable Robin Solid Wall Boundary Conditions for the Navier-Stokes Equations. Journal of Computational Physics 230, pp. 7519-7532, 2011.

50. J. Gong & J. Nordström, Interface Procedures for Finite Difference Approximations of the Advection-diffusion Equation, Journal of Computational and Applied Mathematics. Vol. 236, Issue 5, pp. 601-996, 2011.

51. J. E. Kozdon, E. M. Dunham & J. Nordström, Interaction of Waves with Frictional Interfaces Using Summation-By-Parts Difference Operators: Weak Enforcement of Nonlinear Boundary Conditions, Journal of Scientific Computing, Volume 50, No 2, Pages 341-367, 2012.

52. J. Nordström, S. Eriksson and P. Eliasson, Weak and Strong Wall Boundary Procedures and Convergence to Steady-State of the Navier-Stokes Equations, Journal of Computational Physics, Vol 231, pp. 4867-4884, 2012.

53. J. Berg & J. Nordström, Superconvergent Functional Output for Time-Dependent Problems using Finite Differences on Summation-By-Parts Form, Journal of Computational Physics, Vol 231, pp. 6846-6860, 2012.

54. J. Berg & J. Nordström, Spectral analysis of the continuous and discretized heat and advection equation on single and multiple domains, Applied Numerical Mathematics, Vol 62, pp. 1620-1638, 2012.

55. J. Nordström & B. Lönn, Energy Decay of Vortices in Viscous Fluids: an Applied Mathematics View, Journal of Fluid Mechanics, 709, pp. 593609, 2012.

56. J. E. Kozdon, E. M. Dunham & J. Nordström, Simulation of Dynamic Earthquake Ruptures in Complex Geometries Using High-Order Finite Difference Methods, Journal of Scientific Computing, Volume 55, No 1, pp. 92-124, 2013.

57. T. Fisher, M.H. Carpenter, J. Nordström, N. K. Yamaleev & C. Swanson, Discretely Conservative Finite-Difference Formulations for Nonlinear Conservation Laws in Split Form: Theory and Boundary Conditions, Journal of Computational Physics, Vol 234, pp. 353-375, 2013.

58. J. Nordström & J. Berg, Conjugate Heat Transfer for the Unsteady Compressible Navier-Stokes Equations Using a Multi-block Coupling, Computers & Fluids, Vol 72, pp. 20-29, 2013.

59. J. Berg & J. Nordström, On the impact of boundary conditions on dual consistent finite difference discretizations, Journal of Computational Physics, Vol 236, pp. 41-55, 2013.

60. P. Pettersson, A. Doostan & J. Nordström, On Stability and Monotonicity Requirements of Finite Difference Approximations of Stochastic Conservation Laws with Random Viscosity, Computer Methods in Applied Mechanics and Engineering, Vol 258, pp. 134-151, 2013.

61. J. Nordström & Tomas Lundquist, Summation-By-Parts in Time, Journal of Computational Physics Vol 251, pp. 487-499, 2013.

62. D. Amsallem & J. Nordström, High-order accurate difference schemes for the Hodgkin-Huxley equations, Journal of Computational Physics, Vol. 252, pp. 573-590, 2013.

63. P. Pettersson, G. Iaccarino & J. Nordström, An Intrusive Hybrid Method for Discontinuous Two-Phase Flow under Uncertainty, Computers & Fluids, Volume 86, pp. 228-239, 2013.

64. P. Pettersson, G. Iaccarino & J. Nordström, A stochastic Galerkin method for the Euler equations with Roe variable transformation, Journal of Computational Physics, Volume 257, Part A, pp.481-500, 2014.

65. J. Berg & J. Nordström, Duality based boundary conditions and dual consistent finite difference discretizations of the Navier-Stokes and Euler equations, Journal of Computational Physics, Volume 259, 15 February, pp. 135-153, 2014.

66. S. Ghader & J. Nordström, Revisiting well-posed boundary conditions for the shallow water equations, Dynamics of Atmospheres and Oceans, Vol. 66, p. 1-9, June 2014.

67. M. Svärd & J. Nordström, Review of Summation-By-Parts Schemes for Initial-Boundary-Value Problems, Journal of Computational Physics, Volume 268, pp. 1738, 2014.

68. T. Lundquist & J. Nordström, The SBP-SAT Technique for Initial Value Problems, Journal of Computational Physics, Volume 270, pp. 86-104, 2014.

69. J. Nordström, Q. Abbas, B. A. Erickson & H. Frenander, A Flexible Boundary Procedure for Hyperbolic Problems: Multiple Penalty Terms Applied in a Domain, Communications in Computational Physics, Vol. 16, pp. 541-570, 2014.

70. B. A. Erickson & J. Nordström, Stable, High Order Accurate Adaptive Schemes for Long Time, Highly Intermittent Geophysics Problems, Journal of Computational and Applied Mathematics 271, pp. 328338, 2014.

71. O. OReilly, J. Nordström, J. E. Kozdon & E. M. Dunham, Simulation of Earthquake Rupture Dynamics in Complex Geometries Using Coupled Finite Difference and Finite Volume Methods, accepted in Communications in Computational Physics, Vol. 17, pp.337-370, 2015.

72. J. Nordström & M. Wahlsten, Variance reduction through robust design of boundary conditions for stochastic hyperbolic systems of equations, Journal of Computational Physics, Volume 82, pp. 1-22, 2015.

73. S. Nikkar & J. Nordström, Fully Discrete Energy Stable High Order Finite Difference Methods for Hyperbolic Problems in Deforming Domains. Journal of Computational Physics, Volume 291, Pages 82-98, 2015.

74. S. Ghader & J. Nordström, High-order compact finite difference schemes for the spherical shallow water equations, International Journal for Numerical Methods in Fluids, Volume 78, pp. 709-738, 2015.

75. J. Nordström & S. Ghader, A new well-posed vorticity divergence formulation of the shallow water equations, Ocean Modelling, Volume 93, pp. 1-6, 2015.

76. V. Linders & J. Nordström, Uniformly Best Wavenumber Approximations by Spatial Central Difference Operators, Journal of Computational Physics, Volume 300, Pages 695-709, 2015.

77. C. Sorgentone, C. La Cognata & J. Nordström, A New High Order Energy and Enstrophy Conserving Arakawa-like Jacobian Differential Operator. Journal of Computational Physics, Volume 301, Pages 167-177, 2015.

78. P. Pettersson, J. Nordström & A. Doostan, A Well-posed and Stable Stochastic Galerkin Formulation of the Incompressible Navier-Stokes Equations with Random Data. Journal of Computational Physics, Volume 306, Pages 92-116, 2016.

79. H. Frenander & J. Nordström, A Provable Stable and Accurate Davies-like Relaxation Procedure Using Multiple Penalty Terms for Lateral Boundaries in Weather Prediction. Dynamics of Atmospheres and Oceans, Volume 73, Pages 3446, March 2016.

80. J. Nordström & S. Nikkar, Hyperbolic Systems of Equations Posed on Erroneous Curved Domains, Journal of Computational Physics, Volume 308, Pages 438-442, 2016.

81. D. Amsallem & J. Nordström, Stable Model Reduction of Neurons by Non-Negative Discrete Empirical Interpolation, SIAM Journal of Scientific Computing, Vol. 38, No. 2, pp. B297–B326, 2016.

82. C. La Cognata & J. Nordström, Well-posedness, Stability and Conservation for a Discontinuous Interface Problem. BIT Numerical Mathematics, Volume 56, Issue 2, pp 681-704, 2016.

83. J. Nordström & T. Lundquist, Summation-by-parts in Time: the Second Derivative. SIAM Journal of Scientific Computing, Vol. 38, No. 3, pp. A1561–A1586, 2016.

84. T. Lundquist & J. Nordström, Efficient Fully Discrete Summation-by-parts Schemes for Unsteady Flow Problems. BIT Numerical Mathematics, Volume 56, No. 3, pp. 951–966, 2016.

85. I. Gledhill, H. Roohani, K. Forsberg, P. Eliasson, B. W. Skews, & J. Nordström, Theoretical treatment of fluid flow for accelerating bodies, Theoretical and Computational Fluid Dynamics, Vol. 30, no 5, pp. 449-467, 2016.

86. H. Frenander & J. Nordström, Constructing non-reflecting boundary conditions using summation-by-parts in time. Journal of Computational Physics, Volume 331, pp. 38-48, 2017.

87. J. Nordström, A Roadmap to Well Posed and Stable Problems in Computational Physics, Journal of Scientific Computing, Volume 71, Issue 1, pp. 365-385, 2017.

88. S. Nikkar & J. Nordström, A Fully Discrete, Stable and Conservative Summation-by-Parts Formulation for Deforming Interfaces, Journal of Computational Physics, Volume 339, pp. 500-524, 2017.

89. V. Linders, M. Kupiainen & J. Nordström, Summation-by-Parts Operators with Minimal Dispersion Error for Coarse Grid Flow Calculations, Journal of Computational Physics, Volume 340, pp. 160-176, 2017.

90. Y. T. Delorme, K. Puria, J. Nordström, V. Linders, S. Dong & S. H. Frankel, A Simple and Efficient Incompressible Navier-Stokes Solver for Unsteady Complex Geometry Flows on Truncated Domains, Computers & Fluids, Vol 150, pp. 84-94, 2017.

91. J. Nordström & A. Ruggiu, On Conservation and Stability Properties for Summation-By-Parts Schemes, Journal of Computational Physics, Vol 344, pp. 451-464, 2017.

92. J. Nordström & F. Ghasemi, On the relation between conservation and dual consistency for summation-by-parts schemes, Journal of Computational Physics, Vol 344, pp. 437-439, 2017.

93. D. A. Kopriva, J. Nordström & G. Gassner, Error Boundedness of Discontinuous Galerkin Spektral Element Approximations of Hyperbolic Problems, Journal of Scientific Computing, Vol 72, pp. 314-330, 2017.

94. O. O'reilly, T. Lundquist, E.M. Dunham & J. Nordström. Energy stable and high-order-accurate finite difference methods on

staggered grids, Journal of Computational Physics, Vol 346, pp. 572-589, 2017.

95. S. Eriksson & J. Nordström, Exact Non-Reflecting Boundary Conditions Revisited: Well-Posedness and Stability, Foundations of Computational Mathematics, Vol 17, issue 4, pp. 957-986, 2017.

96. H. Frenander & J. Nordström, A stable and accurate data assimilation technique using multiple penalty terms in space and time, Dynamics of Atmospheres and Oceans, Vol 79, pp. 56-65, 2017.

97. O. O'reilly, E.M. Dunham & J. Nordström. Simulation of wave propagation along fluid-filled cracks using high-order summation-by-parts operators and implicit-explicit time stepping, SIAM Journal of Scientific Computing, Vol 39, pp. B675-B702, 2017.

98. M. H. Carpenter, J. Nordström & D. Gottlieb, Corrigendum to "A stable and conservative interface treatment of arbitrary spatial accuracy" [J. Comput. Phys. 148 (1999) 341365], Journal of Computational Physics, Vol. 351, pp. 534, 2017.

99. K. Mattson & J. Nordström, Corrigendum to "Summation by parts operators for finite difference approximations of second derivatives" [J. Comput. Phys. 199 (2004) 503540], Journal of Computational Physics, Vol. 351, pp. 535, 2017.

100. F. Ghasemi & J. Nordström, Coupling Requirements for Multiphysics Problems Posed on Two Domains, SIAM Journal of Numerical Analysis, Vol 55, issue 6, pp. 2885-2904, 2017.

101. H. Frenander & J. Nordström, Spurious solutions for the advection-diffusion equation using wide stencils for approximating the second derivative, Numerical Methods for Partial Differential Equations, Vol 34, issue 2, pp. 501-517, 2018.

102. A. Ruggiu, P. Weinerfelt & J. Nordström, A New Multigrid Formulation for High Order Finite Difference Methods on Summation-by-Parts Form, Journal of Computational Physics, Vol. 359, pp. 216-238, 2018.

103. A. Ruggiu & J. Nordström, On pseudo-spectral time discretizations in summation-by-parts form, Journal of Computational Physics, Vol. 360, pp. 192-201, 2018.

104. M. Svärd & J. Nordström, Response to "Convergence of Summation-by-Parts Finite Difference Methods for the Wave equation", Journal of Scientific Computing, Vol. 74, pp. 1188-1192, 2018.

105. T. Lundquist, A. Malan & J. Nordström, A hybrid framework for coupling arbitrary summation-by-parts schemes on general meshes, Journal of Computational Physics, Vol. 362, pp. 49-68, 2018.

106. J. Nordström & F. Ghasemi, Corrigendum to "On the relation between conservation and dual consistency for summation-by-parts schemes" [J. Comput. Phys. 344 (2017) 437439], Journal of Computational Physics, Vol. 360, pp. 247, 2018.

107. J. Nordström & V. Linders, Well-posed and Stable Transmission Problems, Journal of Computational Physics, Vol. 364, pp. 95-110, 2018.

108. V. Linders, T. Lundquist & J. Nordström, On the Order of Accuracy of Finite Difference Operators on Diagonal Norm Based Summation-by-Parts Form, SIAM Journal of Numerical Analysis, Vol. 56, No. 2, pp. 1048-1063, 2018.

109. S. Nikkar & J. Nordström, Summation-By-Parts Operators for Non-simply Connected Domains, SIAM Journal of Scientific Computing, Vol. 40, No. 3. pp. A 1250- A 1273, 2018.

110. M. Wahlsten & J. Nordström, The effect of uncertain geometries on advection-diffusion of scalar quantities, BIT Numerical Mathematics, Vol. 58, pp. 509-529, 2018.

111. M. Wahlsten & J. Nordström, Robust Boundary Conditions for Stochastic Incompletely Parabolic Systems of Equations, Journal of Computational Physics, Vol. 371, pp. 192-213, 2018.

112. J. Nordström & H. Frenander, On long time error bounds for the wave equation on second order form, Journal of Scientific Computing, Volume 76, Issue 3, pp 1327–1336, 2018.

113. S. Eriksson & J. Nordström, Finite difference schemes with transferable interfaces for parabolic problems, Journal of Computational Physics, Vol. 375, pp. 935-949, 2018.

114. F. Lauren & J. Nordström, Practical Inlet Boundary Conditions for Internal Flow Calculations, Computers & Fluids, Volume 175, pp 159-166, 2018.

115. O. Ålund & J. Nordström, A stable domain decomposition technique for advection-diffusion problems, Journal of Scientific Computing, Vol 77, issue 2, pp 755-774, 2018.

116. S. Nikkar & J. Nordström, A dual consistent summation-by-parts formulation for the linearized incompressible Navier-Stokes equations posed on deforming domains, Journal of Computational Physics, Vol. 376, pp. 322-338, 2019.

117. J. Nordström & Cristina La Cognata, Energy Stable Boundary Conditions for the Nonlinear Incompressible Navier-Stokes Equations, Mathematics of Computation, Volume 88, Number 316, pp. 665-690, March 2019.

118. D. Changfoot, A. Malan & J. Nordström, A Hybrid CFD Platform to Investigate Aircraft Trailing Vortices, AIAA Journal of Aircraft, Vol. 56, No. 1, pp. 344-355, 2019.

119. O. Ålund & J. Nordström, Encapsulated high order difference operators on curvilinear non-conforming grids, Journal of Computational Physics, Vol. 385, pp. 209-224, 2019.

120. P. Pettersson, A. Doostan & J. Nordström, Level Set Methods for Stochastic Discontinuity Detection in Nonlinear Problems, Journal of Computational Physics, Vol 392, pp. 511-531, 2019.

121. F. Ghasemi & J. Nordström, An Energy Stable Coupling Procedure for the Compressible and Incompressible Navier-Stokes Equations, Journal of Computational Physics, Vol 396, pp. 280-302, 2019.

122. M. Svärd & J. Nordström, On the convergence rates of energy-stable finite-difference schemes, Journal of Computational Physics, Vol 397, 108819, 2019.

123. J. Nordström & A. A. Ruggiu, Dual Time-Stepping Using Second Derivatives, Journal of Scientific Computing, 81(2), pp. 1050 - 1071, 2019.

124. Markus Wahlsten & J. Nordström, Correction to: On Stochastic Investigation of Flow Problems Using the Viscous Burgers Equation as an Example, Journal of Scientific Computing, Vol 81(2), pp. 1118, 2019.

125. Markus Wahlsten & J. Nordström, On Stochastic Investigation of Flow Problems Using the Viscous Burgers Equation as an Example, Journal of Scientific Computing, Vol 81(2), pp. 1111 - 1117, 2019.

126. B. Erickson, O. O'Reilly & J. Nordström, Accuracy of Stable, High-order Finite Difference Methods for Hyperbolic Systems with Non-smooth Wave Speeds, Journal of Scientific Computing, Vol 81(3), pp. 2356 - 2387, 2019.

127. J. Nordström & F. Ghasemi, The Relation Between Primal and Dual Boundary Conditions for Hyperbolic Systems of Equations, Journal of Computational Physics, Vol 401, 109032, 2019.

128. T. Lundquist & J. Nordström, Stable and accurate filtering procedure, Journal of Scientific Computing, Vol 82:16, 2020.

129. T. Lundquist, A. G. Malan & J. Nordström, Efficient and error minimized coupling procedures for unstructured and moving meshes, Journal of Computational Physics, Vol 406, 109158, 2020.

130. J. Nordström & Fredrik Lauren, The Spatial Operator in the Incompressible Navier-Stokes, Oseen and Stokes Equations, Computer Methods in Applied Mechanics and Engineering, Vol 363, 112857, 2020.

131. Andrea A. Ruggiu & J. Nordström, Multigrid schemes for high order discretizations of hyperbolic problems, Journal of Scientific Computing, Vol 82:62, 2020.

132. Andrea A. Ruggiu & J. Nordström, Eigenvalue analysis for summation by parts finite difference time discretizations, SIAM Journal of Numerical Analysis, 58(2), 907928, 2020.

133. F. Ghasemi & J. Nordström, On conservation and dual consistency for summation-by-parts based approximations of parabolic problems, Journal of Computational Physics, Vol 410, 109282, 2020.

134. V. Linders, M.H. Carpenter & J. Nordström, Accurate Solution-Adaptive Finite Difference Schemes for Coarse and Fine Grids, Journal of Computational Physics, 410, 109393, 2020.

**Books**

1. P. Pettersson, G. Iaccarino & J. Nordström, Polynomial Chaos Methods for Hyperbolic Partial Differential Equations, Book in Mathematical Engineering, DOI: 10.1007/978-3-319-10714-1, Springer International Publishing, 2015.

**Book chapters**

1. B. Gustafsson & J. Nordström, Extrapolation Procedures at Outflow Boundaries for the Navier-Stokes Equations, Computing Methods in Applied Science and Engineering, Paris 1990, pp.136-151, SIAM, Philadelphia, PA, 1990.

2. J. Nordström, Model Problems and The Analysis of Boundary Procedures in CFD, in Absorbing Boundaries and Layers, Domain Decomposition Methods, Application to Large Scale Computations, Edited by L. Tourette and L. Halpern, ISBN 1-56072-940-6, Novascience, 2001.

3. P. Pettersson, Q. Abbas, G. Iaccarino, and J. Nordström, Efficiency of shock capturing schemes for Burgers' equation with boundary uncertainty, Numerical Mathematics and Advanced Applications, pp 737-745, Springer-Verlag, Berlin, 2010.

4. J. Lindström and J. Nordström, A stable and high order interface procedure for conjugate heat transfer problems, Numerical Mathematics and Advanced Applications, pp 599-607, Springer-Verlag, Berlin, 2010.

5. Q. Abbas, E. van der Weide and J. Nordström, Energy stability of the MUSCL scheme, Numerical Mathematics and Advanced Applications, pp 61-68, Springer-Verlag, Berlin, 2010.

6. J. Nordström, Linear and Nonlinear Boundary Conditions for Wave Propagation Problems, Notes on Numerical Fluid Mechanics and Multidisciplinary Design, Vol. 120, pp. 283-299, 2013.

7. J. Nordström & P. Eliasson, New developments for increased performance of the SBP-SAT finite difference technique, Notes on Numerical Fluid Mechanics and Multidisciplinary Design, Volume 128, pp. 467-488, 2015.

8. P. Eliasson, M. Kupiainen & J. Nordström, Higher Order Accurate Solutions for Flow in a Cavity: Experiences and Lessons Learned, Spectral and High Order Methods for Partial Differential Equations ICOSAHOM 2014, Lecture Notes in Computational Science and Engineering, No. 106, 189-196, 2015.

9. T. Lundquist & J. Nordström, Efficient Fully Discrete Summation-by-Parts Schemes for Unsteady Flow Problems: An Initial Investigation, Spectral and High Order Methods for Partial Differential Equations ICOSAHOM 2014, Lecture Notes in Computational Science and Engineering, No. 106, 345-353, 2015.

10. S. Nikkar,& J. Nordström, Fully Discrete Energy Stable High Order Finite Difference Methods for Hyperbolic Problems in Deforming Domains: An Initial Investigation, Spectral and High Order Methods for Partial Differential Equations ICOSAHOM 2014, Lecture Notes in Computational Science and Engineering, No. 106, 385-395, 2015.

11. V. Linders & J. Nordström, Uniformly Best Wavenumber Approximations by Spatial Central Difference Operators: An Initial Investigation, Spectral and High Order Methods for Partial Differential Equations ICOSAHOM 2014, Lecture Notes in Computational Science and Engineering, No. 106, 325-333, 2015.

12. C. La Cognata & J. Nordström, Well-Posedness, Stability and Conservation for a Discontinuous Interface Problem: An Initial Investigation, Spectral and High Order Methods for Partial Differential Equations ICOSAHOM 2014, Lecture Notes in Computational Science and Engineering, No. 106, 147-155, 2015.

13. Nordström J., Wahlsten M. Robust Design of Initial Boundary Value Problems. In: Hirsch C., Wunsch D., Szumbarski J., Łaniewski-

Wołłk, Ł., Pons-Prats J. (eds) Uncertainty Management for Robust Industrial Design in Aeronautics. Notes on Numerical Fluid Mechanics and Multidisciplinary Design, vol 140, 463–478, Springer International Publishing, Cham, 2019.

14. M. Wahlsten and J. Nordström, Stochastic Galerkin Projection and Numerical Integration for Stochastic Systems of Equations: An initial attempt, Lecture Notes in Computational Science and Engineering, Vol 126, pp. 1005-1013, 2019.

**Conference papers**

1. A. Bertelrud & J. Nordström, Experimental and Computational Investigation of the Flow in the Leading Edge Region of a Swept Wing, AIAA paper 83-1762, Danvers Massachusetts 1983.

2. J. Nordström, The Use of Viscous Splitting when Solving the Navier-Stokes Equations for High Reynolds Numbers, Proceedings of the International Symposium Computational Fluid Dynamics, Tokyo 1985.

3. J. Nordström, Energy Absorbing Boundary Conditions for the Navier-Stokes Equations, Lecture Notes in Physics Vol. 264, Springer-Verlag Berlin 1986.

4. J. Nordström & B. Gustafsson, Boundary Conditions for the Navier-Stokes Equations at an Artificial Boundary Intersecting a Solid Boundary, Proceedings of the International Symposium on Computational Fluid Dynamics, Nagoya 1989

5. T Berglind & J. Nordström, Flow Simulation Around a Realistic Fighter-Aircraft Configuration Including the Influence of the Hot Jet, Symposium on Advances and Applications in Computational Fluid Dynamics, Dallas 1990.

6. J. Nordström, Accuracy of the Time-dependent Navier-Stokes Equations Using Extrapolation Procedures at Outflow Boundaries, AIAA paper 91-1605, Honolulu 1991.

7. A. Karlssson, B. Winzell, P. Eliasson, J. Nordström, L. Tysell, Unsteady Control Surface Pressure Measurements and Computation, AIAA-96-2417, New Orleans, 1996.

8. P. Eliasson, J. Nordström, L. Tysell, A. Karlssson, B. Winzell, Computations and Measurements of Unsteady Pressure on a Delta Wing with an Oscillating Flap, ECCOMAS, Paris, 1996.

9. P. Eliasson, D. Wang, S. Meijer and J. Nordström Unsteady Euler Computations Through Non-Matching and Sliding-Zone Interfaces, AIAA paper 98-0371, Reno, 1998.

10. T.A. Grönland, P. Eliasson and J. Nordström, Accuracy of Transonic Flow Computations, paper no. ICAS-98-2.4.3, 21:st ICAS Congress, Sept. 13-18 1998, Melbourne, Australia.

11. S. Tsynkov, S. Abarbanel, J. Nordström, V. Ryaben'kii & V. Vatsa, Global Artificial Boundary Conditions for Computation of External Flow Problems with Propulsive Jets, AIAA Paper No.99–3351, the 14th AIAA CFD Conference, Norfolk, Virginia, USA, 1999.

12. G. Efraimsson, J. Nordström & G. Kreiss, Artificial Dissipation and Accuracy Downstream of Slightly Viscous Shocks, AIAA Paper No.2001-2608, the 15th AIAA CFD Conference, Anaheim, California, USA, 2001.

13. M. Sjögren & J. Nordström, Comparison of High Order Spectral Element and Finite Difference Methods for Electromagnetic Wave Propagation, Paper no.494 presented at the 2003 IEEE AP-S International Symposium on Antennas and Propagation and USNC/CNC/URSI North American Radio Science Meeting, Columbus, Ohio, USA, 2003.

14. K. Mattson, M. Svärd, M. H. Carpenter & J. Nordström, Accuracy Requirements for Transient Aerodynamics, AIAA Paper No. 2003-3689, the 16th AIAA CFD Conference, Orlando Florida, USA, 2003.

15. K. Forsberg, I. Gledhill, P. Eliasson & J. Nordström, Investigations of Acceleration Effects on Missile Aerodynamics Using CFD, AIAA Paper No. 2003-4084, the 21th AIAA Applied Aerodynamics Conference, Orlando Florida, USA, 2003.

16. J. Nordström & Jing Gong, A Stable and Efficient Hybrid Method for Aeroacoustic Sound Generation and Propagation, Computa-

tional Aeroacoustics: From Acoustic Sources Modeling to Far-Field Radiated Noise Prediction, Colloquium EUROMECH 449, Paper 49, December 9-12, 2003, Chamonix, France.

17. J. Gong, M. Svärd & J. Nordström, Artificial Dissipation for Strictly Stable Finite Volume Methods on Unstructured Meshes, WCCM Sixth World Congress on Computational Mechanics, September 5-10, 2004, Beijing, China.

18. M. Svärd & J. Nordström, Order of Accuracy for Difference Approximations of Initial-Boundary Value Problems with Second Derivatives, presented at the International Conference On Spectral and High Order Methods, (ICOSAHOM), Brown University, Rhode Island, USA 2004.

19. K. Mattson & J. Nordström, High Order Finite Difference Methods for Wave Propagation in Discontinuous Media, Waves 2005, Brown University, Providence, Rhode Island, June 20-24, 2005.

20. I. M. A. Gledhill, J. Baloyi, M. Maserumule, K. Forsberg, P. Eliasson and J. Nordström, Accelerating Systems: Some Remarks on Pitch Damping, 5th South African Conference on Computational and Applied Mechanics, SACAM06, Cape Town, 16-18 January, 2006.

21. G. Efraimsson, J. Gong, M. Svärd and J. Nordström, An Investigation of the Performance of a High-Order Accurate Navier-Stokes Code, European Conference on Computational Fluid Dynamics, ECCOMAS CFD 2006, paper no. 413, TU Delft, The Netherlands, 2006.

22. L. Tysell and J. Nordström, Accuracy evaluation of the Unstructured Node-Centered Finite Volume Method in Aerodynamic Computations, the 10th ISGG Conference on Numerical Grid Generation, September 16-20, FORTH, Crete, Greece, 2007.

23. Q. Abbas and J. Nordström, Weak Versus Strong No-slip Boundary Conditions for the Navier-Stokes Equation, Sixth South African Conference on Computational and Applied Mechanics SACAM08 Cape Town, 26-28 March 2008.

24. S. Eriksson, C. Law, J. Gong and Jan Nordström, Shock Calculations Using a Very High Order Accurate Euler and Navier-Stokes

Solver, Sixth South African Conference on Computational and Applied Mechanics SACAM08 Cape Town, 26-28 March 2008.

25. S. Eriksson, M. Svärd and J. Nordström, Simulations of Ground Effects on Wake Vortices at Runways, Sixth South African Conference on Computational and Applied Mechanics SACAM08 Cape Town, 26-28 March 2008.

26. P. Eliasson, J. Nordström, S. Peng & L. Tysell, Effect of Edge-based Discretization Schemes in Computations of the DLR F6 Wing-Body Configuration, AIAA Paper No. 2008-4153, the 38th AIAA Fluid Dynamics Conference and Exhibit, 23-26 June 2008, Seattle Washington, USA, 2008.

27. K. Mattsson, M.H. Carpenter and J. Nordström, A High Order Accurate Finite Difference Method for Adaptive Grids, 5th European Conference on Computational Methods in Applied Sciences and Engineering, ECCOMAS 2008, June 30-July 5, Venice, Italy 2008.

28. P. Eliasson, P. Weinerfelt and J. Nordström, Application of a Line-Implicit Scheme on Stretched Unstructured Grids, AIAA Paper No. 2009-163, 47th AIAA Aerospace Sciences Meeting, Jan. 5-8 2009, Orlando, Florida, USA, 2009.

29. P. Pettersson, G. Iaccarino and J. Nordström, Boundary Procedures for the Stochastic Burgers' Equation, AIAA Paper No. 2009-3550, 19th AIAA Computational Fluid Dynamics, 22-25 June 2009, San Antonio, USA, 2009.

30. P. Eliasson, S. Eriksson and J. Nordström, The Influence of Weak and Strong Solid Wall Boundary Conditions on the Convergence to Steady- State of the Navier- Stokes Equations, AIAA Paper No. 2009-3551, 19th AIAA Computational Fluid Dynamics, 22-25 June 2009, San Antonio, USA, 2009.

31. S. Eriksson and J. Nordström, Analysis of Mesh and Boundary Effects on the Accuracy of Node-Centered Finite Volume Schemes, AIAA Paper No. 2009-3651, 19th AIAA Computational Fluid Dynamics, 22-25 June 2009, San Antonio, USA, 2009.

32. Q. Abbas, E. van der Weide and J. Nordström, Accurate and Stable Calculations Involving Shocks Using a New Hybrid Scheme,

AIAA Paper No. 2009-3985, 19th AIAA Computational Fluid Dynamics, 22-25 June 2009, San Antonio, USA, 2009.

33. J. Lindström, J. Bejhed, and J. Nordström, Measurements and Numerical Modeling of Orifice Flow in Micro-channels, AIAA Paper No. 2009-4098, the 41st AIAA Thermophysics Conference, 22-25 June 2009, San Antonio, USA, 2009.

34. J.E. Kozdon and E.M. Dunham and J. Nordström, High-Order Treatment of Fault Boundary Conditions Using Summation-By-Parts Finite Difference Methods, Proceedings and Abstracts SCEC Annual Meeting, Vol.XIX, pp. 307-308, Palm Springs, California, USA, 2009.

35. J.E. Kozdon and E.M. Dunham and J. Nordström, High-Order Treatment of Fault Boundary Conditions Using Summation-By-Parts Finite Difference Methods, 2009 AGU Fall Meeting, San Francisco, USA, 2009.

36. J.E. Kozdon and E.M. Dunham and J. Nordström, Accurate and Stable Treatment of Nonlinear Fault Boundary Conditions with Higher-Order Finite Difference Methods, Annual meeting of the Seismological Society of America, Portland Oregon, 2010.

37. J. Lindström and J. Nordström, Stable and High Order Accurate Heat Transfer, Seventh South African Conference on Computational and Applied Mechanics SACAM10, Pretoria, 10-13 January 2010.

38. S. Eriksson, Q. Abbas and J. Nordström, A stable and conservative method of locally adapting the design order of finite difference schemes, Seventh South African Conference on Computational and Applied Mechanics SACAM10, Pretoria, 10-13 January 2010.

39. P. Pettersson, Q. Abbas, G. Iaccarino and J. Nordström, Efficiency of shock capturing schemes for Burgers equation with boundary uncertainty, Seventh South African Conference on Computational and Applied Mechanics SACAM10, Pretoria, 10-13 January 2010.

40. C. Law, Q. Abbas, J. Nordström and B.W. Skews, The effect of Reynolds number in high order accurate calculation with shock

diffraction, Seventh South African Conference on Computational and Applied Mechanics SACAM10, Pretoria, 10-13 January 2010.

41. Q. Abbas, E. van der Weide and J. Nordström, Energy stability of the MUSCL scheme, Seventh South African Conference on Computational and Applied Mechanics SACAM10, Pretoria, 10-13 January 2010.

42. G. Efraimsson, N. Forsberg and J. Nordström, Simulations of Acoustic Waves in a Turbo-Fan Engine Air Intake, AIAA Paper No. 2010-3999, 16th AIAA/CEAS Aeroacoustics Conference, 7-9 June, Stockholm, Sweden, 2010.

43. G. Iaccarino, P. Pettersson, J. Nordström and J. Witteveen, Numerical Methods for Unceartainty Propagation in High Speed Flows, V European Conference on Computational Fluid Dynamics ECCOMAS CFD, J. C. F. Pereira and A. Sequeira (Eds) Lisbon, Portugal,14-17 June 2010.

44. P. Pettersson, Q. Abbas, G. Iaccarino, and J. Nordström, Efficiency of shock capturing schemes for Burgers' equation with boundary uncertainty, Numerical Mathematics and Advanced Applications, pp 737-745, Springer-Verlag, Berlin, 2010.

45. J. Lindström and J. Nordström, A stable and high order interface procedure for conjugate heat transfer problems, Numerical Mathematics and Advanced Applications, pp 599-607, Springer-Verlag, Berlin, 2010.

46. Q. Abbas, E. van der Weide and J. Nordström, Energy stability of the MUSCL scheme, Numerical Mathematics and Advanced Applications, pp 61-68, Springer-Verlag, Berlin, 2010.

47. O. Oreilly, J.E. Kozdon and E.M. Dunham and J. Nordström, High-Order Finite Difference Methods for Earthquake Rupture Dynamics in Complex Geometries, 2010 AGU Fall Meeting, San Francisco, USA, 2010.

48. O. Oreilly, J.E. Kozdon and E.M. Dunham and J. Nordström, Coupled High-Order Finite Difference and Unstructured Finite Volume Methods for Earthquake Rupture Dynamics in Complex Geometries, SIAM Conference on Mathematical & Computational

issues in the Geosciences March 21-24 Hilton Long Beach & Executive Meeting Center, Long Beach, California, USA, 2011.

49. O. O'Reilly, E. M. Dunham, J. E. Kozdon, and J. Nordström, Earthquake Rupture Dynamics in Complex Geometries using Coupled Summation-By-Parts High-order Finite Difference Methods and Node-Centered Finite Volume Methods, SCEC Annual Meeting – Palm Springs, California, USA, 2012.

50. J. Berg and J. Nordström, A stable and dual consistent boundary treatment using finite differences on summation-by-parts form. In Proc. ECCOMAS Congress 2012, p 14, Tech. Univ. Wien, Austria, 2012.

51. O. O'Reilly, E. M. Dunham, J. E. Kozdon, and J. Nordström, Earthquake Rupture dynamics in complex geometries using coupled high-order finite difference methods and finite volume methods, 2012 AGU Fall Meeting, 3-7 December 2012, at the Moscone Convention Center, San Francisco, California, USA, 2012.

52. S. Nikkar and J. Nordström, Energy Stable High Order Finite Difference Methods for Hyperbolic Equations in Moving Coordinate Systems, AIAA Paper No. 2013-2579, 21st AIAA Computational Fluid Dynamics Conference, San Diego, CA, June 24-27, 2013.

53. T. Lundquist and J. Nordström, The SBP-SAT Technique for Time-Discretization, AIAA Paper No. 2013-2834, 21st AIAA Computational Fluid Dynamics Conference, San Diego, CA, June 24-27, 2013.

54. P. Eliasson and J. Nordström, The Influence of Viscous Operator and Wall Boundary Conditions on the Accuracy of the Navier-Stokes Equations, AIAA Paper No. 2013-2956, 21st AIAA Computational Fluid Dynamics Conference, San Diego, CA, June 24-27, 2013.

55. H. Frenander and J. Nordström, Increasing the convergence rate to steady-state by using multiple penalty terms applied in a domain, AIAA Paper No. 2013-2957, 21st AIAA Computational Fluid Dynamics Conference, San Diego, CA, June 24-27, 2013.

56. J. Berg and J. Nordström, Duality based boundary treatment for the Euler and Navier-Stokes equations, AIAA Paper No. 2013-2956, 21st AIAA Computational Fluid Dynamics Conference, San Diego, CA, June 24-27, 2013.

57. S. Eriksson and J. Nordström, Well-posedness and Stability of Exact Non-reflecting Boundary Conditions, AIAA Paper No. 2013-2960, 21st AIAA Computational Fluid Dynamics Conference, San Diego, CA, June 24-27, 2013.

58. J. Nordström and F. Ghasemi, Coupling Requirements for Well Posed and Stable Multi-physics Problems, Proceedings of the VI International Conference on Coupled Problems in Science and Engineering San Servolo, Venice, Italy May 18, 2015

59. J. Nordström, Well Posed Problems and Boundary Conditions in Computational Fluid Dynamics (Invited), AIAA Paper No. 2015-3197, 22nd AIAA Computational Fluid Dynamics Conference, Dallas, Texas, USA, June 22-26, 2015.

60. M. Wahlsten and J. Nordström, An investigation of uncertainty due to stochastically varying geometry: An initial study, UNCECOMP 2015 - 1st ECCOMAS Thematic Conference on Uncertainty Quantification in Computational Sciences and Engineering, pp. 898-907, Creta Maris Conference Centre Hersonissos, Crete; United Kingdom; 25 May 2015 through 27 May 2015.

61. V. Linders, M. Kupiainen, S. H. Frankel, Y. Delorme and J. Nordström, Summation-by-Parts Operators with Minimal Dispersion Error for Accurate and Efficient Flow Calculations, AIAA Paper No. 2016-1329, 54th AIAA Aerospace Sciences Meeting, San Diego, California, USA, 4-8 January 2016.

62. P. Eliasson, T. Lundquist, and J. Nordström, A global time integration approach for realistic unsteady flow computations, AIAA Paper No. 2016-2016, 54th AIAA Aerospace Sciences Meeting, San Diego, California, USA, 4-8 January 2016.

63. O. O'reilly, T. Lundquist and J. Nordström, ENERGY STABLE HIGH ORDER FINITE DIFFERENCE METHODS ON STAGGERED GRIDS: AN INITIAL INVESTIGATION, Proceedings

of the VII European Congress on Computational Methods in Applied Sciences and Engineering M. Papadrakakis, V. Papadopoulos, G. Stefanou, V. Plevris (eds.) Crete Island, Greece, 510 June 2016.

64. S. Nikkar and J. Nordström, A STABLE AND CONSERVATIVE TIME-DEPENDENT INTERFACE FORMULATION ON SUMMATION-BY-PARTS FORM: AN INITIAL INVESTIGATION, Proceedings of the VII European Congress on Computational Methods in Applied Sciences and Engineering M. Papadrakakis, V. Papadopoulos, G. Stefanou, V. Plevris (eds.) Crete Island, Greece, 510 June 2016.

65. J. Nordström and A. Ruggiu, IMPROVED DUAL TIMESTEPPING USING SECOND DERIVATIVES, Proceedings of the VII European Congress on Computational Methods in Applied Sciences and Engineering M. Papadrakakis, V. Papadopoulos, G. Stefanou, V. Plevris (eds.) Crete Island, Greece, 510 June 2016.

66. M. Wahlsten and J. Nordström, Stochastic Galerkin Projection and Numerical Integration for Stochastic Systems of Equations, Proceedings of the UNCECOMP 2017 – 2nd ECCOMAS Thematic Conference on Uncertainty Quantification in Computational Sciences and Engineering M. Papadrakakis, V. Papadopoulos, G. Stefanou (eds.) Rhodes Island, Greece, 1517 June 2017.

67. Peter Eliasson, Jing Gong and J. Nordström, A Stable and Conservative Coupling of the Unsteady Compressible Navier-Stokes Equations at Interfaces Using Finite Difference and Finite Volume Methods, AIAA Paper No. AIAA-2018-0597, AIAA Aerospace Sciences Meeting, Kissimmee, Florida, USA, 8-12 January 2018.

68. Oskar Ålund and J. Nordström, A Stable, High Order Accurate and Efficient Hybrid Method for Flow Calculations in Complex Geometries, AIAA Paper No. AIAA-2018-1096, AIAA Aerospace Sciences Meeting, Kissimmee, Florida, USA, 8-12 January 2018.

69. Andrea A. Ruggiu and J. Nordström, Multigrid schemes for high order discretizations of hyperbolic problems, AIAA Scitech 2019 Forum, AIAA SciTech Forum, (AIAA 2019-0103), San Diego, California, USA, 7-11 January 2019.

## Reports


1. J. Nordström, Wind Tunnel Calibration of a Hemispherical Head Angle-of-attack and Angle-of-sideslip Indicator, FFA TN 1984-11, Stockholm 1984.

2. J. Nordström, Stability Criteria for a Second Order Accurate, Time-split Finite Volume Scheme to Solve the Navier-Stokes Equations, FFA TN 1985-08, Stockholm 1985.

3. J. Nordström, The Evolution of a Wave Train in a Three-dimensional Boundary Layer, FFA TN 1985-54, Stockholm 1985.

4. J. Nordström, Open Boundary Conditions for the Navier-Stokes Equations, FFA Report 145, Stockholm 1988.

5. A. Bengtsson, E. Ziakouli & J. Nordström, The Influence of Open Boundary Conditions and Difference Operators on the Time-integration of the Burgers Equation, FFA TN 1988-57, Stockholm 1988.

6. B. Gustafsson & J. Nordström, Boundary Conditions for the Navier-Stokes Equations at an Artificial Boundary Intersecting a Solid Boundary, FFA TN 1990-11,Stockholm 1990.

7. B. Gustafsson & J. Nordström, Extrapolation Procedures at Outflow Boundaries for the Navier-Stokes Equations, FFA TN 1990-23, Stockholm 1990.

8. J. Nordström, Accurate Solutions of the Time-dependent Navier-Stokes Equations Despite Erroneous Outflow Boundary Data, Report No. 150/1993, Department of Scientific Computing, Uppsala University, Uppsala 1993.

9. J. Nordström, Accuracy and Stability of Extrapolation Procedures at Artificial Outflow Boundaries for the Time-dependent Navier-Stokes Equations, Report No. 151/1993, Department of Scientific Computing, Uppsala University, Uppsala 1993.

10. J. Nordström, Accurate Solutions of the Time-dependent Navier-Stokes Equations Despite Erroneous Outflow Boundary Data, FFA TN 1993-07, Stockholm 1993.

11. J. Nordström, Accuracy and Stability of Extrapolation Procedures at Artificial Outflow Boundaries for the Time-dependent Navier-Stokes Equations, FFA TN 1993-16, Stockholm 1993.

12. J. Nordström, Artificial Boundary Conditions for the Navier-Stokes Equations, Acta Univ. Ups., Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science 449. ISBN 91-554-3111-9, ISSN 0282-7468, 1993.

13. J. Nordström, The Use of Characteristic Boundary Conditions for the Navier-Stokes Equations, FFA TN 1993-54, Stockholm 1993.

14. J. Nordström & N. Nordin, The Fringe Region Technique Used in the Direct Numerical Simulation of the Incompressible Navier-Stokes Equations, FFA TN 1995-04, Stockholm 1995.

15. F. Jansson & J. Nordström, Boundary Conditions for the Compressible Navier-Stokes Equations at a Subsonic Outflow Boundary, FFA TN 1995-05, Stockholm 1995.

16. N. Nordin & J. Nordström, Improved Far-field Boundary Conditions in EURANUS, FFA TN 1995-26, Stockholm 1995.

17. P. Eliasson & J. Nordström, The Development of an Unsteady Solver for Moving Meshes, FFA TN 1995-39, Stockholm 1995.

18. J. Nordström, On Flux-extrapolation at Supersonic Outflow Boundaries, FFA TN 1997-38, Stockholm 1997.

19. J. Nordström, N. Nordin & D. Henningson, The Fringe Region Technique and the Fourier-method Used in the Direct Numerical Simulation of Spatially Evolving Flows, FFA TN 1998-07, Stockholm 1998.

20. M. H. Carpenter, J. Nordström & D. Gottlieb, A Stable and Conservative Interface Treatment of Arbitrary Spatial Accuracy, NASA/CR-1998-206921, ICASE Report No. 98-12, Langley Research Center, Hampton Virginia 23681-2199, USA, 1998.

21. N. Lindberg, G. Efraimsson & J. Nordström, Numerical Investigation of Extrapolation Boundary Conditions for the Euler Equations, FFA TN 1998-03, Stockholm 1998.

22. J. Nordström & M. H. Carpenter, Boundary and Interface Conditions for High Order Finite Difference Methods Applied to the Euler and Navier Stokes Equations, NASA/CR-1998-207681, ICASE Report No. 98-19, Langley Research Center, Hampton Virginia 23681-2199, USA, 1998.

23. I. Karlsson & J. Nordström, Boundary Conditions in the $\kappa - \omega$ and $\kappa - \epsilon$ Turbulence Models, FFA TN 1998-49, Stockholm 1998.

24. S. Tsynkov, S. Abarbanel, J. Nordström, V. Ryaben'kii & V. Vatsa, Global Artificial Boundary Conditions for Computation of External Flow Problems with Propulsive Jets, NASA/CR-1998-208746, ICASE Report No. 98-52, Langley Research Center, Hampton Virginia 23681-2199, USA, 1998.

25. E. Petrini, G. Efraimsson & J. Nordström, A Numerical Study of the Introduction and Propagation of a 2-D Vortex, FFA TN 1998-66, Stockholm 1998.

26. G. Efraimsson, G Kreiss & J. Nordström, Artificial Dissipation and Accuracy Downstream of Slightly Viscous Shocks, FFA TN 1998-70, Stockholm 1998.

27. Rickard Lindkvist & J. Nordström, Boundary Conditions for the Euler Equations, FFA TN 1999-31, Stockholm 1999.

28. J. Nordström & M. H. Carpenter, High Order Finite Difference Methods, Multidimensional Linear Problems and Curvilinear Coordintes, NASA/CR-1999-209834, ICASE Report No. 99-54, Langley Research Center, Hampton Virginia 23681-2199, USA, 1999.

29. Martin Björck & J. Nordström, Finite Volume Approximations and Strict Stability for Hyperbolic Problems, FFA TN 2000-35, Stockholm 2000.

30. Björn Bretz, Karl Forsberg & J. Nordström, High Order Finite Difference Approximations of Hyperbolic Problems, FFA TN 2000-09, Stockholm 2000.

31. J. Nordström, Model Problems and The Analysis of Boundary Procedures in CFD, FFA TN 2000-35, Stockholm 2000.

32. G. Kreiss, M. Siklosi, C. Johansson, M. Liefvendahl & J. Nordström, Stable and Accurate Boundary Conditions for Aerodynamic and Aeroacoustic Calculations, Trita-NA-0015, Stockholm 2000.

33. T Hagstrom & J. Nordström, Analysis of Extrapolation Boundary Conditions for the Linearized Euler Equations, FFA TN 2000-59, Stockholm 2000.

34. J. Persson & J. Nordström, Discrete Approximations of Electromagnetic Problems, Scientific Report FOI-R–0119-SE, Stockholm 2001.

35. R. Gustafsson & J. Nordström, High Order Finite Difference Approximations of Electromagnetic Wave Propagation Close to Material Discontinuities, Scientific Report FOI-R–0120-SE, Stockholm 2001.

36. C. Adamsson, K. Forsberg & J. Nordström, Finite Volume Methods, Unstructured Meshes and Strict Stability, Scientific Report FOI-R–0121-SE, Stockholm 2001.

37. O. Fogelklou & J. Nordström, Investigation of Time and Frequency Domain Based Methods for Radar Cross Section Calculations, Scientific Report FOI-R–0149-SE, Stockholm 2001.

38. A. Carlsson & J. Nordström, Conservative Difference Formulations, Energy Estimates and Artificial Dissipation, Scientific Report FOI-R–0509-SE, Stockholm 2002.

39. K. Mattson, M. Svärd, M. H. Carpenter & J. Nordström, Accuracy Requirements for Steady and Transient Aerodynamics, Technical Report 2002-0035, ISSN 1404-3203, Uppsala University, January 2002, Uppsala, Sweden.

40. M. Svärd & J. Nordström, A Stable and Accurate Summation-by-Parts Finite Volume Formulation of The Laplacian Operator, Technical Report 2003-0003, Uppsala University, January 2003, Uppsala, Sweden.

41. K. Mattson & J. Nordström, Finite Difference Approximations of Second Derivatives on Summation by Parts Form, Technical

Report 2003-0012, Uppsala University, February 2003, Uppsala, Sweden.

42. K. Mattson, M. Svärd & J. Nordström, Stable artificial dissipation, Technical Report 2003-0013, Uppsala University, February 2003, Uppsala, Sweden.

43. M. Svärd, K. Mattsson & J. Nordström, Steady State Computations Using Summation-By-Parts Operators, Technical Report 2003-0018, Uppsala University, March 2003, Uppsala, Sweden.

44. M. Svärd & J. Nordström, Well Posed Boundary Conditions for the Navier-Stokes Equation, Technical Report 2003-052, Uppsala University, November 2003, Uppsala, Sweden.

45. J. Gong & J. Nordström, A Stable Hybrid Methods for Hyperbolic Problems, Technical Report 2004-039, Uppsala University, November 2004, Uppsala, Sweden.

46. M. Svärd & J. Nordström, On the Order of Accuracy for Difference Approximations of Initial-Boundary Value Problems, Technical Report 2004-040, Uppsala University, September 2004, Uppsala, Sweden.

47. J. Nordström & Shia-Hui Peng, Unsteady Pressure Forces in a Weapon Bay on a Stealth Vehicle, Technical Report FOI-D-0195-SE, Stockholm, 2004.

48. M. Svärd, J. Gong & J. Nordström, An Accuracy Evaluation of Unstructured Node-Centered Finite Volume Methods, NIA Report No. 2005-04, National Institute of Aerospace, Virginia, USA, 2005.

49. M. Svärd, J. Gong & J. Nordström, Stable Artificial Operators for Finite Volume Schemes on Unstructured Grids, NIA Report No. 2005-05, National Institute of Aerospace, Virginia, USA, 2005.

50. J. Nordström & R. C. Swanson, Boundary Conditions for a Divergence Free Velocity-Pressure Formulation of the Incompressible Navier-Stokes Equations, Technical Report 2005-031, Uppsala University, November 2005, Uppsala, Sweden.

51. J. Gong and J. Nordström, Stable, Accurate and Efficient Interface Procedures for Viscous Problems, Technical Report 2006-019, Uppsala University, April, 2006, Uppsala, Sweden.

52. J. Nordström, Error Bounded Schemes for Time-Dependent Hyperbolic Problems, Technical Report 2006-027, Uppsala University, May, 2006, Uppsala, Sweden.

53. J Nordström, M. Svärd, M. Shoeybi, F. Ham, K. Mattsson, G. Iaccarino, E. van der Weide & J. Gong, A Stable, Efficient and Adaptive Hybrid Method for Unsteady Aerodynamics, Annual Research Briefs–2006, Center for Turbulence Research, December 2006.

54. J. Gong and J. Nordström, A Stable and Efficient Hybrid Scheme for Viscous Problems in Complex Geometries, Technical Report 2007-002 , Uppsala University, January 2007, Uppsala, Sweden.

55. S. Eriksson, M. Svärd & J. Nordström, Simulations of Ground Effects on Wake Vortices at Runways, Technical Report from the Department of Information Technology 2007-019, Uppsala University, 2007.

56. J. Nordström, F. Ham, M. Shoeybi, E. van der Weide, M. Svärd, K. Mattsson, G. Iaccarino, and J. Gong, A Hybrid Method for Unsteady Fluid Flow, Technical Report from the Department of Information Technology 2007-020, Uppsala University, 2007.

57. J.Gong, J. Nordström and E. van der Weide, A Hybrid Method for the Unsteady Compressible Navier-Stokes Equations, Technical Report from the Department of Information Technology 2007-029, Uppsala University, 2007.

58. M.H. Carpenter, J. Nordström and D. Gottlieb, Revisiting and Extending Interface Penalties for Multi-Domain Summation-By-Parts Operators. NASA/TM-2007-214892, Langley Research Center, Hampton Virginia, USA, 2007.

59. J Nordström, J. Gong, E. van der Weide & M. Svärd, A Hybrid Method for the Unsteady Compressible Navier-Stokes Equations, Annual Research Briefs–2007, Center for Turbulence Research, Stanford University, December 2007.

60. S. Eriksson, Magnus Svärd & J Nordström, Simulation of Ground Effects on Wake Vortices at Runways, Annual Research Briefs–2007, Center for Turbulence Research, Stanford University, December 2007.

61. P. Pettersson, G. Iaccarino & J. Nordström, Numerical Analysis of Burgers' Equation with Uncertain Boundary Conditions Using the Stochastic Galerkin Method, Technical Report from the Department of Information Technology 2008-011, Uppsala University, 2008.

62. J. Nordström, J. Gong, E. van der Weide and M. Svärd, A Stable and Conservative High Order Multi-block Method for the Compressible Navier-Stokes Equations, Technical Report from the Department of Information Technology 2009-006, Uppsala University, 2009.

63. S. Eriksson & J. Nordström, Analysis of the Order of Accuracy for Node-Centered Finite Volume Schemes, Technical Report from the Department of Information Technology 2009-009, Uppsala University, 2009.

64. J. Nordström & S. Eriksson, Well Posed, Stable and Weakly Coupled Fluid Structure Interaction Problems, Technical Report from the Department of Information Technology 2009-011, Uppsala University, 2009.

65. M. H. Carpenter, J. Nordström & D. Gottlieb, Revisiting and Extending Interface Penalties for Multi-Domain Summation-By-Parts Operators, Technical Report from the Department of Information Technology 2009-014, Uppsala University, 2009.

66. J. Lindström & J. Nordström, A Stable and High Order Accurate Conjugate Heat Transfer Problem, Technical Report from the Department of Information Technology 2009-027, Uppsala University, 2009.

67. P. Pettersson, G. Iaccarino & J. Nordström, Boundary procedures for the time-dependent stochastic Burgers equation, Annual Research Briefs–2009, Center for Turbulence Research, Stanford University, December 2009.

68. J. Lindström & J. Nordström, Well-posedness and stability of a coupled fluid flow and heat transfer problem, Annual Research Briefs–2009, Center for Turbulence Research, Stanford University, December 2009.

69. J. E. Kozdon, E. M. Dunham & J. Nordström, Interaction of Waves with Frictional Interfaces Using Summation-By-Parts Difference Operators, 1. Weak Enforcement of Nonlinear Boundary Conditions, Technical Report from the Department of Information Technology 2010-017, Uppsala University, 2010.

70. J. E. Kozdon, E. M. Dunham & J. Nordström, Interaction of Waves with Frictional Interfaces Using Summation-By-Parts Difference Operators, 2. Extension to Full Elastodynamics, Technical Report from the Department of Information Technology 2010-018, Uppsala University, 2010.

71. J. Lindström & J. Nordström, Spectral analysis of the continuous and discretized heat and advection equation on single and multiple domains. Technical Report from the Department of Information Technology 2010-030, Uppsala University, 2010.

72. J. E. Kozdon, E. M. Dunham & J. Nordström, Interaction of waves with frictional interfaces using summation-by-parts difference operators: Weak enforcement of nonlinear boundary conditions, LiTH-MAT-R, No. 2011:5, 2011.

73. J. Berg & J. Nordström, Stable Robin Boundary Conditions for the Navier-Stokes Equations. Technical Report from the Department of Information Technology 2011-012, Uppsala University, 2011.

74. Q. Abbas & J. Nordström, A weak boundary procedure for high order finite difference approximations of hyperbolic problem, Technical report from Department of Information Technology, Uppsala University nr 2011-019, 2011.

75. J. Nordström, S. Eriksson & P. Eliasson, Weak and Strong Wall Boundary Procedures and Convergence to Steady-State of the Navier-Stokes Equations, LiTH-MAT-R–2011/15–SE, 2011.

76. J. Nordström & J. Berg, Conjugate heat transfer using modied interface conditions for the Navier-Stokes equations, LiTH-MAT-R–2011/18–SE, 2011.

77. T. C. Fisher, M. H. Carpenter, J. Nordström, N. Yamaleev & R. C. Swanson, Discretely Conservative Finite-Difference Formulations for Nonlinear Conservation Laws in Split Form: Theory and Boundary Conditions, NASA/TM-2011-217307, Langley Research Center, Hampton, Virginia, USA 2011.

78. J. E. Kozdon, E. M. Dunham & J. Nordström, Simulation of Dynamic Earthquake Ruptures in Complex Geometries Using High-Order Finite Difference Methods, LiTH-MAT-R, No. 2012:2, 2012.

79. J. Berg & J. Nordström, Superconvergent Functional Output for Time-Dependent Problems using Finite Differences on Summation-By-Parts Form, Technical report from Department of Information Technology, Uppsala University nr 2012-04, 2012.

80. J. Nordström & Tomas Lundquist, Summation-By-Parts Operators for Time Discretisation: Initial Investigations, LiTH-MAT-R-2012, Department of Mathematics, Linköping University, 2012.

81. J. Berg & J. Nordström, A Stable and Dual Consistent Boundary Treatment Using Finite Differences on Summation-By-Parts Form Technical Report from Department of Information Technology, Uppsala University 2012-014, 2012.

82. J. Berg & Nordström, On the Impact of Boundary Conditions on Dual Consistent Finite Difference Discretizations, Technical Report from Department of Information Technology, Uppsala University, 2012-025, 2012.

83. P. Pettersson, G. Iaccarino & J. Nordström, A Roe Variable Based Chaos Method for the Euler Equations under Uncertainty, Technical Report from Department of Information Technology, Uppsala University, 2012-021, 2012.

84. P. Pettersson, A. Doostan & J. Nordström, On stability and monotonicity requirements of discretized stochastic conservation laws with random viscosity, Technical report from Department of Information Technology, Uppsala University, 2012-028, 2012.

85. S. Eriksson & J. Nordström, Exact Non-Reflecting Boundary Conditions Revisited: Well-Posedness and Stability, Technical Report from Department of Information Technology, Uppsala University, 2012-032, 2012.

86. P. Pettersson, G. Iaccarino & J. Nordström, A Stochastic Galerkin Method for the Euler Equations with Roe Variable Transformation, Technical Report from Department of Information Technology, Uppsala University, 2012-033, 2012.

87. P. Pettersson, G. Iaccarino & J. Nordström, An Intrusive Hybrid Method for Discontinuous Two-Phase Flow under Uncertainty, Technical Report from Department of Information Technology, Uppsala University, 2012-035, 2012.

88. D. Amsallem & J. Nordström, High-order accurate difference schmes for the Hodgkin-Huxley equations, LiTH-MAT-R, 9, Department of Mathematics, Linköping University, 2012.

89. S. Ghader & J. Nordström, Well-posed boundary conditions for the shallow water equations, LiTH-MAT-R, 4, Department of Mathematics, Linköping University, 2013.

90. J. Nordström, Qaisar Abbas, Brittany A. Erickson & Hannes Frenander, A Flexible Far Field Boundary Procedure for Hyperbolic Problems: Multiple Penalty Terms Applied in a Domain, Department of Mathematics, Linköping University, LiTH-MAT-R, 2013:2, 2013.

91. P. Pettersson, A. Doostan & J. Nordström, On Stability and Monotonicity Requirements of Finite Difference Approximations of Stochastic Conservation Laws with Random Viscosity, LiTH-MAT-R–2013/03–SE, Department of Mathematics, Linköping University, 2013.

92. J. Berg & J. Nordström, Duality based boundary conditions and dual consistent finite difference discretizations of the Navier-Stokes and Euler equations, Technical Report from Department of Information Technology, Uppsala University, Technical Report 2013-013.

93. S. Ghader & J. Nordström, High-order compact finite difference schemes for the spherical shallow water equations", LiTH-MAT-R–2013/9-SE, 2013, Department of Mathematics, Linköping University.

94. B. A. Erickson & J. Nordström, Stable, High Order Accurate Adaptive Schemes for Long Time, Highly Intermittent Geophysics Problems, LiTH-MAT-R–2013/10–SE, 2013, Department of Mathematics, Linköping University.

95. O. OReilly, J. Nordström, J. E. Kozdon & E. M. Dunham Simulation of Earthquake Rupture Dynamics in Complex Geometries Using Coupled Finite Difference and Finite Volume Methods, LiTH-MAT-R, 11, 2013, Department of Mathematics, Linköping University.

96. T. Lundquist & J. Nordström, The SBP-SAT Technique for Initial Value Problems LiTH-MAT-R, 2013:14, 2013, Department of Mathematics, Linköping University.

97. M. Svärd & J. Nordström, Review of Summation-by-Parts Schemes for Initial-Boundary-Value Problems, LiTH-MAT-R, 2013:15, 2013, Department of Mathematics, Linköping University.

98. J. Nordström & M. Wahlsten, Variance reduction through robust design of boundary conditions for stochastic hyperbolic systems of equations, LiTH-MAT-R, 2014:03, 2014, Department of Mathematics, Linköping University.

99. H. Frenander & J. Nordström, "Spurious solutions for the advection-diffusion equation using wide stencils for approximating the second derivative.", LiTH-MAT-R, No. 2014: 07, 2014, Department of Mathematics, Linköping University.

100. J. Nordström & T. Lundquist, Summation-by-parts in Time: the Second Derivative, LiTH-MAT-R, 2014:11, 2014, Department of Mathematics, Linköping University.

101. J. Nordström, M. Wahlsten & S. Nikkar, Boundary Conditions for Hyperbolic Systems of Equations on Curved Domains, LiTH-MAT-R, 2014:12, 2014, Department of Mathematics, Linköping University.

102. C. La Cognata & J. Nordström, Well-posedness, Stability and Conservation for a Discontinuous Interface Problem, LiTH-MAT-R, 2014:16, 2014. Department of Mathematics, Linköping University.

103. H. Frenander & J. Nordström, A Provable Stable and Accurate Davies-like Relaxation Procedure Using Multiple Penalty Terms for Lateral Boundaries in Weather Prediction, LiTH-MAT-R, 2014:19, 2014, Department of Mathematics, Linköping University.

104. T. Lundquist & J. Nordström, Efficient Fully Discrete Summation-by-parts Schemes for Unsteady Flow Problems, LiTH-MAT-R, 2014:18, 2014. Department of Mathematics, Linköping University.

105. S. Nikkar & J. Nordström, Fully Discrete Energy Stable High Order Finite Difference Methods for Hyperbolic Problems in Deforming Domains, LiTH-MAT-R, 2014:15, 2014. Department of Mathematics, Linköping University.

106. J. Nordström & S. Ghader, A new well-posed vorticity divergence formulation of the shallow water equations, LiTH-MAT-R, 2014:20, 2014. Department of Mathematics, Linköping University.

107. V. Linders & J. Nordström, Uniformly Best Wavenumber Approximations by Spatial Central Difference Operators, LiTH-MAT-R, 2014:17, 2015.

108. P. Pettersson, J. Nordström & A. Doostan, A Well-posed and Stable Stochastic Galerkin Formulation of the Incompressible Navier-Stokes Equations with Random Data", LiTH-MAT-R, No. 2015:06, 2015.

109. C. Sorgentone, C. La Cognata & J. Nordström, "A New High Order Energy and Enstrophy Conserving Arakawa-like Jacobian Differential Operator", LiTH-MAT-R, No. 2015:05, 2015.

110. T. Lundquist & J. Nordström, On the Suboptimal Accuracy of Summation-by-parts Schemes with Non-conforming Block Interfaces, LiTH-MAT-R, 2015:16, 2015, Department of Mathematics, Linköping University.

111. T. Lundquist & J. Nordström, An Energy Stable Summation-by-parts Formulation for General Multi-block and Hybrid Meshes, LiTH-MAT-R, 2016:03, 2016, Department of Mathematics, Linköping University.

112. V. Linders, M. Kupiainen & J. Nordström, Summation-by-Parts Operators with Minimal Dispersion Error for Coarse Grid Flow Calculations, LiTH-MAT-R, 2016:7, 2016, Department of Mathematics, Linköping University.

113. F. Ghasemi & J. Nordström, Coupling Requirements for Multiphysics Problems, LiTH-MAT-R, No. 2016:08, 2016, Department of Mathematics, Linköping University.

114. S. Nikkar & J. Nordström, A fully discrete, stable and conservative summation-by-parts formulation for deforming interfaces, LiTH-MAT-R, No. 2016:9, 2016, Department of Mathematics, Linköping University.

115. S. Nikkar & J. Nordström, Dual consistent summation-by-parts formulation for the linearized incompressible Navier-Stokes equations posed on deforming domains, LiTH-MAT-R, No. 2016:10, 2016, Department of Mathematics, Linköping University.

116. S. Nikkar & J. Nordström, Summation-by-parts operators for non-simply connected domains, LiTH-MAT-R, No. 2016:11, 2016, Department of Mathematics, Linköping University.

117. D. Kopriva, J. Nordström & G. Gassner, Error Boundedness of Discontinuous Galerkin Spectral Element Approximations of Hyperbolic Problems, LiTH-MAT-R, No. 2016:13, 2016, Department of Mathematics, Linköping University.

118. O. Oreilly, E. M. Dunham & J. Nordström, Simulation of wave propagation along fluid-filled cracks using high-order summation-by-parts operators and implicit-explicit time stepping, LiTH-MAT-R, No. 2016:16, 2016.

119. O. Alund & J. Nordström, A provably stable, non-iterative domain decomposition technique for the advection-diffusion equation, LiTH-MAT-R, No. 2016:15, 2016.

120. H. Frenander & J. Nordström, Constructing non-reflecting boundary conditions using summation-by-parts in time, LiTH-MAT-R, No. 2016:14, 2016.

121. O. OReilly, T. Lundquist, J. J. Nordström & Eric M. Dunham, Energy stable and high-order-accurate finite difference methods on staggered grids, LiTH-MAT-R, No. 2016:17, 2016.

122. H. Frenander & J. Nordström, A stable and accurate data assmimilation technique using multiple penalty terms in space and time, LiTH-MAT-R, No. 18, 2016.

123. M. Wahlsten & J. Nordström, Robust Boundary Conditions for Stochastic Incompletely Parabolic Systems of Equations, LiTH-MAT-R, No. 19, 2016.

124. M. Wahlsten & J. Nordström, The effect of uncertain geometries on advection-diffusion of scalar quantities, LiTH-MAT-R, No. 20, 2016.

125. J. Nordström & H. Frenander, Long time error bounds for the wave equation on second order form, LiTH-MAT-R, No. 2017:1, 2017.

126. T. Lundquist & J. Nordström, An analysis of non-conforming grid techniques for high order summation-by-parts metods, LiTH-MAT-R, No. 2017:2, 2017.

127. A. A. Ruggiu, P. Weinerfelt & J. Nordström, A New Multigrid Formulation for High Order Finite Difference Methods on Summation-by-Parts Form, LiTH-MAT-R, No. 2017:08, 2017.

128. C. La Cognata & J. Nordström, Spectral analysis of the incompressible Navier-Stokes equations with different boundary conditions, LiTH-MAT-R, No. 2017:10, 2017.

129. J. Nordström & Cristina La Cognata, Energy Stable Boundary Conditions for the Nonlinear Incompressible Navier-Stokes Equations, LiTH-MAT-R, No. 2017:9, 2017.

130. V. Linders, T. Lundquist & J. Nordström, On the order of Accuracy of Finite Difference Operators on Diagonal Norm Based Summation-By-Parts Form, LiTH-MAT-R, No. 2017:11, 2017.

131. M. Svärd & J Nordström, ON THE CONVERGENCE RATES OF ENERGY-STABLE FINITE-DIFFERENCE SCHEMES, LiTH-MAT-R, No. 2017/14, 2017.

132. J. Nordström & V. Linders, Well-posed and Stable Transmission Problems, LiTH-MAT-R, No. 15, 2017.

133. Sofia Eriksson & Jan Nordström, Finite difference schemes with transferable interfaces for parabolic problems, LiTH-MAT-R–2018/01–SE, 2018.

134. Markus Wahlsten & Jan Nordström, Stochastic Galerkin Projection and Numerical Integration for Stochastic Investigations of the Viscous Burgers Equation, LiTH-MAT-R–2018/02–SE, 2018.

135. Markus Wahlsten & Jan Nordström, An efficient hybrid method for uncertainty quantification, LiTH-MAT-R–2018/03–SE, 2018.

136. Per Pettersson, Alireza Doostan & Jan Nordström, Level Set Methods for Stochastic Discontinuity Detection in Nonlinear Problems, LiTH-MAT-R–2018/11–SE, 2018.

137. Viktor Linders, Jan Nordström & Steven H. Frankel, Convergence and stability properties of summation-by-parts in time, LiTH-MAT-R–2019/04–SE, 2019.

138. Fatemeh Ghasemi & Jan Nordström, On conservation and dual consistency for summation-by-parts based approximations of parabolic problems, LiTH–MAT–R–2019/5–SE 2019.

139. Fatemeh Ghasemi & Jan Nordström, The Relation Between Primal and Dual Boundary Conditions for Hyperbolic Systems of Equations, LiTH–MAT–R–2019/6–SE 2019.

140. Fatemeh Ghasemi & Jan Nordström, An Energy Stable Coupling Procedure for the Compressible and Incompressible Navier-Stokes Equations, LiTH–MAT–R–2019/7–SE 2019.

141. Jan Nordström & Andrew R. Winters, Energy versus entropy estimates for nonlinear hyperbolic systems of equations, LiTH–MAT–R–2019/8–SE 2019.