

RESUME - Leo G Rebholz

PERSONAL DATA

Assistant Professor
Department of Mathematical Sciences
Clemson University
Clemson, SC 29634
864-656-1840

EDUCATION

Ph.D., University of Pittsburgh, 2006, Mathematics
M.A., University of Pittsburgh, 2003, Mathematics
M.S., Duquesne University, 2002, Computational Mathematics
B.S., Duquesne University, 2000, Mathematics

PROFESSIONAL EXPERIENCE

Clemson University, 2008- , Assistant Professor of Mathematical Sciences
Bechtel Bettis Atomic Power Laboratory, 2007-2008, Senior Mathematician
2004-2007, Mathematician
University of Pittsburgh, 2004-2006, Teaching Fellow
2002-2004, Teaching and Research Assitant
Community College of Allegheny County, 2002-2003, Mathematics Instructor
Management Science Associates Inc., 2001-2002, Market Research Analyst

MEMBERSHIPS

Member, American Mathematical Society, AMS, (2000-)
Member, Society for Industrial and Applied Mathematics, SIAM, (2007-)

PUBLICATIONS

Refereed Journal Publications

1. L. Rebholz, A multiscale V-P discretization for flow problems, *Applied Mathematics and Computation*, 177 (1), 24-35, (2006).
2. L. Rebholz, Conservation laws of turbulence models, *Journal of Mathematical Analysis and Applications*, 326 (1), 33-44, (2007).
3. L. Rebholz, An Energy and Helicity conserving finite element scheme for the Navier-Stokes Equations, *SIAM Journal on Numerical Analysis*, 45 (4), 1622-1638, (2007).
4. W. Layton, C. Manica, M. Neda and L. Rebholz, Numerical Analysis and Computational Testing of a high-order Leray-deconvolution turbulence model, *Numerical Methods for Partial Differential Equations*, 24 (2), 555-582, (2008).

5. L. Rebholz, A family of new high order NS-alpha models arising from helicity correction in Leray turbulence models, *Journal of Mathematical Analysis and Applications*, 342 (1), 246-254, (2008).
6. W. Layton, C. Manica, M. Neda and L. Rebholz, The joint helicity-energy cascade for homogeneous, isotropic turbulence generated by approximate deconvolution models, *Advances and Applications in Fluid Mechanics*, 4 (1), 1-46, (2008).
7. A. Labovsky, W. Layton, C. Manica, M. Neda and L. Rebholz, The stabilized, extrapolated trapezoidal finite element method for the Navier-Stokes equations, *Computer Methods in Applied Mechanics and Engineering*, 198 (9-12), 958-974, (2009).
8. W. Layton, C. Manica, M. Neda, M. Olshanskii and L. Rebholz, On the accuracy of the rotation form in simulations of the Navier-Stokes equations, *Journal of Computational Physics*, 228 (9), 3433-3447, (2009).
9. L. Rebholz, Enhanced physics-based numerical schemes for two classes of turbulence models, *Advances in Numerical Analysis*, 2009 (ID:370289), 1-13, (2009).
10. W. Layton, C. Manica, M. Neda and L. Rebholz, Numerical analysis and computational comparisons of the NS-alpha and NS-omega regularizations, *Computer Methods in Applied Mechanics and Engineering*, to appear.
11. W. Miles and L. Rebholz, An enhanced physics based scheme for the NS-alpha turbulence model, *Numerical Methods for Partial Differential Equations*, to appear.
12. L. Rebholz and M. Sussman, On the high accuracy NS-alpha-deconvolution model of turbulent fluid flow, *Mathematical Models and Methods in Applied Sciences*, to appear.
13. W. Layton, L. Rebholz, and M. Sussman, Energy and helicity dissipation rates of the NS-alpha and NS-alpha-deconvolution models, submitted.
14. C. Manica, M. Neda, M. Olshanskii and L. Rebholz, Enabling accuracy of Navier-Stokes-alpha through deconvolution and enhanced stability, submitted.
15. M. Olshanskii and L. Rebholz, Velocity-Vorticity-Helicity formulation and a solver for the Navier-Stokes equations, submitted.
16. M. Olshanskii and L. Rebholz, A note on helicity balance of the Galerkin method for the 3D Navier-Stokes equations, submitted.
17. W. Layton, C.D. Pruett, and L. Rebholz, Temporally regularized direct numerical simulation, submitted.

Refereed Conference Proceedings

1. A. Labovschii, W. Layton, C. Manica, M. Neda, L. Rebholz, I. Stanculescu, C. Trenchea, Architecture of approximate deconvolution models of turbulence, *Quality and Reliability of Large-Eddy Simulations*, Part I, ERCOFTAC Series, Volume 12, editors J. Meyers, B. Guerts, P. Sagaut, (2008).

PRESENTATIONS

Computational Math Research Seminar, University of Pittsburgh, 10/04

AMS Eastern Fall 2004, Special Session on Multiscale Algorithms in Computational Fluid Dynamics, Pittsburgh PA, 11/04

Computational Math Research Seminar, University of Pittsburgh, 10/05

Mathematics as an Enabling Science Conference, Virginia Tech, 10/05

Computational Math Research Seminar, University of Pittsburgh, 2/06

Finite Element Circus, University of Maryland Baltimore County, 3/06

AMS Midwestern Fall 2007, Special Session on Mathematics Modeling and Numerical Methods, Depaul University, 10/07

Computational Math Research Seminar, University of Pittsburgh, 11/07

Fluid Mechanics Seminar Series, Clemson University, 11/08

Joint VT/UTK/Pitt/Clemson Applied Mathematics Conference, Virginia Tech, 2/09

AMS Southeast Spring 2009, Special Session on Advancements in Turbulent Flow Modeling and Computation, North Carolina State University, 4/09

AWARDS

Culver-Teplitz Prize, University of Pittsburgh, 2006.

SPONSORED RESEARCH

“Enabling long time accuracy in turbulent flow simulations,” National Science Foundation, DMS-0914478, Principal Investigator, \$256,583 (\$256,583), (2009-2012).

GRADUATE STUDENT ADVISING

Current Graduate Advising

Nicholas Wilson (PhD), *Enhanced physics-based schemes for fluid flow approximation*, expected graduation August 2012.

Abigail Bowers (MS/PhD), *Numerical methods for approximate deconvolution turbulence models*, expected graduation (for MS) May 2010.

Keith Galvin (MS/PhD), *Multilevel numerical methods for fluid flow approximation*, expected graduation (for MS) May 2010.

Ryan Hill (MS), *On the α models of turbulence*, expected graduation May 2010.

TEACHING

Courses Taught (Beginning Fall 2008)

MathSc206, Multivariable Calculus, FA08,SP09

MathSc860, Scientific Computing, SP09

MathSc983, Computational Fluid Mechanics, FA09

SERVICE

Departmental:

Clemson Calculus Challenge 2009 exam writing and grading committees

Graduate Committee (2009-)

Technical Societies:

AMS Southeast Spring 2009 special session organizer:

Advancements in Turbulent Flow Modeling and Computation

North Carolina State University, April 2009

Journal Refereeing:

SIAM Journal on Numerical Analysis

Journal of Mathematical Analysis and Applications

Numerical Methods for Partial Differential Equations

Updated September 17, 2009