AGENDA

Partial Differential Equations on the Sphere (PDEs)

7-11 April 2014, Boulder, CO

Monday 7 April 2014

08:15 Shuttle departure from the Millennium Hotel to NCAR Mesa Lab

09:00 Opening Remarks

09:20 | *Cotter, C.* | Implementing mixed finite elements on curved elements on the sphere.

09:40 | *Weller, H.* | Curl-free pressure gradients over orography in a solution of the fully compressible Euler equations with long time-steps.

10:00 Break

10:30 | *Gadian, A.* | Performance of the Cut-cel Method of Representing Orography in Idealised Simulations.

10:50 | *Bosler, P.* | Lagrangian particle methods for global atmospheric flow.

11:10 | *Fornberg, B.* | Spherical harmonics-based numerical quadrature over a sphere.

11:30 Break

12:00 | *Steppeler, J.* | Sparse Grids for Spectral Elements Using L-Galerkin Methods.

12:20 | *Dubos, T.* | Non-hydrostatic sound-proof equations of motion for gravity-dominated compressible flows.

12:40 | *Tort, M.* | Towards an energy-conserving quasi-hydrostatic deep-atmosphere dynamical core.

13:00 Lunch (On your own. NCAR Mesa Lab does have a cash-only cafeteria.)

14:00 | *Sorgentone, C.* | Generalization of Arakawa's Jacobian.

14:20 | *Bui-Thanh, T.* | A Hybridized Discontinuous Galerkin Method for Dynamic Cores of Atmospheric and Ocean General Circulation Models.

14:40 | *Li, J.* | Solutions of 3-D coordinate surfaces of an orthogonal terrain-following coordinate and its preliminary 2-D advection experiments.

15:00 Break

15:30 | *Petterson, K.* | Optimization-based Tracer Transport on the Sphere.

15:50 | *Iga, S.* | Improved smoothness and homogeneity of icosahedral grids using the spring dynamics method.

16:10 Advertising of Posters:

| *Flyer, N.* | Radial Basis Function-generated Finite Differences for Atmospheric Modeling.

| *Li, Y.* | An analysis of the orthogonal terrain-following vertical grids on reducing the advection errors in the terrain-following coordinate.

| *Schreiber, M.* | Cluster-Based Parallelization of Simulations on Dynamically Adaptive Grids on the Sphere.

| *Eldred, C.* | Linear Properties of Numerical Schemes for the Shallow Water Equations.

| *Shipton, J.* | Mimetic finite element methods for solving the nonlinear shallow water equations.

16:30 Adjourn

17:00 Shuttle departure from NCAR Mesa Lab to Millennium Hotel

Tuesday 8 April 2014

08:15 Shuttle departure from the Millennium Hotel to NCAR Mesa Lab

09:00 | *Purser, J.* | Two strategies for the mitigation of coordinate singularities of a spherical polyhedral grid.

09:20 | *Enomoto, T.* | Quasi-uniform grids using a spherical helix.

09:40 | *Peixoto, P.* | Gometric cell alignment on geodesic grids.

10:00 Break

10:30 | *Bonaventura, L.* | Exponential Rosenbrock integrators for accurate simulation of atmospheric flows.

10:50 | *Wingate, B.* | An Asymptotic Parallel-in-Time Method for Highly Oscillatory PDEs.

11:10 | *Bao, L.* | Horizontally Explicit and Vertically Implicit (HEVI) Time Discretization Scheme for a Discontinuous Galerkin Non-Hydrostatic Model.

11:30 Break

12:00 | *Haut, T.* | Advances on an asymptotic parallel-in-time method.

12:20 | *Norman, M.* | Improving Dynamical Core Scalability, Accuracy, and Limiting Flexibility with Differential Transforms (DTs) and the ADER-DT Time Discretization.

12:40 | *Melvin, T.* | Variable Order Mixed Finite Elements on Quadrilateral Grids for the Shallow Water Equations.

13:00 Lunch (On your own. NCAR Mesa Lab does have a cash-only cafeteria.)

14:00 | *Bauer, W.* | A new covariant form of the equations of geophysical fluid dynamics and their structure-preserving discretization.

14:20 | *Myerscough, K.* | Controlling the kinetic energy spectrum.

14:40 Advertising of Posters:

| *Beckers, S.* | Riemann solver for the adjoint shallow water equations with discontinuous coefficients.

| *Oh, TJ.* | Implicit-Explicit Runge-Kutta Time integration methods on a Spectral-Element-based Fully Compressible Non-hydrostatic Atmospheric Model.

| *Kloefkorn, R.* | Implementation Techniques for Discontinuous Galerkin Methods for Atmospheric Models.

| *Spotz, W.* | Aeras: Extending Albany to Solve PDEs on the Sphere.

| *Sandbach, S.* | Implicit time-integration of an atmospheric model on massively-parallel computing systems.

15:00 | *Paldor, N.* | Hermite Functions as a basis of spectral global scale Shallow Water models.

15:10 Break and Group Photo

15:30 Poster Session

17:00 Reception

18:30 First shuttle departure from NCAR Mesa Lab to Millennium Hotel

19:30 Second shuttle departure from NCAR Mesa Lab to Millennium Hotel

Wednesday 9 April 2014

08:15 Shuttle departure from the Millennium Hotel to NCAR Mesa Lab

09:00 | *Kritsikis, E.* | A high order finite element method for the shallow-water equations on the cubed sphere.

09:20 | *Calhoun, D.* | A parallel, multi-rate finite volume framework for adaptive, logically Cartesian sphere grids.

09:40 | *Tumolo, G.* | An accurate and efficient numerical framework for adaptive numerical weather prediction.

10:00 Break

10:30 | *Mueller, A.* | Comparison of Adaptive and Uniform 2D Galerkin Simulations.

10:50 | *Ferguson, J.* | Assessments of the Chombo adaptive mesh refinement model in shallow water mode.

11:10 | *Hendricks, E.* | Adaptive Mesh Refinement for Tropical Cyclone Prediction.

11:30 Break

12:00 | *Kevlahan, N.* | A dynamically adaptive wavelet-based method for geophysical flows on the sphere.

12:30 | *Behrens, J.* | An adaptive and quasi-conservative Semi-Lagrangian advection-diffusion algorithm.

12:40 | *Shin, S.* | Development of a non-hydrostatic vertical slice model based on the spectral element method and mass-based vertical coordinate.

13:00 Lunch (On your own. NCAR Mesa Lab does have a cash-only cafeteria.)

13:30 First shuttle departure from NCAR Mesa Lab to Millennium Hotel

14:00 Adjourn

14:30 Second shuttle departure from NCAR Mesa Lab to Millennium Hotel

Thursday 10 April 2014

08:15 Shuttle departure from the Millennium Hotel to NCAR Mesa Lab

09:00 | *Vater, S.* | Parallel adaptive tsunami modelling with triangular discontinuous Galerkin schemes.

09:20 | *Kavcic, I.* | Lagrangian vertical coordinate for UM ENDGame dynamical core.

09:40 | *Ullrich, P.* | HARDCore - Efficient Computation of Atmospheric Flows Using High-order Local Discretization Methods.

10:00 Break

10:30 | *Smolarkiewicz, P.K.* | A consistent framework for discrete integrations of soundproof and compressible PDEs of all-scale atmospheric dynamics.

10:50 | *Kopera, M.* | Mass conservation properties of CG/DG methods on non-conforming dynamcially adaptive meshes.

11:10 Advertising of Posters:

| *Zarzycki, C.* | The impact of localized grid refinement on sub-grid parameterization in idealized climate experiments.

| *Deconinck, W.* | A massively-parallel framework for finite-volume simulation of global atmospheric dynamics.

| *Heikes, R.* | Design of Atmosphere Models Based on the Nonhydrostatic Unified System of Equations in the Sigma Vertical Coordinates.

| *Zhao, Z.* | A computational study of stratified flow past a sphere.

11:30 Break

12:00 | *Hall, D.* | A Nondydrostatic Spectral-Element Dynamical-Core in CAM-SE.

12:20 | *Guba, O.* | New dissipation mechanisms for the spectral element dynamical core in the Community Atmosphere Model (CAM).

12:40 | *Wood, N.* | ENDGame, a Tropical Tropopause Layer warm bias, and Lagrange vs Hermite.

13:00 Lunch (On your own. NCAR Mesa Lab does have a cash-only cafeteria.)

14:00 | *Harris, L.* | Towards high resolution climate simulation using a two-way nested model: precipitation and extreme events.

14:20 | *Zaengl, G.* | The Icosahedral Nonhydrostatic (ICON) modelling framework: Basic formulation, NWP and high-performance computing aspects, and its perspective towards a unified model for seamless prediction.

14:40 | *Juang Hann-Ming, H.* | A discretization of deep-atmospheric model dynamics for the NCEP Global Forecast System.

15:00 Break

15:30 | *Lee, J.* | A 3-D Finite-Volume Non-hydrostatic Icosahedral Model (NIM).

15:50 | *Sakamoto, M.* | Development of Yin-Yang Grid Global Model Using a New Dynamical Core ASUCA.

16:10 Advertising of Posters:

| *Kurowski, M.* | Towards an all-scale cloud-resolving model.

| *Bayona, V.* | Modeling Global Thunderstorm Electrical Activity with Radial Basis Function-generated Finite Differences.

| *Thatcher, M.* | A prototype reversibly-staggered atmosphere-ocean coupled model for regional climate simulations.

| *Chen, JH.* | The development of Semi-Lagrangian Semi-Implicit global forecast model of the Taiwan Central Weather Bureau.

| *Lauritzen, P.* | Physics-Dynamics Coupling with Galerkin Methods: Equal-Area Physics Grid.

16:30 Adjourn

16:45 First shuttle departure from NCAR Mesa Lab to Millennium Hotel

17:35 Second shuttle departure from NCAR Mesa Lab to Millennium Hotel

18:30 Shuttle departure from Millennium Hotel to Boulder Dushanbe Teahouse (20-25 minute walk)

19:00 Group dinner: Boulder Dushanbe Teahouse

21:30 Shuttle departure from Boulder Dushanbe Teahouse to Millennium Hotel

Friday 11 April 2014

08:15 Shuttle departure from the Millennium Hotel to NCAR Mesa Lab

09:00 | *Debreu, L.* | Numerical delicacies associated with the use of isoneutral mixing operators in ocean models.

09:20 | *McGregor, J.* | Formulation and performance of VCAM.

09:40 | *Diamantakis, M.* | Numerical sensitivities of the ECMWF semi-Lagrangian scheme in upper air forecasts.

10:00 Break

10:30 | *Thuburn, J.* | Towards a forced-dissipative shallow water test case with physics-dynamics coupling.

10:50 | *Klemp, J.* | Evaluation of the Global MPAS for Nonhydrostatic Supercell Simulations.

11:10 Advertising of Posters:

| *Baldauf, M.* | An analytical solution for gravity and sound wave expansion of the linearized compressible, non-hydrostatic Euler equations on the sphere.

| *Reed, K.* | Idealized tropical cyclone experiments of varying complexity: a tool for model development.

| *Kent, J.* | Determining The Effective Resolution of Advection Schemes.

| *Thatcher, D.* | A Moist Variant of the Held--Suarez Test for Atmospheric Model Dynamical Core Intercomparisons.

| *Yao, W.* | A Stratospheric Perspective of a GCM Dynamical Core Intercomparison.

11:30 Break

12:00 | *Jablonowski, C.* | Updates on the Dynamical Core Model Intercomparison Project (DCMIP).

12:20 DCMIP Discussion

12:40 DCMIP Discussion

13:00 Lunch (On your own. NCAR Mesa Lab does have a cash-only cafeteria.)

14:00 Poster Session

15:00 First shuttle departure from NCAR Mesa Lab to Millennium Hotel

15:30 Adjourn

16:00 Second shuttle departure from NCAR Mesa Lab to Millennium Hotel