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


12:20  | 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.


14:40  | 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.
  |  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.  | Geometric 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.


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.


| 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.


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.


10:00  Break
10:30 | Smolarkiewicz, P.K. | A consistent framework for discrete integrations of soundproof and compressible PDEs of all-scale atmospheric dynamics.


11:10 Advertising of Posters:

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


15:50 | 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.
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