

Agenda  
PDEs on the Sphere – 2009

Monday, 27 April 2009

8:00 – 8:50 Registration

8:50 - 9:00 Welcome

**Session 1**

09:00 - 09:25

Would it be worthwhile running a climate model at 1km horizontal resolution?

*Terry Davies*

09:25 - 09:50

A study of two nondissipative velocity and pressure regularization in the shallow water equation case

*Marco Restelli, Marco Giorgetta, Tobiasz Hundertmark, Peter Korn, Sebastian Reich*

09:50 – 10:15

Assessing implicit large eddy simulation for 2D flow

*James Kent*

10:15 – 11:00

Coffee Break

**Session 2**

11:00 - 11:25

A hybrid radial basis function pseudospectral method for 3D thermal convection in the earth's mantle

*Natasha Flyer*

11:25 - 11:50

Adaptive node refinement for RBFs

*Erik Lehto*

11:50 - 12:15

RBF approximation of vector functions and their derivatives on the sphere with applications to solving PDEs

*Grady Wright*

12:15 -14:00

Lunch Break

**Session 3**

14:00 - 14:25

A vortex/radial basis function algorithm for the barotropic vorticity equation on a rotating sphere

*John Boyd, Lei Wang, Robert Krasny, Cheng Zhou*

14:25 - 14:50

Off-centring revisited

*Christian Lerrahn*

14:50 - 15:15

GECoRe: A new geometrically exact remapping scheme on the sphere

*Paul Ullrich, Peter Lauritzen, Christiane Jablonowski*

15:15 -16:00

Coffee Break

**Session 4**

16:00 - 16:25

A Laplace transform filtering integration scheme for the shallow water equations

*Colm Clancy, Peter Lynch*

16:25 - 16:50

Application of the spectral bicubic interpolation scheme to a shallow-water model

*Takeshi Enomoto*

16:50 - 17:15

An inherently mass-conserving semi-implicit semi-Lagrangian discretisation of the shallow water equations on the sphere

*Mohamed Zerroukat, Nigel Wood, Andrew Staniforth, Andy White, John Thuburn*

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Tuesday, 28 April 2009

**Session 5**

- 09:00 - 09:25      Multirate infinitesimal step methods for compressible atmospheric flow  
*Joerg Wensch*, Alexander Galant, Oswald Knoth, Stefan Jebens
- 09:25 - 09:50      An unstructured mesh framework for simulating rotating stratified flows  
*Piotr Smolarkiewicz*, Joanna Szmeltzer
- 09:50 – 10:15      Grid refinement in the icosahedral-triangular ICON model: Implementation and first results  
*Gunther Zangl*
- 10:15 – 11:00      Coffee Break

**Session 6**

- 11:00 - 11:25      Aspects of unstructured grid methods for weather and climate  
*Max Gunzburger*, Lili Ju, Todd Ringler, Vani Cheruvu, Janet Petersen, Geoff Womeldorff, Steve Price, Huai Zhang
- 11:25 - 11:50      Discretizing fluid dynamics in vector invariant form on orthogonal (geodesic) C-grids  
*Almut Gassman*
- 11:50 - 12:15      A staggered conservative scheme for the shallow-water equations and its geometrical properties  
*Matthias Sommer*
- 12:15 -14:00      Lunch Break

**Session 7**

- 14:00 - 14:25      Wave propagation on arbitrarily structured C-grids  
*Bill Skamarock*, John Thuburn, Joe Klemp, Todd Ringler, Max Gunzburger, Lili Ju
- 14:25 - 14:50      A test suite for GCMs: An intercomparison of 10 atmospheric dynamical cores  
*Christiane Jablonowski*, Peter Lauritzen, Mark Taylor, Ram Nair
- 14:50 - 15:15      Development of a global wave propagation model with local grid refinement  
*Jorn Behrens*, Alexey Androsov, Sven Harig, Alfred Wegener
- 15:15 -16:00      Coffee Break

**Session 8**

- 16:00 - 16:25      Towards a fully-implicit version of the parallel ocean program  
*Wilbert Weijer*, Kate Evans, E. Bernsen, J. Theis, Andrew Salinger, D. Rouson
- 16:25 - 16:50      Further improvement of NICAM dynamical core toward the PETAFLOPS computing  
*Hirofumi Tomita*
- 18:00              Workshop Banquet

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Wednesday, 29 April 2009

**Session 9**

- 09:00 - 09:25 Tracer advection using characteristic discontinuous Galerkin  
**Robert Lowrie**
- 09:25 - 09:50 How to monotonize the spectral element advection operator  
**Amik St-Cyr**, Mark Taylor, Aime Fournier
- 09:50 – 10:15 A conservative semi-Lagrangian multi-tracer transport scheme (CSLAM) on the cubed-sphere grid  
**Peter H. Lauritzen**, Ramachandran D. Nair, Paul A. Ullrich
- 10:15 – 11:00 Coffee Break

**Session 10**

- 11:00 - 11:25 CCSM with the HOMME spectral element atmospheric dynamical core on the cubed-sphere grid  
**Mark Taylor**, Amik St-Cyr, Peter Lauritzen, Aime
- 11:25 - 11:50 A discontinuous Galerkin method for (non)-hydrostatic atmospheric flows  
**Matthias Laeuter**, Francis Giraldo, Marco Restelli, Sebastian Reich, Dorthe Handorf, Klaus Dethloff
- 11:50 - 12:15 A viscous discontinuous Galerkin shallow water model on the sphere  
**Ram Nair**
- 12:15 -14:00 Lunch Break

**Session 11**

- 14:00 - 14:25 High-order semi-implicit time-integrators for element-based continuous and discontinuous Galerkin methods for geophysical fluid dynamics  
**Francis Giraldo**
- 14:25 - 14:50 Efficient solution of frameworks for cubed sphere atmospheric climate models  
**Kate Evans**, Rick Archibald, Damian Rouson, Andrew Salinger, Mark Taylor, James White III, John Drake
- 14:50 - 15:15 A framework for testing global nonhydrostatic models  
**Nils Wedi**, Piotr Smolarkiewicz
- 15:15 -16:00 Coffee Break

**Session 12**

- 16:00 - 16:25 An upwind, fully discrete, and high-order accurate linearized Riemann solver: Application to non-hydrostatic atmospheric simulation  
**Matthew Norman**
- 16:25 - 16:50 Nonhydrostatic Icosahedral Model  
**J.L. Lee**, A.E. MacDonald
- 16:50 - 17:15 Viability of hexagonal C-grid staggering for nonhydrostatic applications  
**Joe Klemp**, Bill Skamarock, Todd Ringler

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Thursday, 30 April 2009

**Session 13**

09:00 - 09:25

A full shallow water model with the Yin-Yang grid

*Abdessamad Qaddouri*, Jean Cote

09:25 - 09:50

Predicting mesh density for adaptive modeling of the global atmosphere

*Hilary Weller*

09:50 – 10:15

Developing mass conserving and positive definite semi-Lagrangian advection for NCEP GFS

*Hann-Ming Henry Juang*

10:15 – 11:00

Coffee Break

**Session 14**

11:00 - 11:25

Numerical treatment of energy and potential vorticity conservation on arbitrarily structured C-grids

*Todd Ringler*, John Thuburn, Joe Klemp, Bill Skamarock, Max Gunzburger, Lili Ju

11:25 - 11:50

Uniformly accelerated particle motion on the sphere.

*Jean Côté*, Monique Tanguay and Claude Girard

11:50 - 12:15

The ICON Hydrostatic atmospheric dynamical core: properties of the differencing operators and results from idealized tests

*Hui Wan*