Emmanuel Audusse

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Department of Mathematics and Computer Science
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Citizenship: France.
Date of Birth: August 1, 1975 (Clamart, France).

Present position :

- Post-doctoral position at Freie Universitaet Berlin (Germany),
  since October 2004.

  Group : Numerical Analysis and Scientific computing,
  Head of the group: Prof. Rupert Klein. forces, Numerical schemes and dry areas.

Research Domains :

- Hyperbolic systems of balance laws: Shallow water equations.
- Scalar conservation laws: Discontinuous flux case.
- Fluid mechanics : Hyperbolic multilayer models for shallow water flows, Conservative approach for Coriolis forces.
- Finite volumes : Kinetic schemes, Well-balanced schemes, Second-order schemes for unstructured meshes, conservative mesh adaptation.

Education :

- Doctor of Philosophy in Mathematics, Sept. 2004,
  INRIA Rocquencourt and Université Pierre et Marie Curie (Paris 6), France.

  Title: *Hyperbolic Models and Numerical Analysis for shallow water flows.*

  Advisor: Prof. Benoit Perthame.

  Keywords: Shallow water equations, multilayer model, transport equation, scalar conservation law, discontinuous flux, finite volumes, well-balanced scheme, kinetic interpretation, hydrostatic reconstruction, Kruzkov's entropies.
- Master in Numerical Analysis,
  Université Pierre et Marie Curie (Paris 6), France, June 1999.
- Engineer degree from the Ecole Nationale des Ponts et Chaussées,
  ENPC, France, June 1999.

Publications :

- E. Audusse & M.O. Bristeau,
  A well-balanced positivity preserving second order scheme for shallow water flows on unstructured grids,
  to appear in Journal of Computational Physics.

- E. Audusse & B. Perthame,
  Uniqueness for discontinuous fluxes via adapted entropies,
  to appear in Proceedings of the Royal Society of Edinburgh - Section A : Mathematics.

- E. Audusse,
  A multilayer Saint-Venant model,
  to appear in Discrete and Continuous Dynamical Systems - Series B.

- E. Audusse, F. Bouchut, M.O. Bristeau, R. Klein & B. Perthame,
  A fast and stable well-balaced scheme with hydrostatic reconstruction for shallow water flows,
  SIAM Journal of Scientific Computing, **25** (2004), no. 6, 2050–2065.

- E.Audusse & M.O. Bristeau,
  Transport of pollutant in shalow water : a two time steps kinetic method,
  M2AN, **37** (2003), no. 2, 389–416.

Conferences :

- *Mathematical and numerical analysis of a reduced multilayer model for shallow water flows.*
  ECCOMAS 2004, Jyvaskyla, Finlande, Juillet 2004.

- *Shallow water flows on unstructured grids : A fast and stable well-balanced kinetic method.*
  WONAPDE 2004, Concepcion, Chili, Janvier 2004.

- *Transport of pollutant in shallow water flows.*
  TELEMAC user's club, Chamrousse, France, Octobre 2003.

- *A multilayer Saint-Venant model.*
  CANUM 2003, Montpellier, France, Juin 2003.

- *Transport of pollutant in shallow water flows (poster).*
  Journées savoisiennes de mathématiques appliquées, Chambéry, France, Mai 2002.

Teaching experience:

- Linear algebra with Maple,
  Versailles University, Spring 2003.

- Analysis and linear algebra,
  Marne-la-Vallee University, Winter 2002.

- Mathematic teacher (national service),
  Ecole de la Neuville, 1999-2001.