Méthodes Numériques pour les Fluides
Le 14 Juin 2007
Bât. A, Université Paul-Verlaine-Metz, Ile du Saulcy, 57045 Metz Cedex
Salle 122
10h30-11h00
Accueil

11h00-11h50 F. DUBOIS
(Cons. Nat. Arts-et-Métiers, Paris)
Introduction to the Lattice Gas Boltzmann Method
This talk gives an elementary introduction to the Lattice Gas Boltzmann method, along the lines of the MRT scheme of P. Lalemand and D. D'Humieres. The basic ingredients consist solely of the (exact) characteristics method and of the Euler explicit time scheme. The modified equation analysis of the scheme gives a Chapman-Enskok like asymptotic expansion.

11h50-12h40 V. JOHN
(Saarland University, Saarbrücken)
Numerical Simulation Population Balance Systems
Population balance systems model fluids with particles for which the particle size distribution is of interest. They are a coupled system of physical conservation laws. This talk will discuss approaches for the numerical simulation for the individual components of the population balance systems. First numerical results for a population balance system describing a barium sulphate precipitation are presented.

12h50-14h00
Pause repas

14h10-15h00 I. GREFF
(Univ. Pau et des Pays d'Adour)
Introduction to H-matrices
Linear algebra is an essential part of almost all large scale computations modelizing p.d.e governed phenomena. One of the major advantage of H-matrices is to allow to perform approximate matrix arithmetics in almost linear complexity. In this talk, we give an introduction to H-matrices, based on the Winterschool « Hierarchical Matrices » by W. Hackbusch, L. Grasedyck, S. Boerm, (MPI Leipzig).

15h00-15h50 K. DOMELEVO
(Univ. Toulouse 3)
Finite Volume Method and Discrete Duality
We address a finite volume method for elliptic problems equipped with a discrete duality principle, which combines conservation and discrete derivation operators in duality. Tools to perform the analysis as well as perspectives will be given.

15h50-16h40 J-F. SCHEID
(Univ. Nancy 1)
A Numerical Study of the Motion of a Deformable Body in a Viscous Fluid
We are interested in the numerical study of a model for the motion of a deformable body in a Navier-Stokes incompressible fluid. We present a numerical method based on a fixed mesh method already in use in the rigid body case. Numerical simulations are performed for a fish-like swimming model.

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