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SEMINAR OF NUMERICAL ANALYSIS

➢ **WEDNESDAY 22 MARCH 2017 - ROOM ME D0 1418 - 16h15**

Dr. Laurent Gosse (Istituto per le Applicazioni del Calcolo, IAC – CNR, Rome, Italy) will present a seminar entitled:

«An overview of "piecewise-exact" finite-difference schemes for various types of time-dependent PDE's»

Abstract:

The idea of taking advantage of local exact solutions of a differential operator in order to derive a numerical scheme solving a given PDE appears with the 1926 paper by Trefftz. It was meant to increase accuracy for an elliptic boundary-value problem. Then, the idea was extended to (mostly 1D) time-dependent problems, like for instance Scharfetter-Gummel's and Chang-Cooper's schemes for drift-diffusion equations. In the 90's, another extension was proposed, for scalar balance laws, under the name of "well-balanced schemes", and became famous for practical resolution of shallow water equations with topography. A challenging issue was to generalize these methods from 1D to 2D without dimensional-splitting. This was done for both kinetic models (including e.g. chemotaxis) and diffusive-type equations (some preliminary numerics will be presented for incompressible 2D Navier-Stokes-Coriolis, displaying in particular decay onto "zonal jets").

Lausanne, 2 March 2017/AB/ms

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The seminars are announced at http://mathicse.epfl.ch/seminars