

Prof. Fabio NOBILE

Mathematics Institute of Computational Science and Engineering - MATHICSE

SEMINAR OF NUMERICAL ANALYSIS

➤ **TUESDAY 17 JULY 2011 - ROOM MA A1 10 - 16h15**

Dr. Mohammad MOTAMED (King Abdulla University, Jeddah, Kingdom of Saudi Arabia) will present a seminar entitled:

"Acoustic and elastic waves in random media"

ABSTRACT:

In the first part of this talk, we propose and analyze a stochastic collocation method for solving the second order wave equation with a random wave speed and subjected to deterministic boundary and initial conditions. The speed is piecewise smooth in the physical space and depends on a finite number of random variables. The numerical scheme consists of a finite difference or finite element method in the physical space and a collocation in the zeros of suitable tensor product orthogonal polynomials (Gauss points) in the probability space. This approach leads to the solution of uncoupled deterministic problems as in the Monte Carlo method. We consider both full and sparse tensor product spaces of orthogonal polynomials. We demonstrate different types of convergence of the "probability error" with respect to the number of collocation points for full and sparse tensor product spaces and under some regularity assumptions on the data. In the second part of the talk, we present extensions to the elastic wave equation with random coefficients and random boundary conditions.

Lausanne, 7 July 2012/FN/cr