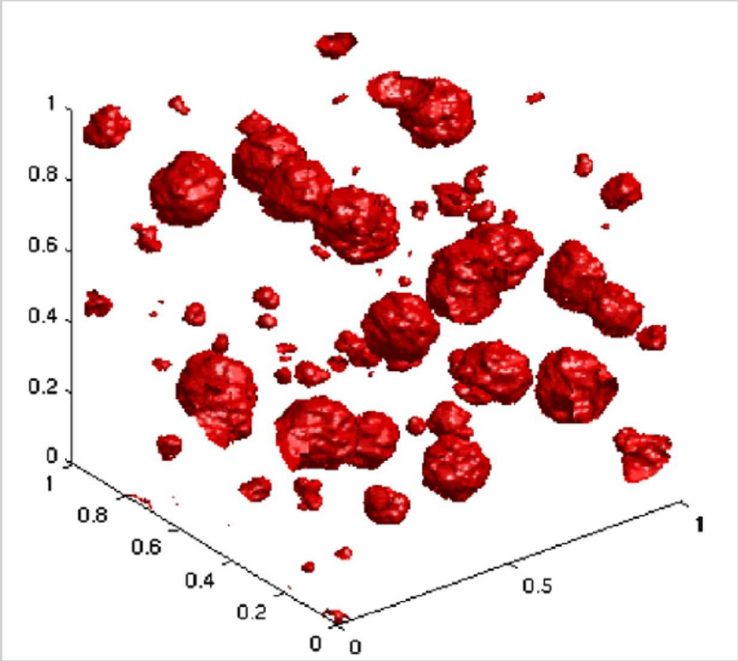
ciencia e ingenieria de estructuras

SEMINARIO INTERUNIVERSITARIO DE MECÁNICA Y MATERIALES
SEMINARIO JOSÉ ANTONIO GARCÍA GARCÍA
MÁSTER DE ESTRUCTURAS

LOW-RANK APPROXIMATIONS AND OPTIMAL MODEL REDUCTION FOR UNCERTAINTY QUANTIFICATION



Anthony NOUY

Ecole Centrale de Nantes, Nantes (France)

Día : Jueves 21 de noviembre 2013
Hora : 12:00h
Lugar : Seminario II, 4ª planta, E.T.S. Ing. Caminos, C. y P.

Campus Fuentenueva

Universidad de Granada

http://w3.mecanica.upm.es/seminarios http://www.ugr.es/~sjagg http://www.ugr.es/~iestructuras

SEMINARIO INTERUNIVERSITARIO DE MECANICA Y MATERIALES
SEMINARIO JOSÉ ANTONIO GARCÍA
MÁSTER DE ESTRUCTURAS

LOW-RANK APPROXIMATIONS AND OPTIMAL MODEL REDUCTION FOR UNCERTAINTY QUANTIFICATION

Anthony NOUY

Abstract

Tensor based numerical methods are receiving a growing attention for their use in uncertainty quantification where functions of multiple random parameters have to be approximated. Here, we present strategies for complexity reduction which are based on low-rank and sparse approximation methods. We discuss the connection between best approximation problems in low-rank tensor subsets and the problem of optimal model reduction in low-dimensional reduced spaces, and we present algorithms for the approximation of these reduced spaces.

We finally present algorithms that are able to directly construct quasi-optimal low-rank approximations of the solution of equations in tensor format, where the optimality is associated to a desired metric. These algorithms, that apply to a large class of stochastic PDEs, are based on perturbations of ideal minimal residual formulations.

Brief-Bio

Anthony NOUY received his PhD in 2003 from Ecole Normale Superieure de Cachan in France. In 2004, he became assistant professor at the University of Nantes.
Since 2010, he is a full professor in the Department of Mathematics and Informatics of the Ecole Centrale de Nantes, and he is a member of the Research institute in civil engineering and mechanics (GeM).

His current research interests mainly concern the development of numerical methods for uncertainty quantification, multiscale numerical methods, model reduction techniques and tensor-based methods for solving high-dimensional problems in computational science.
His website is http://www.ec-nantes.fr/anthony-nouy