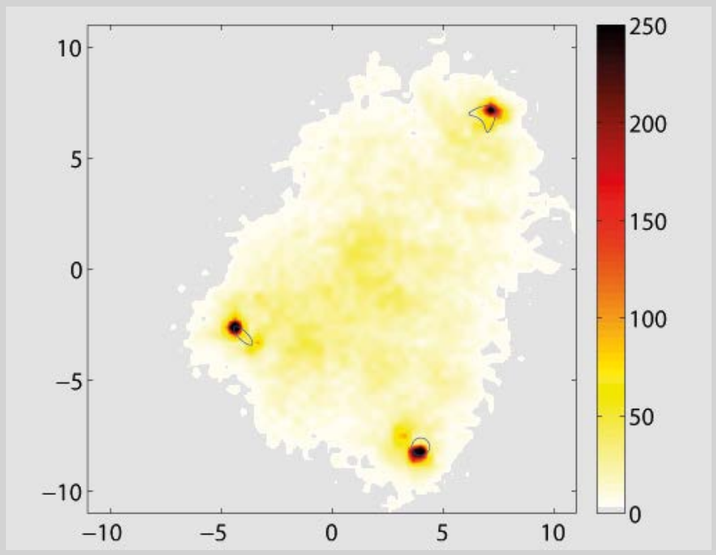

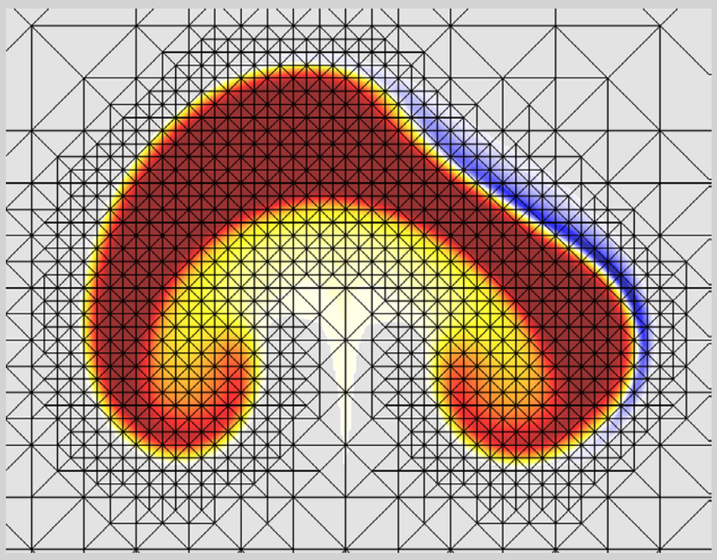

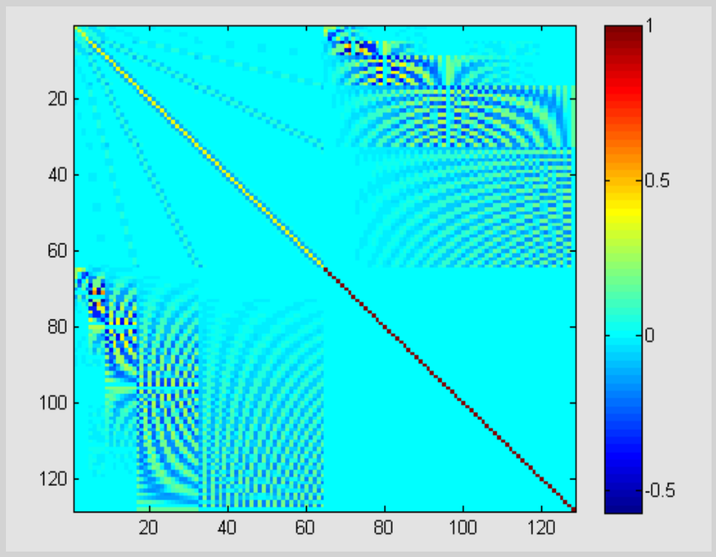

Oberseminar Numerik

Frau Prof. Dr. Alina Chertock

(North Carolina State University)

20.06.17
10:15 Uhr
Seminarraum 05-426
Staudingerweg 9, 55128 Mainz

„Numerical methods for hyperbolic systems of PDEs with uncertainties“

Abstract:
Many system of hyperbolic conservation and balance laws contain uncertainties in model parameters, initial or boundary data due to modeling or measurement errors. Quantifying these uncertainties is important for many applications since it helps to conduct sensitivity analysis and to provide guidance for improving the models. Among the most popular numerical methods for uncertainty quantification are stochastic spectral methods. Such methods decompose random quantities on suitable approximation bases. Their attractive feature is that they provide a complete probabilistic description of the uncertain solution.
A classical choice for the stochastic basis is the set of generalized Polynomial Chaos (gPC) spanned by random polynomials, continuous in the stochastic domain and truncated to some degree. It is well-known, however, that when applied to general nonlinear (non-symmetric) hyperbolic systems, such approximations result in systems for the gPC coefficients, which are not necessarily globally hyperbolic since their Jacobian matrices may contain complex eigenvalues. In this talk, I will present a splitting strategy that allows one to overcome this difficulty and demonstrate the performance of the proposed approach on a number of numerical examples including systems of shallow water and compressible Euler equations.

Hierzu sind alle herzlich eingeladen.

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