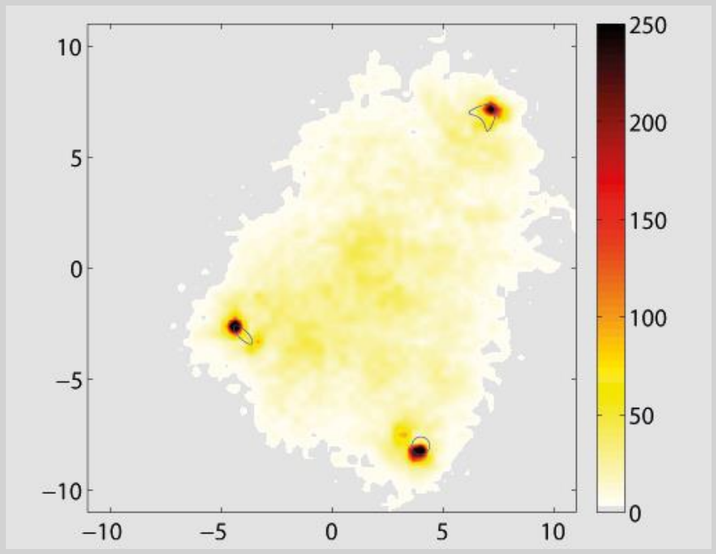

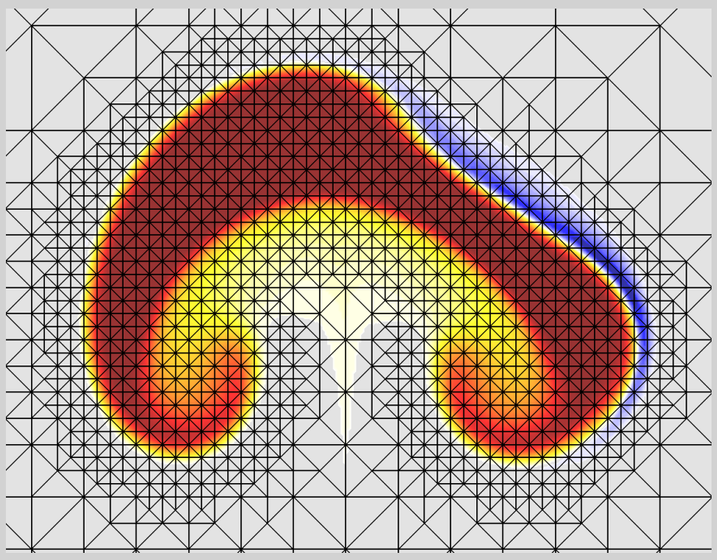

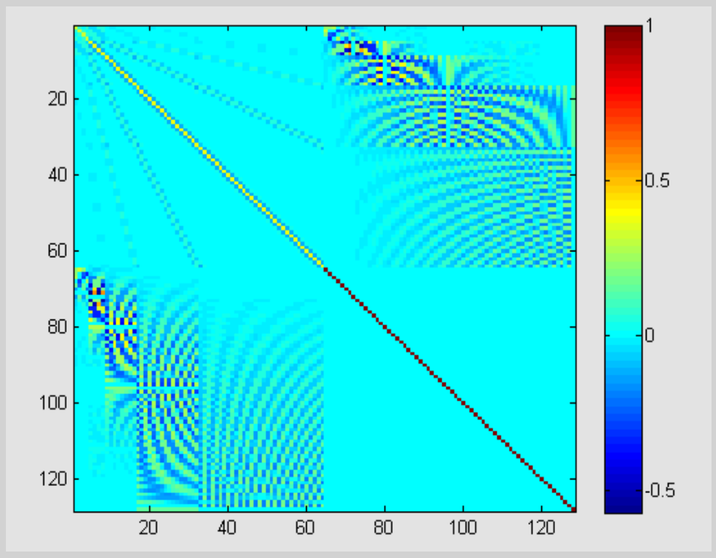

Oberseminar Numerik

Herr Dr.-Ing. B. Müller,
Herr Dr.-Ing. F. Kummer
(TU Darmstadt)

24.03.15
10:30 Uhr
Hilbertraum (05-432), Staudingerweg 9, 55128 Mainz

„BoSSS: A framework for the development of discontinuous Galerkin based numerical methods“

Abstract: We are presenting a novel Discontinuous Galerkin (DG) based solver framework, which is currently being developed at the Chair of Fluid Dynamics (fdy) at the TU Darmstadt. It is organized as a versatile set of object-oriented libraries and aimed towards being a rapid-prototyping environment for new DG-based solvers for various equations, thus bridging the gap between Matlab based proofs of concepts and highly optimized single-purpose codes. In the first part of the talk, we will briefly outline the relevant design features which manifest themselves in the structure of the framework.

Current applications include solvers for the compressible as well as the incompressible Navier-Stokes equations and surfactant transport. A special emphasis is put on immersed boundary and multiphase flow solvers, with both, sharp- and smeared interface approaches. In this context, BoSSS contains several novel supportive technologies; most importantly hp-accurate quadrature on cut-cells of arbitrary shape which is necessary to provide hp-convergence for sharp interface methods. The second important feature is a linear solver framework which is tightly integrated with the DG discretization. This allows exploiting DG-specific properties of the system, e.g. in the preconditioner, which is usually not possible with 'black-box' solver approaches. Recent results from simulations of these problems will be shown in the second part of the talk.

A public release of the BoSSS code is planned within the year 2015.

Hierzu sind alle herzlich eingeladen.

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