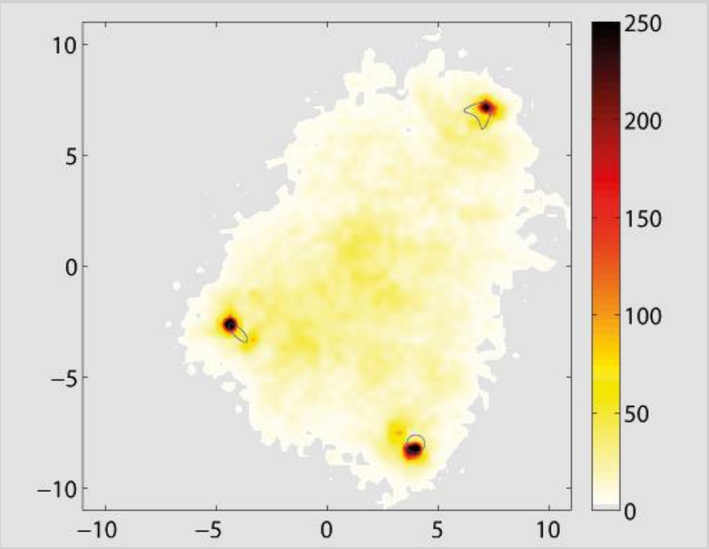

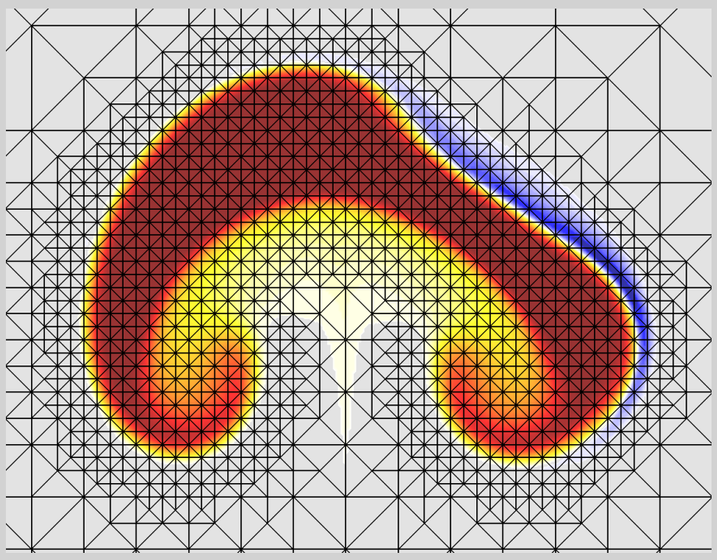

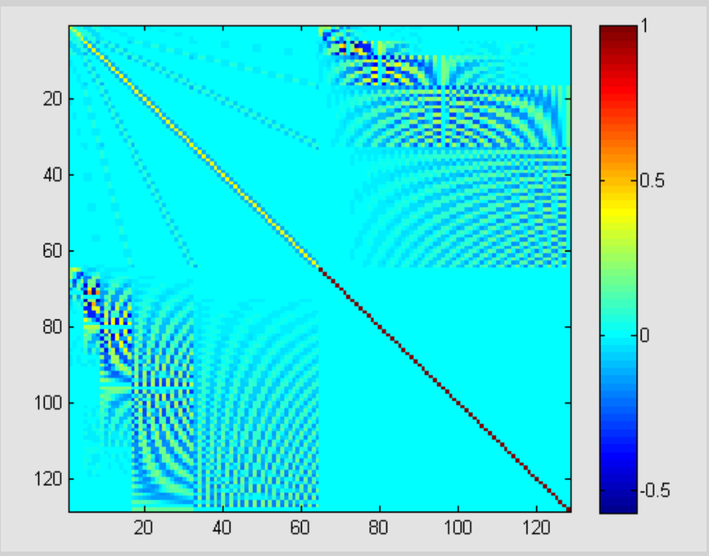

Oberseminar Numerik

Frau Dr. Nehzat Emamy
(Chair of Fluid Dynamics, TU Darmstadt)

12. 02.2015
14:15 Uhr
05-426
Staudingerweg 9, 55128 Mainz

“Projection scheme using a high-order discontinuous Galerkin Finite Element method for solving the incompressible Navier-Stokes equations in coupled multi-physics problems”

Abstract:
Numerical simulations of deformation of a droplet in electric fields are performed in the present study. The droplet is suspended in another immiscible fluid with the same density and viscosity but a different dielectric property (permittivity). By applying an electric field, both fluids are polarized that gives rise to forces at the common interface and deformation.
An electromechanical approach to solve the above mentioned problem consists of solving the governing equations of the electric and fluid fields, computing the coupling forces and capturing the movement of the interface of the droplet and the surrounding fluid. The interface is represented as the zero iso-value of a level set function and an advection equation is solved to find the movement of the interface.
The governing equations of the electric and fluid fields and the level set advection equation are discretized using the Discontinuous Galerkin Finite Element method (DG) with an in-house code for solving conservation laws. Considering that there is no jump in the fluid properties, a single phase solver of the Navier-Stokes equations including the surface tension force at the interface is developed.
Focus of the talk is to solve the incompressible Navier-Stokes equations using the DG method, for which a projection scheme with a consistent Neumann pressure boundary condition is employed.

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Hierzu sind alle herzlich eingeladen.

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