Talk announcement

Daniel Jodlbauer

Tuesday, Nov 29, 2016

15:30, S2 059

Robust preconditioners for fluid-structure interaction problems

Fluid-structure-interaction problems have a wide range of applications, but their efficient solution remains challenging. In this work we provide all details necessary for a monolithic ALE implementation using the finite element library deal.II. Moreover, we show different ways of incorporating the continuity conditions on the interface on the discrete level. To actually solve the arising linear systems, we develop a preconditioner based on an approximate block-wise LU-factorization, splitting the coupled system of equations into its natural fluid, solid and mesh sub-problems. Numerical results illustrate the robust convergence with respect to different material parameters and mesh-size h, but with an acceptable dependence on the time-step size Δt. Furthermore, we observe that this iterative approach outperforms direct solvers even for a low number of degrees of freedoms and without parallelization.