

A parallel space-time multigrid solver for the Navier-Stokes equations

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For evolution equations we present a space-time method based on Discontinuous Galerkin finite elements. Space-time methods have advantages if we have to deal with moving domains and if we need to do local refinement in the space-time domain. For this method we present a multigrid approach based on space-time slabs. This method allows the use of parallel solution algorithms. In particular it is possible to solve parallel in time and space. Furthermore this multigrid approach leads to a robust method with respect to the polynomial degree which is used for the DG time stepping scheme. Numerical examples for the Stokes and Navier-Stokes equations will be given which show the performance of this space-time multigrid approach.