
THOMAS WIHLER, McGill University, 805 Sherbrooke W., Montreal, QC, Canada H3A 2K6

hp-Discontinuous Galerkin methods for the Stokes equations

We will discuss hp-discontinuous Galerkin finite element discretizations for the Stokes equations in two space dimensions. In hp-approaches both the element sizes as well as the approximation orders can vary locally. In this way, hp-methods can adjust to the local solution behavior very efficiently.

We shall first present some a priori results for smooth solutions with local singularities in polygonal domains. Specifically, we will show how exponential rates of convergence can be obtained in the numerical approximations.

Secondly, we will present an hp-error indicator (based on a suitable hp-a posteriori error analysis) that can be combined with an hp-adaptive algorithm resulting in automatic refinements of the approximation spaces. In addition, some numerical experiments shall be given.