The twol-level hp-version of Local Projection Stabilizations for inf-sup stable elements and their efficient solution

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Recently, Local Projection Stabilization (LPS) techniques have become quite popular. The key ingredients of LPS methods are projections π on discontinuous coarse spaces and a restriction of the stabilizing effect on the fluctuation $(Id - \pi)$. This approach possesses several advantages in comparison to classical residual based methods.

In this talk we present the results of [3,4] and extend [1] to inf-sup stable elements using the abstract framework developed in [6]. In contrast to [7] we focus on the two-level case. We present a priori estimates including the dependency on the polynomial orders of the finite element spaces. These estimates are optimal with respect to the mesh size h and are used for the determination of the stabilization parameters. Numerical experiments confirm our theoretical results. The approach will be compared with the equal order case, cf. [5], and with residual based methods, cf. [2]. Finally, we address the efficient solution of the corresponding saddle point problems.

References

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