Application of a Discontinuous Petrov-Galerkin (DPG) Method to the Stokes Equations

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Outline

1 Introduction

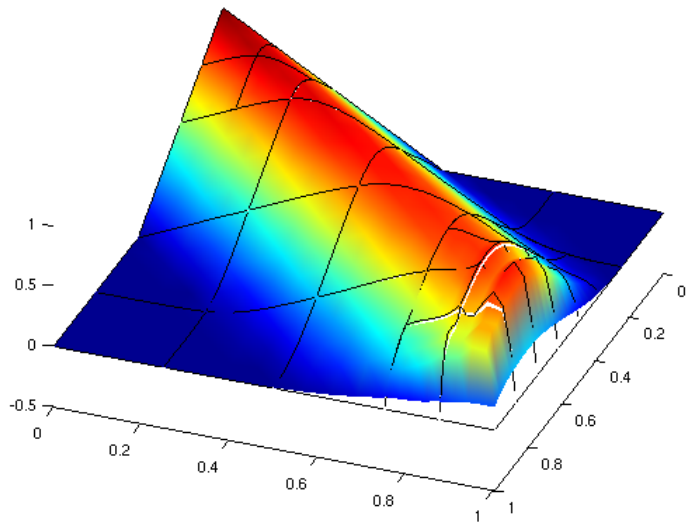
Stokes Formulation

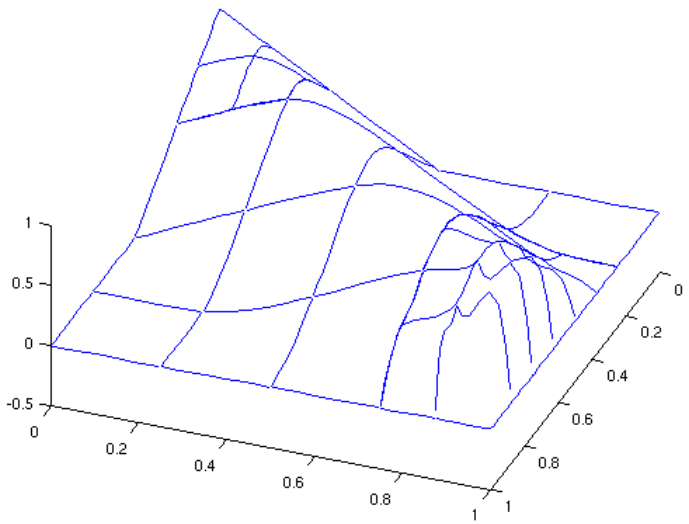
Experiments with parallel adaptivity

We have implemented Heuer and Demkowicz's inner product in Camellia

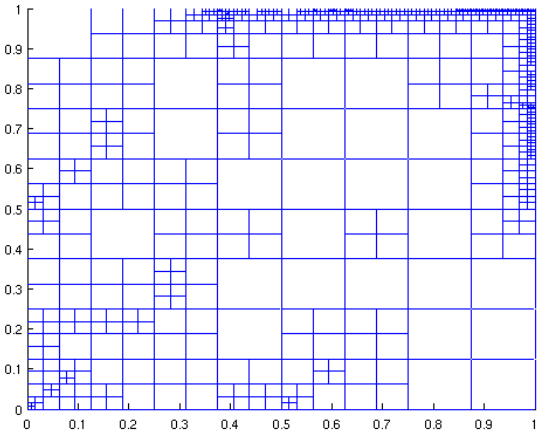
$$((\tau, v), (\delta\tau, \delta v))_V = C(K, \epsilon)\|v\| + \epsilon\|\nabla v\| + \|\beta \cdot \nabla v\|_w + \|\tau\|_w + \|\nabla \cdot \tau\|_w$$

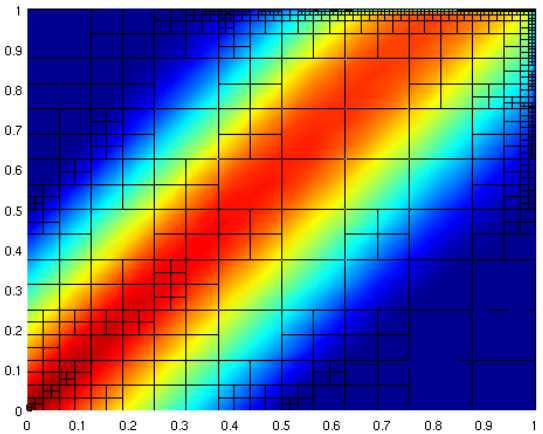
where $C(K, \epsilon) = \min(\epsilon, |J(K)|)$.

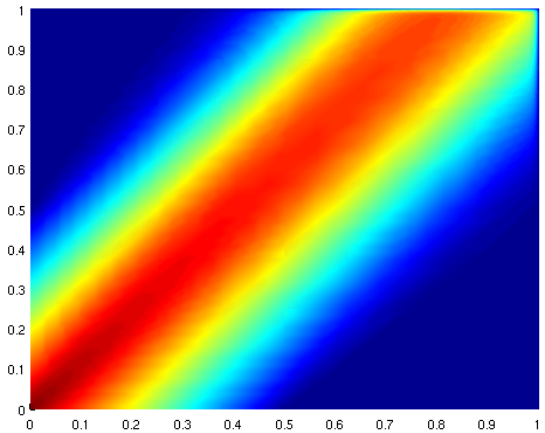




For better pictures, $\epsilon = 5e - 2$, slightly skew advection.







To make sure we still work at smaller scales, $\epsilon = 1e-3$