

A STABILIZED MIXED DISCONTINUOUS GALERKIN METHOD FOR DARCY FLOW

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Previously we developed a stabilized mixed finite element method for Darcy flow [1]. Velocities were assumed continuous or in $H(\text{div}, \Omega)$ and pressure could be continuous or discontinuous. Almost all combinations were shown to be convergent. An interesting feature of the formulation is that there are no mesh-dependent parameters in the stabilization terms. In this work we generalize to a discontinuous Galerkin formulation in which velocities may also be discontinuous. This permits complete freedom in the choice of interpolations. We present numerical results and error estimates in the “stability norm”.

References

[1] A. Masud and T.J.R. Hughes, “A stabilized mixed finite element method for Darcy flow,” *Comput. Methods Appl. Mech. Engrg.* 191 (2002) 4341—4370.