

Stabilized Dual Hybrid Mixed Method Applied to Elliptic Problems

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ABSTRACT

This paper deals with the application of the Stabilized Dual Hybrid Mixed (SDHM) method [1], which solves elliptic problems, in particular those associated with miscible flows in heterogeneous porous media.

The SDHM is designed considering a discontinuous approximation among the elements, with continuity along the interface weakly imposed via a Lagrange multiplier and stabilization terms associated with interior and edge elements. This formulation is employed to a elliptic system given by a combination of the Darcy's law and the conservation of mass equation.

Numerical simulations demonstrating the efficiency and accuracy of the method compared to stabilized and mixed discontinuous Galerkin methods [2, 3] and the Local Discontinuous Galerkin (LDG) method [4]. Optimal rates of convergence are found to equal order interpolation in all variables adopting triangular or quadrilateral elements.

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