

Least squares methods with interface approximation for two phase Stokes flow

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We consider the coupled problem with Stokes flow in two subdomains separated by an interface. At the interface, continuity of the velocity and the momentum balance condition for the stress tensor need to be imposed. The interface is characterized by a level set function which satisfies an appropriate transport equation and the problem can be written as a domain decomposition problem.

In this talk we first present how the stationary Stokes problem can be written as a first order system. For numerical results a combination of $H(\text{div})$ -conforming Raviart-Thomas and standard H^1 -conforming elements is used.

After that we analyze the effect of approximated flux boundary conditions on Raviart-Thomas finite elements in order to get the effect of the approximated interface on the momentum balance condition. In particular, we present an estimate for the normal flux on interpolated boundaries.

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