

WORKING GROUPS PDE

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Hermite finite elements for fluid flow equations

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A couple of Hermite methods are shown to be advantageous alternatives to classical finite elements to solve fluid flow problems. Emphasis is given to flows in porous media and to incompressible flows on curved manifolds.

Fictitious domain approach and level-sets method for the Stokes problem

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In this paper, we focus on shape optimization related to the Stokes system. We recall to general framework of classical optimization to compute the shape and topological derivative of a given cost functional. So we combine fictitious domain approach and the two derivatives to propose a numerical scheme (based on level set method) to study the Stokes problem. To end the paper, we give some numerical results for $d = 2$.

¹The presentation will last about 30 minutes + further questions and discussions