

Iterative coupling solution of a novel stabilization scheme for Biot's model**Authors:**

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Abstract: The coupling of fluid flow and mechanical deformation within a porous media is studied by Biot's model [1]. For the numerical simulation of this poroelastic problem, there are mainly two ways to deal with the solution of the large sparse systems arising after discretization of the system. Namely, fully coupled or monolithic methods and iterative coupling methods. In this talk, we present a decoupled method falling in this latter group. The proposed iterative scheme naturally appears by iterating between the flow and mechanics problems from a new stabilized discretization of the model. We demonstrate the parameter-robust convergence of the proposed iterative coupling method, and show the optimality of this method for one-dimensional problems and their good behavior in higher dimensions.

References:

- [1] M.A. Biot, *General Theory of Three-Dimensional Consolidation*, Journal of Applied Physics, 12 (1941), pp. 155-164.