



Monotonicity properties of some finite element discretizations of the linear Biot's model in poroelasticity

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ABSTRACT

We discuss on monotonicity properties of some discrete schemes for the linear Biot's model in poroelasticity. We introduce a non-conforming three field discretization: Crouzeix-Raviart elements for the displacement field and piece-wise constant elements for the pressure field. We show convergence of such fully discrete scheme using implicit Euler method in time. We also consider the monotone behavior of the this discretization and also of P1-P1-stabilized and MINI element discretizations. We prove that eliminating the bubble functions in the MINI element leads to operator with improved monotonicity properties. This is a joint work with Carmen Rodrigo (University of Zaragoza), Francisco J. Gaspar (University of Zaragoza) and Xiaozhe Hu (Tufts University).

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