A posteriori error estimation by stress and flux reconstruction for Biot's consolidation model

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Flux and stress equilibration procedure for the Biot's consolidation (see [2]) problem is proposed and analyzed. Using Raviart-Thomas elements with weakly symmetry as in [4], the stress tensor is reconstructed from a displacement-pressure approximation computed with a stable finite element pair. The Darcy velocity is reconstructed in the Raviart-Thomas finite element space, such that both reconstructions are H(div)-conforming. The equilibration procedure offer serveral advantages (see [1]). These reconstructions are build on vertex patches (see also [3]) such that they lead to a local efficient a posteriori error estimator for the Biot's consolidation problem, involving constants that depends only on the shape regularity of the triangulation.

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