A posteriori Error Estimation by stress reconstruction using non conforming methods - presentation in Pairs

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Non conforming methods do not require continuity of the solution along edges, and this often implies more flexibility. In particular, the constants involved in the error estimation remain more local allowing the use of adaptive strategies. Stress and flux reconstruction techniques constitute a well-studied tool in association with adaptive finite element computations (see e.g. [1] and [2]), and this presentation in pairs examines the stress reconstruction for non conforming methods from two different angles. On the one hand, we extend the stress reconstruction procedure for the nonconforming triangular piecewise quadratic finite element space by Fortin and Soulie can be used for the displacement approximation and its combination with discontinuous piecewise linear pressure elements is known to constitute a stable combination for incompressible linear elasticity computations (see [3]). On the other hand we examine discontinuous Galerkin methods for problems arising in elasticity and extend our analysis of reconstruction-based error estimators to these formulations. For both mehtods, we are interested in global efficiency and guaranteed reliability bound involving only known constants.

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