STABILIZED FINITE ELEMENT APPROXIMATION FOR A GENERALIZED BOUSSINESQ PROBLEM: A POSTERIORI ERROR ANALYSIS

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ABSTRACT. In this talk we present an a posteriori error analysis for low order stabilized finite element approximations for a heat driven flow called the generalized Boussinesq problem. We mainly consider standard stabilization procedures over conforming finite element spaces, and a more novel one, that is built upon the previous one, delivering a final low order discrete non-conforming solution, but with the main advantage of being solenoid [1]. The a posteriori error analysis is based on a so-called Ritz projection of the errors [2], by using energy-type norms, and the constructed a posteriori error estimators, for which we prove reliability and a locally efficient results, are of residual-type. Several numerical experiments reveal the good performance of the devise a posteriori error estimators on adaptive procedures for three dimensional problems.

Keywords: Low-order stabilized finite element methods; divergence free finite element methods; a posteriori error analysis.

Mathematics Subject Classifications (2010): 65N15

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