Error estimates of a two-grid penalty finite element method for the Smagorinsky model

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Abstract

In the paper, we consider the penalty finite element methods (FEMs) for the stationary Smagorinsky model. Firstly, a one-grid penalty FEM is proposed and analyzed. Since this method is nonlinear, a novel linearized iteration scheme is derived for solving it. We also derived the stability and convergence of numerical solutions for this iteration scheme. Furthermore, a two-grid penalty FEM is developed for Smagorinsky model. Under $\varepsilon<

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