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Title:

Error Analysis of the Generalized MAC Scheme

 Abstract

We provide a rigorous convergence analysis for the generalized MAC scheme on curvilinear domains. The error analysis for the velocity field is mainly done by the energy estimate utilizing the discrete identities satisfied by the spatially compatible discretizations which properly incorporates the no-slip, no-penetration condition on physical boundaries. In addition, we also proved the by

Ladyzhenskaya-Babuska-Brezzi (LBB) condition for our scheme, which is important on its own and is essential to the pressure error estimate.