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A GALERKIN/LEAST-SQUARE FINITE ELEMENT APPROXIMATION OF BRANCHES OF NONSINGULAR SOLUTIONS OF THE STATIONARY NAVIER-STOKES EQUATIONS

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摘要
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A GALERKIN/LEAST-SQUARE FINITE ELEMENT APPROXIMATION OF BRANCHES OF NONSINGULAR SOLUTIONS OF THE STATIONARY NAVIER-STOKES EQUATIONS

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Abstract In the author's previous paper [13], a Galerkin/Least-Square type finite element method was proposed and analyzed for the stationary N-S equations. The method is consistent and stable for any combination of discrete velocity and pressure spaces(without requiring the Babuska-Brezzi stability condition). Under the condition that the solution of N-S equations is unique (i.e. in the case of sufficient viscosity or small data), the existence, uniqueness and convergence (at optimal rate) of discrete solution were proved. In this paper, we further investigate the established Galerkin/Least-Square finite element method for the stationary N-S equations. By applying and extending the results of Lopez-Marcos \& Sanz-Serna [15], an existence theorem and error estimates are proved in the case of branches of nonsingular solutions.

Key words

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