

A MIXED FEM FOR A VORTICITY BASED FORMULATION OF THE BRINKMAN PROBLEM

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ABSTRACT. In this talk, we develop a mixed finite element method for the Brinkman equations formulated in terms of velocity, vorticity and pressure. Employing the Babuška–Brezzi theory, it is proved that the resulting continuous and discrete variational formulations are well-posed. In particular, we show that Raviart-Thomas elements of order $k \geq 0$ for the approximation of the velocity field, piecewise continuous polynomials of degree $k + 1$ for the vorticity, and piecewise polynomials of degree k for the pressure, yield unique solvability of the discrete problem. We establish a priori error estimates in the natural norms. Finally, we report several numerical experiments illustrating the behavior of the proposed scheme and confirming our theoretical results

Keywords: Brinkman equations, mixed finite elements, error estimates

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