

On the Well-Posedness of Darcy-Forchheimer Power Model Equation

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Abstract : In a bounded subset of \mathbb{R}^d , $d=2$ or 3 , we consider the Darcy-Forchheimer power model with the exponent $1 < m \leq 2$ for a single-phase strong-inertia fluid flow in a porous medium. Under necessary compatibility condition, and some mild regularity assumptions on the interior and the boundary data, we prove the existence and uniqueness of solution (u, p) in $L^{m+1}(\Omega) \times (W^{1,(m+1)/m}(\Omega) \cap L^2_0(\Omega))$ and its stability.

Keywords : porous media, power law, strong inertia, nonlinear, monotone type

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