World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:11, No:01, 2017

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

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Abstract : In a bounded subset of 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) (Ω)^d X (W^(1,(m+1)/m) (Ω)^d ∩L_0^2 (Ω)^d) and its stability.

Keywords : porous media, power law, strong inertia, nonlinear, monotone type
Conference Title : ICPODE 2017 : International Conference on Partial and Ordinary Differential Equations
Conference Location : Jeddah, Saudi Arabia
Conference Dates : January 30-31, 2017