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Luan Thach Hoang* (luan.hoang@ttu.edu), Department of Mathematics and Statistics, Texas Tech University, Box 41042, Lubbock, TX 79409, and **Akif Ibragimov** (akif.ibragimov@ttu.edu), Department of Mathematics and Statistics, Texas Tech University, Box 41042, Lubbock, TX 79409. *Structural Stability of Nonlinear Flows in Porous Media.*

We study the generalized Forchheimer equations for slightly compressible fluids in porous media. The structural stability is established with respect to either the boundary data or the coefficients of the Forchheimer polynomials. A weighted Poincare-Sobolev inequality related to the non-linearity of the equation is used to study the asymptotic behavior of the solutions. Moreover, we prove a perturbed monotonicity property of the vector field associated with the resulting non-Darcy equation, where the correction is Lipschitz continuous in the coefficients of the Forchheimer polynomials. (Received August 15, 2010)