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Generalized Forchheimer equations for porous media: Part III (continued)

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ABSTRACT. 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 explicit and Lipschitz continuous in the coefficients of the Forchheimer polynomials.

This is joint work with Akif Ibragimov.