1136-35-14 **Thinh Kieu*** (thinh.kieu@ung.edu), 3820 Mundy Mill Rd., Oakwood, GA 30019. *A MIXED FINITE ELEMENT APPROXIMATION FOR NON-DARCY FLOWS OF SLIGHTLY COMPRESSIBLE FLUIDS IN POROUS MEDIA.* Preliminary report.

We consider the generalized Forchheimer flows for slightly compressible fluids in porous media. Using Muskat's and Ward's general form of Forchheimer equations, we describe the flow of a single-phase fluid in by a nonlinear degenerate system of density and momentum. A mixed finite element method is proposed for the approximation of the solution of the above system. The stability of the approximations are proved; the error estimates are derived for the numerical approximations for both continuous and discrete time procedures. The continuous dependence of numerical solutions on physical parameters are demonstrated. Experimental studies are presented regarding convergence rates and showing the dependence of the solution on the physical parameters. (Received October 13, 2017)