Texas Tech University. Applied Mathematics Seminar.

L^∞-estimates for generalized Forchheimer flows

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ABSTRACT. We study the degenerate parabolic equation with time-dependent flux boundary condition for generalized Forchheimer (non-Darcy) flows of slightly compressible fluids in porous media. The solution is estimated, particularly for large time, in L^∞-norm, $W^{1,r}$-norm for $r \geq 1$, and $W^{2,2-\delta}$-norm for $\delta > 0$. The L^∞-estimates of the solution's time derivative are also obtained. The De Giorgi and Ladyzhenskaya-Uraltseva iteration techniques are combined with uniform Gronwall-type estimates, specific monotonicity properties and suitable parabolic Sobolev embeddings. This is joint work with Thinh Kieu and Tuoc Phan.