1137-76-12   **Aleksey S Telyakovskiy*** (`alekseyt@unr.edu`), Department of Mathematics and Statistics, University of Nevada, Reno, NV 89557, and **Jeffrey Olsen** and **Jeff Mortensen**. *Similarity Solutions to the Forchheimer Equation.* Preliminary report.

The nonlinear Forchheimer equation models turbulent flows in groundwater aquifers. For certain types of initial and boundary conditions with similarity transformation initial-boundary value problem for partial differential equation can be reduced to a free boundary value problem for a nonlinear ordinary differential equation. Polynomial approximate solutions to that nonlinear ordinary differential equation were constructed and they were compared with a highly accurate numerical solution obtained through a rescaling algorithm. (Received December 05, 2017)