1122-76-263 **Aleksey S. Telyakovskiy*** (alekseyt@unr.edu), Department of Mathematics and Statistics, University of Nevada, Reno, NV 89557, and **Jeffrey S. Olsen** and **Jeff Mortensen**. *Polynomial Approximate Solutions of a Forchheimer Groundwater Flow Equation.* Preliminary report.

The nonlinear Forchheimer equation is often used to model flows in groundwater aquifers. We consider an aquifer of semi-infinite extend that is initially dry. The boundary conditions are specified at the inlet. For certain types of the boundary conditions the problem can be reduced using the dimensional analysis to a boundary-value problem for a nonlinear ordinary differential equation. We derive polynomial approximate solutions to that nonlinear ordinary differential equation. Newly constructed approximate solution compares well with a highly accurate numerical solution obtained through a rescaling algorithm. (Received August 15, 2016)