

Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-76-1588 **Aleksey S Telyakovskiy*** (alekseyt@unr.edu), Department of Mathematics and Statistics, MS 084, University of Nevada, Reno, NV 89557. *Closed-form approximate solutions to nonlinear diffusion equations modeling groundwater flows.*

Nonlinear diffusion equations appear in many applications, we consider the Boussinesq equation and its generalization the porous medium equation. The Boussinesq equation describes unconfined groundwater flow, while the porous medium equation describes the filtration of moisture in case of the power-law diffusivity. For certain types of initial and boundary conditions there are approximate solutions techniques. We analyze one-dimensional semi-infinite initially dry aquifer with boundary conditions at the inlet. Solutions would propagate with the finite speed in this case, and the constructed approximate solutions would preserve certain scaling properties of the original problems. (Received October 05, 2004)