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**Venkataram Vanaja\*** (vvanaja2@usf.edu). *Exact Solutions of a Nonlinear Diffusion-convection Equation.*

Symbolic methods are used to obtain travelling-wave solutions of the equation  $\frac{\partial u}{\partial t} = \frac{\partial(u^n)}{\partial x} + \frac{\partial^2(u^m)}{\partial x^2}$ , where  $n$  and  $m$  are integers, and  $n \geq m > 1$ . This equation models the flow of water under gravity through a homogeneous and isotropic porous medium. For certain values of  $n$  and  $m$  satisfying the given condition, analytical solutions of the equation as a polynomial in  $\tan(x)$  or  $\tanh(x)$ , with integral or fractional powers are obtained, and the plots for real solutions are given. From the exact solutions, we determine whether the moisture content is positive and the seepage velocity is continuous. (Received January 13, 2012)