

Abstract

Hossam E. Shawky

New solutions for solving Boussinesq equation via potential symmetries method

This work deals with the Boussinesq equation that describes the propagation of the solitary waves with small amplitude on the surface of shallow water. Firstly, the equation is written in a conserved form, a potential function is then assumed reducing it to a system of partial differential equations. The Lie-group method has been applied for determining symmetry reductions of the system of partial differential equations. The solution of the problem by means of Lie-group method reduces the number of independent variables in the given partial differential equation by one leading to nonlinear ordinary differential equations. The resulting non-linear ordinary differential equations are then solved numerically using MATLAB package.