

Similarity analysis of modied shallow water equations and evolution of weak waves

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In this paper, we obtain exact solutions to the nonlinear system of partial differential equations (PDEs), describing the one dimensional modied shallow water equations, using invariance group properties of the governing system. Lie group of point symmetries with commuting infinitesimal operators, are presented. The symmetry generators are used for constructing similarity variables which lead the governing system of PDEs to system of ordinary differential equations (ODEs); in some cases, it is possible to solve these equations exactly. A particular solution to the governing system, which exhibits space- time dependence, is used to study the evolutionary behaviour of weak discontinuities.

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