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Conditional Symmetry Groups of Nonlinear Diffusion Equations with x-Dependent Convection and Absorption

QU Chang-Zheng and ZHANG Shun-Li

Department of Mathematics, Northwest University, Xi'an 710069, China

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Abstract: The generalized conditional symmetry and sign-invariant approaches are developed to study the nonlinear diffusion equations with x-dependent convection and source terms. We obtain conditions under which the equations admit the second-order generalized conditional symmetries and the first-order sign-invariants on the solutions. Several types of different generalized conditional symmetries and first-order sign-invariants for the equations with diffusion of power law are obtained. Exact solutions to the resulting equations are constructed.

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Key words: symmetry group, sign-invariant, nonlinear diffusion equation, exact solution

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