

Abundant New Explicit Exact Soliton-Like Solutions and Painlevé Test for the Generalized Burgers Equation in (2+1)-Dimensional Space

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Abstract: We obtain Bäcklund transformation and some new kink-like solitary wave solutions for the generalized Burgers equation in (2+1)-dimensional space, $u_t + (1/2)(u \partial_y^{-1} u_x)_x - u_{xx} = 0$, by using the extended homogeneous balance method. As is well known, the introduction of the concept of dromions (the exponentially localized solutions in (2+1)-dimensional space) has triggered renewed interest in (2+1)-dimensional soliton systems. The solutions obtained are used to show that the variable u_x admits exponentially localized solutions rather than the physical field $u(x, y, t)$ itself. In addition, it is shown that the equation passes Painlevé test.

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Key words: generalized Burgers equation, Bäcklund transformation, exact solution, Painlevé test

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