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Lienard Equation and Exact Solutions for Some Soliton-Producing Nonlinear Equations

ZHANG Wei-Guo,[1] CHANG Qian-Shun,[2] and ZHANG Qi-Ren[1]

[1] Department of Basic Sciences, University of Shanghai for Science and Technology, Shanghai 200093, China
[2] Institute of Applied Mathematics, Academy of Mathematics and Systems Sciences, the Chinese Academy of Sciences, Beijing 100080, China
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Abstract: In this paper, we first consider exact solutions for Lienard equation with nonlinear terms of any order. Then, explicit exact bell and kink profile solitary-wave solutions for many nonlinear evolution equations are obtained by means of results of the Lienard equation and proper deductions, which transform original partial differential equations into the Lienard one. These nonlinear equations include compound KdV, compound KdV-Burgers, generalized Boussinesq, generalized KP and Ginzburg-Landau equation. Some new solitary-wave solutions are found.

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Key words: solitary wave, Lienard equation, compound KdV equation, compound KdV-Burgers equation, generalized Boussinesq equation, generalized KP equation, Ginzburg-Landau equation

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