2004 Vol.41 No.4 pp.487-492 DOI:

Conservation Laws and Soliton Solutions for Generalized Seventh Order KdV Equation

YAO Ruo-Xia,[1,2] XU Gui-Qiong,[1,3] and LI Zhi-Bin[1]

[1] Department of Computer Science, East China Normal University, Shanghai 200062, China
[2] Department of Computer Science, Weinan Teachers College, Weinan 714000, China
[3] Department of Information Administration, Shanghai University, Shanghai 200436, China
(Received: 2003-7-2; Revised:)

Abstract: With the assistance of the symbolic computation system Maple, rich higher order polynomial-type conservation laws and a sixth order t/x-dependent conservation law are constructed for a generalized seventh order nonlinear evolution equation by using a direct algebraic method. From the compatibility conditions that guaranteeing the existence of conserved densities, an integrable unnamed seventh order KdV-type equation is found. By introducing some nonlinear transformations, the one-, two-, and three-solition solutions as well as the solitary wave solutions are obtained.

PACS: 02.30.Jr, 02.70.Wz, 03.40.Kf, 03.65.Fd
Key words: seventh order evolution equation, conservation law, soliton solution, symbolic computation

[Full text: PDF]

Close