New Doubly Periodic Solutions of Nonlinear Evolution Equations via Weierstrass Elliptic Function Expansion Algorithm

YAN Zhen-Ya

Key Laboratory of Mathematics Mechanization, Institute of System Sciences, Academy of Mathematics and System Sciences, the Chinese Academy of Sciences, Beijing 100080, China
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Abstract: A Weierstrass elliptic function expansion method and its algorithm are developed in this paper. The method changes the problem solving nonlinear evolution equations into another one solving the corresponding system of nonlinear algebraic equations. With the aid of symbolic computation (e.g. Maple), the method is applied to the combined KdV-mKdV equation and (2+1)-dimensional coupled Davey-Stewartson equation. As a consequence, many new types of doubly periodic solutions are obtained in terms of the Weierstrass elliptic function. Jacobi elliptic function solutions and solitary wave solutions are also given as simple limits of doubly periodic solutions.

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