

A New Generalization of the (2+1)-dimensional Davey-Stewartson Equation

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Using an asymptotically exact reduction method based on Fourier expansion and spatiotemporal re-scaling, a new integrable system of the nonlinear partial differential equation in (2+1)-dimensions, extended Davey-Stewartson I equation, is deduced from a known (2+1)-dimensional integrable equation. The integrability of the new equation system is explicitly proved by the spectral transformation. Actually, the corresponding Lax pair of the new equations can be obtained by applying the same reduction method to the Lax pair of the original equation.

Key words: Integrable Models; Davey-Stewartson I Equation; Fourier Asymptotical Expansion.