12th International Summer School on Geometry, Mechanics and Control

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Title

The singular manifold method and soliton-like solutions for Nonlinear Schrödinger Equations.

Abstract

The Painlevé property has been proved to be a powerful test for identifying the integrability as well as a good basis for the determination of many properties of a given (nonlinear) PDE. The singular manifold method, based on the Painlevé analysis, provides the Lax pair and the Bäcklund transformation for the PDE. Furthermore, by employing the Darboux transformation approach, an iterative algorithmic method to construct recursive solutions can be implemented. It will be illustrated by means of some examples, related to Nonlinear Schrödinger equations, in which solutions such as solitons and rogue waves will be thoroughly discussed.