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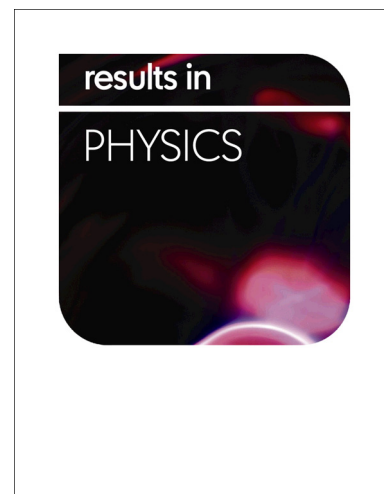
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Construction of lump soliton and mixed lump stripe solutions of (3+1)-dimensional soliton equation

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Abstract: In this letter, we apply two different ansatzs for constructing the lump soliton and mixed lump strip solutions of (3+1)-dimensional soliton equation, which is associating with the Hirota bilinear form. These lump soliton solutions rationally localized in all directions in the space. The solutions of interactions between a lump and a stripe are shown by graphic illustration of some special solutions which would give us a better understanding on the evolution of solutions of waves.

Key words: lump solutions; mixed lump strip solutions; (3+1)-dimensional soliton equation; Hirota bilinear form

1. Introduction

In soliton theory [1-7], exact solutions, integrable systems, Painleve analysis and Hamiltonian structure are the hot topics. And the exact solutions of mathematical equations play a vital role in the proper understanding on qualitative features of the concerned phenomena and processes in nonlinear science, such as nonlinear optics, plasma physics and others. Deriving an exact solution of nonlinear partial differential equations (PDEs) is important, which could help us understand the complexity of the phenomena based on integer or fractional order derivatives. And the exact solution could also help us to analyze the stability of these systems and validate the results of numerical analysis in nonlinear PDEs. In recent years, localizing in all directions in the space, the lump solution attracted much attention [8-10], which is a kind rational function solution [11-13]. There are some recent studies on the topic have been

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