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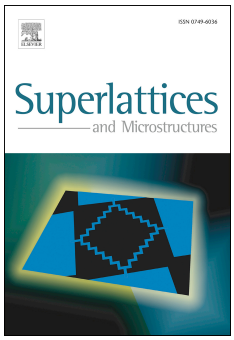

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Soliton solutions for quintic complex Ginzburg-Landau model

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Abstract

In this paper, we find the rational function solution, confluent hypergeometric functions solutions and solitary wave solutions for quintic complex Ginzburg-Landau (CGLQ) model by using extended trial equation method. We also find some new solitary wave soliton solutions for CGLQ equation by using modified extended tanh-function method.

Key words: Complex Ginzburg-Landau model, Solitons, Integrability

1 Introduction

Optical soliton molecules form the fundamental structure of fiber-optic transmission technology along trans-continental and trans-oceanic distances [1-16]. This technology is modeled by the nonlinear Schrödingers equation (NLSE). The NLSE is familiar as a universal model discussing the propagation of pulses in dispersive and nonlinear media. When the medium produces linear and nonlinear gains or lossess, the NLSE becomes cubic complex Ginzburg-Landau (CGLC) which describes the evolution of the envelope of a pulse. To study laser dynamics, CGLC equation is used. But the CGLC model does not admits stable soliton solution. Now to get stability of the solitons, higher order nonlinear terms have been introduced. The new equation is called quintic (cubic-quintic) complex Ginzburg-Landau (CGLQ) equation [17]. In this paper, we find the

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