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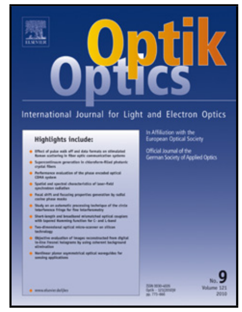

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On soliton structures of generalized resonance equation with time dependent coefficients

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Abstract: This paper integrates soliton, shock and singular solutions for the generalized long-short wave resonance equations with time dependent coefficients. We obtained several types of solitons of the mentioned equation. It is illustrated that the examined dependent coefficients are effected the speed of the wave. The first integral method (FIM) and ansatz method are applied to reach the soliton solutions of this equation. These solutions may be useful and desirable to explain some nonlinear physical phenomena.

Keywords: FIM, Generalized resonance equation, First integral method, Ansatz approach.

1. INTRODUCTION

The dynamics of the spread between continents and oceans are modeled by optical solitons through optical fiber for extreme distance. In generally, the fiber optical structures are governed by nonlinear Schrödinger's equation (NLSE). The NLSE is derived from electromagnetic with the analysis of some analytical approaches. There are lots of forms of NLSE which are studied to explain the physical behaviors of solitons. The well-known optical phenomena is NLSE.

Achieve the overall solution of nonlinear equations is very important. Thus, the general solution of the types of NLSE provides lots of information for researchers. There are lots of analytical methods to achieve solitons. More information about the methods can be viewed from [1-13].

One of the the popular and effective method FIM initially is governed by Feng [14]. Different types of regular and fractional NPDE are solved with the aim of FIM.

The main structure of this study, we present the governing equation in section 2. The FIM is described and applied in section 3. In order to construct the different forms of the soliton solutions, ansatz approach is applied in section 4. Lastly, we give some conclusions in the last section.

2. GOVERNING EQUATION

The relation between the long wave and the short wave about the resonance interaction was presented [15] with the following equation

$$ih_t + h_{xx} = \alpha hq \tag{1}$$