Exact traveling wave solution of the Zoomeron equation by (F/G) -expansion method

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Abstract

In this work, the new (F/G)-expansion method is proposed for obtaining traveling wave solutions of non linear evolution equations. This method is more powerful than the method $(G^{'}/G)$-expansion method. The efficiency of the method is demonstrated on a variety of nonlinear PDEs such as, Zoomeron equation. As a result, more traveling wave solutions are obtained including not only all the known solutions but also the computation burden is greatly decreased compared with the existing method. Abundant exact traveling wave solutions of these equations are expressed by the hyperbolic functions the trigonometric functions.

Keywords: (F/G)-expansion method, Traveling wave solutions,Zoomeron equation, Exact solutions.
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1 Introduction

Nonlinear partial differential equations $(NLPDEs)$ have been widely applied in many branches of applied sciences such as fluids dynamics, bio-mechanics and chemical physics etc.The solutions of nonlinear equations play a crucial role in applied mathematics and physics, because; solutions of nonlinear partial differential equations provide a very significant contribution to people about the exact solutions of nonlinear evolution equations have been established and developed, such as the sub-ODE method [1],the homogeneous balance method [2] and so on.

Recently, Wang et al. [3] interoduced a new direct method called the $(G^{'}/G)$-expansion method. Motivated by work in [3], the main purpose of this paper is to introduce a new technique called (F/G)-expansion method is that the traveling wave solutions of a nonlinear evolution equation can be expressed by a polynomial in (F/G), where $G = G(\xi)$ and $F = F(\xi)$ satisfy the first order linear ordinary differential system $(FLODS)$ as follows: $F^{'}(\xi) = \lambda G(\xi)$, $G^{'}(\xi) = \mu F(\xi)$, where μ, λ are constants. This new method will play an important role in expressing the traveling wave solutions for Zoomeron equation.

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