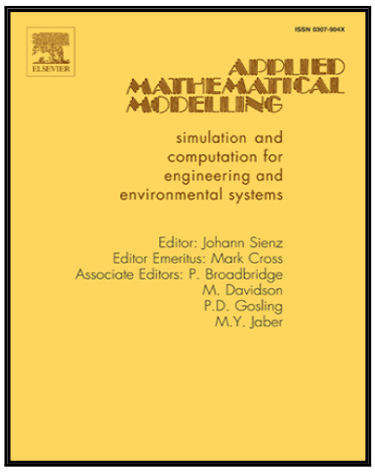

The modified extended tanh-function method and its applications to the Bogoyavlenskii equation

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The modified extended tanh-function method and its applications to the Bogoyavlenskii equation

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Abstract In this work, exact traveling wave solutions of Bogoyavlenskii equation are studied by using the modified extended tanh-function method. This method presents a wider applicability for handling many other nonlinear evolution equation in mathematical physics.
Keywords: The Bogoyavlenskii equation, The modified extended tanh-function method, Riccati equation, traveling wave solutions.
MSC 2010: 35CXX - 35C07 - 35C08 - 35C11 - 35EXX - 35E99

1 Introduction

The nonlinear equations of mathematical physics are major subjects in physical science [1]. Exact solutions for these equations play an important role in many phenomena in physics such as solid state physics, fluid mechanics, hydrodynamics, Optics, Plasma physics and so on. Recently many new approaches for finding these solutions have been proposed, for example, tanh - sech method [2-4], sine - cosine method [5-7], homogeneous balance method [8,9], Jacobi elliptic function method [10-13], F-expansion method [14-16], exp-function method [17-18], trigonometric function series method [19], $(\frac{G'}{G})-$ expansion method [20-23], the modified simple equation method [24-26], extended tanh - method [27-29]. The extended tanh method, developed by Wazwaz [30,31], is a direct and effectie algebraic method for handling nonlinear equations. All methods mentioned above have limitation in thier applications.
The objective of this article is to apply the modified extended tanh-function method to find the exact traveling wave solutions of the Bogoyavlenskii equation [32] in the form

$$\begin{cases} 4u_t + u_{xxy} - 4u^2u_y - 4u_xv = 0, \\ uu_y = v_x. \end{cases} \tag{1}$$