

The use of Adomian decomposition method for solving a specific nonlinear partial differential equations

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Abstract

In this paper, by considering the Adomian decomposition method, explicit solutions are calculated for partial differential equations with initial conditions. The method does not need linearization, weak nonlinearly assumptions or perturbation theory. The decomposition series analytic solution of the problem is quickly obtained by observing the existence of the self-cancelling “noise” terms where sum of components vanishes in the limit.

1 Introduction

The theory of nonlinear problem has recently undergone much study. We do not attempt to characterize the general form of nonlinear equations [1]. Rather, we solve a specific equation in the following nonlinear problem by using the Adomian decomposition method [2-4]. By solving this type of problems, we do not use conventional transformations which transform a nonlinear problem to an evolution equation and the reduced to a bilinear form. Some times transformation of the nonlinear problem might produce an even more complicated problem. Nonlinear phenomena play a crucial role in applied mathematics and physics. The nonlinear problems are solved easily and elegantly without linearizing the problem by using the Adomian’s decomposition method.

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