A Modified Adomian Decomposition Method for Solving Higher-Order Singular Boundary Value Problems

Weonbae Kim[a] and Changbum Chun[b]

[a] Department of Mathematics, Daejin University, Pocheon, Gyeonggi-do 487-711, Republic of Korea
[b] Department of Mathematics, Sungkyunkwan University, Suwon 440-746, Republic of Korea

Reprint requests to C. C.; Fax: +82-31-290-7033, E-mail: cbchun@skku.edu

In this paper, we present a reliable modification of the Adomian decomposition method for solving higher-order singular boundary value problems. He's polynomials are also used to overcome the complex and difficult calculation of Adomian polynomials occurring in the application of the Adomian decomposition method. Numerical examples are given to illustrate the accuracy and efficiency of the presented method, revealing its reliability and applicability in handling the problems with singular nature.

Key words: Adomian Decomposition Method; Singular Boundary Value Problems;
Higher-Order Ordinary Differential Equation; Modified Adomian Decomposition Method;
He's polynomials; Homotopy Perturbation Method.

PACS number: 02.60.Lj