Solution of System of Viscous Burgers’ Equation via Collocation Method

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Abstract: This paper presents a new approach to solve one dimensional system viscous Burgers’ equation with boundary conditions Dirichlet type using collocation method based on cubic trigonometric B-spline. The usual finite difference scheme is applied to discretize the time derivative. Cubic Trigonometric B-spline basis functions are used as an interpolating function in the space dimension. Two test problems are presented to confirm the accuracy and efficiency of the new scheme and to show the performance of trigonometric basis functions. The numerical results are found to be in good agreement with known exact solutions and also with earlier studies.

Keywords: PDE, Burgers’ equation, One dimensional coupled viscous Burgers’ equation, cubic trigonometric B-spline basis functions, cubic trigonometric B-spline collocation method, stability

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1. Introduction

Partial differential equations (PDEs) have numerous essential applications in various fields of science and engineering such as fluid mechanic, thermodynamics, heat transfer and physics. Most of

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