

Elzaki decomposition method for approximate solution of a one-dimensional heat model with axial symmetry

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Abstract

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Abstract: This paper considers the application of the Elzaki Decomposition Method (EDM) for approximate solution of a one-dimensional heat model with axial symmetry. By the proposed EADM, the series solutions of the sampled cases are obtained with ease and high level of accuracy as regards less computational time. These results, therefore, show the effectiveness of the proposed method. [View less](#)

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I. Introduction

Differential models and their applications have been noted as building blocks in sciences and engineering. Though obtaining their exact or analytical solutions appears complicated and tedious in most cases [1 – 7]. In this work, a source-less heat model describing one-dimensional unsteady thermal processes with axial symmetry will be considered. This is mostly represented in the form of:

$$\left(\frac{\partial \Psi}{\partial t} - \beta \gamma \frac{\partial}{\partial \gamma} \left(\gamma \frac{\partial \Psi}{\partial \gamma} \right) \right) \Psi(\gamma, 0) = h(\gamma) \quad (1.1)$$

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