A numerical solution for nonlinear heat transfer of fin problems using the Haar wavelet quasilinearization method (Article) (Open Access)

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Abstract

The aim of this paper is to study the new application of Haar wavelet quasilinearization method (HWQM) to solve one-dimensional nonlinear heat transfer of fin problems. Three different types of nonlinear problems are numerically treated and the HWQM solutions are compared with those of the other method. The effects of temperature distribution of a straight fin with temperature-dependent thermal conductivity in the presence of various parameters related to nonlinear boundary value problems are analyzed and discussed. Numerical results of HWQM gives excellent numerical results in terms of competitiveness and accuracy compared to other numerical methods. This method was proven to be stable, convergent and, easily coded. © 2019 The Authors

SciVal Topic Prominence

Topic: Differential equations  |  Partial differential equations  |  Legendre wavelets
Prominence percentile: 72.146

Author keywords

Fin problem  |  Haar wavelet  |  Nonlinear equation  |  Quasilinearization method  |  Temperature-dependent thermal conductivity

Funding details

Funding sponsor  |  Funding number  |  Acronym
International Islamic University Malaysia

Funding text

The authors are grateful for the financial support from the International Islamic University Malaysia. This work was performed under IIUM Research Initiative Grant Scheme (RIGS) with Grant No. RIGS17-081-0656. The authors are indebted to Dr. Amran Hussin for his guidance and support. The authors also gratefully thank the Referee for the constructive comments and recommendations which definitely help to improve the readability and quality of this paper.


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