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

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Abstract

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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

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