

عنوان مقاله:

Thermal Analysis of Fluid Flow with Heat Generation for Different Logarithmic Surfaces

محل انتشار:

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خلاصه مقاله:

This study investigated the effect of temperature changes on different logarithmic surfaces. One-dimensional heat transfer was considered. The heat generation source term is added to the governing equations. Most scientific problems and phenomena such as heat transfer occur nonlinearly, and it is not easy to find exact analytical solutions. Using the appropriate similarity transformation for temperature and the generation components causes the basic equations governing flow and heat transfer to be reduced to a set of ordinary differential equations. These equations have been solved approximately subject to the relevant boundary conditions with numerical and analytical techniques. According to the given boundary conditions, Collocation, Galerkin, and least squares methods were used to find an answer to the governing differential equations. The validation of the present techniques has been done with the fourth-order Runge-Kutta method as a numerical method. The temperature profiles for different values of β and α have been obtained. The results showed that the proposed methods could consider nonlinear equations in heat transfer. Therefore, the results accepted by current analytical methods are very close to those of numerical methods. Comparing the results provides a more realistic solution and reinforces the conclusions regarding the efficiency of these methods. Furthermore, changes in temperature profiles occur with decreasing and increasing β and α numbers

کلمات کلیدی:

Galerkin method, Collocation method, Least Squares Method, heat transfer, Logarithmic surface

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