

عنوان مقاله:

Investigation of the heat transfer and MHD flow of non-Newtonian Maxwell fluid through a parallel plate channel using Akbari-Ganji method

محل انتشار:

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خلاصه مقاله:

Analytical and numerical studies have been implemented to analyze the problem of Magnetohydrodynamic (MHD) flow and heat transfer of an upper-convected Maxwell fluid in a parallel plate channel. The equations of continuity, momentum, and energy have been reduced to two ordinary differential equation forms by introducing a similarity transformation. To solve this problem, the Akbari- Ganji method (AGM) and fourth-order Runge-Kutta numerical method (NUM) has been implemented. Also, velocity and temperature fields have been computed and shown graphically for various values of the physical parameters. The objectives of this work are to study the effect of the Deborah numbers (De), Hartman electric number (Ha), Reynolds number (Re_w), and Prandtl number (Pr) on the velocity and temperature fields. As a crucial outcome, it has been observed that rising the Hartman number tends to a reduction in the velocity values while increasing the Deborah number has no significant impact on the velocity increment.

کلمات کلیدی:

Akbari-Ganji method (AGM), heat transfer, MHD flow, non-Newtonian Maxwell fluid, parallel plate channel

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