

Documents

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Investigation of magneto-hydrodynamic fluid squeezed between two parallel disks by considering Joule heating, thermal radiation, and adding different nanoparticles

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Abstract

Purpose: This paper aims to study the impacts of viscous dissipation, thermal radiation and Joule heating on squeezing flow current and the heat transfer mechanism for a magnetohydrodynamic (MHD) nanofluid flow in parallel disks during a suction/blowing process. Design/methodology/approach: First, the governing momentum/energy equations are transformed into a non-dimensional form and then the obtained equations are solved by modified Adomian decomposition method (ADM), known as Duan–Rach approach (DRA). Findings: The effect of the radiation parameter, suction/blowing parameter, magnetic parameter, squeezing number and nanoparticles concentration on the heat transfer and flow field are investigated in the results. The results show that the fluid velocity increases with increasing suction parameter, while the temperature profile decreases with increasing suction parameter. Originality/value: A complete analysis of the MHD fluid squeezed between two parallel disks by considering Joule heating, thermal radiation and adding different nanoparticles using the novel method called DRA is addressed. © 2019, Emerald Publishing Limited.

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