A REVISED MODEL ON MHD MIXED CONVECTION OF MAXWELL NANOFLUID OVER AN INCLINED STRETCHING SHEET

MUHAMMAD RIDZUAN BIN KHAIDZIR

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College of Computing, Informatics and Mathematics
Universiti Teknologi MARA

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ABSTRACT

Maxwell fluid is one of the viscoelastic type non-Newtonian fluid that is commonly used in various industry like cosmetic and industrial lubrication. When nanoparticles are combined with Maxwell fluid, it can enhance the thermal conductivity of the fluid and improve heat transfer. Hence, the aim of this research is to investigate the behaviour of Maxwell nanofluid under the influences of mixed convection, magnetohydrodynamic (MHD), viscous dissipation and revised model. Similarity transformation variable is applied to Partial Differential Equations (PDEs) to reduce its complexity to Ordinary Differential Equations (ODEs). Runge-Kutta-Fehlberg Fourth Fifth (RKF45) method is implemented to solved the problems in MAPLE software. The current results are validated after comparing it with previous studies. The graphs of velocity, temperature, and concentration profiles are generated to explore the effects of various parameters like Deborah number, magnetic field parameter, mixed convection parameter, Eckert number, concentration buoyancy parameter, Brownian motion, thermophoresis diffusion parameter, and Lewis number. The results indicate that as the Brownian motion parameter increases, the temperature profile increases, while the concentration profile decreases. Besides, both the temperature and concentration profile are increased and the thermophoresis diffusion parameter increases. Additionally, the increment of Eckert number also leads to increasing temperature profile.

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