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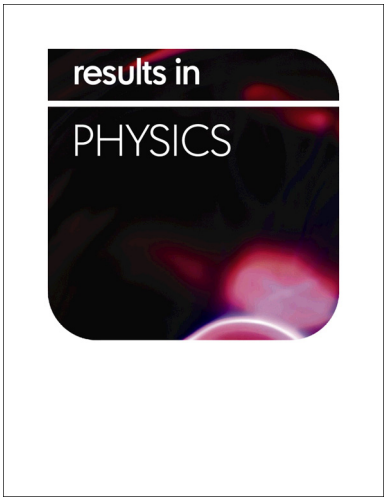

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Imran Ullah, Sharidan Shafie, Ilyas Khan, Kai Long Hsiao

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Brownian diffusion and thermophoresis mechanisms in Casson fluid over a moving wedge

Imran Ullah[1,2], Sharidan Shafie[*1], Ilyas Khan[3], Kai Long Hsiao[4]

[1]Department of Mathematical Sciences, Faculty of Science, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia

[2]Department of Basic Sciences, National University of Sciences and Technology, Islamabad, 44400 Pakistan

[3]Department of Basic Sciences, College of Engineering Majmaah University, Majmaah 11952, Saudi Arabia

[4]Department of Digital Recreation and Game Design, Taiwan Shoufu University, 168, Nansh Li District, Madou Jen, Tainan, Taiwan, China.

*Corresponding author-
Email: sharidan@utm.com

Abstract: The effect of Brownian diffusion and thermophoresis on electrically conducting mixed convection flow of Casson fluid induced by moving wedge is investigated in this paper. It is assumed that the wedge is saturated in a porous medium and experiences the thermal radiation and chemical reaction effects. The transformed nonlinear governing equations are solved numerically by Keller box scheme. Findings reveal that increase in Casson and magnetic parameters reduced the boundary layer thickness. The effect of Brownian motion and thermophoresis parameters are more pronounced on temperature profile as compared to nanoparticles concentration. The presence of thermal radiation assisted the heat transfer rate significantly. The influence of magnetic parameter is observed less significant on temperature and nanoparticles concentration.

Keywords: Casson fluid; magnetic field; wedge; Brownian diffusion; Thermophoresis; Keller-box scheme

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