Journal of Physics: Conference Series
Volume 890, Issue 1, 21 September 2017, Article number 012002
1st International Conference on Applied and Industrial Mathematics and Statistics 2017, ICoAIMS 2017; Vistana City CentreKuantan, Pahang; Malaysia; 8 August 2017 through 10 August 2017; Code 130792

MHD Jeffrey nanofluid past a stretching sheet with viscous dissipation effect (Conference Paper)

Zokri, S.M.[a] Arifin, N.S.[a], Salleh, M.Z.[a], Kasim, A.R.M.[a], Mohammad, N.F.[b], Yusoff, W.N.S.W.[a]

[a]Applied and Industrial Mathematics Research Group, Faculty of Industrial Science and Technology, Universiti Malaysia Pahang, Kuantan, Pahang, Malaysia
[b]Dept. of Comp. Theo. Sc., Kulliyyah of Science, International Islamic University Malaysia, Kuantan, Pahang, Malaysia

Abstract

View references (16)

This study investigates the influence of viscous dissipation on magnetohydrodynamic (MHD) flow of Jeffrey nanofluid over a stretching sheet with convective boundary conditions. The nonlinear partial differential equations are reduced into the nonlinear ordinary differential equations by utilizing the similarity transformation variables. The Runge-Kutta Fehlberg method is used to solve the problem numerically. The numerical solutions obtained are presented graphically for several dimensionless parameters such as Brownian motion, Lewis number and Eckert number on the specified temperature and concentration profiles. It is noted that the temperature profile is accelerated due to increasing values of Brownian motion parameter and Eckert number. In contrast, both the Brownian motion parameter and Lewis number have caused the deceleration in the concentration profiles. © Published under licence by IOP Publishing Ltd.

Indexed keywords

Engineering controlled terms: Boundary conditions, Magnetohydrodynamics, Mathematical transformations, Nanofluidics, Nonlinear equations, Ordinary differential equations, Partial differential equations, Runge Kutta methods, Viscous flow

Compendex keywords: Concentration profiles, Convective boundary conditions, Dimensionless parameters, Magnetohydrodynamic flows, Nonlinear ordinary differential equation, Nonlinear partial differential equations, Runge-Kutta Fehlberg method, Similarity transformation

Engineering main heading: Brownian movement

Funding details

Funding number	Funding sponsor	Acronym
RDU141306	Universiti Malaysia Pahang	UMP

Funding text
The authors are thankful to the Universiti Malaysia Pahang (UMP) for the funding through grants PGRS1703100, RDU170358 and RDU141306.

ISSN: 17426588
Source Type: Journal
Original language: English

DOI: 10.1088/1742-6596/890/1/012002
Document Type: Conference Paper
Volume Editors: Muhammad N.
Sponsors:
Publisher: Institute of Physics Publishing

References (16)

View in search results format ›

All Export Print E-mail Save to PDF Create bibliography

1 Ding, Y., Chen, H., Wang, L., Yang, C.-Y., He, Y., Yang, W., Lee, W.P., (...), Huo, R.
Heat transfer intensification using nanofluids

(2007) *KONA Powder and Particle Journal*, 25 (March), pp. 23-38. Cited 134 times.
https://www.jstage.jst.go.jp/article/kona/25/0/25_2007006/_pdf
doi: 10.14356/kona.2007006

View at Publisher