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MHD Casson nanofluid flow past a wedge with Newtonian heating (Article)

Ahmad, K.[a] (https://www.scopus.com/authid/detail.uri?authorId=55613229585&eid=2-s2.0-85013339811) (mailto:kartini@iium.edu.my),
Hanouf, Z.[b] (https://www.scopus.com/authid/detail.uri?authorId=55983256500&eid=2-s2.0-85013339811),
Ishak, A.[c] (https://www.scopus.com/authid/detail.uri?authorId=22953468800&eid=2-s2.0-85013339811)

[a]Department of Science in Engineering, Kulliyah of Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia
[b]Department of Mechanical Engineering, Kulliyah of Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia
[c]School of Mathematical Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, Selangor, Malaysia

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Abstract

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The problem of steady Casson nanofluid flow past a wedge is studied in this paper. The presence of magnetic field along with Newtonian heating at the surface is considered. The governing partial differential equations are first transformed into a set of nonlinear ordinary differential equations by similarity transformations, before being solved numerically using the Keller-box method. The effects of the wedge angle Ω from 0 ° (horizontal plate) to 180 ° (vertical plate) as well as of as the magnetic parameter M on the non-Newtonian fluid flow and heat transfer characteristics are investigated. It is found that the surface temperature is slightly higher for the flow over a horizontal plate compared to that over a vertical plate. It is also found that the magnetic field decreases the surface temperature but increases the skin friction. The flow of a Newtonian fluid is found to give higher skin friction as compared to that of Casson fluid. © 2017, Società Italiana di Fisica and Springer-Verlag Berlin Heidelberg.

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