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### Heat transfer analysis of ethylene glycol-based Casson nanofluid around a horizontal circular cylinder with MHD effect

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#### Abstract

In this work, efforts were taken to investigate the free convection of ethylene glycol-based Casson nanofluid and it is affected by a magnetic field about a horizontal circular cylinder. Three different types of oxide nanoparticles were used along with constant wall temperature. Tiwari and Das's nanofluid model was used to investigate the MHD free convective flow of Casson nanofluid. The transformed governing PDEs were solved via the Keller box method. Numerical and graphical findings were acquired by using MATLAB software, in addition to studying and analyzing the influence of related parameters, on the velocity, temperature, local skin friction coefficient, and local Nusselt number. The results demonstrate that copper oxide ethylene glycol-based Casson nanofluid has the lowest local Nusselt number, velocity and, it has the highest temperature. Also, our results were in excellent agreement with prior published results.

#### Keywords

Casson nanofluid, MHD, ethylene glycol, horizontal circular cylinder, constant wall temperature

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