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Unsteady MHD boundary layer flow of tangent hyperbolic two-phase nanofluid of moving stretched porous wedge
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Abstract
Purpose: The purpose of this paper is to address the thermo-physical impacts of unsteady magneto-hydrodynamic (MHD) boundary layer flow of non-Newtonian tangent hyperbolic nanofluid past a moving stretching wedge. To delineate the nanofluid, the boundary conditions for normal fluxes of the nanoparticle volume fraction are chosen to be vanish. Design/methodology/approach: The local similarity transformation is implemented to reformulate the governing PDEs into coupled non-linear ODEs of higher order. Then, numerical solution is obtained for the simplified governing equations with the aid of finite difference technique. Findings: Numerical calculations point out that pressure gradient parameter leads to improve all skin friction coefficient, rate of heat transfer and absolute value of rate of nanoparticle concentration. As well as, lager values of Weissenberg number tend to upgrade the skin friction coefficient, while power law index and velocity ratio parameter reduce the skin friction coefficient. Again, the horizontal velocity component enhances with upgrading power law index, unsteadiness parameter, velocity ratio parameter and Darcy number and it reduces with rising values of Weissenberg number. Originality/value: A numerical treatment of unsteady MHD boundary layer flow of tangent hyperbolic nanofluid past a moving stretched wedge is obtained. The problem is original. © 2018, Emerald Publishing Limited.

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