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Thermal Analysis for Darcy Forchheimer Effect with Hybrid Ferro Fluid Flow

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Abstract : The article analyzes the Darcy Forchheimer 2D Hybrid ferrofluid. The flow of a Hybrid ferrofluid is made due to an unsteady porous channel. The classical liquid water is treated as a based liquid. The flow in the permeable region is characterized by the Darcy-Forchheimer relation. Heat transfer phenomena are studied during the flow. The transformation of a partial differential set of equations into a strong ordinary differential frame is formed through appropriate variables. The numerical Shooting Method is executed for solving the simplified set of equations. In addition, a numerical analysis (ND-Solve) is utilized for the convergence of the applied technique. The influence of some flow model quantities like Pr (Prandtle number), r (porous medium parameter), F (Darcy-porous medium parameter), Re (Reynolds number), Pe (Peclet number) on velocity and temperature field are scrutinized and studied through sketches. Certain physical factors like f ''(η) (skin friction coefficient) and θ^'(η) (rate of heat transfer) are first derived and then presented through tables.

Keywords : darcy forcheimer, hybrid ferro fluid, porous medium, porous channel
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