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Hydromagnetic natural convection flow of water based nanofluid along a vertical wavy surface with heat generation

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Abstract: The interaction of nanoparticles (Al_2O_3 (Alumina) and Ag (Silver)) with external applied magnetic field in the presence of internal heat generation along the vertical rough surface of sinusoidal nature is major concern of this study. The problem is formulated in mathematical form by using the model of Tiwari and Das [19]. The obtained system of partial differential equations is transformed into dimensionless form and then solved numerically by an appropriate finite difference scheme. The values of skin friction coefficient and Nusselt number are obtained for emerging dimensionless parameters and are shown graphically. The important factors for the present study are Al_2O_3 (Alumina) and Ag (Silver) nanoparticles, heat generation parameter, wavy amplitude, magnetic parameter, volume fraction parameter of nanoparticle and Prandtl number. To predict the flow and heat transfer along the surface of sinusoidal nature, streamlines and isotherm lines are also plotted.

Keywords: Natural convection, Nanofluid, Hydromagnetic flow, Heat generation, Finite difference.

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