Double-Diffusive Natural Convective Flow of a Nanofluid past an Inclined Wavy Plate in a Non-Darcy Porous Medium

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In this article, the double-diffusive natural convection in the boundary layer region of a semi-infinite inclined wavy plate in a nanofluid saturated non-Darcy porous medium is investigated. Following Prandtl’s transposition theorem, a coordinate transformation is used to transform the irregular wavy surface into a smooth surface. The convective type thermal boundary condition is taken into account and also the thermophoresis and Brownian motion effects are incorporated into the present nanofluid model. Initially, the governing equations are cast into a set of ordinary differential equations using suitable similarity transformations. The resulting ordinary differential equations are solved numerically by using the Spectral Local Linearization Method (SLLM). The effects of thermophoresis parameter, Brownian motion parameter, angle of inclination of the wavy surface, amplitude of the wavy surface on the dimensionless velocity, temperature, solid volume fraction, Nusselt and nanoparticle Sherwood number are discussed and shown graphically.

***Keywords*:** Inclined wavy plate, Non-Darcy porous medium, Double-diffusivity, Convective boundary condition.