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Numerical Study of Entropy Generation Due to Hybrid Nano-Fluid Flow through Coaxial Porous Disks

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Abstract : The current investigation of two-dimensional hybrid nanofluid flows with two coaxial parallel disks has been presented. Consider the hybrid nanofluid has been taken as steady-state. Consider the coaxial disks that have been porous. Consider the heat equation to examine joule heating and viscous dissipation effects. Nonlinear partial differential equations have been solved numerically. For shear stress and heat transfer, results are tabulated. Hybrid nanoparticles and Eckert numbers are increasing for heat transfer. Entropy generation is expanded with radiation parameters Eckert, Reynold, Prandtl, and Peclet numbers. A set of ordinary differential equations is obtained to utilize the capable transformation variables. The numerical solution of the continuity, momentum, energy, and entropy generation equations is obtaining using the command bvp4c of Matlab as a solver. To explore the impact of main parameters like suction/infusion, Prandtl, Reynold, Eckert, Peclet number, and volume fraction parameters, various graphs have been plotted and examined. It is concluded that a convectional nanofluid is highly compared by entropy generation with the boundary layer of hybrid nanofluid.

Keywords : entropy generation, hybrid nano fluid, heat transfer, porous disks
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