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The Properties of the Physical Parameters in the Triple Diffusive Fluid Flow Model
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Abstract
The existence of more than one diffusive component in fluid mixtures is observed in these situations: underground water flow, the mechanism of acid rain, the existence of contaminant in some certain mixture, etc. These diffusive components are occurred with the single temperature gradient (since all of the elements are dissolved into the same mixture) and 2 types of concentration gradients (since the dual diffusive components are dissolved in the same mixture). Besides, many industrial and engineering processes are utilizing the concept of convective fluid flow especially over a shrinking sheet. Therefore, a mathematical model for triple-diffusive flow over a nonlinear compressing sheet has been developed in this paper, and subjected to the Soret-Dufour effects. The model comprises of five initial equations namely continuity, momentum, energy, concentration of component 1 and concentration of component 2 equations, together with boundary conditions. These initial equations are expressed as partial differential equations. However, the finalized equations are in the form of ordinary differential equations. Later, the bvp4c programme provided by the Matlab Software is used to solve the ordinary differential equations and the boundary conditions. Three distinct values of each governing parameter are fixed into the bvp4c function, to observe the behaviour of the physical parameters, namely as local Nusselt number and local Sherwood number. The main finding of the dual numerical solutions varies for increasing governing parameters until they intersect at the critical points. In conclusion, the governing parameters affects the heat and mass transfer of the fluid flow model model.

Author Keywords
Local Nusselt number; local Sherwood number; triple diffusive

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