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Chapter 5

Numerical Solution of Boundary Layer Flow Past a Stretching Sheet with Zero Flux Saturated by a Nanofluid

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Abstract

In this paper, the boundary layer flow of a nanofluid past a stretching sheet with zero flux has been investigated numerically. The model used for the nanofluid, includes the effects of Brownian motion and thermophoresis. Using similarity transformations the partial differential equations are turned into first-order ordinary differential equations. This system of equations has been solved numerically by using shooting method. The resulting solutions depend on the Prandtl number (Pr), Lewis number (Le), Brownian motion (Nb) and thermophoresis parameter (Nt). For various values of Prandtl and Lewis number, the variations of the reduced Nusselt and Sherwood numbers with Brownian motion and thermophoresis parameters are shown in tabular and graphical form. For the special cases, present results are compared with the results available in the research papers, which are found in better agreement.

Keywords: boundary layer, Brownian motion, nanofluid, stretching sheet, thermophoresis

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