Abstract

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Semi-analytical solutions of flow and heat transfer of fluid along expandable-stretching horizontal cylinder

In the presence of suction/injection, a mathematical formulation for laminar boundary layer flow and heat transfer of an incompressible viscous fluid along an expandable-stretching horizontal cylinder is provided. The partial differential equations governing system is reduced to a system of ordinary differential equations. With the aid of Mathematica, semi-analytical solutions for the resultant system of ordinary differential equations are obtained using the OHAM (Optimal Homotopy Asymptotic Method) and the Legendre-Galerkin method. It is found that the suction process increases surface stiffness and strength while the injection process reduces surface skin friction. Also, other flow and thermal factors are discussed graphically.