

Unsteady viscous flow and heat transfer due to a permeable stretching/shrinking cylinder

Abstract

An analysis is carried out to investigate the unsteady viscous flow and heat transfer due to a permeable stretching/shrinking cylinder. The unsteady Navier-Stokes equations are first transformed to nonlinear ordinary differential equations using a similarity transformation, before being solved numerically by a shooting method. The effects of the parameters involved namely the suction parameter, the stretching/shrinking parameter and the unsteadiness parameter on the velocity and temperature fields are analyzed and presented graphically. The numerical results indicate that dual solutions exist for a certain range of the stretching/shrinking parameter. The surface shear stress and the surface heat flux increase in the presence of suction at the boundary

Keywords

Permeable; Stretching/shrinking cylinder; Unsteady viscous flow