

Abstract

During last years many research papers studied magnetic and porous effects on the different motions of viscous fluids with or without thermal effects. These effects have been separately brought to light by graphs or tables. However, such an approach is superfluous or even misleading because both effects can be underlined together using one parameter only. We shall prove this for a motion produced by an infinite plate which applies an arbitrary time-dependent shear stress to the fluid.

Finally, using the Laplace transform technique, we establish exact solutions for the unsteady flow of a fractional second grade fluid over an infinite plate. The magnetic and porous effects are taken into consideration. The expressions that have been obtained for the dimensionless velocity of the fluid are presented in terms of Fox's H -function. The influence of the fractional parameter on the fluid motion is studied and a comparison between velocity of the fractional and classical fluid is made.