Abstract

Incompressible viscous fluid flow through a porous medium between two infinite parallel plates with moving upper plate in a rotating system has been studied here. The exact solution of the governing equation for the velocity field has been obtained by using Laplace and finite Fourier sine transformations in series form in terms of Mittage-Leffler function. It can be found that the fluid velocity decreases with the increasing values of fractional calculus parameter $\alpha$ and the permeability of the porous medium $K$. It can be also observed that the fluid velocity increases with the higher values of the viscosity of the porous medium. The dependence of the velocity field on fractional calculus parameters as well as material parameters has been illustrated graphically.

References

1236-1252.

**Index Terms**

Computer Science

Applied Sciences

**Keywords**

Caputo operator; Generalised Oldroyed-B fluid; Laplace transformation; Finite Fourier sine transformation; porous medium.