ON THE VISCOUS FLUID FLOW THROUGH CYLINDRICAL TUBE OF ELLIPTICAL CROSS-SECTION FILLED WITH POROUS MEDIUM

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Abstract: This paper concerns with the study of viscous fluid flow through cylindrical tube of elliptical cross section filled with porous medium with impermeable core. Velocity profiles and flow rate are obtained analytically. Also, for different value of parameter the behavior of velocity profiles and flow rate are presented graphically.

1. Introduction

The problem of fluid flow through cylinders of elliptical cross sections filled porous medium has been longstanding interest for many researchers because of their applications in physical sciences, chemical engineering and industries. Various aspects of the problem have been investigated by many authors. Chandna [3] give a theoretical investigation of the unsteady two dimensional flow of a viscous, incompressible fluid normal to a thin elliptical cylinder and find the flow solution for small values of time. Choi and Lee [4] investigated turbulent boundary layer on elliptical cylinder. Khan [5] et al. solved the elliptical cylinder problem by using analytical approach. In this paper the problem is solved using semi- analytical approach.

Further EL-Bashir [6] study on Creeping Flow Past an Elliptical Cylinder in the Presence of a Vortex and presented the fluid flow passing through an elliptical cylinder in the presence of a vortex and numerical results are investigated. A