A STEADY FLOW OF A HOMOGENEOUS VISCOUS INCOMPRESSIBLE FLUID THROUGH A STRAIGHT POROUS TUBE OF EQUILATERAL TRIANGULAR CROSS SECTION UNDER A CONSTANT PRESSURE GRADIENT

P. SRINIVASA REDDY[1] AND N. CH. PATTABHIRAMACHARYULU[2]

[1]Department of Mathematics,Kakatiya University,
Warangal-506009, India
[2]Former Faculty, National Institute of Technology,
Warangal -. 506 004, India

Abstract

This paper presents an investigation on a viscous incompressible fluid flow in a long straight porous tube of equilateral triangular cross section with an impermeable wall under a constant pressure gradient. The porous medium is homogeneous and isotropic and the governing equation is non-Darcian Navier Stokes equation. Exact analytical expressions have been derived for the velocity field and the flow rate across the cross-section. The effect of the porosity coefficient on the flow rate is illustrated graphically.

—————————————————————