Analysis of Stokes flow of micropolar fluid through a porous cylinder

Deepak Maurya¹, Satya Deo¹, and D. Khanukaeva²

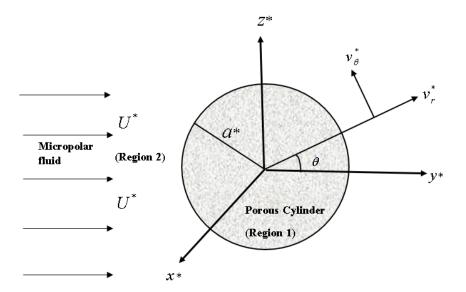
August 17, 2020

Abstract

The present study concerns the Stokes flow of a micropolar fluid through a porous cylinder which axis is perpendicular to the plane of flow. Stream functions, velocities, fluid pressures and stresses are evaluated for corresponding fluid flow regions. Streamlines for various values of different parameters are plotted and discussed. Also, the fluid velocity vector and microrotation vector for inside and outside the cylinder are plotted for the different values of the viscosity coefficients and discussed for boundary conditions with continuity of couple stress / continuity of tangential stress. A comparative study of the streamlines, velocity components, microrotation components is presented for two types of the boundary value problems.

Hosted file

Analysis of Stokes flow of micropolar fluid through a porous cylinder.pdf available at https://authorea.com/users/351545/articles/476124-analysis-of-stokes-flow-of-micropolar-fluid-through-a-porous-cylinder



¹University of Allahabad Faculty of Science

²Gubkin Russian State University of Oil and Gas

