

Analysis of Stokes flow of micropolar fluid through a porous cylinder

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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.

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