عنوان مقاله:

Axisymmetric Creeping Flow of a Micropolar Fluid over a Sphere Coated with a Thin Fluid Film

محل انتشار:

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نویسندگان:

B. R. Gupta - *Department of mathematics, Jaypee University of Engineering &Technology, Guna, MP, India*

S. Deo - *Department of mathematics, University of Allahabad, Allahabad-۲۱۱۰۰۲, UP, India*

خلاصه مقاله:

Consideration is given to the problem of steady axisymmetric Stokes flow of a micropolar fluid past a sphere coated with a thin, immiscible Newtonian fluid layer. Inertial effects are neglected for both the outer fluid and the fluid film.The stream function solutions of the governing equations are obtained in terms of modified Bessel functions and Gegenbauer functions. The explicit expressions of flow fields are determined by applying the boundary conditions at the coated sphere interface and uniform velocity at infinity. The drag force experienced by the fluid-coated sphere is evaluated and its variation is studied with respect to various geometric and material parameters. It is found that a sphere without coating experience greater resistance in comparison to coated fluid. Some well-known results are then deduced from the present study.

کلمات کلیدی:

Micropolar fluid, Stokes flow, Modified Bessel functions, Drag force