Effects of Dispersion on Peristaltic Flow of a Micropolar Fluid Through a Porous Medium with Wall Effects in the Presence of Slip

Authors : G. Ravi Kiran, G. Radhakrishnamacharya

Abstract : This paper investigates the effects of slip boundary condition and wall properties on the dispersion of a solute matter in peristaltic flow of an incompressible micropolar fluid through a porous medium. Long wavelength approximation, Taylor's limiting condition and dynamic boundary conditions at the flexible walls are used to obtain the average effective dispersion coefficient in the presence of combined homogeneous and heterogeneous chemical reactions. The effects of various pertinent parameters on the effective dispersion coefficient are discussed. It is observed that peristalsis enhances dispersion. It also increases with micropolar parameter, cross viscosity coefficient, Darcy number, slip parameter and wall parameters. Further, dispersion decreases with homogenous chemical reaction rate and heterogeneous chemical reaction rate.