

Effect of heat and mass transfer and rotation on peristaltic flow through a porous medium with compliant walls

ABSTRACT

Purpose: The purpose of this paper is to investigate the peristaltic flow of an incompressible Newtonian fluid in a channel with compliant walls. The effects of rotation and heat and mass transfer are also taken into account. The governing equations of two dimensional fluid have been simplified under long wavelength and low Reynolds number approximation. An exact solutions is presented for the stream function, temperature, concentration field, velocity and heat transfer coefficient. **Design/methodology/approach:** The effect of the concentration distribution, heat and mass transfer and rotation on the wave frame are analyzed theoretically and computed numerically. Numerical results are given and illustrated graphically in each case considered. Comparison was made with the results obtained in the presence and absence of rotation and heat and mass transfer. **Findings:** The results indicate that the effect of the permeability and rotation are very pronounced in the phenomena. **Originality/value:** The objective of the present analysis is to analyze the effects of rotation, heat and mass transfer and compliant walls on the peristaltic flow of a viscous fluid.

Keyword: Rotation; Heat transfer; Mass transfer; Peristaltic flow; Compliant walls