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Features of Convective Heat Transfer on MHD Peristaltic Movement of Williamson Fluid with the Presence of Joule Heating

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In this article, Peristaltic motion with the effects of heat, mass transfer and radially varying MHD of a Prandtl fluid in an endoscope has been studied. The formulated equations of velocity, temperature and concentration field are simplified using long wavelength and low Reynolds number assumptions. The coupled non-linear differential equations are solved analytically by means of the homotopy perturbation method for small values of material parameters. The salient features of pumping and trapping are discussed with particular focus on the effects of Soret, Schmidt number and magnetic parameter. It is observed that temperature and concentration profile shows the opposite behavior. Expressions of pressure rise, friction forces and their graphical results has been also represented. Another is the graphical display of pressure gradient. Stream lines pattern for five different wave frames are also represented. It is observed that trapping bolus of the triangular wave is smaller than the other wave forms.

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