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Hall effects on mhd peristaltic flow of Jeffrey fluid through porous medium in a vertical stratum
(2018) *Interfacial Phenomena and Heat Transfer*, 6 (3), pp. 253-268. Cited 1 time.

Abstract
In this paper, we discuss heat transfer on the peristaltic magnetohydrodynamic flow of a Jeffrey fluid through a porous medium in a vertical echelon under the influence of a uniform transverse magnetic field normal to the channel, taking Hall current into account. This study is motivated towards the physical flow of blood in a microcirculatory system by taking account of the particle size effect. Here we consider the Reynolds number to be small enough and wavelength-todiameter ratio large enough to neglect inertial effects. The nonlinear governing equations for the Jeffrey fluid are solved making use of the perturbation technique. The exact solutions for the velocity, temperature, and the pressure rise per one wavelength are determined analytically. Its behavior is discussed computationally with reference to different physical parameters. Some parameters are the strongest on the trapping bolus phenomenon and the pumping characteristics. The size of the trapping bolus decreases with increasing Hartmann number or permeability parameter and increases with increasing Hall parameter or Jeffrey number. © 2018 by Begell House, Inc.

2-s2.0-85068709478
Document Type: Article
Publication Stage: Final
Source: Scopus