

THE EFFECTS OF DIFFUSION ON THE MECHANISM OF PERISTALTIC FLOW AT SLIP BOUNDARIES WHEN INTERNAL JOULE HEATING IS PRESENT

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Abstract

This study's primary objective is to demonstrate how diffusion-thermo and thermal diffusion influence of peristaltic flow processes with slip boundaries when joule heating happens from the interior. Several operational factors and their impacts on the system were analysed, along with the corresponding graphs. As slip parameters rise, the axial pressure gradient fluid flow tends to drop. The pressure rate is demonstrated to drop in the backward and peristaltic pumping regions as the quantity of the second order slide parameter rises, whereas it rises in the co-pump zone. As slip parameters rise, fluid temperature and concentration tend to drop. Changes in the thermal diffusion and thermo diffusion factors cause changes in the fluid's temperature and concentration. The Nusselts number can be increased by increasing the Prandtl number, the thermo-diffusion constraint, the dufour number, and the Schmidt number. However, this will result in fewer Sherwood number.

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