عنوان مقاله:

Influence of Combined Mixed Convection-Radiation Heat Transfer within a Vertical Channel on Flow Reversal: a Numerical Analysis

محل انتشار:

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خلاصه مقاله:

The present study deals with the numerical analysis of combined (radiative and convective) mixed (free and forced) heat transfer within a vertical channel, considering all radiative properties (i.e., emitting, scattering and absorbing). The radiative transfer equation has been solved by the discrete ordinates method (DOM), adopting its S6 quadrature scheme. The control volume method is used for solving the governing equations. The main objective of present work is to evaluate the effect of radiation on the occurrence of flow reversal. Also, the results are compared with the available numerical data in the literature showing the occurrence of flow reversal at the centre of channel. The influence of radiative parameters, namely the conduction-radiation parameter and optical thickness, on the occurrence of flow reversal has been studied. The results are represented as the profiles of temperature and velocity for various values of the radiative parameters. The center-line velocity and the streamlines of flow are the quantities whose variations within the channel have been investigated. Flow reversal occurrence regime versus the radiative parameters is also demonstrated.

کلمات کلیدی:

mixed convection/flow reversal/ radiative heat transfer/vertical channel/ finite volume method/discrete ordinates method

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