

NATURAL CONVECTION IN A VERTICAL CHANNEL

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ABSTRACT:

This paper examines the numerical simulation of air natural convection in a vertical channel. The channel is asymmetrically heated with a uniform heat flux. The computational procedure is made by solving the unsteady two dimensional Navier-Stokes and energy equations. This nonlinear system is integrated by a finite volume approach and then solved in time using the projection method, allowing the decoupling pressure from velocity. The aim of this work is to conduct a detailed numerical study to analyze the effects of the Rayleigh number $Ra=10^3$, $Ra=10^4$ and $Ra=10^5$ on the natural convection. The numerical results (velocity, pressure and temperature fields) give detailed information about the evolution of the flow structure.