

Numerical simulation of heat transfer in a semi-cylindrical cavity with different heating models

Sofiane Kherrou^{*1}, Rida Zarrit¹, Lyes Boutina¹, Hocine Bensaha¹

¹Unité de Recherche Appliquée en Energies Renouvelables, URAER, Centre de Développement des Energies Renouvelables, CDER, 47133, Ghardaïa, Algeria *

Abstract: *The present article reports numerical results of laminar natural convection heat transfer within an air filled semi cylindrical cavity with its horizontal walls submitted to different heating models. In this work, the horizontal surface is maintained at constant temperatures T_c (Dirichlet condition) or heat fluxes q (Newman condition), while that of the opposite surface is considered at cold temperature T_f . The parameters governing the problem are the Rayleigh number ($10^3 < Ra < 10^6$), and the Prandtl number ($Pr = 0.71$). The effect of thermal boundary condition on fluid flow and heat transfer is examined in the two cases. The comparison of the constant temperature and constant heating conditions lead to a strong change in the flow structure and the corresponding heat transfer.*

Key words : *laminar natural convection, semi cylindrical cavity , Dirichlet condition, Newman condition, Rayleigh number*

