

EFFECT OF VARIABLE ORIENTATION ON NATURAL CONVECTION IN A FLUID-SATURATED POROUS MEDIA IN AN ELLIPTICAL ANNULUS

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ABSTRACT. The purpose of the present paper is to analyze numerically the flow and heat transfer by steady laminar natural convection in an elliptical horizontal annulus filled with a Newtonian incompressible fluid saturated porous medium, with an isothermal inner and outer boundary. This study is carried out using the Darcy flow model, Boussinesq's approximation and the vorticity-stream function formulation, the continuity and the momentum equations are expressed. A computer code was developed, using finite volume method. The stream lines and temperature distributions are presented and analyzed, examining the slope effect.

KEYWORDS: *natural convection, Boussinesq equations, porous medium, elliptical annulus, Darcy flow model, slope effect.*