

Abstract Submitted
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Transient double-diffusive convection in an axisymmetric wavy-walled enclosure¹ FAUSTO SANCHEZ, SIMON MARTINEZ, HUGO RAMIREZ, JESUS CHAVEZ, Universidad Autonoma de Nuevo Leon, ABRAHAM MEDINA, Instituto Politecnico Nacional — Transient double-diffusive convection within a vertical wavy-wall cylinder was numerically studied. The enclosure is filled with a saturated porous medium, the fluid is Newtonian and the Boussinesq approach was applied. The cavity is heated from below while the lateral wavy wall is thermally insulated. The saturation concentration of a passive tracer is assumed to exist at the top. The initial condition considers the fluid is at rest with zero concentration. An analytical coordinate transformation was used to change the computational domain into a square. Heat and mass transfer were analyzed using non-dimensional parameters which include the cavity aspect ratio, dimensionless wavelength and amplitude of the wavy-wall, the Rayleigh-Darcy, effective Prandtl and Schmidt numbers. The average Nusselt and Sherwood numbers were evaluated while the transport phenomena evolve within the cavity. After a large dimensionless time the concentration gradients become weak and thermal stratification arises promoting low heat transfer, specially when the wave amplitude is large.

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