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Buoyancy and blockage effects on transient laminar opposing mixed convection heat transfer from two horizontal confined isothermal cylinder in tandem[1] LORENZO MARTÍNEZ-SUÁSTEGUI, ESIME Azcapotzalco, Instituto Politécnico Nacional, ERICK SALCEDO, Departamento de Termofluidos, Facutlad de Ingeniería, UNAM, JUAN CAJAS, Barcelona Supercomputing Center (BCS-CNS), Edificio NEXUS I, Campus Nord UPC, Gran Capitán 2-4, CÉSAR TREVIÑO, UMDI, Facultad de Ciencias, Universidad Nacional Autónoma de México, SISAL — Transient mixed convection in a laminar cross-flow from two isothermal cylinders in tandem arrangement confined inside a vertical channel is studied numerically using the vorticity-stream function formulation of the unsteady two-dimensional Navier-Stokes and energy equations. Numerical experiments are performed for a Reynolds number based on cylinder diameter of Re = 200, Prandtl number of Pr = 7, blockage ratio of D/H = 0.2, a pitch-to-diameter ratio of L/D = 2, and several values of buoyancy strength or Richardson number Ri = Gr/Re^2. The results reported herein demonstrate how the wall confinement, interference effects and opposing buoyancy affect the flow structure and heat transfer characteristics of the cylinder array.

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