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Numerical Simulations of Unsteady Natural Convection in Interconnected Systems¹ CARLOS IVAN RIVERA-SOLORIO, RAMON RAMIREZ-TIJERINA, Tecnologico de Monterrey, SOLAR ENERGY AND THERMO FLUID TEAM — Numerical simulations are performed to study the process of unsteady natural convection in a configuration formed by two interconnected systems. In this configuration, one of the systems has a heat source that increases the temperature of the fluid. By natural convection, this fluid moves to a second system, which works as a radiator. The fluid cools off and descends to return to the first system. The process studied applies to oil heaters, power oil transformers, electrical devices and electronic equipment. The evolution of the velocities and temperature fields of the fluid are analyzed for different configurations and operating conditions of the interconnected systems. The effect in the time response of the heat transfer process is studied for the conditions considered. Conclusions drawn from the numerical results are presented.

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