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Study of the natural convection flow induced by injecting a hot fluid in a porous medium AYAX HERNANDO TORRES VICTORIA, Tecnológico de Estudios Superiores de Cuautitlan Izcalli, Estado de Mexico, Mexico, SALOMON PERALTA LOPEZ, ABRAHAM MEDINA OVANDO, SEPI ESIME Azcapotzalco, Instituto Politecnico Nacional, Mexico City, Mexico, VADIM KOURDIOUMOV, Departamento de Combustibles Fosiles, CIEMAT, Madrid, Spain, JAIME KLAPP, Departamento de Fisica, Instituto Nacional de Investigaciones Nucleares ABACUS-Centro de Matematicas Aplicadas y Computo de Alto Rendimiento, Mexico — In this work, we present the study of a steady flow driven by the injection of a hot fluid of temperature T_i , from a horizontal line source of mass embedded in an unbounded porous medium of constant permeability K and porosity ϕ , the medium is saturated with the same fluid. The fluid far from the source is stagnant with a uniform temperature T_∞ , where $T_\infty < T_i$. The density changes of the fluid are considered to be small enough so that the Boussinesq approximation is applicable and we shall also assume that the fluid and solid in the porous medium have the same temperature locally. This configuration conforms interesting flow and temperature patterns in the surrounding medium near the line source as demonstrated numerically and experimentally.

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