Lattice Boltzmann modeling for fluid flow and heat and mass transport applied to geothermal reservoirs

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Recently, Lattice Boltzmann Modelling (LBM) techniques attract many scientists in various fields of research. This work shows the capability for LBM to simulate the fluid flow and solute transport in porous and fracture media, additionally, how to study behavior of nanofluids submitted to a temperature gradient, which it is an important process in natural aquatic environments, water treatment, and other water related technologies. LBSim is used in this work as Lattice Boltzmann Model simulator software. In this article, a series of cases using the lattice Boltzmann method are presented, showing the capability of the method in simulating phenomena with fluid flow and heat transfer in porous media. Results show that the lattice Boltzmann method delivers reliable and helpful simulations for the analyses of processes in water related technologies. Thus, LBSim is a recommended tool for simulating fluid flow at laminar and turbulent condition, and heat and mass transport under complex geometry and boundary condition. parameter values.
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