

Lattice Boltzmann simulation of the flow of non-Newtonian fluids in porous media

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We present a LB study of the flow of single-phase non-Newtonian fluids. This follows our recent LB simulation of Newtonian binary immiscible fluids with viscosity contrast (Chin *et al.* 2001). Here we use a power law relationship between the effective viscosity and the local shear rate. Channel flow experiments were carried out to measure the velocity profiles. The simulation results are found to be in good agreement with theoretical velocity profiles. Based on these validation results, we also report simulations of the flow of non-Newtonian fluids in a 2-D porous medium.

References:

J.Chin, E.S.Boek and P.V.Coveney, *Phil.Trans.R.Soc.Lond. A* **360**, 547-558 (2001).