

UK Fluids Network SIG 10: Fluid Mechanics of Cleaning and Decontamination

Authors in SIG

Title	Numerical simulation of pressure-driven displacement of a viscoplastic material by a Newtonian fluid using the lattice Boltzmann method
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Publication details	<i>Euro. J. Mech. – B/Fluids</i> , 49, 197–207 (2015)
DOI (if available)	http://dx.doi.org/10.1016/j.euromechflu.2014.08.010
Summary paragraph	The pressure-driven displacement flow of a non-Newtonian fluid by a Newtonian fluid is studied. A two-phase lattice Boltzmann method is used. Various regularized viscoplastic models have been tested. Increasing the Bingham number and the flow index decreases the interfacial instabilities.
Novel/notable aspects	Full CFD of pressure-driven displacements of yield stress materials in pipes
Flow key words	Multiphase flow; Non-Newtonian fluids; Lattice Boltzmann simulation; Immiscible fluids; Instability; Laminar flow
Cleaning type/key words	Pressure-driven flow cleaning
Field/background	Chemical engineering; mechanical engineering
Theory/method/analysis key words	CFD; Lattice-Boltzmann method; Numerical simulations