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Induced phase transitions of nanoparticle-stabilized emulsions STEFAN FRIJTERS, FLORIAN GÜNTHER, JENS HARTING, Eindhoven University of Technology — Nanoparticles can stabilize fluid-fluid interfaces over long timescales and are nowadays commonly used, e.g. in emulsions. However, their fundamental properties are as of yet poorly understood. Nanoparticle-stabilized emulsions can exhibit different phases, such as Pickering emulsions or bijels, which can be characterized by their different topologies and rheology. We investigate the effect of various initial conditions on random mixtures of two fluids and nanoparticles - in particular, the final state these systems will reach. For this, we use the well-established 3D lattice Boltzmann method, extended to allow for the added nanoparticles. After the evolution of the emulsions has stopped, we induce transitions from one state to another by gradually changing the wettability of the nanoparticles over time. This changes the preferential local curvature of the interfaces, which strongly affects the global state. We observe strong hysteresis effects because of the energy barrier presented by the necessary massive reordering of the particles. Being able to change emulsion states *in situ* has potential application possibilities in filtering technology, or creating particle scaffolds.

Stefan Frijters
Eindhoven University of Technology

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