Physics > Fluid Dynamics

# Viscous coalescence of droplets -- a Lattice Boltzmann study

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The coalescence of two resting liquid droplets in a saturated vapor phase is investigated by Lattice Boltzmann simulations in two and three dimensions. We find that, in the viscous regime, the bridge radius obeys a t^{1/2}-scaling law in time with the characteristic time scale given by the viscous time. Our results differ significantly from the predictions of existing analytical theories of viscous coalescence as well as from experimental observations. While the underlying reason for these deviations is presently unknown, a simple scaling argument is given that describes our results well.

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