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Title:
Dynamics of small droplets on solid surfaces
Abstract:
The behavior of individual microdrops on solid surfaces is very important in many practical processes [1,2]. Despite of its importance, many aspects of this behavior, however, are still not well understood. Here, we address some of these aspects. The main focus is on the behavior of small drops on a super hydrophobic surface with a gradient of roughness; the effect of a step wise change in the pillar density on the dynamics of drops is investigated via lattice Boltzmann (LB) simulations [3], and the dependence of the drop velocity on the surface tension and the gradient of pillar density is analytically modeled [4]. In addition to the case of drops on a gradient of roughness, based on a detailed LB survey of the local viscous dissipation inside sliding droplets on flat substrates, we model the dependence of the drop velocity on the equilibrium contact angle [5]. Finally, we study the behavior of droplets at situations in which the size of a droplet is comparable to the roughness scale of the solid substrate using LB simulations. In this case, possible morphologies and a so-called re-entrant transition are studied [6].
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