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Dimensional crossover in the viscous dynamics of coalescence of liquid drops confined in between two plates[1] MARIA YOKOTA, KO OKUMURA, Department of Physics, Graduate School of Ochanomizu University — Recently, it has been established that the dynamics of coalescence of liquid drops, driven by capillary force, is balanced by viscous force at shorter times (or in viscous drops) and by inertial force at longer times (or in less-viscous drops) [1, 2]. This has been confirmed also in two-dimensional coalescence [3]. Here, we study coalescence of a liquid droplet to a bath of the same liquid in a confined geometry of a Hele-Shaw cell [4]. We followed the dynamics of the neck which bridges the drop and the liquid bath. We find, in a single coalescence event, a crossover from a three dimensional viscous dynamics to another quasi two-dimensional viscous dynamics. This crossover is established by demonstrating clear data collapse, thanks to simple dimensional arguments. We discuss further the third scaling regime between the two viscous regimes, together with an unusual charge effect on the coalescence which makes the dynamics self-similar.
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