

Simulation of the Dynamic Wetting Process of Droplets

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Abstract

Spreading of liquid droplets on a rigid flat surface is universal and usually happens in a time scaled from milliseconds to seconds. To explain the effect of viscosity on the initial spreading of droplets, simulation of the shear rate distribution of droplets at the spreading front was carried out. The dynamic process of droplets wetting on a solid substrate was simulated by using the level set method. The simulation results show that the viscous force is high at beginning of spreading even for low-viscosity liquids due to the high local shear rate at the spreading front.

Figures used in the abstract

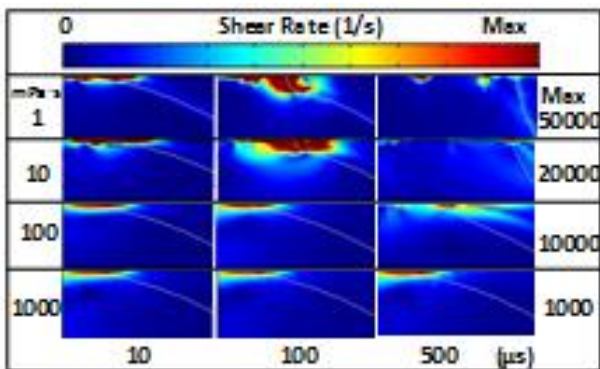


Figure 1: Evolution of shear rate contour of different viscosity liquids as a function of spreading time.