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A Numerical impact on behavior of drop on smooth hydrophilic and hydrophobic surfaces

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Abstract

A computational fluid dynamics model (CFD) based on the volume of fluid technique (VOF) is applied to simulate the spreading of an incompressible viscous liquid over smooth hydrophilic and hydrophobic surfaces. Surface tension, wall adhesion and surface roughness phenomenon are included in the computational model. The influence of different factors, such as surface roughness, drop nature, and type of surface, on the temporal evolution of the drop base radius and contact angle is systematically investigated. The numerical results reproduce perfectly the several spreading regimes which occur during the time course of the drop. We have shown, using several independent numerical experiments that the calculated results compare very well with the experimental data for a large range of drops and surfaces. The fact that we obtain a good agreement between the proposed theory and the experimental results over five decades of time is a strong argument in favor of the model

Biography

Hocine Alla has completed his Ph.D. from University of Sciences and Technology of Oran in 2006 and has published several papers in reputed journals.

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