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Numerical Simulation of Droplet Impact on Dry Solid Surfaces Using the Moment of Fluid Method YISEN GUO, YONGSHENG LIAN, University of Louisville, MARK SUSSMAN, Florida State University — The impact of liquid droplets on solid surfaces is a ubiquitous phenomenon in nature and industries. The understanding of the underlying physics involved is critical to many industrial problems such as spray cooling, ink-jet printing, and fuel injection. In this work, we study the droplet impacts on solid surfaces using a Navier-Stokes solver based on the moment of fluid surface representation method. Both dynamic contact angle model and static contact angle model are used. The impacts on both hydrophobic and normal substrates are simulated. The droplet spreading, receding, and rebounding are investigated. Numerical results are compared with experimental results in terms of the droplet base diameters and droplet shapes. Our simulations show that the numerical method can accurately capture the droplet impact phenomena. The simulations also indicate that the dynamic contact models give better match than the static contact angle model.

Yisen Guo
University of Louisville

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