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Simulation of Droplet Impact on a Liquid-Liquid Interface EMIL COYAJEE[1], Division of Chemistry and Chemical Engineering, California Institute of Technology, RENE DELFOS, HARMEN SLOT, BENDIKS JAN BOERSMA, J.M. Burgerscentre, Delft University of Technology, The Netherlands — In this study, a liquid droplet is released into a container of a heavier, more viscous liquid resting underneath another layer of the same fluid as the droplet. The droplet accelerates upward due to buoyancy until it impacts on the interface between the two liquid layers. Upon impact, both the droplet and the interface undergo large deformation. The droplet is rebounded by the elasticity of the interface, resulting in a damped oscillatory motion. Finally, after all fluid has come to rest, the droplet rests in a more or less elliptic configuration against the liquid-liquid interface. Numerical simulations are performed with a combined LS/VOF method using the novel concept of multiple marker functions to represent multiple interfaces in a single computational cell. Therefore, interfaces can collide without numerical coalescence. To validate our results, simulations are compared with physical laboratory experiments.

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