

Abstract Submitted
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Lattice Boltzmann Simulations of a Falling Droplet on a Rest Fluid Film¹ YUEHONG QIAN, Shanghai University, KE ZHANG, XUESHENG CHU, KAI YAN, Ship Scientific Research Center of China, Wuxi, 214082 — A single-phase model based on lattice Boltzmann [1,2] method is used to investigate the motion of the free surface. To describe the topological deformation of the fluid interface, the cell in the single-phase free surface model is divided into three types: fluid cells, interface cells and the empty cells. The distinctive feature of the model is that the propagation and interaction processes are carried out only in the interface cell and the fluid cell. Numerical simulations of a droplet falling onto a resting fluid film [3] is presented. The Crown formation shown in figure 1 as well as the splashing droplets have been found at different dimensionless Reynolds and Weber numbers, Some comparison with experiment will be also made. REFERENCES [1] Y.H. Qian, D. D’Humières, P. Lallemand. Lattice BGK models for Navier-Stokes equation. *Europhys. Lett* 1992(17): 479-484. [2] N. Thurey, U. Rude. Interactive free surface fluids with the lattice Boltzmann method. Technical report 2005. University of Erlangen-Nuremberg, Germany. [3] Z.Y. Shi, Y.H. Yan, F. Yang, Y.H. Qian and G.H. Hu. A lattice Boltzmann method for simulation of a three dimensional drop impact on a liquid film. *Journal of Hydrodynamics* 2008,20 (3):267-272.

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