A Numerical Analysis on the Collision Behavior of Water Droplets

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ABSTRACT

Droplet collision phenomena have been investigated experimentally and theoretically and two different types of separating collisions, namely reflexive and stretching separations, were identified. In this study, performed was a numerical simulation of the binary collision dynamics of water drops for size ratios of 1 and 0.75, for the Weber-number range of 5 to 100, and for wide range of impact parameters. The numerical method is based on a fractional-step method with a finite volume formulation. The interface is tracked with Volume of Fluid (VOF) method, and the surface tension is considered using a Continuous Surface Force (CSF) model by Brackbill and the Peskin kernel. Numerical results compared with four different separating theories as well as with an experimental result

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