

Abstract Submitted
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The Generation of Secondary Droplets due to Drop Impact on a Water Surface in the Presence of Wind and Surfactants¹ REN LIU, XINAN LIU, University of Maryland — The impact of single water drops on a water surface was studied experimentally in a wind tunnel. Water drops were generated from a needle oriented vertically from the top surface of the wind tunnel test section. The wind speed ranged from 0 to 10.0 m/s. After leaving the needle, the drops move downward due to gravity and downstream due to the effect of the wind, and eventually hit a pool of water on the bottom of the test section. The drop impacts were recorded simultaneously from the side and from above with two high-speed movie cameras set at 1,000 frames per second. It is shown that the water drop obliquely impacts the water surface and the impingement angle relative to vertical increases with increasing wind speed. After the drop hits the water surface, a chain of secondary drops are formed and move in the leeward direction. This is followed by a stalk formation at the location of water drop impact. The effects of wind speed and initial drop size on the number, diameter and total mass of secondary drops and the shape of the stalk were investigated. The effects of surfactants on these parameters were also studied.

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Xinan Liu
University of Maryland

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