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The effects of the impact velocity of water droplets on the surface features in a rain field[1] REN LIU, XINAN LIU, JAMES DUNCAN, University of Maryland, College Park — The characteristics of the shape of a water surface in response to the impact of simulated raindrops are studied experimentally. The experiment is carried out in a 1.22-m by 1.22-m water pool with a water depth of 0.3 m. Simulated raindrops are generated by an array of 22-gauge needles that are attached to a flat plate and connected to a water reservoir with soft hoses. A random translational motion is added to the plate to produce a randomness of the drop impact locations for each needle. The height of the flat plate relative to the water surface of the pool is varied from 1 m to 3 m to vary the impact velocities of the water drops. The surface features due to the impact of the drops, including the crown, stalk and ring waves are measured with a cinematic laser-induced- fluorescence (LIF) technique. It is found that the size of the crown, the height of the stalks and the wavelength of the waves vary with the impact velocity of drops. A comparison of these features with those found in a single drop impact is highlighted.

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