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Simultaneous measurements of shape characteristics and radar backscattering of a water surface in a rain field[1] REN LIU, XINAN LIU, JAMES H. DUNCAN, University of Maryland, College Park — The characteristics of radar backscattering from a water surface that is stimulated by a rain field are studied at laboratory scale. 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 the bottom of a water reservoir located above the pool. A two-dimensional horizontal translational motion is added to the water reservoir in order to vary the drop impact location for each needle during each experimental run. A cinematic Laser-Induced-Florescence (LIF) technique is used to measure the water surface shape while radar backscattering from the water surface is simultaneously recorded by a dual-polarized, ultra-wide band radar. Both the radar return intensity and the water surface shape are measured for a range of rain rates and a range of radar incidence angles. The relationship between the geometric features of the water surface shape and the radar return are explored.

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