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On the collision and mixing of water droplets on superhydrophobic surfaces MICHAEL A. NILSSON, JONATHAN P. ROTHSTEIN, University of Massachusetts Amherst — The dynamics of water drop collisions on superhydrophobic surfaces is investigated using high-speed photography. Teflon is sanded to create the superhydrophobic surfaces. The results of the surface fabrication technique are presented, showing the effect of grit size on hysteresis. This method of creating superhydrophobic surfaces allows for the specification of varied advancing contact angles with similar hysteresis, or varying hysteresis with near similar advancing contact angles. Deionized water droplets are made to collide on these surfaces by propelling one droplet into another using a burst of pressurized air. The subsequent collision is captured, and several impact characteristics are calculated as a function of contact angle hysteresis. The Weber number and impact number are calculated, as well as the maximum deformation of the combined drop. In some experiments, the drops left the surface after collision even with low hysteresis at the low Weber numbers tested. Characteristic images of different regimes of the collision dynamics will be presented, as will how each of these regimes affect the mixing of the drops.

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