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Droplet Train Impingement on Superhydrophobic Surfaces JONATHAN STODDARD, JULIE CROCKETT, DANIEL MAYNES, Brigham Young University — The dynamics of a droplet train impinging on a superhydrophobic (SH) surface is investigated. The surfaces are patterned with either post or ribbed microfeatures and coated with Teflon to render them hydrophobic. The height of the features are nominally 15 microns and the spacing for the post and ribbed surfaces are approximately 16.5 microns and 32 microns respectively. Droplets at the induced frequencies of 600-4600 Hz with sizes varying from 0.7 to 1.5 mm in diameter are forced to impinge on these SH surfaces. When each individual droplet impinges on the surface, a crown forms which spreads out radially until reaching a semi-stable or regularly oscillating crater radius. At this point the water either builds up or breaks up into droplets. In some cases the crown may breakup before reaching the crater, causing splashing. We characterize the occurrence of these dynamics and quantify the crater radius over a Weber number range of 70-1450. In addition we compare the crater radius to the breakup radius of a uniform jet with equivalent momentum and describe the transition dynamics from droplet train impingement to uniform laminar jet impingement on a SH surface.

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