

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Puddle Jumping ANDREW WOLLMAN, Portland State University, TREVOR SNYDER, 3D Systems, MARK WEISLOGEL, Portland State University — Rebounding droplets from superhydrophobic surfaces have attracted significant public and scientific attention because they are both enjoyable as well as industrially relevant. Demonstrations of bouncing droplets with volumes between 0.003 and 0.03 ml are common in the literature and limited primarily by gravity. In this presentation we demonstrate large droplet “rebounds” made possible by low-gravity testing in a drop tower. The up to 300 ml drops are best described as puddles that launch in a nearly identical manner to rebounding drops 4 orders of magnitude smaller in volume. A variety of jumping liquid and gas puddles are shown including puddles of highly specified and unusual initial geometry. The large length scales of the capillary fluidic surfaces $\sim \mathcal{O}(10\text{ cm})$ enable 3D printing of all superhydrophobic surface topologies demonstrated. In addition, we demonstrate such puddle jumping as a passive drop-on-demand technique for large low-gravity drop dynamics investigations; such as collisions, rebounds, heat and mass transfer, and containerless possessing.

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Date submitted: 31 Jul 2014

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