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Drop impact dynamics on liquid-infused superhydrophobic surfaces JEONG-HYUN KIM, JONATHAN ROTHSTEIN, Univ of Mass - Amherst — In this talk, we present a series of experiments investigating the drop impact dynamics on hydrophobic, air-infused and lubricant-infused superhydrophobic surfaces. To create the superhydrophobic surfaces, smooth Teflon (PTFE) surfaces were roughened by a 240-grit sandpaper. The immiscible and incompressible silicone oils with different viscosities were infused into features of the superhydrophobic surfaces by a skim coating technique. The spreading and retraction dynamics on a series of the tested surfaces will be presented. We will show that the maximal deformation of the drops on lubricant-infused surfaces grows with increasing viscosity ratio between a water drop and the infused oil. We will show that this increase in the maximal deformation with the viscosity ratio is consistent with increasing the velocity and the viscosity of the drops but the rims of the drops destabilize with increasing the drop velocity. Finally, we will demonstrate that increasing the viscosity of the infused oil induces higher viscous force at the contact line, resulting in reduction in the movement of the drops during retraction and corresponding increase in the final drop size.

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