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Fog interaction with a textured hydrophobic surface: deposition, growth, and wetting TONY S. YU, Brown University, JOONSIK PARK, HYUNEUI LIM, Korea Institute of Machinery and Materials, KENNETH S. BREUER, Brown University — A hydrophobic surface patterned with micro-pillars can exhibit "superhydrophobic" behavior, wherein drops only touch the tops of pillars (the so-called Cassie-Baxter state). This state, however, requires drops much larger than the pillar size/spacing. In contrast, drops smaller than the microtexture can adsorb both on top of and in- between these pillars and readily stick to the solid. In this study, we image the deposition of drops from fog (i.e. micron-sized droplets suspended in air) flowing over a substrate textured with square pillars, which are tens-of-micron in size. After texturing, the surface is coated with a hydrophobic monolayer. While drop growth at early time is dominated by deposition, late-time growth is dominated by coarsening due to the coalescence of adjacent drops. In this talk, we quantify the evolution of the size of these adsorbed drops. In addition, we show how closely-spaced pillars limit the size distribution of growing drops and enhance their spatial ordering.

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