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**Investigation of drag reduction properties of liquid impregnated micro-textured surfaces** VAMSI SPANDAN, Indian Institute of Technology Madras, GARETH MCKINLEY, Massachusetts Institute of Technology, SARIT DAS, Indian Institute of Technology Madras — The liquid repelling and drag reducing properties of superhydrophobic surfaces are attributed to microscopic pockets of air trapped in between topographical structures with low surface energy. In this work we numerically investigate the drag reduction properties of textured surfaces which are impregnated with an immiscible liquid lubricant instead of air. Although these surfaces outperform conventional superhydrophobic surfaces in dynamic characteristics such as droplet movement (due to lack of contact line pinning), the question whether such surfaces can exhibit drag reduction when immersed in a fluid remains open. We employ a continuum approach (using Volume of Fluid simulations) to investigate changes in skin friction on such surfaces. This method enables the simulation of two incompressible, immiscible fluids with the inclusion of capillary effects between the phases and specification of a finite contact angle between the phases and the textured wall. We study the effect of viscosity ratio, interfacial tension, and topography of the microtextures on the drag reducing properties of such liquid impregnated surfaces.

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