

Abstract Submitted
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Turbulent Taylor-Couette flow over liquid infused surfaces¹

BRIAN ROSENBERG, ALEXANDER SMITS, Princeton University — We experimentally study the flow of turbulent water over a textured surface that is impregnated with a second immiscible liquid. Two configurations are studied: (i) a configuration in which the impregnating fluid is contained within the texture, so that the turbulent flow sees a composite liquid/solid surface and (ii) a configuration in which the impregnating fluid overlies the texture. Experiments are performed in turbulent Taylor-Couette flow at a friction Reynolds number around 150. We characterize the impact the liquid infused surfaces have on the skin friction as well as the critical Reynolds number for transition to turbulence. Particular attention is focused on the influence of the texture geometry and length scale as well as the impregnating fluid properties.

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