

Abstract Submitted
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Turbulent Drag Reduction Using Superhydrophobic Surfaces¹

ROBERT J. DANIELLO, JONATHAN P. ROTHSTEIN, Department of Mechanical and Industrial Engineering, University of Massachusetts, Amherst — Superhydrophobic surfaces have received considerable attention for their ability to reduce drag in laminar flows. In this talk we demonstrate that engineered, micropatterned, superhydrophobic surfaces produce the same effect, with similar geometric scaling, in turbulent flows. Direct velocity measurements were used to measure slip velocities up to 40% of the mean flow. Shear stress reductions up to 60% were noted in comparison between smooth and superhydrophobic walls, with slip lengths up to $230\mu\text{m}$ for several microridge geometries. Drag reduction was noted to increase with microfeature spacing and with reduced laminar sublayer thickness for a fixed shear free area ratio.

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