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Drag Reduction using Superhydrophobic Sanded Teflon DONG SONG, ROBERT DANIELLO, JONATHAN ROTHSTEIN, University of Massachusetts - Amherst — In this talk, we present a series of microfluidic experiments designed to investigate drag reduction using series of roughened Teflon surfaces. The Teflon surfaces where made superhydrophobic by imparting surface texture through sanding with sand papers with a range of grit sizes. Our previous work showed that there exists an optimal sand paper grit (240 grit) for eliminating contact angle hysteresis. We will show that a Teflon surface roughened with the same sand paper grit also maximizes the drag reduction and the slip length observed in laminar flows. Increasing or decreasing the grit size was found to reduce the drag reduction and slip length. A number of different sanding protocols were investigated including sanding preferentially in the flow direction, normal to the flow direction and with a randomized circular pattern. Of these three techniques, sanding in the flow direction was found to maximize the slip length.

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