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Influence of Slip on the Flow Past Superhydrophobic Circular Cylinders[1] JONATHAN ROTHSTEIN, ROBERT DANIELLO, NANGELIE FERRER, PRANESH MURALIDHAR, University of Massachusetts — Superhydrophobic surfaces have been shown to produce significant drag reduction for both laminar and turbulent flows of water through large and small-scale channels. In this presentation a series of experiments will be presented which investigate the effect of superhydrophobic-induced slip on the flow past a circular cylinder. In these experiments, circular cylinders are coated with a series of superhydrophobic surfaces fabricated from PDMS with well-defined micron-sized patterns of surface roughness. We will show that the presence of the superhydrophobic surface has a significant effect on both the drag coefficient of the cylinder and vortex shedding dynamics in its wake. When compared to a smooth, no-slip cylinder, we will show that the drag coefficient of the superhydrophobic cylinder decreases, the separation moves towards the rear of the cylinder and the vortex shedding frequency increases. In addition, we will show that the vortex shedding dynamics are very sensitive to changes of feature spacing, size and orientation.

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