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Effective Slip and Drag Reduction in Transitional Flow over Superhydrophobic Surfaces MARGARET HECK, The University of Oklahoma, DIMITRIOS PAPAVASSILIOU, The University of Oklahoma & National Science Foundation — Superhydrophobic surfaces (SHS) have recently attracted attention as a passive technique for reducing drag in both laminar and turbulent flows [1,2]. These surfaces result in a reduced contact area between a liquid and a solid by trapping air between roughness elements [1,3]. The liquid then glides over the pockets of air between the roughness elements, exhibiting hydrodynamic slip [1]. Most studies considering systems involving SHS focus on laminar or low Reynolds number (*Re*) turbulent flow. Turbulence closure models may be useful when considering large *Re* flows and complicated surface topologies of the SHS. This study explores the behavior of the effective slip length and the drag reduction for Newtonian fluids flowing over SHS in the transitional flow regime using computations and both laminar and traditional turbulence models. For *Re* in the range between 1,000 and 5,000, slip length is observed to differ from that for purely laminar or fully developed turbulent flow. The values obtained using popular models for turbulence, such as the standard k-e and the standard k-w models, are compared, and a possible explanation for the observed variance is explored using predictive models, such as that proposed by Fukagata et al. [4].

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