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Super-Hydrophobic-Like Effect Created by Surface Corrugations

Drag reduction can result from the use of surfaces with micro-features where trapped gas bubbles reduce shear stress over part of the surface exposed to a moving liquid. This is the so-called super-hydrophobic effect. The best surface topography for such effect is yet to be determined and is subject to an active search. In the current implementation this effect can be taken advantage of only in the case of liquids and requires presence of a gas phase. We are looking for creation of a similar effect using surface grooves that reduce shear either through the local flow separation or through the fluid squeezing. The available results show that the shear drag can be reduced but this effect can become practical only if the associated pressure drag can be controlled. Current understanding of this effect will be discussed.