

Abstract Submitted
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Thermo-super-hydrophobic effect JERZY M. FLORYAN, The University of Western Ontario — Super-hydrophobic effect involves capture of gas bubbles in pores of solid wall. These bubbles separate moving liquid from the solid surface resulting in a substantial reduction of shear drag experienced by the liquid. The super-hydrophobic effect requires presence of two phases and thus drag reduction can be accomplished only for liquids. Thermo-super-hydrophobic effect takes advantage of the localized heating to create separation bubbles and thus can work with single phase flow systems. Analysis of a simple model problem shows that this effect is very strong in the case of small Re flows such as those found in micro-channels and can reduce pressure drop down to 50% of the reference value if the heating pattern as well as the heating intensity are suitable chosen. The thermo-super-hydrophobic effect becomes marginal when Re increases above a certain critical value.

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