

Abstract Submitted
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Experimental study of flow in a channel with a periodically heated wall AYUMU INASAWA, KEINOSUKE TANEDA, Tokyo Metropolitan University, JERZY M. FLORYAN, University of Western Ontario — Flows in a channel with spatially periodic wall heating are examined experimentally at the Reynolds numbers below $Re = 20$ and at the Rayleigh number based on the amplitude of the periodic heating and the channel half width $Rap = 3500$, to realize the super-thermohydrophobic effect leading to a significant drag reduction (Floryan, 2012). The periodic heating is applied at the lower wall while the temperature of the upper wall is uniform and controlled. The results show that steady separation bubbles are created by periodic heating, which separate the main stream from the wall and, thus, the net friction drag is reduced. It is also found that the separation bubbles are strengthened when the average temperature of the lower wall exceeds that of the upper wall. Comparisons between the experiments and the theoretical results are presented.

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