

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Control of flow separation in a turbulent boundary layer¹ MIN-JEONG CHO, SANGHO CHOI, HAECHEON CHOI, Seoul National University — Towards the development of successful control methods for separation delay in a turbulent boundary layer, we adopt a model flow field, in which a turbulent separation occurs above a flat plate (Na and Moin 1998 JFM), and apply controls to this flow for reducing the size of the separation bubble and investigating the interaction between the forcing and flow near the separation bubble. We provide a single-frequency forcing with zero net mass flow rate at the upstream of the separation bubble. At low forcing frequencies, spanwise vortices are generated and travel downstream, bringing high momentum toward the wall and reducing the size of the separation bubble. Also, these vortices cause the separation and reattachment points to travel downstream. On the other hand, at high forcing frequencies, the size of the separation bubble becomes smaller and larger in time, respectively, due to the pressure gradient alternating favorably and adversely in time.

¹Supported by NRF-2011-0028032 and 2014048162

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Date submitted: 30 Jul 2015

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