Abstract Submitted
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**Local suppression of turbulent noise by passively inducing relaminarization**[1] RICHARD KIRKMAN, MEREDITH METZGER, University of Utah — Direct numerical simulations of turbulent channel flow were performed to study potential means of locally suppressing wall pressure noise by passively driving the flow towards relaminarization. The noise reduction is achieved by altering the surface geometry along a wall of the channel. Two separate geometries were investigated, namely a wedge-shaped protrusion and an inverted wedge-shaped depression. In both configurations, the wedge remains stationary and spans the width of the channel. The flow tends toward relaminarization due to local convective acceleration along the upslope of the wedge (in the case of the protrusion) and due to the gradual unstalled expansion along the downslope of the wedge (in the case of the depression). Simulations were performed at a Reynolds number based on friction velocity of 180. The no-slip condition along the surface of the protrusion/depression was enforced using an immersed boundary method. Profiles of turbulence statistics and wall- pressure intensity, as well as the wall-pressure spectra along the front face of the two different wedges are compared in relation to those of the undisturbed approach boundary layer.

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