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A Novel Method to Induce Hydrodynamic Instability in Boundary Layer Flows[1] MORTEZA GHARIB, DAVID JEON, FRANCISCO PEREIRA, BEVERLEY MCKEON, California Institute of Technology — We have developed a method to induce passive hydrodynamic displacement of boundary layer type flows by implementing spatially patterned hydrophobic patches in the form of bands and spots on the surface of a boundary layer plate. These patterns can be designed as parallel bands of a certain width, spacing and direction, or spots with a random or regular distribution of a certain shape, size and spatial density. We will present results from a series of experiments where the response of boundary layers in low to medium Reynolds number ranges to these spatial forcing will be demonstrated. Also, we will discuss potential use of this novel technique for drag reduction and separation delay applications where our technique could be used to replace riblets, trip wires and vortex generators.

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