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Characterization of base pressure fluctuations in a blunt trailing edge wake with three-dimensional forcing HEATHER CLARK, PHILIPPE LAVOIE, University of Toronto — The wakes of many nominally two-dimensional bluff bodies exhibit multiple intrinsic three-dimensional instabilities whose spatiotemporal structure and growth rate depend on geometry and Reynolds number. Here, these features are investigated experimentally for a blunt trailing edge profiled body using simultaneous measurements of velocity and fluctuating surface pressure on the model rear face near separation. Passive three-dimensional forcing of the wake is implemented with an array of vortex generators that are distributed according to the characteristic spanwise wavelength of the dominant secondary instability. For a Reynolds number of 8000 based on model thickness, the control strategy is found to increase the base pressure coefficient by 26% while globally reducing the amplitude of base pressure fluctuations, relative to the unforced flow. Additionally, amplitude modulation of the pressure signals that is observed in the natural wake decreases in strength with distributed forcing as a result of the modified three-dimensional flow structure. The spanwise distribution of pressure will be further examined for the baseline and controlled flows via temporal spectral analysis and spatial modal decomposition.

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