

Abstract Submitted
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Open loop control of an axisymmetric turbulent wake using periodic jet blowing JONATHAN MORRISON, ANTHONY OXLADE, Imperial College — In this study we investigate the effects of periodic jet blowing on the turbulent wake of an axisymmetric bullet-shaped body with a sharp trailing edge. The jet is formed from an annular orifice situated immediately below the trailing edge and oriented in the direction of the freestream. By varying the frequency and amplitude of the perturbation, we achieve a mean pressure increase on the base of the body of up to 35%. This pressure rise is obtained only when the forcing frequency is greater than four times the frequency of the shear layer mode. The mechanism of pressure recovery is characterised via measurements of fluctuating pressure on the base of the body, and high resolution 2C PIV in the wake. Modal decomposition of the pressure fluctuations reveals a nonlinear coupling between the symmetric ($m = 0$) perturbation and higher order azimuthal modes that results in an asymmetric mean pressure distribution.

Jonathan Morrison
Imperial College

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