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Open loop control of an axisymmetric turbulent wake using pulsed jet blowing[1] JONATHAN MORRISON, ANTHONY OXLADE, Department of Aeronautics, Imperial College — We investigate the effects of pulsed 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 33%. Modal decomposition of the base-pressure fluctuations reveals a nonlinear coupling between the symmetric ($m = 0$) perturbation and higher order azimuthal modes ($m \pm 1, \pm 2$) that results in an asymmetric mean pressure distribution. The pressure recovery is shown to be proportional to the strength of the jet vortices and is accompanied by a broadband suppression of energy across all modes with no preferential selection, reaching saturation at approximately 5 times the shear layer frequency. This proportionality is a direct result of reduced coupling between the jet perturbation and both the convective and global wake instabilities. The entrainment interface is examined in detail.

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