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Suppression of Vortex Induced Vibration of a Circular Cylinder[1]

SUCHUAN DONG, Purdue University — Prevention of undesirable vortex induced vibrations (VIV) of cylindrical structures is important to many engineering applications. In this project we investigate the effects of three flow control schemes - suction-only, blowing-only, and a scheme combining suction/blowing - on the free oscillation of a cylinder subject to vortex induced vibrations. Results of three-dimensional direct numerical simulations show that the combined suction/blowing scheme is the most effective among the three in terms of VIV reduction, and the cylinder oscillation can be completely suppressed.

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