

Abstract Submitted  
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**Active control of vortex induced vibrations for flow past a circular cylinder** M. SRIDHAR, B.S.V. PATNAIK, IIT Madras, Chennai - 600 036  
— The flow past rigid bodies which are flexibly mounted would experience vortex induced oscillations. The phenomenon of eddy shedding is responsible for the asymmetric force distribution on the cylinder. In a variety of natural and technological applications, these vortex induced oscillations may cause resonance and structural failure [1]. Controlling vortex shedding by active annihilation of the wake vortices is of interest in flow control studies [2]. An active closed loop feedback control algorithm is designed and implemented for controlling the flow induced oscillations in the circular cylinder. Admissible acting functions are incorporated in the form of rotating control cylinders. The control algorithm is designed and integrated along with the equations for mass, momentum transport. The state of the flow is reported through multiple sensors and the quantum of actuations is performed by the controllers as dictated by the control algorithm. Present simulations are carried out at low Reynolds number, 100 and 200, and the complete suppression of self-excited oscillations is observed.

[1] Williamson C.H.K. and Govardhan R., *Ann. Rev. Fluid Mech.*, **36**, 413-455, (2004).

[2] Muddada S. and Patnaik B.S.V., *Eur. J. Mech. B - Fluids*, **29**, 93 - 104 ,(2010).

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