

Abstract Submitted  
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**Separation control on curved boundaries** KAMAL KUMAR R,  
MANIKANDAN MATHUR, Indian Inst of Tech-Madras — Flow separation and its characteristics are an important consideration in the field of bluff body aerodynamics. Specifically, the location and slope of the separation, and the size of the re-circulation bubble that forms downstream of the bluff body significantly affect the resulting aerodynamic forces. Recent theories based on dynamical systems (Haller, 2004) have established criteria based on wall-based quantities that identify the location and slope of separation in unsteady flows. In this work, we adapt the closed-loop separation control algorithm proposed by Alam, Liu & Haller (2006) to curved boundaries, and demonstrate the effectiveness of the same via numerical simulations on the flow past a cylinder in the vortex-shedding regime. Using appropriately placed wall-based actuators that use inputs from shear stress sensors placed between the actuators, we demonstrate that the separation characteristics including the re-circulation bubble length, can be desirably modified.

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