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Proportional feedback control of flow over a hemisphere[1] JUNGIL LEE, JINHYUK YUN, Ajou University, DONGGUN SON, Korea Atomic Energy Research Institute — In the present study, a proportional feedback control is applied to laminar flow over a hemisphere at Re = 300 to reduce its lift fluctuations. As a control input, blowing/suction is distributed on the surface of hemisphere before the separation, and its strength is linearly proportional to the transverse velocity at a sensing location in the centerline of the wake. To determine the optimal sensing location, we introduce a correlation function between the lift force and the time derivative of sensing velocity. The optimal proportional gains for the proportional control are obtained for the sensing locations considered. It is shown that the present control successfully attenuates the velocity fluctuations at the sensing location, resulting in the reduction of lift fluctuations of hemisphere.

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