

Abstract Submitted
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Control of cellular vortex shedding over a cone O. RAMESH, Indian Institute of Science, RAHUL CHOPDE, Defence Research and Development Organisation(India) — Vortex shedding over 3D geometries is known to be complex involving the so-called cellular vortex shedding phenomenon, wherein cells of constant frequency are formed. In the present work we consider the passive control methodology of Strykowski and Sreenivasan (of placing a small control cylinder outside the undisturbed wake of the main cylinder) to the cellular shedding problem. It is interesting that this control methodology which was originally meant for 2D flows works well in the present 3D flows also. Similarly, the vortex shedding was quenched by this methodology even for other cellular shedding configurations such as a uniform flow over a stepped cylinder or a shear flow over a uniform cylinder also. The smearing of vorticity due to the control rod (envisaged in the 2D scenario of Strykowski and Sreenivasan hypothesis) may be expected to be non-uniform all over the span in a 3D geometry as the gap between the main cylinder and the control cylinder varies with the span. It is hypothesised that the control rod works on the global instability modes and alters their growth rates all across the span even when the gap between the cone and the control cylinder varies along the span.

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