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Suppressing vortex shedding behind a circular cylinder via a tangential standing wave NANSHENG LIU, XIYUN LU, Depart. of Modern Mechanics, Univ. of Sci. & Tech. of China — Flow over a circular cylinder with a tangential standing wave imposed on the leeward surface has been numerically studied using the lattice Boltzmann method. The modulating effects of the Tangential Standing Wave (TSW) on the vortex shedding and the hydrodynamic forces have been investigated. Three vortical flow regimes in the wake have been identified, namely, Natural Vortex Shedding (NVS) dominated, NVS/TSW competing and TSW dominated regimes. Specifically, in the TSW dominated regime, alternative vortex shedding found behind an uncontrolled circular cylinder is fully suppressed so that elimination of von Karman vortex street occurs; More interestingly, an inverse von Karman vortex street leading to a net thrust is demonstrated under some certain cases of TSW control.

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