

Abstract Submitted
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Numerical study of turbulent flow separation over a wall mounted circular cylinder¹ TAEJONG YU, DONGHYUN YOU, Department of Mechanical Engineering, Pohang Univ of Sci & Tech — Flow over a wall-mounted circular cylinder with a finite span and a free end is numerically studied at a range of Reynolds numbers. Separated flow behind a wall-mounted cylinder is characterized by dominant vortical structures developed around and behind the cylinder: *i.e.*, Karman vortices and tip-shedding vortices. The formation and interaction among the vortices are found to be distinct depending on the aspect ratio of the span length to the diameter of the cylinder as well as the Reynolds number. It is also found that drag and lift forces on the cylinder show different dominance of Karman vortices and tip vortices for different span-to-diameter ratios. A detailed analysis of the mean and fluctuating velocity, pressure fields, and spectral characteristics of separated flow is presented for laminar-to-transitional flows over cylinders with different aspect ratios.

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