

Abstract Submitted  
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**Near wake structure of a wall-mounted finite-length square cylinder**<sup>1</sup> YU ZHOU, HANFENG WANG — The wake of an ‘infinite’ cylinder has long been extensively studied. While, in various engineering applications, the cylinder-like structures often have a finite length, most with one end free and the other mounted on a flat plate. Due to the three dimensionality caused by the free end, the limited length and the ground-wall boundary layer, the flow structure of a finite cylinder should differ drastically from that of an infinite one. Indeed, such a great difference has been found by quite a number of previous investigations. However, it remains a subject of some debate to date, especially the fundamentals of near wake flow structures. This paper reports an experimental investigation of the near-wake structure of a finite-length square cylinder. The aspect ratio ranges from 3 to 7. Present measurements were carried out mainly in a low-speed wind tunnel at  $Re=9300$ , using hot-wire anemometer and PIV. To gain the topology of the wake, PIV measurements were performed in streamwise, lateral and spanwise directions. In addition, flow visualizations were also conducted to demonstrate more clearly the downstream development of the near-wake structure. A new flow model is proposed for the near wake structure based on the present experimental results.

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