

Abstract Submitted
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Large Eddy Simulation of fully developed turbulent flow over a moving wavy surface LIMING SUN, SHUYANG CAO, SKLDR, Tongji University, China — In order to investigate the vertical profile of wind speed over waves during typhoons for wind engineering applications, Large eddy simulation is performed to analyze the fully developed turbulent flow over a moving wavy surface. The Reynolds number Re is 10170, where Re is based on the channel depth δ and bulk velocity U . The wave steepness $2\pi\alpha/\lambda$ (α and λ is wave amplitude and wavelength respectively) is 0.25. Different wave age c/U that ranges from -1.0 to 2.0 is considered to model the influence of c/U on flow separation, drag force and vertical profiles of mean velocity and turbulence intensity. The simulation considered two kinds of flow motions, translation and undulation, in other words, whether the rigid wavy surface translates downstream with velocity c (>0), or the wavy surface moves downstream as a deformable undulation with phase speed c . Comparisons of the mean and turbulent velocity characteristics between these two flow motions are made to illustrate the difference of turbulence generation mechanism of these two motions, while shedding lights on the clarification of wind profile for wind engineering applications.

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