

## **Sensitivity analysis of WRF–CFD downscaling method for evaluation of urban wind field distribution under typhoon environment**

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### **ABSTRACT**

In recent years, strong tropical storms have increasingly disturbed coastal urban agglomerations more frequently owing to the influence of climate change, and severe typhoons will cause damage to urban complexes during their passing through, as well as resulting in various types of secondary disasters. To accurately assess the impact of typhoons on the distribution of the urban wind field during their passing through, in this work, three schemes are adopted to evaluate the reliability of the downscaling method, including full-information CFD modeling (Scheme 1), combined WRF–CFD downscaling (Scheme 2), and combined WRF–CFD downscaling coupled with urban canopy model (Scheme 3). The wind velocity and turbulence intensity distribution of the microscale urban wind field at various heights are compared among the three schemes, and the wind power density in vertical and horizontal cross-sections of selected high-rise buildings is also analyzed. This study provides several references for the measures of wind-resistant technology utilized in the protection of urban infrastructures.

### **REFERENCES**

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