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BCM-LES application to wind gust disaster under extreme meteorological events. TETSURO TAMURA, MASAHARU KAWAGUCHI, Tokyo Institute of Technology — Recently in Japan, people tend to realize so frequent occurrences of tornado and many attacks of typhoon to Japanese islands. In 2011, Tsukuba tornado arose in the Kanto plain based on a supercell. It causes the wind gust disaster on houses built on city area. In 2018, the typhoon Jebi attacked at Osaka area on September 4. High wind collapsed the wooden houses and the claddings of buildings and structures. This study applies LES based on BCM (Building Cube Method) to flow field for several km square area of disaster occurrence. This numerical model is formulated on the very fine Cartesian mesh system utilizing the IBM which can solve unsteady wind flows around actual complicated building shapes. Also, this research presents LES method for generating broad-banded turbulence flow that is able to regenerate high frequency components for existing meteorological model output. We performed the hybrid analysis of the meteorological model and engineering LES, in order to investigate near-ground turbulent wind under extreme meteorological events. This study numerically estimates the maximum wind velocity and the peak pressures on the building. Mechanism for process to failure of buildings will be discussed for establishment of safety at city.

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