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LES-based generation of high-frequency fluctuation in wind turbulence obtained by meteorological model TETSURO TAMURA, MASAHARU KAWAGUCHI, HIDENORI KAWAI, TAO TAO, Tokyo Tech — The connection between a meso-scale model and a micro-scale large eddy simulation (LES) is significant to simulate the micro-scale meteorological problem such as strong convective events due to the typhoon or the tornado using LES. In these problems the mean velocity profiles and the mean wind directions change with time according to the movement of the typhoons or tornadoes. Although, a fine grid micro-scale LES could not be connected to a coarse grid meso-scale WRF directly. In LES when the grid is suddenly refined at the interface of nested grids which is normal to the mean advection the resolved shear stresses decrease due to the interpolation errors and the delay of the generation of smaller scale turbulence that can be resolved on the finer mesh. For the estimation of wind gust disaster the peak wind acting on buildings and structures has to be correctly predicted. In the case of meteorological model the velocity fluctuations have a tendency of diffusive variation without the high frequency component due to the numerically filtering effects. In order to predict the peak value of wind velocity with good accuracy, this paper proposes a LES-based method for generating the higher frequency components of velocity and temperature fields obtained by meteorological model.

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