

Measurements of wind variation in surface boundary layer with tilted 1.3GHz wind profiler

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This study aims to elucidate the effects of local wind field in the surface boundary layer. In this study, tilted 1.3 GHz wind profiler and fine mesh numerical model are used to investigate behavior of wind field and large eddy in the layer. The wind and large eddy are changed in a short time, and warm or cold air is mixed near surface. These are important parameter to understand lower troposphere phenomena. Many studies depend on tower observations; therefore it is not understand widely distribution of changing wind in surface boundary layer.

In this study, to reduce the minimum height of observation, the antenna of the wind profiler is tilted from the ground surface. Three radar beams are used to observe radial wind in the boundary layer. It is appear to non-uniform system.

We also use the fine mesh numerical model called Large Eddy Simulation. The domain of this numerical model is from several meters to several kilometers, and can predict the airflow over complex terrain with high precision. Model domain used 50 m resolution topography data. This topography data was provided from Geospatial Information Authority of Japan. We compared simulation and observation result to appear the phenomena of the surface boundary layer.