

Improvement in the simulation of wind field over the complex coastal area, Korea

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In this study, we focus on the improvement of wind field over complex coastal area located in the southeastern Korea during the warm season. Local Analysis Prediction System (LAPS) has been made by advanced data assimilation technique from direct and indirect observational data and used for wind field modeling. During the clear days with weak wind speed (~ 4 m s-1), the simulations of wind field were performed by Mesoscale Meteorological model (MM5), which showed that calculated wind field obtained by modeling with LAPS has a good agreement with observations compared with the case without the LAPS. Simulation experiments for sensitivity analysis were also conducted in different cases based on the LAPS to evaluate the performance of wind field modeling. Three cases of simulation were employed with: 1) buoy, satellite, and KMA-surface data, 2) buoy, wind profiler, and KMA-surface data, 3) buoy and KMA- and JMA-surface data. The results showed the insignificant difference of wind field among the cases, but suggested a reasonable improvement of wind field simulation for the case including satellite data. These indicate that application of the selective LAPS inputs can play an important role improving wind field simulation over the complex coastal area like the southeastern region of Korea.

Keywords: wind field, complex coastal area, LAPS, data assimilation, sensitivity analysis, buoy