

Numerical simulation of the urban effect on the atmospheric boundary layer structure in Tokyo using the SPUC urban canopy scheme

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Seino et al. (2018) investigated the influence of urbanization in the Tokyo area and showed that about one degree temperature rise in the central urban area in Tokyo can lead to 10% precipitation increase in August. We examined new method of the initial temperature field preparation in the model simulation, in which previously predicted temperatures of urban canopy elements were used as their initial temperatures in the succeeding simulation. Simulation results for one month in summer showed that the implementation of this forecast-cycle procedure improved the surface air temperature representation. On the other hand, comparisons with the winter observation results indicated that the atmospheric boundary layer height was underestimated in the model results. We will validate the model performance in other observation cases for the better understanding of finer scale features of urban effect.

Keywords: urbanization, numerical simulation , atmospheric boundary layer