



Evaluation of simulated meteorological and aerosol fields around Tokyo during August 2007 using a new-type seamless model from global-to-regional scales

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An aerosol-coupled global cloud-resolving model, NICAM-SPRINTARS, developed by Suzuki et al. (2008) based on the aerosol module of Spectral Radiation-Transport Model for Aerosol Species (SPRINTARS; Takemura et al., 2005) and the global cloud-resolving model of Nonhydrostatic Icosahedral Atmospheric Model (NICAM; Tomita and Satoh, 2004; Satoh et al., 2008) is capable to simulate the aerosol processes and distributions not only in the whole globe but also over specific regions using a stretched grid system developed by Tomita (2008) as a 'seamless' model. This seamless aerosol-transport model with the stretched grid can simulate atmospheric aerosols with spatially high-resolved grid and smaller computational cost compared to global calculations. In the present study, we develop the seamless aerosol-transport model with the spatial resolution of about 10 km to simulate aerosols in the megacity, Kanto region, including Tokyo/Japan. In the Kanto region, more than 42 million people are living and exposed to atmospheric pollutions including anthropogenic aerosols, as is the case for other mega cities in the world. At the same time, both continuous and intensive measurements of atmospheric pollutions by Japanese's government are available to evaluate the model results. As a result, we found that although in some cities near mountains the present model does not always reproduce both the meteorological and aerosol fields mainly due to large spatial resolution, around the center of Tokyo it can realistically simulate meteorological fields and primary particles such as black carbon against the measurements. In conclusion, our seamless aerosol-transport model covering from global-to-regional scales can be fully applied for the regional simulation.