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Spatial and temporal distributions of aerosol concentrations in March 2002 over Asia

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The Asian dust aerosol model (ADAM) and the aerosol dynamic model with the MM5 meteorological output in a grid of 45×45 km^2 have been used to simulate the temporal and spatial distribution of the Asian dust aerosol and the anthropogenic aerosol concentrations in Asia (70-150E°, 60°-10) for the period of March 2002. The aerosol dynamic model includes such processes of nucleation, condensation/ evaporation, coagulation, sedimentation, hygroscopic growth and dry and wet deposition. This model is coupled with the gas-phase chemistry of the California Institute of Technology Model and the aqueous-phase chemistry of the Regional Acid Deposition Model with the emission inventory data of SONS°$_2$, NO_X, NH_3, VOC, CO, $PM_{2.5}$ and PM_{10} in the base year of 2001 (Street et al., 2003). The result indicates that the ADAM model simulates quite well the spatial and temporal variations of the Asian dust concentration whereas the aerosol dynamic model simulates slightly lower concentrations of anthropogenic aerosols compared with observations. The spatial distributions of the anthropogenic aerosols including sulfate, nitrate and ammonium in Asia show quite similar distribution patterns of the corresponding emission inventory. We will present the temporal and spatial distributions of both the anthropogenic aerosols and the Asian dust aerosol in Asia.

Reference

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