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Title: Estimation of anthropogenic aerosols in East Asia during April 2001

Abstract: An aerosol dynamic model including such processes of nucleation, condensation/evaporation, coagulation, sedimentation, hygroscopic growth and dry and wet deposition coupled with the gas-phase chemistry of the California Institute of Technology (CIT) model and the aqueous-phase chemistry of the Regional Acid Deposition Model (RADM) together with meteorological outputs of the MM5 model in a grid of 60 X 60 km2 has been used to estimate anthropogenic aerosols in East Asia (95-145E, 20-50N) for the period of 2-30 April 2001 in the ACE-Asia experimental period. During this period an Asian dust event has been observed from 10-13 and 24-26 April in the Korean peninsula. The sensitivity of condensation evaporation and coagulation has been tested for the formation of anthropogenic aerosols excluding the Asia dust period. The results indicate that the area averaged column integrated anthropogenic aerosol concentration in East Asia excluding the Asian dust periods is estimated to be about 20 mg m-2, of which 46%, 29%, 20%, 4% and 1% are contributed by mixed type, inorganic (IOC), sea salt, organic carbon and black carbon aerosol, respectively. It is found that the coagulation process enhances the concentration of the accumulation mode in the expense of that of the fine mode, whereas the condensation evaporation process more effectively simulates the observed mass spectral distribution of aerosols when multi bins are used rather than two bins (file and coarse mode) are used in the size distribution.

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