A modeling of Air Pollutants transport in Asia

Soon-Ung Park, Jae-In Jeong, Lim-Seok Chang and Eun-Hee Lee
School of Earth and Environmental Sciences
Seoul National University, Seoul, 151-742 Korea

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 model and the aqueous-phase chemistry of the Regional Acid Deposition Model together with meteorological outputs of the MM5 model in a grid of 45 x 45 km^2 has been used to estimate concentrations of gaseous pollutants and anthropogenic aerosols in Asia for the four-month period of March, July, December 2001 and March 2002 to participate the model intercomparison study in Asia. In our model the Asian Dust Aerosol Model (ADAM) is incooperated during the spring season to estimate the dust aerosol concentration in Asia.

Our presentation will include;

1) Modeled daily mean concentrations of SO_2, NO_2, O_3 will be compared with observations at several EANET sites for the chosen four-month period.
2) Modeled monthly mean concentrations of SO_2, NO_2, and O_3 will be compared with observations at several EANET sites.
3) Modeled hourly mean concentrations of SO_2, NO_2, O_3 and PM_{10} averaged over South Korea will be compared with those observations for the chosen four months.
4) Modeled monthly mean concentrations of SO_2, NO_2, O_3 and PM_{10} over South Korea will be compared with observations.
5) The model performance test for gaseous pollutants has been conducted by constructing scatter diagrams in South Korea, China and Japan.
6) The modeled wet depositions of SO_4^{2-}, NO_3^- and NH_4^+ will be compared with observations at EANET sites for the chosen four months.
7) The modeled precipitation on July 2001 will be compared with NCEP precipitation data to find the model performance in precipitation.
8) Model simulated aerosol concentrations of SO_4^{2-}, NO_3^-, NH_4^+ will be compared with observations at EANET sites.
9) The spatial distributions of surface concentrations of SO_2, NO_2, O_3, NH_3, sulfate, nitrate and ammonium over Asia will be presented.
10) Averaged monthly mean surface concentrations of SO_2, NO_2, NH_3, SO_4^{2-}, NO_3^-, NH_4^+ and O_3.
11) Spatial distributions of dry deposition of SO_2, NH_3 and O_3 and wet and dry depositions of sulfate, nitrate and ammonium will be presented.