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Submicron aerosol size distribution measurements in the mega city of Seoul

SEONG SOO YUM[1] and JONG-HWAN KIM[1]
[1]*Dept. of Atmospheric Sciences, Yonsei University, Seoul 120-749, Korea*

Atmospheric submicron aerosols play a key role in determining the solar energy budget in the earth-atmosphere system by scattering and absorbing solar radiation. The propensity of these particles also determines atmospheric visibility. Furthermore, cloud condensation nuclei (CCN), a subset of atmospheric particles that can serve as a nucleus of embryonic cloud droplets, are of these sizes and therefore the concentration of submicron aerosols can be used to estimate CCN concentration. Submicron aerosol size distributions and total particle (i.e., condensation nuclei, CN) concentrations are measured by a TSI SMPS-3936L10 and a TSI CPC-3010, respectively, at the campus of Yonsei University, located in a highly populated area of a mega city of Seoul for many months. These long term measurements of submicron aerosols are classified according to air mass types and major differences in physical characteristics of these aerosols due to air mass types and weather conditions are identified. Figure 1 shows monthly average diurnal variations of SMPS total concentration. Consistent morning peak and distinctively higher January concentration are notable.

Keywords: submicron aerosols; condensation nuclei.

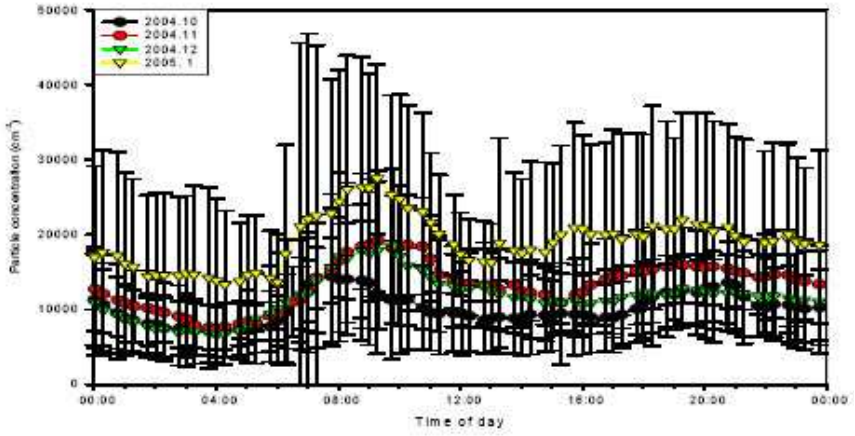

Figure 1. Diurnal variation of monthly average SMPS total concentrations measured in Seoul.