

## PF8) Atmospheric Aerosol Optical Properties in the Korean Peninsula

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### Abstract

The radiative properties of atmospheric aerosol are determined by the mass and chemical characteristics, and optical properties such as aerosol optical depth (AOD), Ångström parameter ( $\alpha$ ) and single scattering albedo (SSA). In particular these aerosol optical properties also determine surface temperature perturbation that may give some information in understanding the regional atmospheric radiative forcing. For understanding the radiative forcing and regional source of aerosol, this paper summarizes and compares the aerosol optical properties results from and compares the atmospheric aerosol optical properties results from two different experiments: Anmyeon 2000 and Jeju 2001.

Korea Global Atmosphere Watch Observatory (KGAWO) at Anmyeon island and ACE-Asia super-site at Gosan Jeju island have measured the radiations and aerosols since the year of 2000. The sites are located in the mid-west and south of Korea peninsula where it is strongly affected by the Asian dust coming from China region in every spring. Aerosol optical properties over both sites were measured through the ground-based sun and sky radiometers were analyzed for understanding the radiation and climate properties. Number concentration and chemical components of aerosol were additionally analyzed for the source estimation in the transportation.

The frequency distributions of aerosol optical depth are rather narrow with a modal value of 0.38 at both sites. However, the distributions of show one peak (1.13) at Jeju but two peaks (0.63 and 1.13) at Anmyeon. In the cases of Anmyeon, one peak around 0.63 corresponds to relatively dust-free cases, and the second peak around 1.13 characterizes the situation when Asian dust is presented. The correlation between AOD and resulted high correlation on the wide range with high values of optical depth at Anmyeon, otherwise a narrow range of with moderate to low AOD at Jeju.

In dust free condition SSA decrease with wavelength while in the presence of Asian dust SSA either stays neutral or increases slightly with wavelength. The change of surface temperature shows the stronger positive correlations with aerosol optical depth increase at Anmyeon than Jeju. In the chemical properties the aerosol are related to high concentrations in inorganic matters,  $\text{SO}_4$ ,  $\text{NO}_3$ ,  $\text{CA}_2^+$  in fine and coarse.