E139-018 **Room: 301B** **Time: May 16 10:15-10:30**

Chemical characteristics of submicron aerosols transported from urban area measured using an Aerodyne Aerosol Mass Spectrometer

Takuma Miyakawa[1]; Nobuyuki Takegawa[2]; Yutaka Kondo[3]; Yuichi Komazaki[4]; Masato Fukuda[1]; Nobuhiro Moteki[5]

[1] Earth and Planetary Sci., Univ. of Tokyo; [2] RCAST, Univ of Tokyo; [3] RCAST, Univ. of Tokyo; [4] none; [5] Earth and Planetary Sci., Tokyo Univ

http://noysun1.atmos.rcast.u-tokyo.ac.jp/

Aerosols can significantly affect air quality and climate change in the troposphere. Size-resolved chemical composition and chemical characteristics of aerosols are essential for evaluating impacts of aerosols on air quality and climate changes.

Size resolved chemical composition of submicron (PM1) aerosols was measured using an Aerodyne Aerosol Mass Spectrometer (AMS) at a sub-urban site in Kisai (36.11N, 139.56E) during the summer of 2004. Black carbon was measured using a light-absorbing technique. Carbonaceous aerosol, which is defined as organic aerosol (OA) + black carbon (BC), is found to be the dominant component (about 60%) of PM1 aerosols in Kisai throughout the observation period. Oxygenated organic aerosol (OOA) and hydrocarbon-like organic aerosol (HOA) were estimated from the AMS mass spectral time series. OOA well correlated with ozone (O3) during the daytime (r2 = 0.90), indicating a strong relationship between OOA and O3 in the observed air mass. The enhancement ratio of OOA to O3 was found to be 0.17 ug m-3 ppbv-1. Although this relationship is empirical, it offers some information on the evaluation of secondary organic aerosol (SOA) formation in modeling studies.

Photochemical age derived from a hydrocarbon ratio is used in order to investigate the aging process of PM1 aerosols. The fraction of carbonaceous aerosol to PM1 aerosols did not significantly vary throughout the photochemical aging within about 0.5 day. On the other hands, the fraction of OOA to OA increases from about 50% to 70% with air mass aging, suggesting a significant formation of SOA during the photochemical aging. The size distributions of OA in fresh air were bimodal (mode diameter: 80 - 100 nm and 300 - 600 nm), while those in aged air were monomodal (300 - 600 nm). On average, the size-resolved chemical composition of PM1 aerosols showed significant change within about 0.5 day. These results provide useful insights into the characteristic time scale of photochemical aging of PM1 aerosols.