

## Aerosol chemical constituents observed in aerial observations in China and simultaneous ground-based observations

# Shiro Hatakeyama[1]; Akinori Takami[1]; Wei Wang[2]; Junko Aizawa[3]

[1] NIES; [2] CRAES; [3] Environmental Sciences, Tsukuba Univ.

<http://www.nies.go.jp/>

**1. Introduction** For the purpose of doing Lagrangean analyses of a long-range transport and succeeding transformation of air pollutants transported from north China to Okinawa through the Yellow Sea and the East China Sea, both aerial observations of air pollutants around Beijing and Tianjin, China and ground-based observations in Qingdao and Dalian. Dalian and Qingdao are affected by yellow sand dust and ammonia gas originated from fertilizer, respectively. Therefore, it is very interesting to carry out observations in this area.

**2. Method** Aerial observations were carried out around Beijing and Tianjin in April-May, 2006. Aircraft used was a Chinese YUN-12 airplane. Gas monitors such as ozone, NO<sub>x</sub>, SO<sub>2</sub>, and CO as well as aerosol samplers such as PM<sub>10</sub> and PM<sub>2.5</sub> samplers were settled on board. Ground-based observations were made in Dalian (April 5-20, 2006) and in Qingdao (April 5-24, 2006). Ozone, NO<sub>x</sub>, SO<sub>2</sub>, and CO as well as aerosol as chemical constituents of aerosols were measured.

**3. Results and Discussion** Aerial observations of air pollutants were carried out over Beijing-Tianjin area and over Bohai Bay. CO at lower altitude was very high: up to 3-4 ppm. SO<sub>2</sub> and NO<sub>x</sub> were also very high. However, ozone was comparatively low. NO clear negative correlation between ozone and NO<sub>x</sub> was observed in this area.

Because of the impacts of yellow sand dust, concentration of Ca<sup>2+</sup> was generally high than NH<sub>4</sub><sup>+</sup>, which is different from the situation seen in other season or other area.

Ionic components in Dalian and Qingdao showed clear contrast. Ca<sup>2+</sup> was higher than NH<sub>4</sub><sup>+</sup> in Dalian while NH<sub>4</sub><sup>+</sup> was higher than Ca<sup>2+</sup> in Qingdao even on the day of yellow sand dust events.

Back trajectory analyses suggest that air masses arrived in Dalian came from northwest but that in Qingdao came from central eastern China. The former indicates the impact of yellow sand dust and the latter implies the impact of ammonia emission around that area.