

Dynamics of particulate matter in the atmosphere

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In recent years, due to the rapid economic growth and industrial development, many air pollutants from East Asian regions are discharged into the atmosphere. This trend is seen to continue, transboundary pollution to Japan may become more serious. In this study, we collected particulate matter at two points. One is the surface layer which we live, and the other is the atmospheric boundary layer whose air is easily transported. Our purpose is the elucidation of particulate matter dynamics and of the effect of transboundary pollution from East Asia.

Collecting particulate matter is conducted on period between April, 11, 2012 and August, 3, 2012 at the University of Shiga Prefecture as the surface layer and on period between October, 17, 2012 and November 22, 2012 at the Mt. Ibuki in Shiga prefecture as the atmospheric boundary layer. Sample we collect is measured ion component by ion chromatography and heavy metal by ICP-MS. Analysis of backward trajectories used HYSPLIT model provided by NOAA.

At the surface layer, we observed NO_3^- , NH_4^+ , nss SO_4^{2-} , nss Ca^{2+} at high concentrations, when we observed yellow sand in spring. At this time, the air mass comes from the continent. On the other hand, same trend was not seen in summer. At this time, the air mass comes from the ocean. Forms of deposition are mainly NH_4NO_3 , $(\text{NH}_4)_2\text{SO}_4$, $\text{Ca}(\text{NO}_3)_2$, CaSO_4 during observing period.

At the atmospheric boundary layer, we didn't observe same trend as the surface layer. Forms of transport are mainly NaNO_3 , Na_2SO_4 during observing period. This indicates that NaCl which derived from sea salt is altered by HNO_3 and SO_2 .

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