



HKUST

## Division of Environment

### MPhil Thesis Presentation

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## Surface Characterization of Size-fractioned Aerosols in Hong Kong

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### Abstract

Atmospheric particles exert influence on both human health and the environment. Study also showed that many important climate-related chemical and physical processes occur at the particles surfaces. In this study, we collected size-segregated aerosol samples from different sources and analyzed the surface chemical compositions using both X-ray photoelectron spectroscopy (XPS) and time-of-flight secondary ion mass spectrometry (ToF-SIMS) techniques. XPS was used to study surface elemental compositions and the chemical states of carbon, nitrogen and sulfur were determined using peak synthesis. The results revealed that surface elemental compositions are strongly dependent on their size fractions, sampling seasons and the location of collection. Surface characterization of aerosol particles was also performed using ToF-SIMS. The spectra of each size fraction were analyzed using PCA. The PCA results also confirmed that the surface chemical compositions of aerosol particles strongly depend on their size mode. ToF-SIMS imaging and depth profiling were applied in the study. Imaging was used to locate the interesting area on the sample and depth profiling qualitatively characterized the chemical species along the depth of the sample. Three modes were all characterized and their distinct near surface structures were revealed from this study.

**Date: 30 April 2013 (Tuesday)**

**Time: 3:00pm**

**Venue: Room 3408 (Lifts 17-18), HKUST**

*~ All are welcome ~~*