

Vertical profiles of aerosol size distribution in small forest within a western suburb of Tokyo

YABUKI, Masanori^{1*} ; TAKAHASHI, Kenshi¹ ; TSUDA, Toshitaka¹ ; MATSUDA, Kazuhide²

¹Research Institute for Sustainable Humanosphere, Kyoto University, ²Tokyo University of Agriculture and Technology

Forests interact in a complex manner with the atmosphere by acting as sinks for many atmospheric pollutants and trace gases, and by emitting biogenic volatile organic compounds into the air. These constituents influence the atmospheric chemistry and composition, including aerosols related to cloud condensation nuclei (CCN). Aerosol chemical and physical properties vary both temporally and spatially owing to various atmospheric processes (e.g., scavenging, nucleation, evaporation, and condensation) during the dispersion and transportation of air mass within and above forest canopies.

In this paper, we report on the field observations conducted from a 30-m-high tower in a small forest at the Field Museum Tama Hills, an experimental forest of the Tokyo University of Agriculture and Technology, located in a western suburb of Tokyo, between July 27 and August 3, 2013. At this site, atmospheric aerosols were expected to include the particles both from natural and anthropogenic sources. Using five sampling inlets placed at altitudes ranging from 8 m to 30 m, we conducted altitude-resolved measurements of particle number size distributions in the size range of 10-5000 nm. Herein, we present an outline of the observation systems, as well as the preliminary results of variability of sub-micrometer and nano particles within and above the forest canopy.

Keywords: Aerosol, Size distribution, Vertical distribution, Forest canopy