

1.032 Spatial distribution of number concentration and characteristics of ultrafine particles in Roadside Atmosphere.

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Abstract:

Understanding local-scale transport and dispersion of pollutants emitted from traffic sources is important for urban planning and air quality assessments. To understand the distribution of the ultrafine particles in the vicinity of urban roads, the number concentration distribution of ultrafine particles in the air was observed at road side and background area. Two portable SMPSs were used for measuring the particle number size distribution (NSD) according to the particle diameter. One SMPS was installed at the pavement to measure the roadside NSD (this observation point are called "Stationary site"), and another was moved vertically to the main street to measure NSD in various points away from the main street (this observation points are called "Mobile site"). The points of mobile site were set at the edge of the sidewalk, the end of the sidewalk, and also more behind of road side and the height was 1.5m. The wind direction / speed data by ultrasonic anemometer and the measurement result of VOC concentration distribution were used for examine the diffusion situation in more detail. In mobile site, there was large difference between winter and spring in NSD. Especially, the amount of <50 nm particles in winter was larger than that in spring. The number of <50 nm particles was considered to be decreased in spring, because higher temperature in spring compared to that in winter made it more difficult to form ultrafine aerosol. NSD in the road side, the changing with time and the diffusion to the background area were examined by comparing the number distribution of stationary site and mobile site. Depending on the conditions, attenuation at very short distances was observed. By comparing the distribution of particle number and the distribution of VOC, characteristics of attenuation of nanoparticles were discussed.