

# Optical and in-situ measurements of aerosol, nitrogen dioxide, and water vapor in relation to weather and sky radiation conditions in Chiba

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## Abstract

Aerosols and trace gases affect air quality in large cities. Their monitoring is important also from the viewpoint of radiation budget studies. Although ground-based, in-situ sampling measurement can provide local data on air pollutants, such data do not always represent the actual condition in a wider region. In this paper we report our recent results of differential optical absorption spectroscopy (DOAS) measurement conducted at Chiba University. Both nitrogen dioxide (NO<sub>2</sub>) and aerosol can be continuously measured along an optical path of several kilometers using a xenon flashlight as a light source. The results are compared with the data from government-operated sampling stations located nearby. Also, aerosol characterization data taken with a three-wavelength nephelometer and optical particle counter are compared with the DOAS data to study if the sampling process in such instruments influences the aerosol quality in relation to the humidity difference between the atmospheric and laboratory conditions. In addition, data from a weather monitor, a multi-wavelength lidar system, a sunphotometer, and imaging measurements of the solar irradiance and sky radiance are exploited for the interpretation of the air quality data obtained from DOAS and related schemes.