



Aerosol Height Retrieval using UV-Visible Hyperspectral Satellite over East Asia

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From Multi Axis Differential Optical Absorption Spectroscopy (MAX-DOAS) instrument, one of ground-based measurement, the vertical distribution of aerosol are estimated by the observed oxygen-dimer (O₄) slant column densities (SCD) for several geometries (e.g., Hoenninger et al., 2004; Irie et al., 2009; Lee et al., 2011). Because the spatial and temporal variation of O₄ distribution is little, the O₄ SCD difference can be converted to the difference of optical path length. However, there have been very limited studies to date to retrieve aerosol height information by using satellite observation in UV wavelength range.

This study investigates the sensitivities of aerosol height from the O₄ SCDs using its absorption bands at 340, 360, 380, and 477 nm, where O₄ SCD is calculated by the DOAS method using simulated spectra. From the experiment, robust relationship is obtained between the difference of O₄ SCD and the aerosol height at 477 nm. Finally, the O₄ SCD is converted to aerosol height by using the OMI observation for aerosol loaded cases, which is compared with ground-based lidar.