

Probing tropospheric aerosol and trace gas profiles using a ground based UV and Vis hyperspectral measurements and inversion technique

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Abstract: The capability of Multi-Axis Differential Optical Absorption spectroscopy (MAX-DOAS) of retrieving information on atmospheric aerosol extinction based on O₄ measurement has been recently investigated. For determination of O₄ Slant Column Density (SCD), its absorption bands in UV (343nm, 360 nm, and 380nm) or visible (477 nm, 532 nm, 577 nm and 630 nm) regions are utilized. This study presents the aerosol retrieval results based on O₄ data obtained by MAX-DOAS instrument at UV and Vis absorption bands (338, 367, 380, and 470 nm) at highly populated urban sites; Beijing, China (16 August ~ 10 September 2006), Seoul, Korea (April 15 ~ June 15 2007), Gwangju, Korea (22 February ~ 26 April 2008), and Fresno, U.S.A (7 ~ 15 December 2009). MAX-DOAS based aerosol extinction coefficient and aerosol optical depth (AOD) obtained for the lower surface layers were compared with those obtained by lidar and sunphotometer measurements.

Keyword : Gas profiles; Aerosol profiles; DOAS, Air pollution