



Multi-component vertical profile retrievals for ground-based MAX-DOAS

Hitoshi Irie (1), Yugo Kanaya (1), Hisahiro Takashima (1), Michel van Roozendael (2), Folkard Wittrock (3), and Ankie Piters (4)

(1) Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Research Institute for Global Change, Yokohama, Japan (irie@jamstec.go.jp), (2) Belgian Institute for Space Aeronomy, (3) Institute of Environmental Physics, University of Bremen, (4) Climate Observations Department, Royal Netherlands Meteorological Institute

We attempt to retrieve lower-tropospheric vertical profile information for 8 components from ground-based Multi-Axis Differential Optical Absorption Spectroscopy (MAX-DOAS) measurements. The components retrieved include aerosol extinction coefficients (AEC) at two wavelengths 357 and 476 nm, NO₂, HCHO, CHOCHO, H₂O, SO₂, and O₃ volume mixing ratios (VMRs). This method was applied to MAX-DOAS observations performed at Cabauw, the Netherlands (52.0°N, 4.9°E) in June-July 2009 during the Cabauw Intercomparison campaign of Nitrogen Dioxide measuring Instruments (CINDI) campaign. For the lowest layer of retrieved profiles at 0-1 km, two channels of AEC values reveal consistent variations. NO₂ showed typical diurnal variations with maximum in early morning and minimum in the afternoon. Positive correlations between HCHO and CHOCHO were often seen. H₂O VMR agreed well with that derived from NCEP surface data, and was used to judge cloudy cases after conversion to relative humidity. All these results support the capability of MAX-DOAS observations applicable to various air quality studies. Similar multi-component retrievals applied to observations in Japan are also presented in this talk.