



NO₂ Profile Retrieval using airborne multi axis UV-visible skylight absorption measurements over central Europe

M. Bruns (1), S. A. Buehler (1), J. P. Burrows (1), A. Richter (1), A. Rozanov (1), P. Wang (1), K.-P. Heue (2), U. Platt (2), I. Pundt (2), T. Wagner (2)

(1) Institute of Environmental Physics, University of Bremen, P. O. Box 330 440, 28334 Bremen, Germany, (2) Institute of Environmental Physics, University of Heidelberg, Im Neuenheimer Feld 229, 69120 Heidelberg, Germany, (marco.bruns@iup.physik.uni-bremen.de)

A recent development in ground-based remote sensing of atmospheric constituents by UV/visible absorption measurements of scattered light is the simultaneous use of several horizon viewing directions in addition to the traditional zenith-sky pointing. The different light paths through the atmosphere enable the vertical distribution of some atmospheric absorbers such as NO₂, BrO or O₃ to be retrieved. This approach has recently been implemented on an airborne platform. The novel instrument called Airborne MultiAXis Differential Optical Absorption Spectrometer, AMAXDOAS, has been flown for the first time.

A sensitivity study for a combination of four lines of sight (LOS) and three wavelength regions will be presented. This setup has proved to be the optimum combination of different LOS and wavelength regions to retrieve the maximum amount of profile information from AMAXDOAS data. Finally the retrieved NO₂ profiles of selected days from 2 airborne campaigns in 2002 and 2003 will be presented.

This study shows the potential of the method used to retrieve profile information from airborne multi-axis UV/visible scattered skylight measurements. Significant amounts of boundary layer NO₂ and NO₂ in upper troposphere/lower stratosphere region (UTLS) were detected during the campaigns mentioned above. The latter are being interpreted as NO₂ from aircraft emissions.