Geophysical Research Abstracts
Vol. 17, EGU2015-10719, 2015
EGU General Assembly 2015

Comparison of stratospheric NO_2 profiles above Kiruna, Sweden retrieved from ground-based zenith sky DOAS measurements, SAOZ balloon measurements and SCIAMACHY limb observations

Myojeong Gu (1), Carl-Fredrik Enell (2), François Hendrick (3), Janis Pukite (1), Michel Van Roozendael (3), Ulrich Platt (4), Uwe Raffalski (5), and Thomas Wagner (1)

(1) Max-Planck Institute for Chemistry, Satellite Research, Mainz, Germany (myojeong.gu@mpic.de), (2) EISCAT Scientific Association, Kiruna, Sweden, (3) Institut d'Aéronomie Spatiale de Belgique (IASB-BIRA), Brussels, Belgium, (4) Institute for Environmental Physics, University of Heidelberg, Heidelberg, Germany, (5) Swedish Institute of Space Physics, Kiruna, Sweden

Stratospheric NO_2 not only destroys ozone but acts as a buffer against halogen catalyzed ozone loss by converting halogen species into stable nitrates. These two roles of stratospheric NO_2 depend on the altitude. Hence, the objective of this study is to investigate the vertical distribution of stratospheric NO_2.
We compare the NO_2 profiles derived from the zenith sky DOAS with those obtained from, SAOZ balloon measurements and satellite limb observations.
Vertical profiles of stratospheric NO_2 are retrieved from ground-based zenith sky DOAS observations operated at Kiruna, Sweden (68.84°N, 20.41°E) since 1996. To determine the profile of stratospheric NO_2 measured from ground-based zenith sky DOAS, we apply the Optimal Estimation Method (OEM) to retrieval of vertical profiles of stratospheric NO_2 which has been developed by IASB-BIRA. The basic principle behind this profiling approach is the dependence of the mean scattering height on solar zenith angle (SZA).
We compare the retrieved profiles to two additional datasets of stratospheric NO_2 profile. The first one is derived from satellite limb observations by SCIAMACHY (Scanning Imaging Absorption spectrometer for Atmospheric CHartographY) on EnviSAT. The second is derived from the SAOZ balloon measurements (using a UV/Visible spectrometer) performed at Kiruna in Sweden.