Geophysical Research Abstracts
Vol. 16, EGU2014-11222, 2014
EGU General Assembly 2014

Observations of O_3, NO_2 and BrO and in the tropical UT/LS during the 2013/2014 NASA ATTREX experiment

Bodo Werner (2), Jochen Stutz (1), Max Spolaor (1), Catalina Tsai (1), Fedele Colosimo (1), Ross Cheung (1), Tim Deutschmann (2), Rasmus Raecke (1,2), Ugo Tricoli (2), Lisa Scalone (2), and Klaus Pfeilsticker (2)

(1) Department of Atmospheric and Oceanic Sciences, University of California Los Angeles, Los Angeles, USA, (2) Institut für Umweltphysik, University of Heidelberg, Heidelberg, Germany

Reactive bromine plays an important role for the chemistry of ozone in the stratosphere and likely also in the upper troposphere. It is thus crucial to understand the sources and sinks of inorganic bromine species as well as their transport and that of their organic precursors into the stratosphere. Much progress has been made in recent years in understanding the budget of inorganic bromine through field observations of very short-lived organic bromine precursors, such as $CHBr_3$ und CH_2Br_2 and inorganic product gases at stratospheric entry level. Nevertheless a number of processes influencing bromine chemistry require better quantification, including the transport of organic and inorganic bromine through the tropical TTL region and the interaction of inorganic bromine species with ice particles in cirrus clouds.

Here we report on BrO, NO_2, and O_3 profile measurements performed within the TTL from aboard the NASA's unmanned high-altitude Global Hawk aircraft during the Airborne Tropical TRopopause EXperiment (ATTREX) deployments in 2011 - 2014. The technique involves limb scanning of UV/vis skylight spectra, spectral retrieval via Differential Optical Absorption Spectroscopy (DOAS), forward modelling of the radiative transfer for each observation and a non-linear optimal estimation of the targeted atmospheric parameters. Key features of the technique are reported and first retrieval results are discussed.