Geophysical Research Abstracts
Vol. 17, EGU2015-3779, 2015
EGU General Assembly 2015

Bromine Chemistry in the Tropical UTLS during the 2011, 2013 and 2014 ATTREX Experiments

Bodo Werner (1), Jochen Stutz (2), Max Spolaor (2), James Festa (2), Catalina Tsai (2), Fedele Colosimo (2), Ross Cheung (2), Tim Deutschmann (1), Rasmus Raecke (1,2), Lisa Scalone (1), Ugo Tricoli (1), Klaus Pfeilsticker (1), Maria Navarro (3), Elliot Atlas (3), Martyn Chipperfield (4), and Ryan Hossaini (4)

(1) University of Heidelberg, Institute of Environmental Physics, Heidelberg, Germany (bodo.werner@iup.uni-heidelberg.de), (2) Department of Atmospheric and Oceanic Science, University of California Los Angeles, Los Angeles, USA, (3) Rosenstiel School of Marine and Atmospheric Science, University of Miami, (4) Institute for Climate and Atmospheric Science, School of Earth and Environment, University of Leeds, Leeds, UK

Bromine plays an important role for the chemistry of ozone in the stratosphere and upper troposphere. An accurate quantitative understanding of the sources, sinks, and chemical transformation of bromine species is thus important to understand the bromine budget in the upper troposphere and lower stratosphere (UTLS), which also serves as a gate to the stratosphere. Vertical transport of very short-lived organic bromine precursors and inorganic product gases has been identified as the main source of bromine in the UTLS. However, the contribution of inorganic vs. organic compounds is not well quantified, particularly in the tropical UTLS.
A limb scanning Differential Optical Absorption Spectroscopy instrument was deployed onboard NASA's UAV Global Hawk during the NASA Airborne Tropical TRopopause EXperiment (ATTREX) during a series of flights into the eastern and western Pacific tropopause layer (flight altitudes up to 18 km), which is a gateway to the stratosphere. The measurement methodology to retrieve vertical trace gas concentration profiles will be briefly presented. Observations of BrO, NO_2 and O_3 and of other trace species, in particular of brominated hydrocarbons are compared with simulations of the SLIMCAT CTM and interpreted with respect to photochemistry and the budget of bromine within the tropical tropopause layer (TTL).