Geophysical Research Abstracts
Vol. 12, EGU2010-6889, 2010
EGU General Assembly 2010

Global variations of water vapor isotopologues derived from ACE-FTS satellite data

William Randel (1), Mijeong Park (1), Elizabeth Moyer (2), Eric Jensen (1), Peter Bernath (3), Kaley Walker (4), and Chris Boone (5)

(1) NCAR, ACD, Boulder, United States (randel@ucar.edu), (2) University of Chicago, Chicago, United States (moyer@uchicago.edu), (3) University of York, Heslington, UK (pfb500@york.ac.uk), (4) University of Toronto, Toronto, Canada (kwalker@atmosp.physics.utoronto.ca), (5) University of Waterloo, Waterloo, Canada (cboone@acebox.uwaterloo.ca)

Water vapor isotopologues provide a sensitive measure of transport and deep convective influences on water vapor in the UTLS. We use satellite observations from the Atmospheric Chemistry Experiment Fourier Transform Spectrometer (ACE-FTS) to document the global behavior of isotopologues of H2O, including HDO and H2O(18). The ACE-FTS data reveal a minimum in (HDO/H2O) within the tropical tropopause layer, and systematic increases above the tropopause linked to methane oxidation, stratospheric transport and (possibly) overshooting convection. There is a relatively small seasonal cycle of (HDO/H2O) near the tropical tropopause. Climatological latitude-longitude structure is also analyzed, revealing localized regions of enhanced (HDO/H2O) in the UTLS, including continental monsoon regions.