Geophysical Research Abstracts
Vol. 13, EGU2011-2624-1, 2011
EGU General Assembly 2011

Evaluation of UT/LS humidity in the ECMWF model using five years of CARIBIC observations

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Water vapor, relative humidity and temperature in the upper troposphere and lower stratosphere (UT/LS) derived from the ECMWF model is evaluated and compared to long-term in-situ CARIBIC passenger aircraft measurements. The combination of a sidewards-facing inlet for (gas-phase) water vapor and a forward-facing inlet for total water (water vapor plus cloud water/ice) allows to distinguish measurements taken inside and outside of clouds. Probability density functions are used to study the models capability to forecast UT/LS humidity. Furthermore, seasonally and latitudinally resolved vertical profiles have been inferred from ECMWF and CARIBIC data to investigate the ability of the model to represent troposphere-to-stratosphere water transport.