Geophysical Research Abstracts,
Vol. 11, EGU2009-9359, 2009
EGU General Assembly 2009

Ability of the global models to reproduce UT/LS large scale features of CO, CH4, CO2 and oxygenated compounds assessed by comparisons with the airborne CARIBIC data

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Due to the lack of observations, the budgets of key chemical species in the upper troposphere/lower stratosphere region are still highly uncertain. Hence, the large scale gradient of CO/CO2/CH4 or the abundance and feature of oxygenated compounds are poorly captured by the global chemistry-transport models.

The CARIBIC project relies on the use of a passenger aircraft for making frequent atmospheric chemistry measurements mainly in the tropopause region. It provides accurate and simultaneous observations of several compounds in the upper troposphere/lower stratosphere. These airborne observations, nowadays covering several years, are used in this work to evaluate the ability of two global models (TM5 and LMDz-INCA) to simulate the seasonal variations, inter-hemispheric differences and vertical distributions of CH4, CO and CO2 in this region.

Furthermore, as CARIBIC provides original measurements of oxygenated compounds, the distribution and budget of such compounds which control the radical production in the UTLS, is also investigated.

This work is performed in the framework of the GEOmon EU project.