



Long-range transport of air pollutants in the upper troposphere observed during CARIBIC flights over Atlantic Ocean

G. Schlaf (1), F. Slemr (1), C. Brenninkmeijer (1), H. Wernli (2), J. Lelieveld (1)

(1) Max Planck Institute for Chemistry, Atmospheric Chemistry Division, D-55128

Mainz

(2) Institute for Atmospheric Physics, Johannes Gutenberg-University Mainz, D-55099 Mainz

(schlaf@mpch-mainz.mpg.de / Fax: 0049-6131-305 436 / Phone: 0049-6131-305 427)

In the course of the CARIBIC project (Civil Aircraft for the Regular Investigation of the atmosphere Based on an Instrumented Container) 23 flights from Germany to four locations in the Caribbean region were conducted in the period between Mai 12, 2001, and April 28, 2002, using a Boeing 767-ER of LTU International Airways. O₃, CO and aerosol particles larger than 4, 12, and 18 nm were measured continuously during these flights. In addition, 12 air samples were taken into canisters during each flight at regular intervals over a sampling period of about 20 min and analysed for CO, CO₂, H₂ and their isotopic composition, hydrocarbons, halocarbons, CH₄, N₂O, and SF₆. Using meteorological data and chemical signatures the tropospheric data were separated from the stratospheric ones. Long-range transport of hydrocarbons, halocarbons and trace gases like carbon monoxide, ozone, methane, sulfur hexafluoride in the upper troposphere from North-America to Mid-Atlantic and Europe was observed frequently during these flights. In several instances the calculated backward trajectories suggested Asia to be origin of the observed airmasses transported in the upper troposphere over the American continent to the Atlantic. To corroborate this suggestion of intercontinental long-distance transport, chemical tracers like halocarbons that are still in use in Asia but not in America will be looked for.