Geophysical Research Abstracts, Vol. 8, 08923, 2006
SRef-ID: 1607-7962/gra/EGU06-A-08923

Aircraft measurements of halocarbons and other trace gases showing tropospheric variability and trends.

O'Sullivan. D (1), Oram. D (1), Brenninkmeijer. C (2), Penkett. S (1), Slemr. F (2), Van Velthoven. P (3), Zahn. A (4)

1. University of East Anglia, Norwich, U.K
2. Max-Planck Institute for Chemistry, Mainz, Germany
3. KNMI Royal Dutch Meteorological Institute, de Blit, the Netherlands
4. Institute for Meteorology and Climate Research, Karlsruhe, Germany

The CARIBIC project (Civil Aircraft for Regular Investigation of the Atmosphere Based on an Instrumented Container) was set up to make regular measurements of a wide variety of trace gases in the UTLS region. From 1998 to 2002 the CARIBIC container was installed on an LTU airways Boeing 767-ER. During this period around 40 successful return flights were carried out sampling air in the mid to upper troposphere and lower stratosphere on routes from Germany to the Maldives, Africa and the Caribbean. After 3 years of construction a new CARIBIC container was installed on a Lufthansa Airbus A340-600 and since January 2005 monthly flights have been continuing to provide data on the temporal and spatial distribution of trace gases in the UTLS. Flight routes are predominantly from Germany to South America and China. This regular sampling is planned to continue with Lufthansa for the next 10 years.

Whole air samples collected within the CARIBIC project have been analyzed using GCMS around 40 halocarbons and related hydrocarbons, among them many potent greenhouse gases and species important for ozone depletion, and effects on tropospheric reactivity. The large spatial and temporal coverage of the CARIBIC project has enabled new work to be done investigating recent inter-annual trends in the CFCs, halons, and other greenhouse gases, as well as identifying clear inter-hemisphereic and seasonal variability for a number of species, such as methylene chloride, HCFC-21, methyl chloride, and methyl bromide. Data is also presented showing evidence of long-range transport of biomass burning plumes, and all the data combined together

provide valuable information on the global distribution and variability of a many halogenated compounds and other trace gases.