



Large scale distribution of nitrogen oxides in the UTLS - Results of NO and NO_y measurements during CARIBIC

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Measurements of nitrogen oxides performed in the upper troposphere and lower stratosphere are presented. NO and NO_y measurements contribute to the identification of specific sources determining the trace gas budget around the tropopause. These observations were carried out within the CARIBIC project (Civil aircraft for the regular investigation on the atmosphere based on an instrument container).

Since its first deployment in spring 2002 the NO and NO_y instrument has been successfully operated during more than 70 flights with a Lufthansa Airbus. Most of the flights have been performed between Germany and South America (Sao Paulo and Santiago de Chile) and between Germany and the Far East (Guangzhou and Manila). During these long-haul flights NO and NO_y concentrations in the upper troposphere and lowermost stratosphere have been determined along with species as CO, O₃, particles, and others.

These data were used to study the influence of long range transport, deep convection, lightning, and air traffic emissions on the nitrogen oxides budget in the UTLS region. Case studies and correlation analyses are presented. First attempts have also been made at assessing the seasonal variation of nitrogen oxides in the probed UTLS region.

Average NO and NO_y concentrations obtained during CARIBIC are compared to the results obtained during other aircraft measuring campaigns like NOXAR and SCOUT.