



CO₂ isotope analysis of air samples in the upper troposphere-lowermost stratosphere region, the project CARIBIC

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The project CARIBIC (<http://caribic-atmospheric.com>), aims to study atmospheric chemistry and composition by measuring many compounds and species in the upper troposphere-lowermost stratosphere (UT/LMS) around the globe by using a commercial aircraft. CARIBIC has two phases, CARIBIC-1 and CARIBIC-2 (CARIBIC-LUFTHANSA). During CARIBIC-1 (flights from Germany to mainly India, South Africa and the Caribbean), CO₂ isotope composition was measured on cryogenic extracts from large air samples of 250 l STP. CO₂ isotope analysis in the UT/LMS and free troposphere is continued by CARIBIC-LUFTHANSA. The new instrument container of CARIBIC-LUFTHANSA operates onboard a Lufthansa A340-600 (Frankfurt, Germany) with monthly flights from Frankfurt to remote destinations, collecting 28 air samples for laboratory analyses. A new CO₂ extraction line was installed at JRC-IRMM (Geel, Belgium) and high quality isotope measurements started in June 2007. Particular focus is on traceable calibration to the VPDB-CO₂ scale as well as on the quality of d¹⁸O(CO₂) data, which give important information about CO₂ exchange with oceans, soils and biosphere. d¹⁸O(CO₂) is discussed to be a long-term indicator of global changes in the CO₂ cycle as well as oceans' feedback. About 500 air samples analysed from June 2007 to January 2009 give a reliable data set for free troposphere and the UT/LMS region. New data obtained, trends and tracer-tracer correlations will be presented at the meeting.