



A flying laboratory: DOAS measurements as part of the CARIBIC aircraft project

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CARIBIC (Civil Aircraft for the Regular Investigation of the atmosphere Based on an Instrument Container) is an innovative scientific project to study important chemical and physical processes in the upper troposphere and lowermost stratosphere. The underlying philosophy is to use a passenger aircraft for making measurements during long distance flights. Accordingly, an airfreight container with scientific apparatus has been placed on a new Airbus A340-600, Deutsche Lufthansa, in November 2004 and has successfully passed the test flight.

Besides in-situ measurements of various trace gases, aerosols and water vapour, a miniaturized Multi-Axis Differential Optical Absorption Spectroscopy (MAX-DOAS) instrument is part of this flying air chemistry laboratory. The CARIBIC DOAS is able to detect a number of atmospheric trace gases, such as ozone, NO₂, BrO, HCHO, OCIO, water vapour and O₄. Separation of boundary layer, free tropospheric and stratospheric columns along the flight track of the airplane are possible by observing scattered sunlight from three different directions in the sky (nadir, 10° above and below the horizon). Measurements during ascent and descent of the aircraft allow to retrieve even higher resolved vertical profiles of atmospheric compounds.

We give a brief overview of the technical setup, present first results from recent measurement flights and give a scientific outlook for the CARIBIC DOAS measurements.