Geophysical Research Abstracts
Vol. 13, EGU2011-6349, 2011
EGU General Assembly 2011


# The CARIBIC Atmospheric Chemistry Flying Observatory

Carl Brenninkmeijer and the CARIBIC Team
Max Planck Institute for Chemistry, Atmospheric Chemistry, Mainz, Germany

At present, CARIBIC (Civil Aircraft for the Regular Investigation of the atmosphere Based on an Instrument Container) has been in operation for 6 years using a Lufthansa Airbus 340-600. After a pilot phase (1998-2002) using a Boeing 767, CARIBIC's ongoing success demonstrates that a complex, automated atmospheric chemistry laboratory can be operated regularly with a high degree of reliability. Whereas CARIBIC 1 conducted 2 flights per month, we now routinely absolve 4 consecutive long distance flights. We also manage to maintain a fairly strict monthly rhythm. Next to the aspect of regular operation, and flight destinations, i.e. which regions best to measure, a cardinal issue is how much can actually be measured. The scientific payload encompasses remote sensing with DOAS, real-time measurements of aerosol abundances and size distribution, aerosol elemental composition, ozone, water vapor, nitrogen oxides, acetone, acetonitrile, mercury, carbon dioxide, carbon monoxide, and in addition, fairly complete retrospective trace gas measurements of air samples collected during CARIBIC flights. The system was effectively optimized through the extension of the scientific payload in 2010. With the addition of an 88 capacity air sampler, the amount of information obtained was significantly increased. A new, laser-based system allows for high resolution carbon dioxide and methane measurements. Furthermore, nitrogen dioxide was added to the analytical capacity. What brings the CARIBIC payload even closer to that of a complete platform, or gives it even a pioneering aspect, is the new system for analyzing the D/H and 18O/16O ratios of water vapor. This system gives CARIBIC a great advantage by measuring as much as possible for this very important compound. Conversely, the fact that CARIBIC operates every month, gives the experimentalists near dreamlike conditions for executing and optimizing such challenging measurements.