CARIBIC DOAS NO_2 observation at Frankfurt Airport

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The CARIBIC (Civil Aircraft for the Regular Investigation of the atmosphere Based on an Instrument Container) project obviously is about measurement at cruise altitude (average pressure altitude close to the tropopause at 11km), as it uses a long range Airbus A340-600. Some information is obtained during descend and ascend, yet, to protect the inlet system from contamination, air intake stops at about 450 hPa (6.5km). The DOAS (Differential Optical Absorption Spectrometry) instrument is not prone to contamination and therefore it is the only instrument that is regularly measuring at ground level. The instrument observes scattered sunlight under three elevation angles, one line of sight has an elevation angle of 10 degree; the other two are directed downwards and hence are less suitable for ground based observations. Compared to normal ground based DOAS measurements the CARIBIC DOAS observations offer the advantage, that the reference spectrum can be taken outside the boundary layer under clean air conditions. Due to the difference in the air pressure and temperature of the spectrometers the quality of the DOAS fit is slightly worse compared to in flight spectra, however the main limiting factor still is the light intensity, at the airport the light path is sometimes blocked by airport service cars or neighbouring aeroplanes. In the last years a series of monthly DOAS NO_2 measurements at Frankfurt airport was taken. The NO_2 slant column densities here were approximately $1 \cdot 10^{17}$ molec/cm^2 but also higher values were observed. During a few exceptional stops at Frankfurt also HCHO was observed.
First results of the slant and vertical columns for the years 2008, 2009 and 2011 will be shown.

Abstracts should be submitted to:

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