



Annual and seasonal trends of tropospheric ozone and CO over Frankfurt between 1994-2011 based on MOZAIC-IAGOS aircraft measurements

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At the regional scale, various uncertainties persist on the ozone budget in the troposphere, including the relative contributions of local formation, long-range transport or stratospheric intrusions. In the framework of the MOZAIC-IAGOS program, a large amount of ozone and carbon monoxide data is collected in the troposphere by commercial aircraft since 1994 and 2002, respectively. This work investigates vertical profiles (take-offs, landings) around Frankfurt and Munich airports in Central/Western Europe during the 1994-2011 period. In the troposphere, observations indicate no significant trend for ozone, contrary to CO that is clearly decreasing. A focus is also made on the evolution of the tropospheric ozone seasonal cycle (baseline, amplitude and phase). As most ozone sources (e.g. local formation, long-range transport) have their own seasonality, investigating changes in the ozone seasonality and trends is expected to provide valuable information on their apportionment. The analysis will take advantage of the availability of measurements at various altitudes to put light on the current evolution of ozone variability at different distances from local precursors emissions. Transport patterns at the hemispheric scale are also investigated, showing an inter-annual variability that may explain a part of the inter-annual variability recorded on concentrations.