



High NO_y and CO concentrations in the UT seen in MOZAIC flights – Comparison with MACC Reanalysis

Karin Thomas (1), Martin Schultz (1), Hans-Werner Pätz (1), Andreas Volz-Thomas (1), Olaf Stein (1), Philippe Nedelec (2), and Valerie Thouret (2)

(1) Research Center Jülich, IEK-8, Jülich, Germany (k.thomas@fz-juelich.de), (2) Laboratoire d'Aerologie, CNRS, Toulouse, France

We present a comparison of global CTM simulations from the MACC reanalysis with IFS-MOZART3 for ozone, carbon monoxide and nitrogen oxides with measurements made aboard in-service aircraft in the MOZAIC (Measurement of ozone, water vapour, carbon monoxide and nitrogen oxides aboard Airbus in-service aircraft) programme. The comparison focuses on the climatology in the upper troposphere, as well as correlations and probability distribution functions (PDF) of the chemical species as a function of different vertical coordinates (height, potential temperature and potential vorticity) for different geographical regions (Europe, US East coast, East Asia). In winter, total odd nitrogen concentrations in the upper troposphere (UT) are usually well below 0.5 ppb, whereas concentrations of several ppb are frequently observed in spring and summer, in particular over the western North Atlantic, but also over Europe and the Arabian Peninsula. Very high CO concentrations are observed over East Asia and Northern Canada as a result of biomass burning. Possible explanations are lightning and convective transport from the boundary layer, as is investigated from correlations between total odd nitrogen, ozone and carbon monoxide.