Geophysical Research Abstracts,
Vol. 11, EGU2009-10053, 2009
EGU General Assembly 2009

Convection parameterisation influences on trace species profiles

H. Tost (1,2), P. Jöckel (1), M. G. Lawrence (1), C. Brühl (1), the GABRIEL - Team (), and the SCOUT-O3 / ACTIVE / TWP-ICE Darwin -Team ()

(1) Max-Planck Institute for Chemistry, Airchemistry department, Mainz, Germany (tost@mpch-mainz.mpg.de), (2) The Cyprus Institute, EEWRC, Nicosia, Cyprus

Deep convective clouds are responsible for intense upward transport of air and consequently of trace species into the upper troposphere, both in the tropics and the mid-latitudes. Since in global atmospheric chemistry general circulation models convection must be parameterised, this is a large source of uncertainty.
In this study a comparison between model simulations using the EMAC (ECHAM5/MESSy atmospheric chemistry) model, which is equipped with several different convection parameterisations, and observed data from measurement campaigns is performed. This allows the analysis of the impact of convection on the vertical distribution of trace species in the atmosphere and elucidates the differences in the applied convection schemes. Furthermore, it helps to identify strengths and weaknesses of the individual parameterisations. Both the triggering behaviour and the transport strength and form (e.g. entrainment profiles) contribute to modified vertical tracer profiles. Furthermore, the scavenging and subsequent wet removal processes are substantially influenced by the precipitation determined by the parameterised convection.