Geophysical Research Abstracts
Vol. 20, EGU2018-8420, 2018
EGU General Assembly 2018


# Three-dimensional modelling of the long-term variability of tracer transport in the Asian Summer Monsoon anticyclone

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The Asian Monsoon occurs over a region well known for the important transport of climate-relevant gases from the troposphere to the stratosphere. Recent studies by several groups have focused on quantifying processes which contribute to coupling in the upper troposphere-lower stratosphere (UTLS), including transport during the Asian Summer Monsoon (ASM). Troposphere-to-stratosphere transport in this region has been the focus of a number of recent campaigns, including the EU "StratoClim campaign" in Greece 2016 and Nepal 2017.

Anthropogenic compounds such as CO, very short-lived substances (VSLS), which destroy stratospheric ozone and sulphur compounds, which maintain the stratospheric aerosol layer, are among the important species believed to be transport in the large convective systems such as the ASM. An important question for halogenated VSLS is whether ASM-associated transport can take place on timescales which are short relative to their chemical lifetimes of days to months.

This poster will present results of the TOMCAT/SLIMCAT off-line 3-D chemical transport model to investigate these issues using moderate-resolution simulations (2.8°x2.8°, 60 levels from surface to 60 km). The model is forced by ECMWF ERA-Interim reanalyses. Two different definitions of "centre" of the anticyclone, chosen from the most recent literature will be used. To represent the interannual variability of the confinement of tracers in the anticyclone, the model results are compared with vertical shear of the zonal wind between 850 and 200 hPa averaged over the 0-20N, 40-110E during northern summer season. Comparisons will be made with in-situ and remote satellite data, where possible.