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Simulations of the transport of brominated short - lived ODSs to the UTLS via the Asian Summer Monsoon

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Halogenated species are considered to be very important in atmospheric chemistry. Despite their small abundances, e.g. about 20 pptv of bromine in the stratosphere, these trace gases impact phenomena ranging from air quality to potential climate change. This poster presents results obtained through a series of model tracer experiments designed to investigate and quantify the boundary layer-to-upper troposphere/lower stratosphere (UTLS) transport by the Asian Summer Monsoon (ASM) associated with deep convection. In particular we are interested in bromine Very Short Lived Substances (VSLSs), such as CHBr3 and CH2Br2. These compounds can eventually to contribute to the stratospheric burden of Ozone Depletion Substances (ODSs).

Our experiments were performed using the TOMCAT 3D chemical transport model (CTM), in moderate resolution mode (2.8°x2.8°, 60 levels) forced by ECMWF analyses. We used idealised and artificial tracers in the simulations. A ten-year simulation was run which included CH2Br2, CHBr3 with parametrized loss rates and other idealised tracers with specified source regions and lifetimes. An important question for halogenated VSLS is whether ASM-associated transport can take place on timescales which are short relative to their chemical lifetime. It is also important to quantify the role of the ASM in a global context and to understand any interannual variability in the transport from the troposphere to the stratosphere. We will present results which quantify these processes in the model. Where possible, the model chemical tracers will be compared to relevant satellite and aircraft observations.