

## **The impact of the Asian summer monsoon on the composition of the extratropical lower stratosphere**

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We present tracer measurements from the German research aircraft HALO, which were obtained during the TACTS/ESMVal-project (Transport and Composition in the UT/LS and Earth System Model Validation) in September 2012 in the northern mid latitude lower stratosphere.

We will focus on the distribution of CO, N<sub>2</sub>O and ozone in the extratropics between potential temperatures of 360 K and 410 K and their changes over the course of the campaign. Based on the distribution of N<sub>2</sub>O and CO, which constitute two tropospheric tracers of different lifetime one can quantify time scales of transport and chemical ageing of air masses. To account for mixing we analyze the distribution of CO relative to N<sub>2</sub>O. In geometrical coordinates we observed an increase of N<sub>2</sub>O and CO over a course of four weeks due to the increased impact of the monsoon system. When analyzing CO relative N<sub>2</sub>O to account for mixing we observe a decrease of the tropospheric fraction relative to N<sub>2</sub>O. These results are consistent with the fact that air in Asian monsoon anticyclone is trapped which allows for photochemical CO degradation. Based on the correlation of CO and N<sub>2</sub>O we estimate an upper limit for the degradation of CO relative to N<sub>2</sub>O of 30 days.