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Distribution of chemical compounds observed in the UTLS during the TACTS campaign using the HALO aircraft

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The SPURT (**Spur**enstofftransport in der **T**ropopausenregion, trace gas transport in the tropopause region) campaign was the first systematic observational study of extratropical Upper Troposphere / Lower Stratosphere (UTLS) seasonality. A clear seasonality of the composition in and air mass transport into the lowermost stratosphere (LMS) was found. In particular the composition of the LMS showed a sharp transition between July and October. In the course of the summer the LMS is flushed with very young air indicating air mass transport via the tropical pathway.

For further investigation of these findings the TACTS (**T**ransport **a**nd **C**omposition in the U**T**/LM**S**) campaign was designed to improve our understanding of transport timescales, compositions and pathways in the UTLS region during the transition between mid-summer and fall. In order to cover the seasonal transition, TACTS was flown in conjunction with the ESMVal (**E**arth **S**ystem **M**odel **Val**idation) mission in late August and September 2012 using the new German research aircraft HALO (The **H**igh **A**ltitude and **LO**ng Range Research Aircraft). The TACTS payload with 13 different instruments measuring a wide range of chemical tracers with different lifetimes and different source-sink characteristics provides additional information compared to the SPURT dataset (e.g. very short-lived (VSLS) halocarbons).

We will present a comparison between the SPURT dataset and the in-situ measurements during the TACTS campaign. The main focus will be on a comparison of the observed distribution of nitrous oxide (N_2O), water vapour, ozone and mean age derived from sulfurhexafluoride (SF_6) as function of equivalent latitude and potential temperature. Also comparison of Tracer-Tracer correlations will be shown.

Furthermore we discuss the additional information on transport timescale in the LMS provided by the measurements of very short-lived (VSLS) halocarbons.