



Quantifying transport into the lowermost stratosphere using simultaneous measurements of the passive tracers SF₆ and CO₂

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Simultaneous in-situ measurements of CO₂ and SF₆ have been performed in the extra-tropical UTLS for the time period 2000 – 2003 during the SPURT (SPUREnstofftransport in der Tropopausenregion) project. SPURT delivered for the first time a detailed multi-year UTLS data record of both tracers for every season over a large range of latitudes.

The seasonal cycle of CO₂ in the troposphere propagates through the tropopause into the lowermost stratosphere (LMS), while SF₆ can be regarded as a seasonally undisturbed reference tracer. These different stratospheric input functions of both tracers allow solving a mass balance equation derived from the assumption of a bimodal age spectrum in the LMS. This mass balance quantifies the amount of tropospheric air in the LMS and the mean transport time from the troposphere to the measurements location. We will present the results of this mass balance study and discuss the implications on troposphere-to-stratosphere transport.