



Transport of vortex air into the southern mid latitude lowermost stratosphere during TACTS/ESMVal

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During September 2012 comprehensive measurements of trace gases with the new German research aircraft HALO (High Altitude Long range research aircraft) were performed during the TACTS/ESMVal-project (Transport and Composition of the UTLS/Earth System Model Validation).

The measurements covered latitudes from 80 N to 60 S and were performed in the altitude range from 10-15 km. During one flight we encountered air masses, which differ significantly from the typical southern hemispheric lowermost stratospheric composition. These air masses showed N₂O values down to 220 ppbv accompanied by CO values of less than 15 ppbv at the CO equilibrium from methane production and CO degradation.

Ten day backward trajectories indicate that the air originated in the southern hemispheric Antarctic vortex region and descended down to potential temperature levels of 340 K thereby bringing aged and processed air to lower altitudes. Tracer tracer correlations indicate, that mixing with these vortex influenced airmasses occurred down to $\Theta = 340$ K. Using the ClAMS model we will investigate the origin of the vortex filament and the processes of mixing with southern mid latitude air down to these altitudes.