



Another hint for a changing stratospheric circulation after 2001

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Aircraft data were used to study interannual changes of extratropical lower stratospheric tracer-tracer correlations. The focus is on the time periods before and after 2001 between which a remarkable step-like decrease of stratospheric water vapour has occurred (Randel et al., 2006). This feature associated with a cooling of temperatures near the tropical tropopause, and a decrease in tropical ozone at about the same time has been linked by Randel et al. (2006) to an increased stratospheric upwelling circulation in the tropics (the so-called Brewer-Dobson circulation) caused by enhanced wave driving after 2000 (Dhomse et al., 2006).

Analysis of the extratropical tracer-tracer correlations shows different slopes before and after 2000. These changes could be explained by an enhanced horizontal tracer transport from the tropical lower stratosphere into the extratropics, taking into account that mean age of air has remained constant over the last 3 decades in the midlatitude stratosphere above 30 hPa (Engel et al., 2009).

We will present a comparison of in-situ measured tracer-tracer correlations in the extratropical lower stratosphere before and after 2001 and discuss implications for a changing stratospheric circulation.

References:

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