



Evaluation of the method to derive the stratospheric lifetime from observed tracer-tracer-correlations

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The atmospheric lifetime of a trace gas is defined as the ratio of its global atmospheric burden to its annually averaged global loss rate. Here, we are interested in the lifetimes of the dominant ozone-depleting substances (ODS), which are the prerequisite for the calculation of their ozone-depletion potentials (ODPs). Due to the fact that there is some evidence that the lifetimes for some important ODSs like CFC-11 may be somewhat longer than reported in past WMO assessments the re-evaluation of the dominant ODP lifetimes will be done in the framework of SPARC.

Some of the most important ODSs, i.e. CFCs, have solely stratospheric sinks and their stratospheric equals their atmospheric lifetime. For these compounds, the use of tracer-tracer correlation as described by Volk et al. (1997) is the only way that allows to calculate stratospheric lifetimes from solely observations. We will present an evaluation of this method using the results of the GEOS Chemistry-Climate Model (CCM). Hereby, the modelled lifetime serves as an independent reference for the lifetime calculated from the tracer-tracer correlation consistently derived from the same model experiment. We will discuss the implications of these results on the validity and applicability of the method for lifetime calculations described by Volk et al. (1997).

Volk, C. M., Elkins, J. W., Fahey, D. W., Dutton, G. S., Gilligan, J. M., Loewenstein, M., Podolske, J. R., Chan, K. R., and Gunson, M. R.: Evaluation of source gas lifetimes from stratospheric observations, *J. Geophys. Res.*, 102, 25543-25564, 1997.