



Stratospheric carbonyl sulfide (OCS) burden

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An estimation of the global stratospheric burden of carbonyl sulfide (OCS) calculated using satellite based measurements from the Atmospheric Chemistry Experiment – Fourier Transform Spectrometer (ACE-FTS) will be presented.

OCS is the most abundant sulfur containing gas in the atmosphere in the absence of volcanic eruptions. With a long lifetime of 2-6 years it reaches the stratosphere where it is photolyzed and the sulfur oxidized and condensed to aerosols, contributing to the stratospheric aerosol layer. The aerosol layer is the one factor of the middle-atmosphere with a direct impact on the Earth's climate by scattering incoming solar radiation back to space. Therefore it is crucial to understand and estimate the different processes and abundances of the species contributing to the aerosol layer. However, the exact amount of OCS in the stratosphere has not been quantified yet.

A study on the OCS mixing ratio distribution based on ACE-FTS data has already been made by Barkley et al. (2008), also giving an estimation for the total atmospheric OCS mass. ACE-FTS is an infrared solar occultation spectrometer providing high-resolution profile observations since 2004.

In the scope of this work the focus lies on the stratospheric OCS burden, calculated by integrating the ACE profiles. A global overview on the stratospheric OCS amount in the past and present based on the ACE data as well as a look at regional and seasonal variability will be given. Furthermore, the results of this work will be useful for further studies on OCS fluxes and lifetimes, and in quantifying the contribution of OCS to the global stratospheric sulfur burden.

Barkley et al., 2008, *Geophys. Res. Lett.*, 35, L14810.