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Atmos. Chem. Phys., 9, 7449-7459, 2009  
www.atmos-chem-phys.net/9/7449/2009/

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## Global carbon tetrachloride distributions obtained from the Atmospheric Chemistry Experiment (ACE)

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**Abstract.** The first study of the global atmospheric distribution of carbon tetrachloride ( $\text{CCl}_4$ ), as a function of altitude and latitude, was performed using solar occultation measurements obtained by the Atmospheric Chemistry Experiment (ACE) mission using Fourier transform spectroscopy. A total of 8703 profile measurements were taken in the upper troposphere and lower stratosphere between February 2004 and August 2007. The zonal distribution of carbon tetrachloride displays a slight hemispheric asymmetry and decreasing concentration with increasing altitude at all latitudes. Maximum carbon tetrachloride concentrations are situated below 10 km in altitude with VMR (Volume Mixing Ratio) values of 100–130 ppt (parts per trillion). The highest concentrations are located about the Equator and at mid-latitudes, particularly for latitudes in heavily industrialised regions (20–45° N), with values declining towards the poles. Global distributions obtained from ACE were compared with predictions from three chemistry transport models showing good agreement in terms of the vertical gradient despite an overall offset. The ACE dataset gives unique global and temporal coverage of carbon tetrachloride and its transport through the atmosphere. An estimated lifetime for carbon tetrachloride of  $34 \pm 5$  years was determined through correlation with CFC-11.

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Citation: Allen, N. D. C., Bernath, P. F., Boone, C. D., Chipperfield, M. P., Fu, D., Manney, G. L., Oram, D. E., Toon, G. C., and Weisenstein, D. K.: Global carbon tetrachloride distributions obtained from the Atmospheric Chemistry Experiment (ACE), Atmos. Chem. Phys., 9, 7449-7459, 2009. [Bibtex](#) [EndNote](#) [Reference Manager](#)

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