GLOBAL METHYL CHLORIDE MEASUREMENTS FROM THE ACE-FTS INSTRUMENT

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One of the most abundant chlorine-containing molecules in the atmosphere is methyl chloride; a species whose sources are almost entirely natural. The most common sources of methyl chloride are tropical plants, senescent or dead leaves and biomass burning. As the impacts of the Montreal Protocol and its subsequent amendments are becoming apparent in the reduction of chlorofluorocarbons in the atmosphere, naturally-produced methyl chloride is playing an increasingly significant role in the atmospheric ozone budget.

While much is known about the concentration of methyl chloride at ground level, there are relatively few measurements of its altitude distribution. Solar occultation profiles from the Atmospheric Chemistry Experiment (ACE) satellite mission have been used to produce the first study of the global distribution of methyl chloride in the upper troposphere and stratosphere. Measurements from the infrared Fourier transform spectrometer (ACE-FTS) on board ACE, collected over three years from February 2004 to March 2007, were used in the analysis. These results were compared with results from the MkIV balloon-borne Fourier transform spectrometer, the Global Modelling Initiatives (GMI) combination troposphere and stratosphere model and the GEOS-Chem troposphere model. This paper will discuss the challenges of retrieving methyl chloride from atmospheric spectra. Also, it will discuss the differences between the global methyl chloride distribution as determined from the ACE-FTS and the MkIV FTIR measurements and the GMI and GEOS-Chem models.