

JPL (MLS Team) Scientific Publication

Scientific Theme: Atmospheric Chemistry and Transport

Stratospheric Abundances of Water and Methane Based on ACE-FTS Measurements, R. Nassar, P. F. Bernath, C. D. Boone, G. L. Manney, S. D. McLeod, C. P. Rinsland, R. Skelton, and K. A. Walker, *Geophys. Res. Lett.*, **32**, L15S04, doi:10.1029/2005GL022383, June 2005.

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Summary

Measurements of water and methane from the new Canadian Atmospheric Chemistry Experiment Fourier Transform Spectrometer (ACE-FTS) instrument, along with “potential water” calculated from them, are used to calculate the amount of water entering the stratosphere from below. The results of this study show negligible changes in potential water and in water entering the stratosphere from previous estimates by a similar instrument in 1994. These results are consistent with those found using other datasets to study stratospheric water, and indicate a halt to the increases in stratospheric water seen before about 1996.

This research benefits society by improving our understanding of the transport of water into the stratosphere from below, and extending our time record of trends in stratospheric water. The transport of water into the stratosphere and trends in stratospheric water are key to understanding climate change and its effects on the stratosphere.

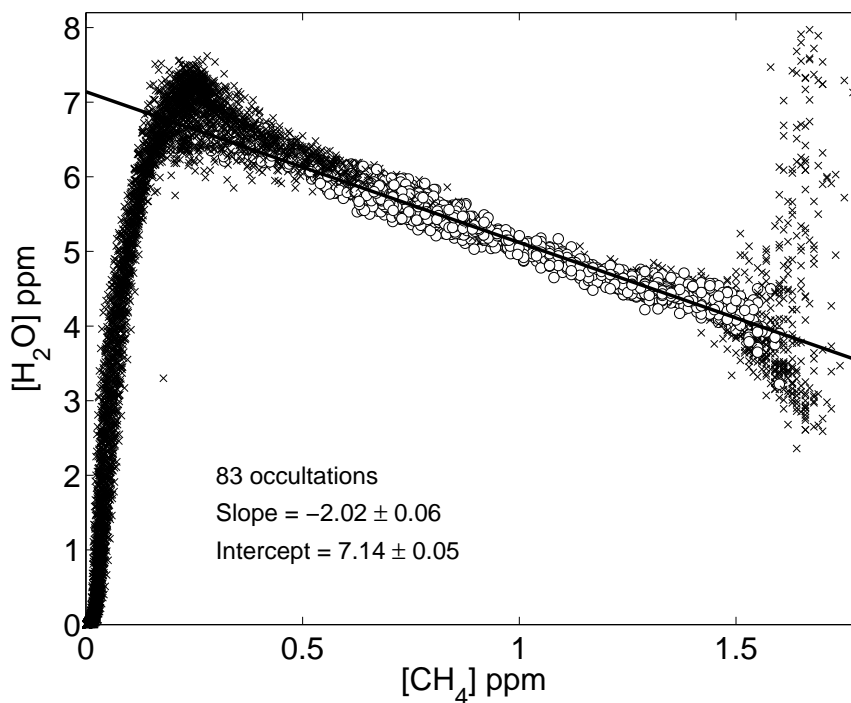


Figure 4. ACE-FTS measurements of water plotted as a function of methane at midlatitudes. The measurements from 18 to 40 km (open circles) are fitted to a line to determine the amount of “potential water” in the midlatitude stratosphere. Changes in this quantity indicate trends in the total amount of water in the stratosphere.