

MLS Scientific Publication
Scientific Theme: Atmospheric Chemistry

Observations for Chemistry (Remote Sensing): Microwave, J.W. Waters, pages 1516-1528 in *Encyclopedia of Atmospheric Sciences*, edited by J.R. Holton, J.A. Curry and J.A. Pyle, Academic Press, 2003. [See <http://earth.elsevier.com> for more information on this new encyclopedia.]

MLS contact: Joe Waters, joe@mls.jpl.nasa.gov, 818-354-3025

Summary

This article summarizes the fundamentals and some results of microwave remote sensing observations for atmospheric chemistry. Measurement fundamentals, chemical species and spectra, and instrumentation characteristics are described. Features and results are discussed for (a) ground-based observations, (b) aircraft-based observations, (c) balloon-based observations and (c) satellite-based observations. A list of articles for further reading is given. This work benefits society by providing a general reference for atmospheric scientists who need to improve their basic knowledge of microwave observations and how they might benefit research on atmospheric chemistry issues facing our planet.

Figure 5. Spectra of some stratospheric molecules and atomic oxygen. Vertical axis is the logarithm of the optical depth for an observation path through the atmospheric limb with the indicated volume mixing ratios (vmr).

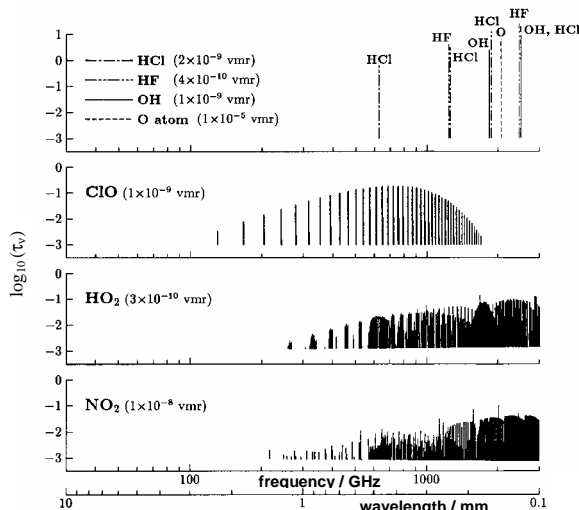


Figure 11. Earth's lower stratosphere in the Northern Hemisphere on 20 February 1996 (top) and in the Southern Hemisphere on 30 August 1996 (bottom). HNO₃, ClO and O₃ measurements are from the Microwave Limb Sounder on the Upper Research Satellite. These measurements elucidate the polar processes involved in chemical destruction of stratospheric ozone by chlorine.

Earth's Lower Stratosphere in 1996 Northern and Southern Winters

