



Home

Online Library ACP

- Recent Final Revised Papers
- Volumes and Issues**
- Special Issues
- Library Search
- Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

Impact
Factor
4.927

ISI
indexed



[Volumes and Issues](#) [Contents of Issue 23](#)

Atmos. Chem. Phys., 9, 9155-9167, 2009

www.atmos-chem-phys.net/9/9155/2009/

© Author(s) 2009. This work is distributed under the Creative Commons Attribution 3.0 License.

On the quality of the Nimbus 7 LIMS Version 6 water vapor profiles and distributions

E. E. Remsberg¹, M. Natarajan¹, G. S. Lingenfelter², R. E. Thompson³, B. T. Marshall³, and L. L. Gordley³

¹NASA Langley Research Center, 21 Langley Blvd., Mail Stop 401B, Hampton, VA 23681, USA

²SSAI, 1 Enterprise Parkway, Hampton, VA 23661, USA

³GATS, Inc. 11864 Canon Blvd., Suite 101, Newport News, VA 23606, USA

Abstract. This report describes the quality of the Nimbus 7 Limb Infrared Monitor of the Stratosphere (LIMS) water vapor (H₂O) profiles of 1978/79 that were processed with a Version 6 (V6) algorithm and archived in 2002. The V6 profiles incorporate a better knowledge of the instrument attitude for the LIMS measurements along its orbits, leading to improvements for its temperature profiles and for the registration of its water vapor radiances with pressure. As a result, the LIMS V6 zonal-mean distributions of H₂O exhibit better hemispheric symmetry than was the case from the original Version 5 (V5) dataset that was archived in 1982. Estimates of the precision and accuracy of the V6 H₂O profiles are developed and provided. Individual profiles have a precision of order 5% and an estimated accuracy of about 19% at 3 hPa, 14% at 10 hPa, and 26% at 50 hPa. Profile segments within about 2 km of the tropopause are often affected by emissions from clouds that appear in the finite field-of-view of the detector for the LIMS H₂O channel. Zonally-averaged distributions of the LIMS V6 H₂O are compared with those from the more recent Microwave Limb Sounder (MLS) satellite experiment for November, February, and May of 2004/05. The patterns and values of their respective distributions are similar in many respects. Effects of a strengthened Brewer-Dobson circulation are indicated in the MLS distributions of the recent decade versus those of LIMS from 1978/79. A tropical tape recorder signal is present in the 7-month time series of LIMS V6 H₂O with lowest values in February 1979, and the estimated, annually-averaged "entry-level" H₂O is 3.5 to 3.8 ppmv. It is judged that this historic LIMS water vapor dataset is of good quality for studies of the near global-scale chemistry and transport for pressure levels from 3 hPa to about 70 to 100 hPa.

[Final Revised Paper](#) (PDF, 1639 KB) [Discussion Paper](#) (ACPD)

Citation: Remsberg, E. E., Natarajan, M., Lingenfelter, G. S., Thompson, R. E., Marshall, B. T., and Gordley, L. L.: On the quality of the Nimbus 7 LIMS Version 6 water vapor profiles and distributions, Atmos. Chem. Phys., 9, 9155-9167, 2009. [Bibtex](#) [EndNote](#) [Reference Manager](#)



Search ACP

Library Search

Author Search

News

- Sister Journals AMT & GMD
- Public Relations & Background Information

Recent Papers

01 | ACPD, 23 Dec 2009: Airborne measurements of aerosol optical properties related to early spring transport of mid-latitude sources into the Arctic

02 | ACPD, 23 Dec 2009: Organic aerosol components observed in worldwide datasets from aerosol mass spectrometry

03 | ACPD, 23 Dec 2009: Optimal estimation of the surface fluxes of methyl chloride using a 3-D global chemical transport model