

**Robert L. Herman**  
Research Scientist  
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## RELEVANT EXPERIENCE

Dr. Herman has served mission formulation as proposal manager or member of the proposal team for numerous proposals. He is also the Principal Investigator of the JPL Laser Hygrometers for *in-situ* measurements of atmospheric water vapor. His scientific interests span atmospheric trace gases, satellite infrared remote sensing, satellite calibration and validation, and climate. He has over 23 years of experience as an aircraft instrument investigator, with additional experience in untethered balloons and Uninhabited Aerial Systems (UASs).

## EDUCATION:

- Ph.D., Geochemistry, California Institute of Technology, 1998.
- M.S., Geochemistry, California Institute of Technology, 1993.
- B.A., Chemistry, University of Chicago, with general honors, 1991.

## PROFESSIONAL EXPERIENCE:

- Leads JPL Laser Hygrometer as PI in field campaigns and scientific interpretation.
- Proposal Manager for ESE mission proposal (Charles Miller, PI).
- Proposal Manager for selected EVI-4 mission EMIT (Robert Green, PI).
- Additional proposal experience as Section Lead for Discovery, New Frontiers, Explorers, MidEx, EVS-3, EVM-2, and PI/co-I for ROSES.

## CURRENT POSITIONS:

- 2020 – present:** TS/SCI (Top Secret/Sensitive Compartmented Information).
- 2005 – present:** Principal Investigator, UAS Laser Hygrometer for NASA Global Hawk UAS.
- 2001 – present:** Research Scientist, JPL.
- 1999 – present:** Principal Investigator, JPL Laser Hygrometers (JLH).

## PREVIOUS POSITIONS:

- 2022 – 2023:** Member of Science Team, CalcIS
- 2020 – 2021:** Member of Science Team, NASA TROPES.
- 2010 – 2021:** Validation Lead, Tropospheric Emission Spectrometer (TES)
- 1999 – 2001:** Scientist, Atmospheric Laser Spectroscopy Group, JPL, ALIAS-II instrument for Observations from the Middle Stratosphere (OMS) balloon payload and the JPL Laser Hygrometer for Airborne payload.
- 1998 – 1999:** Caltech Postdoctoral Scholar, JPL.

## SELECTED REFEREED PUBLICATIONS

Shi, M., Worden, J., Bailey, A., Noone, D., Risi, C., Fu, R., Worden, S., Herman, R., Payne, V., Pagano, T., Bowman, K., Bloom, A., Saatchi, S. S., Liu, J., and Fisher, J.: Amazonian terrestrial water balance inferred from satellite-observed water vapor isotopes, *Nature Communications*, 13, 2686, 2022 (published May 13, 2022). <https://doi.org/10.1038/s41467-022-30317-4>.

- Zeng, Z.-C., Addington, O., Pongetti, T. J., Herman, R. L., Sung, K., Newman, S., Schneider, A., Borsdorff, T., Yung, Y. L., and Sander, S.: Measurements of atmospheric HDO/H<sub>2</sub>O in southern California from CLARS-FTS, *Journal of Quantitative Spectroscopy and Radiative Transfer*, 288, 2022, 108254, ISSN 0022-4073 (version of record June 7, 2022), <https://doi.org/10.1016/j.jqsrt.2022.108254>.
- Fahlen, J. E., Brodrick, P. G., Thompson, D. R., **Herman, R. L.**, Hulley, G., Cawse-Nicholson, K., Green, R. O., Green, J. J., Hook, S. J., and Miller, C. E.: Joint VSWIR-TIR retrievals of earth's surface and atmosphere, *Remote Sensing of Environment*, 267, 112727, 2021, ISSN 0034-4257, <https://doi.org/10.1016/j.rse.2021.112727>.
- Thompson, D. R., Brodrick, P. G., Bohn, N., Braverman, A., Carmon, N., Connelly, D., Fahlen, J., Green, R. O., Herman, R. L., Hobbs, J., Johnson, M., Mahowald, N., Okin, G. S., Poulter, B., Serbin, S., Shiklomonov, A. N., Susiluoto, J., Turmon, M., Toward comprehensive uncertainty predictions for remote imaging spectroscopy, *Proc. SPIE 11504, Imaging Spectrometry XXIV: Applications, Sensors, and Processing*, 115040B (published 22 August 2020); <https://doi.org/10.1117/12.2567732>
- Herman, R. L.**, Worden, J., Noone, D., Henze, D., Bowman, K., Cady-Pereira, K., Payne, V. H., Kulawik, S., and Fu, D.: Comparison of optimal estimation HDO/H<sub>2</sub>O Retrievals from AIRS with ORACLES measurements, *Atmos. Meas. Tech.*, 13, 1825–1834, 2020, <https://doi.org/10.5194/amt-13-1825-2020>.
- Jiang, J. H., Yue, Q., Su, H., Kangaslahti, P., Lebsock, M., Reising, S., Schoeberl, M., Wu, L., and **Herman, R. L.**, “Simulation of remote sensing of clouds and humidity from space using a combined platform of radar and multifrequency microwave radiometers”, *Earth and Space Science*, 6, 2019, <https://doi.org/10.1029/2019EA000580>.
- Worden, J. R., Kulawik, S. S., Fu, D., Payne, V. H., Lipton, A. E., Polonsky, I., He, Y., Cady-Pereira, K., Moncet, J.-L., **Herman, R. L.**, Irion, F. W., and Bowman, K. W., “Characterization and Evaluation of AIRS-Based Estimates of the Deuterium Content of Water Vapor”, *Atmos. Meas. Tech.*, 12, 2331-2339, 2019, <https://doi.org/10.5194/amt-12-2331-2019>.
- Fu, D., Kulawik, S. S., Miyazaki, K., Bowman, K. W., Worden, J. R., Eldering, A., Livesey, N. J., Teixeira, J., Irion, F. W., **Herman, R. L.**, Osterman, G. B., Liu, X., Levelt, P. F., Thompson, A. M., and Luo, M., “Retrievals of Tropospheric Ozone Profiles from the Synergism of AIRS and OMI: Methodology and Validation”, *Atmos. Meas. Tech.*, 11, 5587-5606, 2018, <https://doi.org/10.5194/amt-11-5587-2018>.
- Herman, R. L.**, Ray, E. A., Rosenlof, K. H., Bedka, K. M., Schwartz, M. J., Read, W. G., Troy, R. F., Chin, K., Christensen, L. E., Fu, D., Stachnik, R. A., Bui, T. P., and Dean-Day, J. M., “Enhanced Stratospheric Water Vapor over the Summertime Continental United States and the Role of Overshooting Convection,” *Atmos. Chem. Phys.*, 17, 6113-6124, 2017, <https://doi.org/10.5194/acp-17-6113-2017>.
- Kuai, L., Bowman, K. W., Worden, H. M., Herman, R. L., Kulawik, S. S., “Hydrological controls on the tropospheric ozone greenhouse gas effect,” *Elem. Sci. Anth.* 2017; 5:10. DOI: <http://doi.org/10.1525/elementa.208>
- Herman, R. L.**, Cherry, J. E., Young, J., Welker, J. M., Noone, D., Kulawik, S. S., and Worden, J., “Aircraft validation of Aura Tropospheric Emission Spectrometer retrievals of HDO / H<sub>2</sub>O,” *Atmos. Meas. Tech.*, 7, 3127-3138, 2014, <https://doi.org/10.5194/amt-7-3127-2014>.
- D. W. Fahey, R.-S. Gao, O. Möhler, H. Saathoff, C. Schiller, V. Ebert, M. Krämer, T. Peter, N. Amarouche, L. M. Avallone, R. Bauer, Z. Bozóki, L. E. Christensen, S. M. Davis, G. Durrý, C. Dyroff, R. L. Herman, S. Hunsmann, S. Khaykin, P. Mackrodt, J. Meyer, J. B. Smith, N. Spelten, R. F. Troy, H. Vömel, S. Wagner, F. G. Weinhold, “The AquaVIT-1 Intercomparison of Atmospheric Water Vapor Measurement Techniques,” *Atmos. Meas. Tech.*, 7, 3177-3213, doi:10.5194/amt-7-3177-2014, 2014.
- Froyd, K. D., Murphy, D. M., Lawson, P., Baumgardner, D., and **Herman, R. L.**, “Aerosols that form subvisible cirrus at the tropical tropopause,” *Atmos. Chem. Phys.*, 10, 209-18, 2010, <https://doi.org/10.5194/acp-10-209-2010>.