

## Complete Publication List of Christopher S. Goldenstein

### TEXT BOOKS

1. R.K. Hanson, R.M. Spearrin, **C.S. Goldenstein**, *Spectroscopy and Optical Diagnostics for Gases*, Springer International Publishing AG Switzerland (2016)

### PEER REVIEWED & ARCHIVAL JOURNAL PUBLICATIONS

1. R.D. Rockwell, C.P. Goyne, W. Haw, J.C. McDaniel, **C.S. Goldenstein**, I.A. Schultz, J.B. Jeffries, R.K. Hanson, Measurement of water vapor levels for investigating vitiation effects on scramjet performance, *J. Propuls. Power.* 27 (2011) 1315-1317 [doi.org/10.2514/1.B34270](https://doi.org/10.2514/1.B34270)
2. **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, Diode laser measurements of linestrength and temperature-dependent lineshape parameters of H<sub>2</sub>O-, CO<sub>2</sub>-, and N<sub>2</sub>-perturbed H<sub>2</sub>O transitions near 2474 and 2482 nm, *J. Quant. Spectrosc. Radiat. Transf.* 130 (2013) 100-111 [doi.org/10.1016/j.jqsrt.2013.06.008](https://doi.org/10.1016/j.jqsrt.2013.06.008)
3. **C.S. Goldenstein**, I.A. Schultz, J.B. Jeffries, R.K. Hanson, A two-color absorption spectroscopy strategy for measuring the column density and path-average temperature of the absorbing species in nonuniform gases, *Appl. Opt.* 52 (2013) 7950-7962 [doi.org/10.1364/AO.52.007950](https://doi.org/10.1364/AO.52.007950)
4. R.M. Spearrin, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, Fiber-coupled 2.7  $\mu\text{m}$  laser absorption sensor for CO<sub>2</sub> in harsh combustion environments, *Meas. Sci. Technol.* 24 (2013) 055107 [doi:10.1088/0957-0233/24/5/055107](https://doi.org/10.1088/0957-0233/24/5/055107)
5. K. Sun, X. Chao, R. Sur, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, Analysis of calibration-free wavelength-scanned modulation spectroscopy for practical gas sensing using tunable diode lasers, *Meas. Sci. Technol.* 24 (2013) 125203 [doi.org/doi:10.1088/0957-0233/24/12/125203](https://doi.org/10.1088/0957-0233/24/12/125203)
6. **C.S. Goldenstein**, C.L. Strand, I.A. Schultz, K. Sun, J.B. Jeffries, R.K. Hanson, Fitting of calibration-free scanned-wavelength-modulation spectroscopy spectra for determination of gas properties and absorption lineshapes, *Appl. Opt.* 53 (2014) 356-367 [doi.org/10.1364/AO.53.000356](https://doi.org/10.1364/AO.53.000356)
7. **C.S. Goldenstein**, R.M. Spearrin, J.B. Jeffries, R.K. Hanson, Wavelength-modulation spectroscopy near 2.5  $\mu\text{m}$  for H<sub>2</sub>O and temperature in high-pressure and -temperature gases, *Appl. Phys. B.* 116 (2014) 705-716 [doi.org/10.1007/s00340-013-5754-1](https://doi.org/10.1007/s00340-013-5754-1)
8. **C.S. Goldenstein**, I.A. Schultz, R.M. Spearrin, J.B. Jeffries, R.K. Hanson, Scanned-wavelength-modulation spectroscopy near 2.5  $\mu\text{m}$  for H<sub>2</sub>O and temperature in a hydrocarbon-fueled scramjet combustor, *Appl. Phys. B.* 116 (2014) 717-727 [doi.org/10.1007/s00340-013-5755-0](https://doi.org/10.1007/s00340-013-5755-0)
9. **C.S. Goldenstein**, R.M. Spearrin, I.A. Schultz, J.B. Jeffries, R.K. Hanson, Wavelength-modulation spectroscopy near 1.4  $\mu\text{m}$  for measurements of H<sub>2</sub>O and temperature in high-pressure and -temperature gases, *Meas. Sci. Technol.* 25 (2014) 055101 [doi.org/doi:10.1088/0957-0233/25/5/055101](https://doi.org/10.1088/0957-0233/25/5/055101)
10. **C.S. Goldenstein**, R.M. Spearrin, J.B. Jeffries, R.K. Hanson, Infrared laser absorption sensors for multiple performance parameters in a detonation combustor, *Proc. Combust. Inst.* 35 (2015) 3739-3747 [doi.org/10.1016/j.proci.2014.05.027](https://doi.org/10.1016/j.proci.2014.05.027)
11. **C.S. Goldenstein**, C. A. Almodovar, J.B. Jeffries, R.K. Hanson, and C.M. Brophy, High-bandwidth scanned-wavelength-modulation spectroscopy sensors for temperature and H<sub>2</sub>O in a rotating detonation engine, *Meas. Sci. Technol.* 25 (2014) 105104 [doi.org/doi:10.1088/0957-0233/25/10/105104](https://doi.org/10.1088/0957-0233/25/10/105104)
12. I.A. Schultz, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, R.D. Rockwell, C.P. Goyne, Diode laser absorption sensor for combustion progress in a model scramjet, *J. Propuls. Power.* 30 (2014) 550-557 [doi.org/10.2514/1.B34905](https://doi.org/10.2514/1.B34905)
13. R.M. Spearrin, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, Quantum cascade laser absorption sensor for carbon monoxide in high-pressure gases using wavelength modulation spectroscopy, *Appl. Opt.* 53 (2014) 1938-1946 [doi.org/10.1364/AO.53.001938](https://doi.org/10.1364/AO.53.001938)

14. I.A. Schultz, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, R.D. Rockwell, C.P. Goyne, Spatially-resolved water measurements in a scramjet combustor using diode laser absorption, *J. Propuls. Power.* 30 (2014) 1551-1558 [doi.org/10.2514/1.B35219](https://doi.org/10.2514/1.B35219)
15. I.A. Schultz, **C.S. Goldenstein**, C.L. Strand, J.B. Jeffries, R.K. Hanson, C.P. Goyne, Hypersonic scramjet testing via diode laser absorption in a reflected shock tunnel, *J. Propuls. Power.* 30 (2014) 1586-1594 [doi.org/10.2514/1.B35220](https://doi.org/10.2514/1.B35220)
16. I.A. Schultz, **C.S. Goldenstein**, M. Spearrin, J.B. Jeffries, R.K. Hanson, Multispecies mid-infrared absorption measurements in a hydrocarbon-fueled scramjet combustor, *J. Propuls. Power.* 30 (2014) 1595-1604 [doi.org/10.2514/1.B35261](https://doi.org/10.2514/1.B35261)
17. M. Campbell, S. Wang, **C.S. Goldenstein**, R.M. Spearrin, A. Tulgestke, L. Zaczek, D.F. Davidson, R.K. Hanson, Constrained reaction volume shock tube study of normal heptane oxidation: Ignition delay times, species time histories, and temperature profiles, *Proc. Combust. Inst.* 35 (2015) 231-239 [doi.org/10.1016/j.proci.2014.05.001](https://doi.org/10.1016/j.proci.2014.05.001)
18. R.M. Spearrin, **C.S. Goldenstein**, I.A. Schultz, J.B. Jeffries and R.K. Hanson, Simultaneous sensing of temperature, CO and CO<sub>2</sub> in a scramjet combustor using quantum cascade laser absorption spectroscopy, *Appl. Phys. B*, 117 (2014) 689-698 [doi.org/10.1007/s00340-014-5884-0](https://doi.org/10.1007/s00340-014-5884-0)
19. C.H. Smith, **C.S. Goldenstein**, and R.K. Hanson, A scanned-wavelength-modulation absorption spectroscopy sensor for temperature and H<sub>2</sub>O in low-pressure flames, *Meas. Sci. Technol.* 25 (2014) 115501 [doi.org/doi:10.1088/0957-0233/25/11/115501](https://doi.org/10.1088/0957-0233/25/11/115501)
20. **C.S. Goldenstein** and R.K. Hanson, Diode-laser measurements of linestrength and temperature-dependent lineshape parameters for H<sub>2</sub>O transitions near 1.4 μm using Voigt, Rautian, Galatry, and speed-dependent profiles, *J. Quant. Spectrosc. Radiat. Transf.* 152 (2015) 127-139 [doi.org/10.1016/j.jqsrt.2014.11.008](https://doi.org/10.1016/j.jqsrt.2014.11.008)
21. **C.S. Goldenstein**, V.A. Miller and R.K. Hanson, Infrared planar laser-induced fluorescence with a CW quantum-cascade laser for spatially resolved CO<sub>2</sub> and gas properties, *Appl. Phys. B*. 120 (2015), 185-199 [doi.org/10.1007/s00340-015-6167-0](https://doi.org/10.1007/s00340-015-6167-0)
22. M. Nations, S. Wang, **C.S. Goldenstein**, K. Sun, D.F. Davidson, J.B. Jeffries, and R.K. Hanson, Shock-tube measurements of excited oxygen atoms using cavity-enhanced absorption spectroscopy, *Appl. Opt.*, 54 (2015), 8766-8775 [doi.org/10.1364/AO.54.008766](https://doi.org/10.1364/AO.54.008766)
23. **C.S. Goldenstein**, R.M. Spearrin, and R.K. Hanson, Fiber-coupled diode-laser sensors for calibration-free stand-off measurements of gas temperature, pressure, and composition, *Appl. Opt.*, 55 (2016), 479-484 [doi.org/10.1364/AO.55.000479](https://doi.org/10.1364/AO.55.000479)
24. W.Y. Peng, **C.S. Goldenstein**, R.M. Spearrin, J.B. Jeffries, and R.K. Hanson, A single-ended mid-infrared laser-absorption sensor for simultaneous *in situ* measurements of H<sub>2</sub>O, CO<sub>2</sub>, CO, and temperature in combustion flows, *Appl. Opt.*, 55 (2016), 9347-9359 [doi.org/10.1364/AO.55.009347](https://doi.org/10.1364/AO.55.009347)
25. M.N. Martin, S. Wang, **C.S. Goldenstein**, D.F. Davidson, and R.K. Hanson, Kinetics of excited oxygen formation in shock-heated O<sub>2</sub>-Ar mixtures, *J. Phys. Chem.*, 120 (2016), 8234-8243 [doi.org/10.1021/acs.jpca.6b07274](https://doi.org/10.1021/acs.jpca.6b07274)
26. **C.S. Goldenstein**, R.M. Spearrin, J.B. Jeffries, and R.K. Hanson, Infrared laser-absorption sensing for combustion gases, *Prog. Energy Combust. Sci.*, 60 (2016), 132-176 [doi.org/10.1016/j.pecs.2016.12.002](https://doi.org/10.1016/j.pecs.2016.12.002)
27. J.J. Girard, R.M. Spearrin, **C.S. Goldenstein**, and R.K. Hanson, Compact optical probe for flame temperature and carbon dioxide using interband cascade laser absorption near 4.2 μm, *Combust. Flame*, 178 (2017) 158-167 [doi.org/10.1016/j.combustflame.2017.01.007](https://doi.org/10.1016/j.combustflame.2017.01.007)
28. **C.S. Goldenstein**, V.A. Miller, R.M. Spearrin, and C.L. Strand, SpectraPlot.com: Integrated spectroscopic modeling of atomic and molecular gases, *J. Quant. Spectrosc. Radiat. Transf.* 200 (2017) 249-257 [doi.org/10.1016/j.jqsrt.2017.06.007](https://doi.org/10.1016/j.jqsrt.2017.06.007)  
**C.S. Goldenstein**, V.A. Miller, R.M. Spearrin, and C.L. Strand, SpectraPlot.com: Integrated spectroscopic modeling of atomic and molecular gases, arXiv:1709.06220 [physics.chem-ph] [arxiv.org/abs/1709.06220](https://arxiv.org/abs/1709.06220)

29. D.V. Salazar, **C.S. Goldenstein**, J.B. Jeffries, R. Seiser, R.J. Cattolica, R.K. Hanson, Design and implementation of a laser-based absorption spectroscopy sensor for *in situ* monitoring of biomass gasification, *Meas. Sci. Technol.* 28 (2017) 125501 [doi.org/10.1088/1361-6501/aa8cf6](https://doi.org/10.1088/1361-6501/aa8cf6)
30. Garrett C. Mathews and **Christopher S. Goldenstein**, Wavelength-modulated planar laser-induced fluorescence for imaging gases, *Opt. Lett.* 42 (2017) 5278-5281 [doi.org/10.1364/OL.42.005278](https://doi.org/10.1364/OL.42.005278)
31. Wen Yu Peng, Sean Cassady, Christopher L. Strand, **Christopher S. Goldenstein**, R. Mitchell Spearrin, Christopher M. Brophy, Jay B. Jeffries, Ronald K. Hanson, Single-ended mid-infrared laser-absorption sensor for time-resolved measurements of water concentration and temperature within the annulus of a rotating detonation engine, *Under Review*

#### CONFERENCE PUBLICATIONS

1. **C.S. Goldenstein**, I.A. Schultz, J.B. Jeffries, R.K. Hanson, Tunable diode laser absorption sensor for measurements of temperature and water concentration in supersonic flows, in: 49th *AIAA Aerosp. Sci. Meet.*, AIAA 2011-1094 (2011).
2. I.A. Schultz, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, Tunable diode laser diagnostic for scramjet combustion flows, in: *7th US National Meeting of the Combustion Institute*, Atlanta, CA, 2011.
3. **C.S. Goldenstein**, I.A. Schultz, J.B. Jeffries, R.K. Hanson, TDL absorption sensor for temperature measurements in high-pressure and high-temperature gases, in: *50th AIAA Aerosp. Sci. Meet.*, AIAA 2012-1061 (2012).
4. I.A. Schultz, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, TDL absorption sensor for in situ determination of combustion progress in scramjet ground testing, in: *28th Aerodyn. Meas. Technol. Gr. Testing, Flight Test. Conf.*, AIAA 2012-2654 (2012).
5. R.M. Spearrin, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, Mid-infrared laser absorption diagnostics for detonation studies, in: *29th Int. Symp. Shock Waves*, Madison, (2013).
6. **C.S. Goldenstein**, I.A. Schultz, R.M. Spearrin, J.B. Jeffries, R.K. Hanson, Diode laser measurements of temperature and H<sub>2</sub>O for monitoring pulse detonation combustor performance, in: *24th Int. Colloq. Dyn. Explos. React. Syst.*, Taiwan, (2013).
7. I.A. Schultz, **C.S. Goldenstein**, C.L. Strand, J.B. Jeffries, R.K. Hanson, C.P. Goyne, Hypersonic scramjet testing via TDLAS measurements of temperature and column density in a reflected shock tunnel, in: *52nd Aerospace Sciences Meeting*, AIAA 2014-0389 (2014).
8. I.A. Schultz, **C.S. Goldenstein**, J.B. Jeffries, R.K. Hanson, R.D. Rockwell, C.P. Goyne, Spatially-resolved TDLAS measurements of temperature, H<sub>2</sub>O column density, and velocity in a direct-connect scramjet combustor, in: *52nd Aerospace Sciences Meeting*, AIAA 2014-1241 (2014).
9. **C.S. Goldenstein**, G.C. Mathews, and Y. Zhou, Single-ended infrared laser-absorption sensing of gas properties, in: *OSA Advanced Photonics Congress*, New Orleans, LA, (2017) <https://doi.org/10.1364/SENSORS.2017.SeM3E.1>