

# Stanford

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## Christopher Strand

Senior Research Engineer

Mechanical Engineering

### Bio

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#### ACADEMIC APPOINTMENTS

- Sr Research Engineer, Mechanical Engineering

### Publications

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#### PUBLICATIONS

- **Line mixing study of carbon monoxide near 4.7  $\mu\text{m}$  broadened by nitrogen, helium, and hydrogen** *JOURNAL OF MOLECULAR SPECTROSCOPY*  
Su, W., Ding, Y., Strand, C. L., Hanson, R. K.  
2022; 390
- **Collisional broadening and pressure shift of the potassium resonance doublets by nitrogen, helium, and hydrogen at high temperatures** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Ding, Y., Vandervort, J. A., Freedman, R. S., Strand, C. L., Marley, M. S., Hanson, R. K.  
2022; 283
- **Investigating Arcjet Mixing and Enthalpy Loss Using Atomic Oxygen Laser Absorption Spectroscopy** *AIAA JOURNAL*  
Salazar, D., Strand, C. L., Hanson, R. K., MacDonald, M. E.  
2022; 60 (2): 976-984
- **Line mixing study on the fundamental rovibrational band of nitric oxide near 5.3  $\mu\text{m}$**  *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Su, W., Boulet, C., Almodovar, C. A., Ding, Y., Strand, C. L., Hanson, R. K.  
2022; 278
- **Measurements of Reflected Shock Tunnel Freestream Nitric Oxide Temperatures and Partial Pressure** *AIAA JOURNAL*  
Girard, J. J., Finch, P. M., Strand, C. L., Hanson, R. K., Yu, W. M., Austin, J. M., Hornung, H. G.  
2021; 59 (12): 5266-5275
- **Thermometry and speciation for high-temperature and -pressure methane pyrolysis using shock tubes and dual-comb spectroscopy** *MEASUREMENT SCIENCE AND TECHNOLOGY*  
Pinkowski, N. H., Biswas, P., Shao, J., Strand, C. L., Hanson, R. K.  
2021; 32 (12)
- **Line mixing in the nitric oxide R-branch near 5.2  $\mu\text{m}$  at high pressures and temperatures: Measurements and empirical modeling using energy gap fitting** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Almodovar, C. A., Su, W., Choudhary, R., Shao, J., Strand, C. L., Hanson, R. K.  
2021; 276
- **Shock tube measurements of high-temperature argon broadening and shift parameters for the potassium D1 and D2 resonance transitions** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Ding, Y., Vandervort, J. A., Strand, C. L., Hanson, R. K.  
2021; 275
- **Quantum-cascade-laser-based dual-comb thermometry and speciation at high temperatures** *MEASUREMENT SCIENCE AND TECHNOLOGY*  
Pinkowski, N. H., Cassidy, S. J., Strand, C. L., Hanson, R. K.

2021; 32 (3)

- **Scientific accomplishments and research avenues of Professor Ronald Hanson** *COMBUSTION AND FLAME*  
Davidson, D. F., Jeffries, J. B., Oehlschlaeger, M. A., Strand, C. L.  
2021; 224: 2–5
- **Development of a Stark shift measurement technique using excited-state oxygen atoms to determine electron number density in shock heated O-2/Ar above 10 000 K** *PLASMA SOURCES SCIENCE & TECHNOLOGY*  
Li, Y., Wang, S., Strand, C. L., Hanson, R. K.  
2021; 30 (2)
- **Time-resolved, single-ended laser absorption thermometry and H<sub>2</sub>O, CO<sub>2</sub>, and CO speciation in a H-2/C<sub>2</sub>H<sub>4</sub>-fueled rotating detonation engine** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Cassady, S. J., Peng, W., Strand, C. L., Dausen, D. F., Codoni, J. R., Brophy, C. M., Hanson, R. K.  
2021; 38 (1): 1719-1727
- **An In Situ Laser-Absorption Sensor for Crank Angle-Resolved Temperature, Pressure, and Humidity in Intake-Runner Flows** *SAE INTERNATIONAL JOURNAL OF ENGINES*  
Cassady, S. J., Cha, D. H., Pinkowski, N. H., Strand, C. L., Hanson, R. K., Ferlet, X., French, B., Mernone, B. J., Gilmour, A., Stitt, J. M.  
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- **Temperature-dependent absorption cross section measurements for propene, 1-butene, cis-/trans-2-butene, isobutene and 1,3-butadiene in the spectral region 8.4-11.7  $\mu$  m** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Ding, Y., Su, W., Johnson, S. E., Strand, C. L., Hanson, R. K.  
2020; 255
- **Two-color frequency-multiplexed IMS technique for gas thermometry at elevated pressures** *APPLIED PHYSICS B-LASERS AND OPTICS*  
Wei, W., Peng, W., Wang, Y., Shao, J., Strand, C. L., Hanson, R. K.  
2020; 126 (3)
- **Analysis of laser absorption gas sensors employing scanned-wavelength modulation spectroscopy with 1f-phase detection** *APPLIED PHYSICS B-LASERS AND OPTICS*  
Peng, W., Strand, C. L., Hanson, R. K.  
2020; 126 (1)
- **Dual-comb Spectroscopy for High-temperature Reaction Kinetics** *Measurement Science and Technology*  
Pinkowski, N. H., Ding, Y., Strand, C. L., Horvath, R., Geiser, M.  
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- **Two-temperature Collisional-radiative Modeling of Partially Ionized O<sub>2</sub>-Ar Mixtures over 8000-10,000 K Behind Reflected Shock Waves.** *The journal of physical chemistry. A*  
Li, Y. n., Wang, S. n., Strand, C. L., Hanson, R. K.  
2020
- **Calibration-free breath acetone sensor with interference correction based on wavelength modulation spectroscopy near 8.2  $\mu$  m** *APPLIED PHYSICS B-LASERS AND OPTICS*  
Schwarm, K. K., Strand, C. L., Miller, V. A., Spearrin, R.  
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- **R-branch line intensities and temperature-dependent line broadening and shift coefficients of the nitric oxide fundamental rovibrational band** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Almodovar, C. A., Su, W., Strand, C. L., Hanson, R. K.  
2019; 239
- **High-pressure, high-temperature optical cell for mid-infrared spectroscopy** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Almodovar, C. A., Su, W., Strand, C. L., Sur, R., Hanson, R. K.  
2019; 231: 69–78
- **A two-wavelength ethylene-absorption temperature diagnostic** *MEASUREMENT SCIENCE AND TECHNOLOGY*  
Cassady, S. J., Susa, A. J., Ferris, A. M., Strand, C. L., Hanson, R. K.  
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- **Single-Ended Sensor for Thermometry and Speciation in Shock Tubes Using Native Surfaces** *IEEE Sensors Journal*  
Peng, W. Y., Wang, Y., Cassady, S. J., Strand, C. L., Hanson, R. K.  
2019
- **Single-ended mid-infrared laser-absorption sensor for time-resolved measurements of water concentration and temperature within the annulus of a rotating detonation engine** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Peng, W., Cassady, S. J., Strand, C. L., Goldenstein, C. S., Spearrin, R., Brophy, C. M., Jeffries, J. B., Hanson, R. K.  
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- **Mid-infrared laser absorption spectroscopy of NO<sub>2</sub> at elevated temperatures** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
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- **Line intensities and temperature-dependent line broadening coefficients of Q-branch transitions in the  $\nu_2$  band of ammonia near 10.4  $\mu\text{m}$ .** *Journal of quantitative spectroscopy & radiative transfer*  
Sur, R., Spearrin, R. M., Peng, W. Y., Strand, C. L., Jeffries, J. B., Enns, G. M., Hanson, R. K.  
2016; 175: 90-99
- **Quantification of Supersonic Impulse Flow Conditions via High-Bandwidth Wavelength Modulation Absorption Spectroscopy** *AIAA JOURNAL*  
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- **Hypersonic Scramjet Testing via Diode Laser Absorption in a Reflected Shock Tunnel** *JOURNAL OF PROPULSION AND POWER*  
Schultz, I. A., Goldenstein, C. S., Strand, C. L., Jeffries, J. B., Hanson, R. K., Goyne, C. P.  
2014; 30 (6): 1586-1594
- **Fitting of calibration-free scanned-wavelength-modulation spectroscopy spectra for determination of gas properties and absorption lineshapes** *APPLIED OPTICS*  
Goldenstein, C. S., Strand, C. L., Schultz, I. A., Sun, K., Jeffries, J. B., Hanson, R. K.  
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- **Supersonic Mass-Flux Measurements via Tunable Diode Laser Absorption and Nonuniform Flow Modeling** *49th AIAA Aerospace Sciences Meeting / New Horizons Forum and Aerospace Exposition*  
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