

Selected papers

- [1] W. Chen, J. Burie, D. Boucher, "Mid-infrared cw difference frequency generation using a synchronous scanning technique for continuous tuning of the full spectral region from 4.7 to 6.5 μm ", Rev. Sci. Instrum. **67** (1996) 3411-3415
- [2] W. Chen, G. Mouret, D. Boucher, "Difference-frequency laser spectroscopy detection of acetylene trace constituent", *Special issue "Environmental trace gas detection using laser spectroscopy", Part I: Spectroscopic air monitoring techniques and instrumentation, Editor F. K. Tittel*, Appl. Phys. B **67** (1998) 375-378
- [3] W. Chen, J. Burie, D. Boucher, "Mid-infrared generation by optical frequency conversion and applications to spectroscopy and air monitoring" (*Short-listed papers for the 1999 Sir Harold Thompson Memorial Award*), Spectrochimica Acta A **55** (1999) 2057-2075
- [4] W. Chen, F. Cazier, F. Tittel, D. Boucher, "Measurements of benzene concentration by difference frequency laser absorption spectroscopy", Appl. Opt. **39** (2000) 6238-6242
- [5] W. Chen, G. Mouret, D. Boucher, F. Tittel, "Mid-infrared trace gas detection using cw difference-frequency generation in periodically poled RbTiOAsO₄", Appl. Phys. B **72** (2001) 873-876
- [6] D.P. Leleux, R. Claps, W. Chen, F. Tittel, T.L. Harman, "Applications of Kalman filtering to real-time trace gas concentration measurements", Appl. Phys. B **74** (2002) 85-93
- [7] Z. Bozoki, A. Mohacsi, G. Szabo, Z. Bor, M. Erdelyi, W. Chen, F. Tittel, "Near infrared diode laser based spectroscopic detection of ammonia : A comparative study of photoacoustic and direct optical absorption methods", Appl. Spectrosc. **56** (2002) 715-719
- [8] W. Chen, E. Poulet, J. Burie, D. Boucher, M.W. Sigrist, J.-J. Zondy, L. Isaenko, A. Yelisseyev, S. Lobanov, "Widely tunable continuous-wave mid-infrared radiation (5.5-11 μm) by difference-frequency generation in LiInS₂ crystal", Appl. Opt. **44** (2005) 4123-4129 (among Top 20 Articles since its publication, June 2013)
- [9] J. Cousin, P. Masselin, W. Chen, D. Boucher, S. Kassi, D. Romanini, P. Sriftgiser, "Application of a Continuous-Wave Tunable Erbium Doped Fiber Laser to Molecular Spectroscopy in the Near Infrared", Appl. Phys. B **83** (2006) 261-266
- [10] W. Zhao, X. Gao, W. Chen, W. Zhang, T. Huang, T. Wu, H. Cha, "Wavelength modulation off-axis integrated cavity output spectroscopy in the near infrared", Appl. Phys. B **86** (2007) 353-359
- [11] W. Chen, J. Cousin, E. Poulet, J. Burie, D. Boucher, X. Gao, M. W. Sigrist, F. K. Tittel, "Continuous-wave coherent light radiation in the mid-infrared : Difference frequency generation and Applications", *Special issue "Optical Parametric Sources in the Infrared"*, C. R. Physique **8** (2007) 1129-1150
- [12] W. Chen, A. A. Kosterev, F. K. Tittel, X. Gao, W. Zhao, "H₂S trace concentration measurements using Off-Axis Integrated Cavity Output Spectroscopy in the near-infrared", Appl. Phys. B **90** (2008) 311-315
- [13] J. Cousin, W. Chen, M. Fourmentin, E. Fertein, D. Boucher, F. Cazier, H. Nouali, D. Dewaele, M. Douay, L. S. Rothmann, "Laser Spectroscopic Monitoring of Gas Emission

- and Measurements of the $^{13}\text{C}/^{12}\text{C}$ isotope ratio in CO₂ from a Wood-based Combustion", J. Quant. Spectrosc. Rad. Transfer **109** (2008) 151-167
- [14] K. Liu, X. Guo, H. Yi, W. Chen, W. Zhang, and X. Gao, "Off-Beam Quartz Enhanced PhotoAcoustic Spectroscopy", Opt. Lett. **34** (2009) 1594-1596
 - [15] J. Cousin, W. Chen, D. Bigourd, M. Fourmentin, S. Kassi, "Telecom-grade fiber laser-based difference-frequency generation and ppb-level detection of benzene vapor in air around 3 μm ", Appl. Phys. B **97** (2009) 919-929
 - [16] T. Wu, W. Chen, E. Kerstel, E. Fertein, X. Gao, J. Koeth, K. Rößner, D. Brückner, "Kalman Filtering Real-Time Measurements of H₂O Isotopologue Ratios by Laser Absorption Spectroscopy at 2.73 μm ", Opt. Lett. **35** (2010) 634-636
 - [17] K. Liu, H. Yi, A. A. Kosterev, W. Chen, L. Dong, L. Wang, T. Tan, W. Zhang, F. K. Tittel, X. Gao, "Trace gas detection based on off-beam quartz enhanced photoacoustic spectroscopy: optimization and performance evaluation", Rev. Sci. Instrum. **81** (2010) 103103
 - [18] V. Petrov, J.-J. Zondy, O. Bidault, L. Isaenko, V. Vedenyapin, A. Yelisseyev, W. Chen, A. Tyazhev, S. Lobanov, G. Marchev, and D. Kolker, "Optical, thermal, electrical, damage, and phase-matching properties of lithium selenoindate", J. Opt. Soc. Am. B **27** (2010) 1902-1927
 - [19] W. Zhao, G. Wysocki, W. Chen, E. Fertein, D. Le Coq, D. Petitprez, and W. Zhang, "Sensitive and Selective Detection of OH Free Radical using Faraday Rotation Spectroscopy at 2.8 μm ", Opt. Express **19** (2011) 2493-2501
 - [20] H. Yi, K. Liu, W. Chen, T. Tan, L. Wang, X. Gao, "Application of a broadband blue laser diode to trace NO₂ detection using off beam quartz enhanced photoacoustic spectroscopy", Opt. Lett. **36** (2011) 481-483
 - [21] T. Wu, W. Chen, E. Fertein, F. Cazier, D. Dewaele, X. Gao, "Development of an open-path incoherent broadband cavity enhanced spectroscopy based instrument for simultaneous measurement of HONO and NO₂ in ambient air", Appl. Phys. B **106** (2012) 501-509
 - [22] X. Cui, C. Lengignon, T. Wu, W. Zhao, G. Wysocki, E. Fertein, C. Coeur, A. Cassez, L. Croisé, W. Chen, Y. Wang, W. Zhang, X. Gao, W. Liu, Y. Zhang, F. Dong, "Photonic Sensing of the Atmosphere by absorption spectroscopy", J. Quant. Spectrosc. Rad. Transfer **113** (2012) 1300–1316
 - [23] W. Zhao, G. Wysocki, W. Chen, W. Zhang, "High Sensitivity Faraday Rotation Spectrometer for Hydroxyl Radical Detection at 2.8 μm ", Appl. Phys. B **109** (2012) 511-519
 - [24] W. Zhao, M. Dong, W. Chen, X. Gu, C. Hu, X. Gao, W. Huang, W. Zhang, "Wavelength resolved optical extinction measurements of aerosols using broadband cavity enhanced absorption spectroscopy over the spectral range of 445-480 nm", Anal. Chem. **85** (2013) 2260-2268
 - [25] W. Chen, T. Wu, Q. Zha, Z. Xu and T. Wang, "Field chemical sensing with LEDs", SPIE Newsroom, 18 January 2013, DOI: [10.1117/2.1201301.004689](https://doi.org/10.1117/2.1201301.004689) (SPIE Photonics West 2013 highlighted paper)

- [26] W. Chen, R. Maamary, X. Cui, T. Wu, E. Fertein, D. Dewaele, F. Cazier, Q. Zha, Z. Xu, T. Wang, Y. Wang, W. Zhang, X. Gao, W. Liu, F. Dong, "Photonic Sensing of Environmental Gaseous Nitrous Acid (HONO): Opportunities and Challenges," in *The Wonder of Nanotechnology: Quantum Optoelectronic Devices and Applications*, M. Razeghi, L. Esaki, and K. von Klitzing, **Eds.**, SPIE Press (ISBN 9780819495969), Bellingham, WA, pp. 693-737 (2013)
- [27] H. Yi, W. Chen, A. Vicet, Z. Cao, X. Gao, T. Nguyen Ba, M. Jahjah, Y. Rouillard, L. Naehle, M. Fischer, "T-shape microresonator based quartz enhanced photoacoustic spectroscopy for ambient methane monitoring using 3.38 μm antimonide distributed feedback laser diode", *Appl. Phys. B* **116** (2014) 423-428
- [28] T. Wu, C. Coeur-Tourneur, G. Dhont, A. Cassez, E. Fertein, X. He, W. Chen, "Simultaneous monitoring of temporal profiles of NO_3 , NO_2 and O_3 by incoherent broadband cavity enhanced absorption spectroscopy for atmospheric applications", *J. Quant. Spectrosc. Rad. Transfer* **133** (2014) 199–205
- [29] W. Zhao, X. Xu, M. Dong, W. Chen, X. Gu, C. Hu, Y. Huang, X. Gao, W. Huang, and W. Zhang, "Development of a cavity enhanced aerosol albedometer", *Atmos. Meas. Tech. Discuss.* **7** (2014) 2981–3019
- [30] T. Wu, Q. Zha, W. Chen, Z. Xu, T. Wang, X. He, "Development and deployment of a cavity enhanced UV-LED spectrometer for measurements of atmospheric HONO and NO_2 in Hong Kong", *Atmos. Environ.* **95** (2014) 544-551
- [31] W. Zhao, X. Xu, M. Dong, W. Chen, X. Gu, C. Hu, Y. Huang, X. Gao, W. Huang, W. Zhang, "Development of a cavity-enhanced aerosol albedometer", *Atmos. Meas. Tech.* **7** (2014) 2551–2566
- [32] T. Wu, W. Chen, E. Fertein, P. Masselin, X. Gao, W. Zhang, Y. Wang, J. Koeth, D. Brückner, X. He, "Measurement of the D/H, $^{18}\text{O}/^{16}\text{O}$, and $^{17}\text{O}/^{16}\text{O}$ Isotope Ratios in Water by Laser Absorption Spectroscopy at 2.73 μm ", *Sensors* **14** (2014) 9027-9045
- [33] K. Liu, W. Zhao, L. Wang, T. Tan, G. Wang, W. Zhang, X. Gao, W. Chen, "Quartz-enhanced photoacoustic spectroscopy of HCN from 6433 to 6613 cm^{-1} ", *Opt. Commun.* **340** (2015) 126–130
- [34] H. Yi, R. Maamary, X. Gao, M. W. Sigrist, E. Fertein, W. Chen, "Short-lived species detection of nitrous acid by external-cavity quantum cascade laser based quartz-enhanced photoacoustic absorption spectroscopy", *Appl. Phys. Lett.* **106** (2015) 101109
- [35] R. Maamary, X. Cui, E. Fertein, P. Augustin, M. Fourmentin, D. Dewaele, F. Cazier, L. Guinet, W. Chen, "Quantum Cascade Laser-based Optical Sensor for Continuous Monitoring of Environmental Methane in Dunkirk (France)", *Sensors* **16** (2016) 224
- [36] H. Yi, T. Wu, G. Wang, W. Zhao, E. Fertein, C. Coeur, X. Gao, W. Zhang, and W. Chen, "Sensing atmospheric reactive species using light emitting diode by incoherent broadband cavity enhanced absorption spectroscopy", *Opt. Express* **24** (2016) A781-A790
- [37] X. Cui, F. Dong, M.W. Sigrist, Z. Zhang, B. Wu, H. Xia, T. Pang, P. Sun, E. Fertein, W. Chen, "Investigation of effective line intensities of trans-HONO near 1255 cm^{-1} using continuous-wave quantum cascade laser spectrometers", *J. Quant. Spectrosc. Rad. Transfer* **182** (2016) 277-285

- [38] X. Xu, W. Zhao, Q. Zhang, S. Wang, B. Fang, W. Chen, D.S. Venables, X. Wang, W. Pu, X. Wang, X. Gao, and W. Zhang, "Optical properties of atmospheric fine particles near Beijing during the HOPE-J³A Campaign", *Atmos. Chem. Phys.* **16** (2016) 6421-6439
- [39] Y. Chen, C. Yang, W. Zhao, B. Fang, X. Xu, Y. Gai, X. Lin, W. Chen and W. Zhang, "Ultra-sensitive measurement of peroxy radicals by chemical amplification broadband cavity-enhanced spectroscopy", *Analyst*, **141** (2016) 5870-5878
- [40] T. Seeger, T. Dreier, W. Chen, S. Kearny, W. Kulatilaka, "Laser applications to chemical, security, and environmental analysis : introduction to the feature issue", *Appl. Opt.* **56** (2017) LAC1-LAC3
- [41] R. Maamary, E. Fertein, M. Fourmentin, D. Dewaele, F. Cazier, C. Chen, W. Chen, "Effective line intensity measurements of trans-nitrous acid (HONO) of the v1 band near 3600 cm⁻¹ using laser difference-frequency spectrometer", *J. Quant. Spectrosc. Rad. Transfer* **196** (2017) 69-77
- [42] W. Chen, G. Wang, D. Chen, F. Shen, H. Yi, R. Maamary, P. Augustin, M. Fourmentin, E. Fertein, and M. W. Sigrist, "Monitoring short-lived climate pollutants by laser absorption spectroscopy", SPIE Newsroom, 12 June 2017
- [43] W. Chen, H. Yi, T. Wu, W. Zhao, C. Lengignon, G. Wang, E. Fertein, C. Coeur, G. Wysocki, T. Wang, M. W. Sigrist, X. Gao and W. Zhang, "Photonic Sensing of Reactive Atmospheric Species", in *Encyclopedia of Analytical Chemistry*, eds R.A. Meyers, John Wiley: Chichester (Published September 15, 2017)
- [44] H. Yi, T. Wu, A. Lauraguais, V. Semenov, C. Coeur, A. Cassez, E. Fertein, X. Gao, W. Chen, "High-accuracy and high-sensitivity spectroscopic measurement of dinitrogen pentoxide (N₂O₅) in atmospheric simulation chamber using quantum cascade laser", *Analyst* **142** (2017) 4638-4646
- [45] S. Wang, W. Zhao, X. Xu, B. Fang, Q. Zhang, X. Qian, W. Zhang, W. Chen, W. Pu, X. Wang, "Dependence of columnar aerosol size distribution, optical properties, and chemical components on regional transport in Beijing", *Atmos. Environ.* **169** (2017) 128-139
- [46] B. Fang, W. Zhao, X. Xu, J. Zhou, X. Ma, S. Wang, W. Zhang, D. S. Venables, W. Chen, "A portable broadband cavity-enhanced spectrometer utilizing Kalman filtering : application to real-time, in situ monitoring of glyoxal and nitrogen dioxide", *Opt. Express* **25** (2017) 26910-26922
- [47] G. Wang, S. Reboul, J.-B. Choquel, E. Fertein, W. Chen, "Circular Regression in a Dual-Phase Lock-In Amplifier for Coherent Detection of Weak Signal", *Sensors* **17** (2017) 2615
- [48] C. Yang, W. Zhao, B. Fang, X. Xu, Y. Zhang, Y. Gai, W. Zhang, D. S. Venables, and W. Chen, "Removing Water Vapor Interference in Peroxy Radical Chemical Amplification with a Large Diameter Nafion Dryer", *Anal. Chem.* **90** (2018) 3307-3312
- [49] W. Zhao, B. Fang, X. Lin, Y.-B. Gai, W.-J. Zhang, W. Chen, Z. Chen, H. Zhang, and W. Chen, "Superconducting magnet based Faraday rotation spectrometer for real time in-situ measurement of OH radicals at 10⁶ molecule/cm³ level in an atmospheric simulation chamber", *Anal. Chem.* **90** (2018) 3958-3964

- [50] G. Wang, F. Shen, H. Yi, P. Hubert, A. Deguine, D. Petitprez, R. Maamary, P. Augustin, M. Fourmentin, E. Fertein, M.W. Sigrist, T.-N. Ba, W. Chen, "Laser Absorption Spectroscopy Applied to Monitoring of Short-Lived Climate Pollutants (SLCPs)", *J. Mol. Spectrosc.* **348** (2018) 142-151
- [51] X. Cui, F. Dong, Z. Zhang, P. Sun, H. Xia, E. Fertein, W. Chen, "Simultaneous detection of ambient methane, nitrous oxide, and water vapor using an external-cavity quantum cascade laser", *Atmos. Environ.* **189** (2018) 125-132
- [52] R. Li, Z. Wang, L. Cui, H. Fu, L. Zhang, L. Kong, W. Chen, J. Chen, "Air pollution characteristics in China during 2015–2016 : Spatiotemporal variations and key meteorological factors", *Science of the Total Environment* **648** (2019) 902–915
- [53] H. Yi, T. Wu, A. Lauraguais, V. Semenov, C. Coeur, A. Cassez, E. Fertein, X. Gao, W. Chen, "High-accuracy and high-sensitivity optical tracing of dinitrogen pentoxide (N_2O_5) involved in a nocturnal tropospheric chemical reaction process in smog chamber using quantum cascade laser", *Atlas of Science* (<http://atlasofscience.org>) August 23, 2018
- [54] F. Shen, J. Akil, G. Wang, C. Poupin, R. Cousin, S. Siffert, E. Fertein, T.-N. Ba, W. Chen, "Real-time monitoring of N_2O production in a catalytic reaction process using mid-infrared quantum cascade laser", *J. Quant. Spectrosc. Rad. Transfer* **221** (2018) 1-7
- [55] X. Xu, W. Zhao, X. Qian, S. Wang, B. Fang, Q. Zhang, W. Zhang, D. S. Venables, W. Chen, Y. Huang, X. Deng, B. Wu, X. Lin, S. Zhao, Y. Tong, "Influence of photochemical aging on light absorption of atmospheric black carbon and aerosol single scattering albedo", *Atmos. Chem. Phys.* **18** (2018) 16829-16844
- [56] X. Xu, W. Zhao, B. Fang, J. Zhou, S. Wang, W. Zhang, D. S. Venables, and W. Chen, "Three-wavelength cavity-enhanced albedometer for measuring wavelength-dependent optical properties and single-scattering albedo of aerosols", *Opt. Express* **26** (2018) 33484-33500
- [57] J. Wang, G. Wang, T. Tan, G. Zhu, C. Sun, Z. Cao, W. Chen, X. Gao, "Mid-infrared laser heterodyne radiometer (LHR) based on a 3.53 μm room-temperature interband cascade laser", *Opt. Express* **27** (2019) 9610-9619
- [58] J. Kiefer, T. Seeger, T. Dreier, W. Chen, H. Stauffer, and W. Meier, "Laser applications to chemical, security, and environmental analysis: introduction to the feature issue", *Appl. Opt.* **58** (2019) LAC1-LAC3
- [59] J. Wang, X. Tian, Y. Dong, J. Chen, T. Tan, G. Zhu, W. Chen, and X. Gao, "High-sensitivity off-axis integrated cavity output spectroscopy implementing wavelength modulation and white noise perturbation", *Opt. Lett.* **44** (2019) 3298-3301
- [60] J. Wang, X. Tian, Y. Dong, G. Zhu, J. Chen, T. Tan, K. Liu, W. Chen, and X. Gao, "Enhancing off-axis integrated cavity output spectroscopy (OA-ICOS) with radio frequency white noise for gas sensing", *Opt. Express* **27** (2019) 30517-30529
- [61] G. Wang, P. Kulinski, P. Hubert, A. Deguine, D. Petitprez, S. Crumeyrolle, E. Fertein, K. Deboudt, P. Flament, M. W. Sigrist, H. Yi, and W. Chen, "Filter-Free Light Absorption Measurement of Volcanic Ashes and Ambient Particulate Matter Using Multi-Wavelength Photoacoustic Spectroscopy", *Progress In Electromagnetics Research*, **166** (2019) 59–74

- [62] B. Fang, N. Yang, W. Zhao, C. Wang, W. Zhang, W. Song, D. S. Venables, and W. Chen, "Improved spherical mirror multipass-cell-based interband cascade laser spectrometer for detecting ambient formaldehyde at parts per trillion by volume levels", *Appl. Opt.* **58** (2019) 8743-8750
- [63] T. Zhou, T. Wu, H. Zhang, Q. Wu, W. Chen, C. Ye, X. He, "Influence of Light Coupling Configuration and Alignment on the Stability of HWG-Based Gas Sensor System for Real-Time Detection of Exhaled Carbon Dioxide", *IEEE Sensors Journal* **19** (2019) 11972 - 11979
- [64] C. Yang, W. Zhao, B. Fang, H. Yu, X. Xu, Y. Zhang, Y. Gai, W. Zhang, W. Chen, and C. Fittschen, "Improved Chemical Amplification Instrument by Using a Nafion Dryer as an Amplification Reactor for Quantifying Atmospheric Peroxy Radicals under Ambient Conditions", *Anal. Chem.* **91** (2019) 776–779
- [65] L. Meng, G. Wang, P. Augustin, M. Fourmentin, Q. Gou, E. Fertein, T.-N. Ba, C. Coeur, A. Tomas, and W. Chen, "Incoherent broadband cavity enhanced absorption spectroscopy (IBBCEAS)-based strategy for direct measurement of aerosol extinction in lidar blind zone", *Opt. Lett.* **45** (2020) 1611-1614
- [66] R. Cui, L. Dong, H. Wu, W. Chen, and F. K. Tittel, "Generalized optical design of two-spherical-mirror multi-pass cells with dense multi-circle spot patterns", *Appl. Phys. Lett.* **116** (2020) 091103
- [67] J. Wang, C. Sun, G. Wang, M. Zou, T. Tan, K. Liu, W. Chen, X. Gao, "A fibered near-infrared laser heterodyne radiometer for simultaneous remote sensing of atmospheric CO₂ and CH₄", *Optics and Lasers in Engineering* **129** (2020) 106083
- [68] J. Zhou, X. Xu, W. Zhao, B. Fang, Q. Liu, Y. Cai, W. Zhang, D. S. Venables, W. Chen, "Simultaneous measurement of the relative humidity dependent aerosol light extinction, scattering, absorption and single-scattering albedo with a humidified cavity-enhanced albedometer", *Atmos. Meas. Tech.* **13** (2020) 2623-2634
- [69] T. Zhou, T. Wu, Q. Wu, C. Ye, R. Hu, W. Chen, and X. He, "Real-time measurement of CO₂ isotopologue ratios in exhaled breath by a hollow waveguide based mid-infrared gas sensor", *Opt. Express* **28** (2020) 10970-10980
- [70] X. Cui, W. Chen, M. W. Sigrist, E. Fertein, P. Flament, K. De Bondt and N. Mattielli, "Analysis of the Stable Isotope Ratios (¹⁸O/¹⁶O, ¹⁷O/¹⁶O, and D/H) in Glacier Water by Laser Spectrometry", *Anal Chem.* **92** (2020) 4512-4517
- [71] T. Wu, W. Kong, M. Wang, Q. Wu, W. Chen, C. Ye, R. Hu, X. He, "Compact hollow waveguide mid-infrared gas sensor for simultaneous measurements of ambient CO₂ and water vapor", *J. Lightwave Technol.* **38** (2020) 4580-4587
- [72] Lingshuo MENG, Cécile COEUR, Layal FAYAD, Nicolas HOUZEL, Paul GENEVRAY, Hichem BOUZIDI, Alexandre TOMAS, Weidong CHEN, "Secondary organic aerosol formation from the gas-phase reaction of guaiacol (2-methoxyphenol) with NO₃ radicals", *Atmos. Environ.* **240** (2020) 117740
- [73] T. Zhou, T. Wu, Q. Wu, W. Chen, M. Wu, C. Ye, and X. He, "Real-time monitoring of ¹³C and ¹⁸O-isotopes of human breath CO₂ using a mid-infrared hollow waveguide gas sensor", *Anal. Chem.* **92** (2020) 12943-12949

- [74] S. Wang, S. Crumeyrolle, W. Zhao, X. Xu, B. Fang, Y. Derimian, C. Chen, W. Chen, W. Zhang, Y. Huang, X. Deng, Y. Tong, "Real-time retrieval of aerosol chemical composition using effective density and the imaginary part of complex refractive index", *Atmos. Environ.* **245** (2021) 117959
- [75] K. Wang, L. Shao, J. Chen, G. Wang, K. Liu, T. Tan, J. Mei, W. Chen and X. Gao, "A Dual-Laser Sensor Based on Off-Axis Integrated Cavity Output Spectroscopy and Time-Division Multiplexing Method", *Sensors* **20** (2020) 6192
- [76] Y. Cao, Q. Liu, R. Wang, K. Liu, W. Chen, G. Wang, X. Gao, "Development of a 443 nm diode laser-based differential photoacoustic spectrometer for simultaneous measurements of aerosol absorption and NO₂", *Photoacoustics* **21** (2021) 100229
- [77] N. Wei, B. Fang, W. Zhao, C. Wang, N. Yang, W. Zhang, W. Chen, and C. Fittschen, "Time-Resolved Laser-Flash Photolysis Faraday Rotation Spectrometer : A New Tool for Total OH Reactivity Measurement and Free Radical Kinetics Research", *Anal. Chem.* **92** (2020) 4334–4339
- [78] R. Cui, L. Dong, H. Wu, W. Ma, L. Xiao, S. Jia, W. Chen, and F. K. Tittel, "Three-Dimensional Printed Miniature Fiber-Coupled Multi-pass Cells with Dense Spot Patterns for ppb-Level Methane Detection Using a Near-IR Diode Laser", *Anal. Chem.* **92** (2020) 13034–13041.
- [79] Y. Cao, K. Liu, R. Wang, W. Chen, and X. Gao, "Three-wavelength measurement of aerosol absorption using a multi-resonator coupled photoacoustic spectrometer", *Opt. Express* **29** (2021) 2258-2269
- [80] R. Cui, H. Wu, L. Dong, W. Chen, and F. K. Tittel, "Multiple-sound-source-excitation quartz enhanced photoacoustic spectroscopy based on a single-line spot pattern multi-pass cell", *Appl. Phys. Lett.* **118** (2021) 161101
- [81] "Advances in Spectroscopic Monitoring of the Atmosphere", eds. by Weidong Chen, Dean S. Venables, Markus W. Sigrist, ISBN: 978-0-12-815014-6, Elsevier (2021)
- [82] W. Chen, D. S. Venables, M. W. Sigrist, "Current trends and future outlook in spectroscopic monitoring of the atmosphere", Ch. 1, pp. 1-26, in *Advances in Spectroscopic Monitoring of the Atmosphere*, eds. by Weidong Chen, Dean S. Venables, Markus W. Sigrist, ISBN: 978-0-12-815014-6, Elsevier (2021)
- [83] W. Chen and D. S. Venables, "Broadband optical cavity methods", Ch. 3, pp. 95-158, in *Advances in Spectroscopic Monitoring of the Atmosphere*, eds. by Weidong Chen, Dean S. Venables, Markus W. Sigrist, ISBN: 978-0-12-815014-6, Elsevier (2021)
- [84] F. Shen, G. Wang, J. Wang, T. Tan, G. Wang, P. Jeseck, Y.-V. Te, X. Gao, W. Chen, "Transportable mid-infrared laser heterodyne radiometer operating in the shot-noise dominated regime", *Opt. Lett.* **46** (2021) 3171-3174, <https://doi.org/10.1364/OL.426432>
- [85] H. Yi, M. Cazaunau, A. Gratien, V. Michoud, E. Pangui, J.-F. Doussin, W. Chen, "Intercomparison of IBBCEAS, NitroMAC and FTIR for HONO, NO₂ and CH₂O measurements during the reaction of NO₂ with H₂O vapour in the simulation chamber CESAM", *Atmos. Meas. Tech.* **14** (2021) 5701–5715
- [86] M.-N. Ngo, Y. Zheng, Q. Gou, N. Houzel, T.-N. Ba, C. Coeur, W. Chen, "New line positions and effective line intensities of the v2 band *cis*-HONO near 1661 cm⁻¹ from

quantum cascade laser absorption spectroscopy", *J. Quant. Spectrosc. Rad. Transfer* **278** (2022) 108012

- [87] J. Zhou, W. Zhao, Y. Zhang, B. Fang, F. Cheng, X. Xu, S. Ni, W. Zhang, C. Ye, W. Chen, and D. S. Venables, "Amplitude-Modulated Cavity-Enhanced Absorption Spectroscopy with Phase-Sensitive Detection : A New Approach Applied to the Fast and Sensitive Detection of NO₂", *Anal. Chem.* **94** (2022) 3368–3375
- [88] N. Yan, B. Fang, W. Zhao, C. Wang, F. Cheng, X. Hu, Y. Chen, W. Zhang, W. Ma, G. Zhao, and W. Chen, "Optical-feedback cavity-enhanced absorption spectroscopy for OH radical detection at 2.8 μm using a DFB diode laser", *Optics Express* **30** (2022) 15238-15249
- [89] H. Yi, L. Meng, T. Wu, A. Lauraguais, C. Coeur, A. Tomas, H. Fu, X. Gao and W. Chen, Absolute determination of chemical kinetic rate constants by optical tracking the reaction on the second timescale using cavity-enhanced absorption spectroscopy, *Phys. Chem. Chem. Phys.* **24** (2022) 7396-7404
- [90] X. Cui, Y. Li, C. Jiang, Z. Yuan, S. Zhou, W. Chen, B. Yu, "In situ measurement of water vapor isotope ratios in air with a laser-based spectrometer", *Spectrochimica Acta, Part A*, **283** (2022) 121762
- [91] Z. Xue, F. Shen, J. Li, X. Liu, J. Wang, G. Wang, K. Liu, W. Chen, X. Gao, and T. Tan, "A MEMS modulator-based dual-channel mid-infrared laser heterodyne radiometer for simultaneous remote sensing of atmospheric CH₄, H₂O and N₂O" *Opt. Express* **30** (2022) 31828-31839
- [92] G. Abichou, S. H. Ngagine, T.-N. Ba, G. Wang, P. Flament, K. Deboudt, S. Dusander, M. W. Sigrist, A. Tomas and W. Chen, "A New Photoacoustic Soot Spectrophone for Filter-Free Measurements of Black Carbon at 880 nm", *Molecules* **27** (2022) 6065
- [93] C. Wang, W. Zhao, B. Fang, N. Yang, F. Cheng, X. Hu, Y. Chen, W. Zhang, C. Fittschen, and W. Chen, "Portable cavity ring-down spectrometer for an HO₂ radical measurement: instrument's performance and potential improvement using a narrow linewidth laser", *Optics Express* **30** (2022) 37446
- [94] Y. Liu, T. Wu, Q. Wu, W. Chen, C. Ye, M. Wang, X. He, "A novel mid-infrared hollow waveguide gas sensor for measuring water vapor isotope ratios in the atmosphere", *Sensors and Actuators B: Chemical*, **375** (2023) 132950
- [95] H. Yi, O. Laurent, S. Schilt, M. Ramonet, X. Gao, L. Dong, and W. Chen, "Simultaneous Monitoring of Atmospheric CH₄, N₂O, and H₂O Using a Single Gas Sensor Based on Mid-IR Quartz-Enhanced Photoacoustic Spectroscopy", *Anal. Chem.* **94** (2022) 17522–17532
- [96] R. Wang, J. Peng, Y. Cao, J. Mei, G. Wang, K. Liu, W. Chen, and X. Gao, "Double-enhanced multipass cell-based wavelength modulation spectroscopy CH₄ sensor for ecological applications", *Opt. Express* **31** (2023) 3237-3248
- [97] J. Li, Z. Xue, F. Shen, G. Wang, K. Liu, W. Chen, X. Gao, and T. Tan, "High-resolution oxygen-corrected laser heterodyne radiometer (LHR) for stratospheric and tropospheric wind field detection", *Opt. Express* **31** (2023) 7850-7862

- [98] G. Wang, L. Meng, Q. Gou, B. Hanoune, S. Crumeyrolle, T. Fagniez, C. Coeur, R. Akiki, and W. Chen, "Novel Broadband Cavity-Enhanced Absorption Spectrometer for Simultaneous Measurements of NO₂ and Particulate Matter", *Anal. Chem.* **95** (2023) 3460–3467
- [99] J. Wang, T. Tu, F. Zhang, F. Shen, J. Xu, Z. Cao, X. Gao, S. Plus, and W. Chen, "External-cavity diode laser-based near-infrared broadband laser heterodyne radiometer for remote sensing of atmospheric CO₂", *Opt. Express* **31** (2023) 9251-9263
- [100] J. Zhou, W. Zhao, B. Fang, X. Xu, S. Wang, Q. Liu, W. Zhang and W. Chen, "Unmanned-aerial-vehicle-borne cavity enhanced albedometer: a powerful tool for simultaneous in-situ measurement of aerosol light scattering and absorption vertical profiles", *Opt. Express* **31** (2023) 20518-20529
- [101] Y. Cao, K. Liu, R. Wang, X. Gao, R. Kang, Y. Fang and W. Chen, "NO₂ Sensor Based on Faraday Rotation Spectroscopy Using Ring Array Permanent Magnets", *Anal. Chem.* **95** (2023) 1680-1685
- [102] H. Zhang, T. Wu, Q. Wu, W. Chen, C. Ye, M. Wang, M. Zhu, and X. He, "Methane detection with a near-infrared heterodyne phase-sensitive dispersion spectrometer at a stronger frequency modulation using direct injection-current dithering", *Opt. Express* **31** (2023) 25070-25081
- [103] M.-N. Ngo, T.-N. Ba, D. Dewaele, F. Cazier, W. Zhao, L. Nähle, W. Chen, "Wavelength modulation enhanced off-axis integrated cavity output spectroscopy for OH radical measurement at 2.8 μm", *Sensors & Actuators: A. Physical* **362** (2023) 114654
- [104] J. Li, Z. Xue, F. Shen, J. Wang, Y. Li, G. Wang, K. Liu, W. Chen, X. Gao, and T. Tan, "Erbium-doped fiber amplifier (EDFA)-assisted laser heterodyne radiometer (LHR) working in the shot-noise-dominated regime", *Opt. Lett.* **48** (2023) 5229-5232
- [105] H. Zhang, T. Wu, Q. Wu, W. Chen, C. Ye, M. Wang, and X. He, "Measurement of CO₂ Isotopologue Ratios Using a Hollow Waveguide-Based Mid-Infrared Dispersion Spectrometer", *Anal. Chem.* **95** (2023) 18479-18486
- [106] R. Cui, H. Wu, F. K. Tittel, V. Spagnolo, W. Chen, L. Dong, "Folded-optics-based quartz-enhanced photoacoustic and photothermal hybrid spectroscopy", *Photoacoustics* **35** (2024) 100580
- [107] R. Wang, T. Huang, J. Mei, G. Wang, K. Liu, R. Kan, W. Chen, and X. Gao, "Pressure sensing with two-color laser absorption spectroscopy for combustion diagnostics," *Opt. Lett.* **49** (2024) 1033-1036