

Aleksandra Foltynowicz

EDUCATION

- Postdoctoral** JILA, University of Colorado at Boulder, CO, USA
Advisor: Jun Ye
Cavity-enhanced optical frequency comb spectroscopy
- PhD** (2009) Faculty of Science and Technology, Umeå University, Sweden
Advisor: Ove Axner
“Fiber-laser-based noise-immune cavity-enhanced optical heterodyne molecular spectrometry” available at <http://umu.diva-portal.org/smash/record.jsf?pid=diva2:214195>
- MSc** (2005) Department of Physics, Adam Mickiewicz University, Poznań, Poland
Advisors: Ove Axner, Ryszard Naskręcki

EMPLOYMENT

- 2018 - **Associate professor** Department of Physics, Umeå University, Sweden
- 2012 - 2017 **Assistant professor** Department of Physics, Umeå University, Sweden
- 2010 - 2012 **Postdoctoral research associate** JILA, University of Colorado at Boulder, CO
- 2004 - 2009 **Graduate student** Department of Physics, Umeå University, Sweden

RESEARCH GRANTS, SCHOLARSHIPS AND AWARDS

- 2019 Coblentz Award at ISMS2019
- 2017 - 2020 Swedish Research Council Project Grant
- 2016 Peter Werle Early Career Scientist Award at FLAIR2016
- 2016 - 2021 Knut and Alice Wallenberg Foundation Academy Fellow
- 2015 Kungliga Skytteanska Samfundets teknisk-naturvetenskapliga priset
- 2015 - 2016 Carl-Trygger Foundation equipment grant
- 2013 - 2016 Ingvar Carlsson Award 5 (Swedish Foundation for Strategic Research)
- 2013 - 2016 Swedish Research Council Junior Researcher Project Grant
- 2014 - 2015 Kempestiftelserna postdoctoral stipend
- 2013 - 2014 Carl-Trygger Foundation equipment grant
- 2013 Stiftelsen Lars Hiertas Minne equipment grant
- 2012 Swedish Research Council homing fellowship
- 2010 - 2011 Swedish Research Council postdoctoral fellowship
- 2010 The Wenner-Gren Foundations postdoctoral fellowship (declined)
- 2003 - 2004 European Physical Society university student fellowship

SUPERVISION OF STUDENTS AND POSTDOCS

- Postdocs Francisco Senna Vieira, Ibrahim Sadiek, Grzegorz Soboń, Lucile Rutkowski, Venkata Ramaiah Badarla, Chadi Abd Alrahman, Hsuan-Chen Chen
- PhD students Adrian Hjältén, Chuang Lu, Anna Filipsson, Alexandra C. Johansson, Thomas Hausmaninger (co-supervisor), Amir Khodabakhsh, Isak Silander (co-supervisor)

PEER-REVIEWED PUBLICATIONS

1. *Optical frequency comb photoacoustic spectroscopy*
I. Sadiq, T. Mikkonen, M. Vainio, J. Toivonen, and A. Foltynowicz
Phys. Chem. Chem. Phys. **20**, 27849-27855 (2018) arXiv 1809.02175
2. *Broadband calibration-free cavity-enhanced complex refractive index spectroscopy using a frequency comb*
A. C. Johansson, L. Rutkowski, A. Filipsson, T. Hausmaninger, G. Zhao, O. Axner, and A. Foltynowicz
Opt. Express **26**, 20633-20648 (2018) arXiv 1805.00799
3. *Optical frequency comb Faraday rotation spectroscopy*
A. C. Johansson, J. Westberg, G. Wysocki, and A. Foltynowicz
Appl. Phys. B **124**, 79 (2018) arXiv 1801.08399
4. *An experimental water line list at 1950 K in the 6250-6670 cm⁻¹ region*
L. Rutkowski, A. Foltynowicz, F. M. Schmidt, A. C. Johansson, A. Khodabakhsh, A. A. Kyuberis, N. F. Zobov, O. L. Polyansky, S. N. Yurchenko, and J. Tennyson
JQSRT **205**, 213-219 (2018) arXiv 1712.09406
5. *Optical frequency comb Fourier transform spectroscopy with sub-nominal resolution and precision beyond the Voigt profile*
L. Rutkowski, P. Masłowski, A. C. Johansson, A. Khodabakhsh, and A. Foltynowicz
JQSRT **204**, 63-73 (2018) arXiv 1612.04808
6. *Sensitive and broadband measurement of dispersion in a cavity using a Fourier transform spectrometer with kHz resolution*
L. Rutkowski, A. C. Johansson, G. Zhao, T. Hausmaninger, A. Khodabakhsh, O. Axner, and A. Foltynowicz
Opt. Express **25**, 21711-18 (2017) arXiv 1705.04729
7. *Mid-infrared continuous-filtering Vernier spectroscopy using a doubly resonant optical parametric oscillator*
A. Khodabakhsh, L. Rutkowski, J. Morville, and A. Foltynowicz
Appl. Phys. B **123**, 210 (2017) arXiv 1702.00396
8. *High-power frequency comb source tunable from 2.7 to 4.2 μm based on difference frequency generation pumped by an Yb-doped fiber laser*
G. Sobon, T. Martynkien, P. Mergo, L. Rutkowski, and A. Foltynowicz
Opt. Lett. **42**, 1748-1751 (2017), editor's choice arXiv 1703.03277
9. *Detection of OH in an atmospheric flame at 1.5 μm using optical frequency comb spectroscopy*
L. Rutkowski, A. C. Johansson, D. Valiev, A. Khodabakhsh, A. Tkacz, F. M. Schmidt, and A. Foltynowicz
Phot. Lett. Pol **8**, 110-112 (2016)
10. *Signal line shapes of Fourier transform cavity-enhanced frequency modulation spectroscopy with optical frequency combs*
A. C. Johansson, L. Rutkowski, A. Khodabakhsh, and A. Foltynowicz
J. Opt. Soc. Am. B **34**, 358-365 (2016) arXiv 1609.06443
11. *Fourier transform and Vernier spectroscopy using an optical frequency comb at 3-5.4 μm*
A. Khodabakhsh, V. Ramaiah-Badarla, L. Rutkowski, A. C. Johansson, K. F. Lee, J. Jiang, C. Mohr, M. E. Fermann, and A. Foltynowicz
Opt. Lett. **41**, 2541 (2016) arXiv 1603.09680

12. *Surpassing the path-limited resolution of a Fourier transform spectrometer with frequency combs*
P. Maslowski, K. F. Lee, A. C. Johansson, A. Khodabakhsh, G. Kowzan, L. Rutkowski, A. A. Mills, C. Mohr, J. Jiang, M. E. Fermann, and A. Foltynowicz
Phys. Rev. A **93**, 021802(R) (2016) arXiv:1505.07706
13. *Noise-immune cavity-enhanced optical frequency comb spectroscopy: a sensitive technique for high-resolution broadband molecular detection*
A. Khodabakhsh, A. C. Johansson, and A. Foltynowicz
Appl. Phys. B **119**, 87-95 (2015) arXiv 1410.8800
14. *Noise-immune cavity-enhanced optical frequency comb spectroscopy*
A. Khodabakhsh, C. Abd Alrahman, and A. Foltynowicz
Opt. Lett. **39**, 5034-5038 (2014)
15. *Cavity-enhanced optical frequency comb spectroscopy of high-temperature H₂O in a flame*
C. Abd Alrahman, A. Khodabakhsh, F. M. Schmidt, Z. Qu, and A. Foltynowicz
Opt. Express **22**, 13889-13895 (2014) arXiv 1202.1216
16. *Use of etalon-immune-distances to reduce the influence of background signals in frequency modulation spectroscopy and NICE-OHMS*
P. Ehlers, A. C. Johansson, I. Silander, A. Foltynowicz, and O. Axner
J. Opt. Soc. Am B **31**, 2938-2945 (2014)
17. *Fiber-laser-based NICE-OHMS incorporating an optical circulator*
P. Ehlers, J. Wang, I. Silander, A. Foltynowicz, and O. Axner
Opt. Lett. **39**, 279-282 (2013)
18. *Optical measurement of the gas number density in a Fabry-Perot cavity*
I. Silander, M. Zelan, O. Axner, F. Arrhen, L. Pendrill, and A. Foltynowicz,
Meas. Sci. Instr. **24**, 105207 (2013)
19. *Cavity-enhanced optical frequency comb spectroscopy in the mid-infrared – application to trace detection of hydrogen peroxide*
A. Foltynowicz, P. Maslowski, A. J. Fleisher, B. J. Bjork, and J. Ye
Appl. Phys. B **110**, 163–175 (2013)
20. *Hydrogen peroxide enhanced nonthermal plasma effluent for biomedical applications*
M. Golkowski, C. Golkowski, J. Leszczynski, R. Plimpton, P. Maslowski, A. Foltynowicz, J. Ye, and B. McCollister
IEEE Trans. Plasma Sci. **40**, 1984-1991 (2012)
21. *Quantum-noise-limited optical frequency comb spectroscopy*
A. Foltynowicz, T. Ban, P. Maslowski, F. Adler, and J. Ye
Phys. Rev. Lett. **107**, 233002 (2011) *editors choice and selected for a Viewpoint in Physics*
22. *Reduction of background signals in fiber-based NICE-OHMS*
A. Foltynowicz, I. Silander, and O. Axner
J. Opt. Soc. Am. B **28**, 2797-2805 (2011)
23. *Optical frequency comb spectroscopy*
A. Foltynowicz, P. Maslowski, T. Ban, F. Adler, K. C. Cossel, T. C. Briles, and J. Ye
Faraday Disc. **150**, 23-31 (2011)
24. *Mid-infrared Fourier transform spectroscopy with a broadband frequency comb*
F. Adler, P. Maslowski, A. Foltynowicz, K. C. Cossel, T. C. Briles, I. Hartl, and J. Ye
Opt. Express **18**, 21861-21872 (2010)
25. *Distributed-feedback-laser-based NICE-OHMS in the pressure-broadened regime*
A. Foltynowicz, J. Wang, P. Ehlers, and O. Axner
Opt. Express **18**, 18580-18591 (2010)

26. *Highly sensitive dispersion spectroscopy by probing the free spectral range of an optical cavity using dual-frequency modulation*
F. M. Schmidt, W. Ma, A. Foltynowicz, and O. Axner
Appl. Phys. B **101**, 497-509 (2010)
27. *Wavelength modulated noise-immune cavity-enhanced optical heterodyne molecular spectroscopy signal line shapes in the Doppler limit*
A. Foltynowicz, W. Ma, F. M. Schmidt, and O. Axner
J. Opt. Soc. Am. B **26**, 1384-1394 (2009)
28. *Characterization of fiber-laser-based sub-Doppler NICE-OHMS for trace gas detection*
A. Foltynowicz, W. Ma, and O. Axner
Opt. Express **16**, 14689-14702 (2008)
29. *Noise-immune cavity-enhanced optical heterodyne molecular spectroscopy: Current status and future potential*
A. Foltynowicz, F. M. Schmidt, W. Ma, and O. Axner
Appl. Phys. B **92**, 313-326 (2008)
30. *Sub-Doppler dispersion and noise-immune cavity-enhanced optical heterodyne molecular spectroscopy revised*
O. Axner, W. Ma, and A. Foltynowicz
J. Opt. Soc. Am. B **25**, 1166-1177 (2008)
31. *Doppler-broadened noise-immune cavity-enhanced optical heterodyne molecular spectroscopy signals from optically saturated transitions under low pressure conditions*
A. Foltynowicz, W. Ma, F. M. Schmidt, and O. Axner
J. Opt. Soc. Am. B **25**, 1156-1165 (2008)
32. *Theoretical description of Doppler-broadened noise-immune cavity-enhanced optical heterodyne molecular spectroscopy under optically saturated conditions*
W. Ma, A. Foltynowicz, and O. Axner
J. Opt. Soc. Am. B **25**, 1144-1155 (2008)
33. *Doppler-broadened fiber-laser-based NICE-OHMS - Improved detectability*
F. M. Schmidt, A. Foltynowicz, W. Ma, T. Lock, and O. Axner
Opt. Express **15**, 10822-10831 (2007)
34. *Fiber-laser-based noise-immune cavity-enhanced optical heterodyne molecular spectrometry for Doppler-broadened detection of C₂H₂ in the parts per trillion range*
F. M. Schmidt, A. Foltynowicz, W. Ma, and O. Axner
J. Opt. Soc. Am. B **24**, 1392-1405 (2007)
35. *Wavelength modulation absorption spectrometry from optically pumped collision broadened atoms and molecules*
A. Foltynowicz, F. M. Schmidt, J. Gustafsson, and O. Axner
J. Quant. Spectrosc. Radiat. Transfer **108**, 220-238 (2007)
36. *Absorption spectrometry by narrowband light in optically saturated and pumped collision and Doppler broadened gaseous media under arbitrary optical thickness conditions*
O. Axner, F. M. Schmidt, A. Foltynowicz, J. Gustafsson, N. Omenetto, and J. D. Winefordner
Appl. Spectrosc. **60**, 1217-1240 (2006) *cover*
37. *Wavelength modulation absorption spectrometry from optically saturated collision-broadened transitions.*
F. M. Schmidt, A. Foltynowicz, M. Gustafsson, and O. Axner
J. Quant. Spectrosc. Radiat. Transfer **94**, 225-254 (2005)

BOOK CHAPTERS

1. *NICE-OHMS – Frequency modulation cavity-enhanced spectroscopy – Principles and performance.*
O. Axner, P. Ehlers, A. Foltynowicz, I. Silander, and J. Wang
Cavity-Enhanced Spectroscopy and Sensing, eds H.P. Loock, G. Gagliardi, Springer 2013
2. *Cavity-enhanced direct frequency comb spectroscopy.*
P. Maslowski, K. C. Cossel, A. Foltynowicz, and J. Ye
Cavity-Enhanced Spectroscopy and Sensing, eds H.P. Loock, G. Gagliardi, Springer 2013

INVITED TALKS

1. *Precision Fourier transform spectroscopy using optical frequency combs. (within ‘Spectroscopy for bright future’)*
A. Foltynowicz, L. Rutkowski, A. C. Johansson, A. Filipsson, and A. Khodabakhsh
25th Colloquium on High Resolution Molecular Spectroscopy, Helsinki, Finland, Sept 2017
2. *Optical frequency comb spectroscopy for gas metrology and trace gas detection.*
P. Maslowski, G. Kowzan, D. Charczun, D. Lisak, R. Trawinski, L. Rutkowski, A. C. Johansson, A. Khodabakhsh, A. Foltynowicz, K. F. Lee, and M. E. Fermann (SW4J.5)
Conference on Lasers and Electro-Optics, San Jose, CA, USA, May 2017
3. *Optical frequency comb spectroscopy*
A. Foltynowicz
Optics and Photonics in Sweden, Linköping, Sweden, Nov 2016
4. *Cavity-enhanced Fourier transform and Vernier spectroscopy with optical frequency combs*
L. Rutkowski, A. Khodabakhsh, A. C. Johansson, V. Ramaiah-Badarla, and A. Foltynowicz
Frontiers in Optics, Rochester, NY, Oct 2016
5. *Cavity-enhanced optical frequency combs spectroscopy in the near- and mid-infrared*
A. Foltynowicz, A. Khodabakhsh, L. Rutkowski, A. C. Johansson, and V. Ramaiah-Badarla
Laser Applications to Chemical, Security and Environmental Analysis (LACSEA), Heidelberg, Germany, Jul 2016
6. *High-resolution optical frequency comb spectroscopy*
A. Foltynowicz, L. Rutkowski, A.C. Johansson, and A. Khodabakhsh
23rd International Conference on Spectral Line Shapes, Toruń, Poland, Jun 2016
7. *Broadband molecular detection with cavity-enhanced optical frequency comb spectroscopy*
A. Foltynowicz, A. Khodabakhsh, C. Abd Alrahman, A. C. Johansson
Light, Energy and the Environment Congress: Optics and Photonics for Energy & the Environment (E2), Canberra, Australia, Dec 2014
8. *Optical frequency comb spectroscopy*
A. Foltynowicz
Swedish Physical Society AMO Physics section meeting, Lund, Sweden, Jun 2013
9. *Cavity-enhanced direct frequency comb spectroscopy for human breath analysis*
P. Maslowski, A. Foltynowicz, A. J. Fleisher, B. J. Bjork, and J. Ye
2012 International Breath Analysis Meeting, Sonoma, CA, USA, Oct 2012
10. *Optical frequency comb as a new tool for broadband high resolution spectroscopy*
P. Maslowski, A. Foltynowicz, T. Ban, K. C. Cossel, and J. Ye
21st International Conference on Spectral Line Shapes, St. Petersburg, Russia, Jun 2012
11. *Frequency comb spectroscopy and applications*
A. Foltynowicz, P. Maslowski, T. Ban, F. Adler, K. C. Cossel, and J. Ye
Field Laser Applications in Industry and Research, Murnau, Germany, Sept 2011
12. *Direct frequency comb spectroscopy: time and frequency domain approach*

- T. Ban, A. Foltynowicz, P. Maslowski, D. Aumiler, G. Pichler, and J. Ye
43rd Congress of the European Group on Atomic Systems, Fribourg, Switzerland, Jun 2011
13. *Cavity-enhanced optical frequency comb spectroscopy*
A. Foltynowicz, P. Maslowski, T. Ban, F. Adler, K. C. Cossel, and J. Ye
Cavity Enhanced Spectroscopy, Kingston, ON, Canada, Jun 2011
 14. *Noise-immune cavity-enhanced optical heterodyne molecular spectroscopy (NICE-OHMS): a laser-based cavity-enhanced spectroscopic technique for sensitive detection of gases*
O. Axner, J., Wang, P. Ehlers, I. Silander, A. Foltynowicz, W. Ma
Cavity Enhanced Spectroscopy, Kingston, ON, Canada, Jun 2011
 15. *Broadband direct frequency comb spectroscopy in the mid-infrared*
P. Maslowski, A. Foltynowicz, F. Adler, K. C. Cossel, T. C. Briles, T. Ban, and J. Ye
Conference on Lasers and Electro-Optics, Baltimore, Md, USA, May 2011

CONFERENCE CONTRIBUTIONS

1. *Broadband calibration-free cavity-enhanced complex refractive index spectroscopy using an optical frequency comb.*
A. C. Johansson, L. Rutkowski, A. Filipsson, T. Hausmaninger, G. Zhao, O. Axner, and A. Foltynowicz
Field Laser Applications in Industry and Research, Assisi, Italy, Sept 2018
2. *CO₂ line parameter retrieval beyond the Voigt profile using comb-based Fourier transform spectroscopy.*
A. C. Johansson, A. Filipsson, L. Rutkowski, P. Maslowski, and A. Foltynowicz
Field Laser Applications in Industry and Research, Assisi, Italy, Sept 2018
3. *Optical frequency comb Faraday rotation spectroscopy.*
A. C. Johansson, J. Westberg, G. Wysocki, and A. Foltynowicz
Field Laser Applications in Industry and Research, Assisi, Italy, Sept 2018
4. *Optical frequency comb photoacoustic spectroscopy.*
I. Sadiq, T. Mikkonen, T. Tomberg, F. Senna Vieira, J. Karhu, M. Vainio, J. Toivonen and A. Foltynowicz
Field Laser Applications in Industry and Research, Assisi, Italy, Sept 2018
5. *Near-infrared continuous-filtering Vernier spectroscopy in a flame.*
C. Lu, F. Senna Vieira, A. C. Johansson, F. M. Schmidt, and A. Foltynowicz
Field Laser Applications in Industry and Research, Assisi, Italy, Sept 2018
6. *An experimental water line list at 1950 K in the 1.5-1.6 μm region.*
L. Rutkowski, A. Foltynowicz, F. M. Schmidt, A. C. Johansson, A. Khodabakhsh, A. A. Kyuberis, N. F. Zobov, O. L. Polyansky, S. N. Yurchenko, and J. Tennyson
Field Laser Applications in Industry and Research, Assisi, Italy, Sept 2018
7. *Broadband calibration-free complex refractive index spectroscopy in a cavity using a comb-based Fourier transform spectrometer*
A. C. Johansson, L. Rutkowski, A. Filipsson, T. Hausmaninger, G. Zhao, O. Axner, and A. Foltynowicz
International Symposium on Molecular Spectroscopy, Champaign-Urbana, IL, Jun 2018
8. *CO₂ line parameter retrieval beyond the Voigt profile using comb-based Fourier transform spectroscopy*
A. C. Johansson, A. Filipsson, L. Rutkowski, P. Maslowski, and A. Foltynowicz
International Symposium on Molecular Spectroscopy, Champaign-Urbana, IL, Jun 2018
9. *Broadband complex refractive index spectroscopy via measurement of cavity modes (STu3P.4)*

- A. C. Johansson, L. Rutkowski, A. Filipsson, T. Hausmaninger, G. Zhao, O. Axner, and A. Foltynowicz
Conference on Lasers and Electro-Optics, San Jose, CA, USA, May 2018
10. *CO₂ line parameter retrieval beyond the Voigt profile using comb-based Fourier transform spectroscopy (STu3P.6)*
A. C. Johansson, A. Filipsson, L. Rutkowski, P. Maslowski, and A. Foltynowicz
Conference on Lasers and Electro-Optics, San Jose, CA, USA, May 2018
 11. *Optical frequency comb Faraday rotation spectroscopy (JW2A.165)*
A. C. Johansson, J. Westberg, G. Wysocki, and A. Foltynowicz
Conference on Lasers and Electro-Optics, San Jose, CA, USA, May 2018
 12. *Broadband molecular spectroscopy via probing of cavity modes using a frequency-comb-based Fourier transform spectrometer*
A. C. Johansson, L. Rutkowski, G. Zhao, T. Hausmaninger, A. Khodabakhsh, A. Filipsson, O. Axner, and A. Foltynowicz
25th Colloquium on High Resolution Molecular Spectroscopy, Helsinki, Finland, Sept 2017
 13. *Line parameter retrieval beyond the Voigt profile using comb-based Fourier transform spectroscopy*
A. Filipsson, A. C. Johansson, L. Rutkowski, P. Maslowski, A. Khodabakhsh, and A. Foltynowicz
25th Colloquium on High Resolution Molecular Spectroscopy, Helsinki, Finland, Sept 2017
 14. *Measurement of H₂O and OH Spectra in an Atmospheric Flame using Optical Frequency Comb Spectroscopy*
L. Rutkowski, A. Khodabakhsh, A. C. Johansson, D. M. Valiev, F. M. Schmidt, L. Lodi, O. L. Polyansky, S. Yurchenko, J. Tennyson, and A. Foltynowicz
25th Colloquium on High Resolution Molecular Spectroscopy, Helsinki, Finland, Sept 2017
 15. *Broadband precision spectroscopy and multispecies detection using optical frequency combs*
A. Khodabakhsh, L. Rutkowski, A. C. Johansson, G. Soboń, A. Filipsson, C. Lu, and A. Foltynowicz
OPTO:2017, Warsaw, Poland, Jul 2017
 16. *Broadband and high resolution direct measurement of cavity resonances*
L. Rutkowski, A. C. Johansson, A. Khodabakhsh, and A. Foltynowicz
Conference on Lasers and Electro-Optics – European Quantum Electronics Conference, Munich, Germany, Jun 2017
 17. *Cavity-enhanced continuous-filtering Vernier spectroscopy at 3.3 μm using a femtosecond optical parametric oscillator*
A. Khodabakhsh, L. Rutkowski, J. Morville, A. C. Johansson, G. Sobon, and A. Foltynowicz
Conference on Lasers and Electro-Optics – European Quantum Electronics Conference, Munich, Germany, Jun 2017
 18. *High-power broadband source tunable from 2.8 to 4 μm based on difference frequency generation*
G. Soboń, T. Martynkien, P. Mergo, M. Marangoni, and A. Foltynowicz
Conference on Lasers and Electro-Optics – European Quantum Electronics Conference, Munich, Germany, Jun 2017
 19. *Detection of OH and H₂O in an atmospheric flame by near-infrared optical frequency comb spectroscopy*
L. Rutkowski, A. C. Johansson, A. Khodabakhsh, D. Valiev, L. Lodi, S. Yurchenko, O. L. Polyansky, J. Tennyson, F. M. Schmidt, and A. Foltynowicz

Conference on Lasers and Electro-Optics – European Quantum Electronics Conference, Munich, Germany, Jun 2017

20. *Faraday rotation spectroscopy using an optical frequency comb*
A. C. Johansson, J. Westberg, A. Khodabakhsh, L. Rutkowski, G. Wysocki, and A. Foltynowicz
Conference on Lasers and Electro-Optics – European Quantum Electronics Conference, Munich, Germany, Jun 2017
21. *Direct broadband measurement of cavity modes using a mechanical Fourier transform spectrometer with kHz resolution*
L. Rutkowski, A. C. Johansson, G. Zhao, T. Hausmaninger, A. Khodabakhsh, and A. Foltynowicz
Cavity Enhanced Spectroscopy, Egmont aan Zee, the Netherlands, Jun 2017
22. *Mid-infrared cavity-enhanced continuous-filtering Vernier spectroscopy using a femtosecond optical parametric oscillator*
A. Khodabakhsh, L. Rutkowski, J. Morville, G. Sobon, C. Lu and A. Foltynowicz
Cavity Enhanced Spectroscopy, Egmont aan Zee, the Netherlands, Jun 2017
23. *Line parameter retrieval beyond the Voigt profile using comb-based Fourier transform spectroscopy*
A. C. Johansson, L. Rutkowski, P. Masłowski, A. Filipsson, A. Khodabakhsh, and A. Foltynowicz
Cavity Enhanced Spectroscopy, Egmont aan Zee, the Netherlands, Jun 2017
24. *Detection of OH in an atmospheric flame using near-infrared cavity-enhanced optical frequency comb spectroscopy*
L. Rutkowski, A. Khodabakhsh, A. C. Johansson, D. Valiev, F. M. Schmidt, and A. Foltynowicz
Cavity Enhanced Spectroscopy, Egmont aan Zee, the Netherlands, Jun 2017
25. *Mechanical Fourier transform spectrometer with kHz resolution (SW4J.6)*
L. Rutkowski, A. C. Johansson, A. Khodabakhsh, and A. Foltynowicz
Conference on Lasers and Electro-Optics, San Jose, CA, USA, May 2017
26. *Continuous-filtering Vernier spectroscopy at 3.3 μm using a femtosecond optical parametric oscillator (SW1L.5)*
A. Khodabakhsh, L. Rutkowski, J. Morville, and A. Foltynowicz
Conference on Lasers and Electro-Optics, San Jose, CA, USA, May 2017
27. *Near-infrared Fourier transform cavity-enhanced optical frequency comb spectroscopy*
A. Khodabakhsh, L. Rutkowski, P. Masłowski, F. M. Schmidt, and A. Foltynowicz
Light, Energy and the Environment Congress: Fourier Transform Spectroscopy (FTS), Leipzig, Germany, Nov 2016
28. *Fourier transform and Vernier spectroscopy with a mid-Infrared optical frequency comb*
A. Khodabakhsh, V. Ramaiah-Badarla, L. Rutkowski, A. C. Johansson, K. F. Lee, J. Jiang, C. Mohr, M. E. Fermann, and A. Foltynowicz
Light, Energy and the Environment Congress: Fourier Transform Spectroscopy (FTS), Leipzig, Germany, Nov 2016
29. *Fourier-transform-based noise-immune cavity-enhanced optical frequency comb spectroscopy*
A. C. Johansson, A. Khodabakhsh, L. Rutkowski, and A. Foltynowicz
Light, Energy and the Environment Congress: Fourier Transform Spectroscopy (FTS), Leipzig, Germany, Nov 2016
30. *Detection of H₂O and OH in a flame by optical frequency comb spectroscopy*
L. Rutkowski, A. C. Johansson, A. Khodabakhsh, D. M. Valiev, L. Lodi, O. L. Polyansky, S. Yurchenko, J. Tennyson, F. M. Schmidt, and A. Foltynowicz

Optics and Photonics in Sweden, Linköping, Sweden, Nov 2016

31. *Fourier Transform spectroscopy and Vernier spectroscopy using a mid-infrared optical frequency comb*
A. Khodabakhsh, V. Ramaiah-Badarla, L. Rutkowski, A. C. Johansson, K. F. Lee, J. Jiang, C. Mohr, M. E. Fermann, and A. Foltynowicz
Optics and Photonics in Sweden, Linköping, Sweden, Nov 2016
32. *Noise-immune cavity-enhanced optical frequency comb spectroscopy*
A. C. Johansson, A. Khodabakhsh, L. Rutkowski, and A. Foltynowicz
Optics and Photonics in Sweden, Linköping, Sweden, Nov 2016
33. *Optical frequency comb Fourier transform spectroscopy with resolution beyond the path difference limit*
L. Rutkowski, A. C. Johansson, A. Khodabakhsh, P. Maslowski, G. Kowzan, K. F. Lee, A. Mills, C. Mohr, J. Jiang, M. E. Fermann, and A. Foltynowicz
Field Laser Applications in Industry and Research, Aix-les-Bains, France, Sept 2016
34. *Fourier-transform-based cavity-enhanced optical frequency comb spectroscopy*
A. C. Johansson, L. Rutkowski, A. Khodabakhsh, and A. Foltynowicz
Field Laser Applications in Industry and Research, Aix-les-Bains, France, Sept 2016
35. *Measurement of H₂O and OH in a flame by optical frequency comb spectroscopy*
L. Rutkowski, A. Khodabakhsh, A. C. Johansson, D. M. Valiev, L. Lodi, Z. Qu, R. Ghorbani, O. L. Polyansky, J. Tennyson, F. M. Schmidt, and A. Foltynowicz
Field Laser Applications in Industry and Research, Aix-les-Bains, France, Sept 2016
36. *Fourier transform spectroscopy and Vernier spectroscopy using an optical frequency comb in the 3-5.4 μm range*
A. Khodabakhsh, V. Ramaiah-Badarla, L. Rutkowski, A. C. Johansson, K. F. Lee, J. Jiang, C. Mohr, M. E. Fermann, and A. Foltynowicz
Field Laser Applications in Industry and Research, Aix-les-Bains, France, Sept 2016
37. *Noise-immune cavity-enhanced optical frequency comb spectroscopy*
A. C. Johansson, L. Rutkowski, A. Khodabakhsh, and A. Foltynowicz
23rd International Conference on Spectral Line Shapes, Toruń, Poland, Jun 2016
38. *Optical frequency comb spectroscopy of H₂O and OH in a flame*
L. Rutkowski, A. Khodabakhsh, A. C. Johansson, D. M. Valiev, L. Lodi, Z. Qu, R. Ghorbani, O. L. Polyansky, J. Tennyson, F. M. Schmidt, and A. Foltynowicz
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