

Franklyn J. Quinlan

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Employment

November 2022 to Present: Leader, Precision Photonic Synthesis Group, National Institute of Standards and Technology, Time & Frequency Division

January 2023 to Present: Professor Adjoint, Department of Electrical, Computer and Energy Engineering, University of Colorado, Boulder

July 2013 to November 2022: Physicist, National Institute of Standards and Technology, Time & Frequency Division

January 2019: Visiting Instructor, Undergraduate Optics course, The Colorado College Physics Department

August 2011 to July 2013: Postdoctoral Researcher, National Institute of Standards and Technology, Time and Frequency Division

May 2011 to August 2011: Visiting Scientist, Max Planck Institute for Quantum Optics, group of Theodor Hänsch

February 2009 to May 2011: National Research Council Postdoctoral Fellow, National Institute of Standards and Technology, Time and Frequency Division, Optical Frequency Measurements Group

August 2008 to January 2009: Postdoctoral Researcher with the Ultrafast Photonics Group, College of Optics and Photonics, University of Central Florida

Education

Ph D in Optics, August 2008, College of Optics and Photonics, University of Central Florida, Orlando, FL (advisor: Peter Delfyett)

MS in Optics, 2005, College of Optics and Photonics, University of Central Florida, Orlando, FL

BA in Physics, 1999, The Colorado College, Colorado Springs, CO

Selected Accomplishments

Co-lead of the collaborative team that devised and demonstrated a new method to control superconducting qubits by using photonic links. This control method provides a potential scaling solution towards million-qubit quantum information systems.

Led the effort that demonstrated the world's most frequency-stable microwave signal to date, reaching a fractional frequency instability of 1×10^{-18} at an averaging time of 10,000 seconds. This is two orders-of-magnitude better than the best cesium fountain clocks that realize the SI second.

Devised a new understanding of shot noise in the detection of ultrashort optical pulse trains. The detection of ultrashort pulses results in correlations in the shot noise spectrum that can produce orders-of-magnitude improvement in the timing noise quantum limit. Performed experiments that verified the shot noise analysis.

Developed and built an etalon-based coupled optoelectronic oscillator that is a completely self-contained optical frequency-stabilized comb source. This source also generates 200 10 GHz-spaced phase locked optical comb lines, each with sub 1 MHz frequency instability and sub 10 kHz linewidth without requiring a separate optical or electronic frequency reference.

Measured the optical frequency and repetition rate dynamics for feedback control of the etalon-based coupled optoelectronic oscillator. These were the first such measurements on a coupled optoelectronic oscillator.

Honors and Awards

2021	Elected OPTICA (formerly OSA) Fellow
2019	Presidential Early Career Award for Scientists and Engineers (PECASE), “for defying prevailing theory from the past 40 years to generate the world’s most stable electromagnetic signals spanning the radiofrequency, microwave and optical ranges, and to make a 10,000-fold improvement in the ability to measure those signals”
2018	Elected Senior Member of the IEEE
2015	Young Scientist Award, European Frequency and Time Forum, “for seminal contributions to the understanding of fundamental noise processes in the photodetection of short optical pulses and the realization of very pure microwave signals using femtosecond frequency combs”
2014	Outstanding Paper Award, IEEE Ultrasonics, Ferroelectrics and Frequency Control Society, for “State-of-the-Art RF Signal Generation from Optical Frequency Division”
2009-2011	National Research Council Postdoctoral Research Associate
2009	University of Central Florida Outstanding Dissertation Award for 2008-2009
2009	The College of Optics and Photonics Dissertation of the Year Award for 2008
2008	Optical Society of America-New Focus/Bookham Student Award finalist
2008	The College of Optics and Photonics Student of the Year finalist
2007	1 st place, Student Poster Competition, Joint Conference of the European Frequency and Time Forum and the IEEE International Frequency Control Symposium, Geneva, Switzerland
2005	Gramm Travel Award recipient for “Scholarly aptitude and dedicated service to the College of Optics and Photonics”
2003-2005	NSF IGERT Fellow
2002-2003	University of Central Florida Provost Fellow

Professional Service and Experience

Co-chair, IEEE Summer Topicals meeting on Portable Ultrastable Frequency Sources and Applications, July 2022

Member of technical committee on Microwave Photonics, IEEE Photonics Conference, 2012-2017

Member of the technical committee, IEEE Microwave Photonics Conference, 2018-2019; 2023

Member of the technical committee on Optical Frequency Standards & Applications, IEEE Frequency Control Symposium, 2017-2020

Member of the technical committee on Optical Metrology, CLEO Conference, 2014-2016

Reviewer, *ad hoc*, Nature Photonics; Laser & Photonics Reviews; Optica; Photonics Technology Letters; the Journal of Lightwave Technology; IEEE Photonics Journal; Applied Physics Letters; Optics Letters; Optics Express; IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control; IEEE Microwave and Wireless Technology Letters

Patents

“System for microwave signal delivery to superconducting qubits via a photonic link,” F. Quinlan, J. Teufel, S. Diddams, J. Aumentado, J. Davila-Rodriguez. F. LeCoq, provisional patent 2020.

“Optical reference cavity,” F. Quinlan, S. Diddams, A. Ludlow, F. Baynes, J. Davila-Rodriguez, application #20190252848

“Signal generator, process for making and using same,” T. Fortier, F. Quinlan, S. Diddams, A. Rolland, patent #10,050,722

“Optoelectronic logic gate,” P. Delfyett, F. Quinlan, I. T. Ozdur, S. Ozharar, patent #8521037

“High precision measurement of the free spectral range of an etalon,” S. Gee, P. Delfyett, S. Ozharar, F. Quinlan,” patent #7800763

“Optical frequency self stabilization in a coupled optoelectronic oscillator,” P. Delfyett, F. Quinlan, S. Gee, S. Ozharar, patent #76975779

Refereed Journal Publications

2023

I. Kudelin, W. Groman, Q.-X. Ji, J. Guo, M. L. Kelleher, D. Lee, T. Nakamura, C. A. McLemore, P. Shirmohammadi, S. Hanifi, H. Cheng, N. Jin, S. Halliday, Z. Dai, L. Wu, W. Jin, Y. Liu, W. Zhang, C. Xiang, V. Ilchenko, O. Miller, A. Matsko, S. Bowers, P. T. Rakich, J. C. Campbell, J. E. Bowers, K. Vahala, **F. Quinlan**, S. A. Diddams, “Photonic chip-based low noise microwave oscillator,” *Nature to be published*

H. Cheng, N. Jin, Z. Dai, C. Xiang, J. Guo, Y. Zhou, S. A. Diddams, **F. Quinlan**, J. Bowers, O. Miller, P. Rakich, “A novel approach to interface high-Q Fabry–Pérot resonators with photonic circuits,” *APL Photonics*, vol. 8, art. 116105 (2023)

D. Lee, T. Nakamura, A. J. Metcalf, N. E. Flowers-Jacobs, A. E. Fox, P. D. Dresselhaus, **F. Quinlan**, “Sub-GHz resolution line-by-line pulse shaper for driving superconducting circuits,” *APL Photonics*, vol. 8, (2023)

F. Quinlan, “The photodetection of ultrashort optical pulse trains for low noise microwave signal generation,” *Laser and Photonics Reviews*, vol. 17, art. 2200773 (2023)

M. L. Kelleher, C. A. McLemore, D. Lee, J. Davila-Rodriguez, S. A. Diddams, **F. Quinlan**, “Compact, Portable, Thermal-Noise-Limited Optical Cavity with Low Acceleration Sensitivity,” *Optics Express*, vol. 31, p. 11954 (2023)

2022

C. A. McLemore, N. Jin, M. L. Kelleher, J. P. Henrie, D. Mason, Y. Luo, D. Lee, P. Rakich, S. A. Diddams, **F. Quinlan**, “Miniaturizing ultrastable electromagnetic oscillators: sub-10(-14) frequency instability from a centimeter-scale Fabry-Perot cavity,” *Phys. Rev. Applied* vol. 18, 054054 (2022)

N. Jin, C. A. McLemore, D. Mason, J. P. Hendrie, Y. Luo, M. L. Kelleher, P. Kharel, **F. Quinlan**, S. A.

Diddams, P. T. Rakich, "Scalable fabrication of ultrahigh-finesse micromirrors with variable geometry," *Optica* vol. 9, p. 965 (2022)

J. Guo, C. A. McLemore, C. Xiang, D. Lee, L. Wu, W. Jin, M. Kelleher, N. Jin, D. Mason, L. Chang, A. Feshali, M. Paniccia, P. T. Rakich, K. J. Vahala, S. A. Diddams, **F. Quinlan**, J. E. Bowers, "Towards a Chip-Based Laser with 1 Hertz Integrated Linewidth," *Sci. Adv.* vol. 8, paper eabp9006 (2022)

J. Brevik, D. Lee, A. E. Fox, Y. Peng, A. A. Babenko, J. C. Campbell, P. D. Dresselhaus, **F. Quinlan**, S. Benz, "Bipolar Waveform Synthesis with an Optically Driven Josephson Arbitrary Waveform Synthesizer," *IEEE Trans. Appl. Superconductivity* vol. 32, 1400408 (2022)

C. Fredrick, F. Olsen, R. Terrien, S. Mahadevan, **F. Quinlan**, S. A. Diddams, "Thermal-light heterodyne spectroscopy with frequency comb calibration," *Optica* vol. 9, p. 221 (2022)

2021

B. T. Bosworth, N. R. Jungwirth, K. Smith, J. Cheron, **F. Quinlan**, M. Woodson, J. Morgan, A. Beling, A. Feldman, D. Williams, N. D. Orloff, C. J. Long, "Electro-optically derived millimeter-wave sources with phase and amplitude control," *Appl. Phys. Lett.* vol. 119, 151106 (2021)

D. Lee, T. Nakamura, J. Zhang, J. C. Campbell, S. A. Diddams, **F. Quinlan**, "Reduction of Flicker Phase Noise in High-Speed Photodetectors under Ultrashort Pulse Illumination," *IEEE Photonics Journal*, vol. 13, 5500213 (2021)

F. Lecocq, **F. Quinlan**, K. Cicak, J. Aumentado, S. A. Diddams, J. D. Teufel, "Control and readout of a superconducting qubit using a photonic link," *Nature*, vol. 591, p. 575 (2021)

2020

T. Nakamura, J. Davila-Rodriguez, H. Leopardi, J. A. Sherman, T. M. Fortier, X. J. Xie, J. C. Campbell, W. F. McGrew, X. G. Zhang, Y. S. Hassan, D. Nicolodi, K. Beloy, A. D. Ludlow, S. A. Diddams, **F. Quinlan**, "Coherent optical clock down-conversion for microwave frequencies with 10⁻¹⁸ instability," *Science*, vol. 368, p. 889 (2020)

2019

A. J. Metcalf, T. Anderson, C. F. Bender, S. Blakeslee, W. Brand, D. R. Carlson, W. D. Cochran, S. A. Diddams, M. Endl, C. Fredrick, S. Halverson, D. D. Hickstein, F. Hearty, J. Jennings, S. Kanodia, K. F. Kaplan, E. Levi, E. Lubar, S. Mahadevan, A. Monson, J. P. Ninan, C. Nitroy, S. Osterman, S. B. Papp, **F. Quinlan**, L. Ramsey, P. Robertson, A. Roy, C. Schwab, S. Sigurdsson, K. Srinivasan, G. Stefansson, D. A. Sterner, R. Terrien, A. Wolszczan, J.T. Wright, G. Ycas, "Stellar spectroscopy in the near-infrared with a laser frequency comb," *Optica*, vol. 6, 233 (2019)

S. E. J. Mahabadi, S. K. Wang, T. F. Carruthers, C. R. Menyuk, **F. Quinlan**, M. N. Hutchinson, J. D. McKinney, K. J. Williams, "Calculation of the impulse response and phase noise of a high-current photodetector using the drift-diffusion equations," *Opt. Expr.*, vol. 27, p. 3717 (2019)

J. A. Drisko, A. D. Feldman, **F. Quinlan**, J. C. Booth, N. D. Orloff, C. J. Long, "Impedance Tuning with Photoconductors to 40 GHz," *IET Optoelectronics*, vol. 13, p. 177 (2019)

2018

D. R. Carlson, D. D. Hickstein, W. Zhang, A. J. Metcalf, **F. Quinlan**, S. A. Diddams, S. B. Papp, "Ultrafast electro-optic light with subcycle control," *Science*, vol. 361, p. 1358 (2018)

J. Davila-Rodriguez, X. Xie, J. Zang, C. J. Long, T. M. Fortier, H. Leopardi, T. Nakamura, J. C. Campbell, S. A. Diddams, **F. Quinlan**, "Optimizing the linearity in high-speed photodiodes," *Opt. Expr.* vol. 26, p. 30532

(2018)

2017

J. Davila-Rodriguez, F. N. Baynes, A. D. Ludlow, T. M. Fortier, H. Leopardi, S. A. Diddams, **F. Quinlan**, "Compact, thermal-noise-limited reference cavity for ultra-low-noise microwave generation," *Opt. Lett.*, vol. 42, 1277-1280 (2017)

H. Leopardi, J. Davila-Rodriguez, **F. Quinlan**, J. Olson, J. A. Sherman, S. A. Diddams, and T. M. Fortier, "Single-branch Er:fiber frequency comb for precision optical metrology with 10–18 fractional instability," *Optica*, vol. 4, 879-885 (2017)

2016

T. M. Fortier, A. Rolland, **F. Quinlan**, F. N. Baynes, A. J. Metcalf, A. Hati, A. D. Ludlow, N. Hinkley, M. Shimizu, T. Ishibashi, J. C. Campbell, S. A. Diddams, "Optically referenced electronic synthesizer with 15 digits of resolution," *Laser & Photonics Reviews*, vol. 10, p. 780-790 (2016)

W. Loh, M. T. Hummon, H. F. Leopardi, T. M. Fortier, **F. Quinlan**, J. Kitching, S. B. Papp, S. A. Diddams, "Microresonator Brillouin laser stabilization using a microfabricated rubidium cell," *Opt. Expr.*, vol. 24, 14523-14524 (2016)

2015

A. J. Metcalf, **F. Quinlan**, T. M. Fortier, S. A. Diddams, A. M. Weiner, "Broadly tunable low timing jitter, high repetition rate optoelectronic comb generator," *Electron. Lett.*, vol. 51, 1596-1597 (2015)

F. Baynes, **F. Quinlan**, T. M. Fortier, Q. Zhou, A. Beling, J. C. Campbell, S. A. Diddams, "Attosecond timing in optical-to-electrical conversion," *Optica*, vol. 2, 141-146 (2015)

W. Loh, A. A. S. Green, F. N. Baynes, D. C. Cole, **F. J. Quinlan**, H. Lee, K. J. Vahala, S. B. Papp, S. A. Diddams, "Dual-microcavity narrow-linewidth Brillouin laser," *Optica*, vol. 2, 225-232 (2015)

2014

F. Quinlan, F. N. Baynes, T. M. Fortier, Q. Zhou, A. Cross, J. C. Campbell, S. A. Diddams, "Optical amplification and pulse interleaving for low-noise photonic microwave generation," *Opt. Lett.*, vol. 39, 1581-1584 (2014)

W. Sun, **F. Quinlan**, T. M. Fortier, J.-D. Deschenes, Y. Fu, S. A. Diddams, J. C. Campbell, "Broadband Noise Limit in the Photodetection of Ultralow Jitter Optical Pulses," *Phys. Rev. Lett.*, vol. 113, 203901 (2014)

S. B. Papp, K. Beha, P. Del'Haye, **F. Quinlan**, H. Lee, K. J. Vahala, S. A. Diddams, "Microresonator frequency comb optical clock," *Optica*, vol. 1, 10-14 (2014)

E. Rouvalis, F. N. Baynes, X. Xie, K. Li, Q. Zhou, **F. Quinlan**, T. M. Fortier, S. A. Diddams, A. G. Steffan, A. Beling, J. C. Campbell, "High-Power and High-Linearity Photodetector Modules for Microwave Photonic Applications," *J. Lightw. Technol.*, vol. 32, 3810-3816 (2014)

2013

F. Quinlan, T. M. Fortier, H. Jiang, A. Hati, C. Nelson, Y. Fu, J. C. Campbell, S. A. Diddams, "Exploiting shot noise correlations in the photodetection of ultrashort optical pulse trains," *Nat. Photon.*, vol. 7, 290-293 (2013)

F. Quinlan, T. M. Fortier, H. Jiang, S. A. Diddams, "Analysis of shot noise in the detection of ultrashort optical pulse trains," *JOSA B*, vol. 30, 1775-1785 (2013)

T. M. Fortier, **F. Quinlan**, A. Hati, C. Nelson, J. Taylor, Y. Fu, J. C. Campbell, S. A. Diddams, "Photonic microwave generation with high-power photodiodes," *Opt. Lett.*, vol. 38, 1712-1714 (2013)

A. Hati, C. W. Nelson, C. Barnes, D. Lorette, T. Fortier, **F. Quinlan**, J. A. DeSalvo, A. Ludlow, S. A. Diddams, D. A. Howe, "State-of-the-Art RF Signal Generation From Optical Frequency Division," *IEEE Trans. Ultrasonics Ferro. Freq. Contr.*, vol. 60, 1796-1803 (2013)

2012

S. P. Booplapur, **F. Quinlan**, M. Akbulut, P. J. Delfyett, "Linear Technique for Discrimination of Optically Coded Waveforms Using Optical Frequency Combs," *IEEE Photon. Technol. Lett.*, vol. 24, 1673-1676 (2012)

T. M. Fortier, C. W. Nelson, A. Hati, **F. Quinlan**, J. Taylor, H. Jiang, C. W. Chou, T. Rosenband, N. Lemke, A. Ludlow, D. Howe, C. W. Oates, S. A. Diddams, "Sub-femtosecond absolute timing jitter with a 10 GHz hybrid photonic-microwave oscillator," *Appl. Phys. Lett.*, vol. 100, 231111 (2012)

G. G. Ycas, **F. Quinlan**, S. A. Diddams, S. Osterman, S. Mahadevan, S. Redman, R. Terrien, L. Ramsey, C. F. Bender, B. Botzer, S. Sigurdsson, "Demonstration of on-sky calibration of astronomical spectra using a 25 GHz near-IR laser frequency comb," *Opt. Expr.*, vol. 20, 6631-6643 (2012)

S. L. Redman, G. G. Ycas, R. Terrien, S. Mahadevan, L. W. Ramsey, C. F. Bender, S. N. Osterman, S. A. Diddams, **F. Quinlan**, J. E. Lawler, G. Nave, "A High-Resolution Atlas of Uranium-Neon in the H Band," *APJ Suppl. Series*, vol. 199, 2 (2012)

2011

F. Quinlan, T. M. Fortier, M. S. Kirchner, J. A. Taylor, M. J. Thorpe, N. Lemke, A. D. Ludlow, Y. Jiang, S. A. Diddams, "Ultralow phase noise microwave generation with an Er: fiber-based optical frequency divider," *Opt. Lett.*, vol. 36, 3260-3262 (2011)

H. Jiang, J. Taylor, **F. Quinlan**, T. M. Fortier, S. A. Diddams, "Noise floor reduction of an Er: fiber laser-based photonic microwave generator," *IEEE Photonics Journal*, vol. 3, 1004-1012 (2011)

T. M. Fortier, M. S. Kirchner, **F. Quinlan**, J. Taylor, J. C. Bergquist, T. Rosenband, N. Lemke, A. Ludlow, Y. Jiang, C. W. Oates, S. A. Diddams, "Generation of ultrastable microwaves via optical frequency division," *Nat. Photon.*, vol. 5, 425-429 (2011)

J. Taylor, S. Datta, A. Hati, C. Nelson, **F. Quinlan**, A. Joshi, S. Diddams, "Characterization of Power-to-Phase Conversion in High-Speed P-I-N Photodiodes," *IEEE Photonics Journal*, vol. 3, 140-151 (2011)

M. Akbulut, J. Davila-Rodriguez, I. Ozdur, **F. Quinlan**, S. Ozharar, N. Hoghooghi, and P. J. Delfyett, "Measurement of carrier envelope offset frequency for a 10 GHz etalon-stabilized semiconductor optical frequency comb," *Opt. Expr.*, vol. 19, 16851-16865 (2011)

2010

F. Quinlan, G. Ycas, S. Osterman, S. A. Diddams, "A 12.5 GHz-Spaced Optical Frequency Comb Spanning >400 nm for Near-Infrared Astronomical Spectrograph Calibration," *Rev. Sci. Instrum.* vol. 81, 0063105 (2010)

I. Ozdur, M. Akbulut, N. Hoghooghi, D. Mandridis, S. Ozharar, **F. Quinlan**, P. J. Delfyett, "A Semiconductor-Based 10-GHz Optical Comb Source With Sub 3-fs Shot-Noise-Limited Timing Jitter and 500-Hz Comb Linewidth," *IEEE Photon. Technol. Lett.*, vol. 22, 431-433 (2010)

D. Mandridis, I. Ozdur, **F. Quinlan**, M. Akbulut, J. J. Plant, P. W. Juodawlkis, P. J. Delfyett, "Low-noise, low repetition rate, semiconductor-based mode-locked laser source suitable for high bandwidth photonic analog-digital conversion," *Appl. Optics*, vol. 49, 2850-2857 (2010)

2009

F. Quinlan, S. Ozharar, S. Gee, P. J. Delfyett, "Harmonically mode-locked semiconductor-based lasers as high repetition rate ultralow noise pulse trains and optical frequency comb sources," (INVITED REVIEW), Journal of Optics A, vol. 11, 103001 (2009)

S. Ozharar, I. Ozdur, **F. Quinlan**, P. J. Delfyett, "Jitter Reduction by Intracavity Active Phase Modulation in Mode-locked Semiconductor Laser," Opt. Lett., vol. 34, 677-679 (2009)

C. Williams, **F. Quinlan**, P. J. Delfyett, "Injection Locked Mode-Locked Laser with Long-Term Stabilization and High Power-per-Compline," IEEE Photon. Technol. Lett., vol. 21, 94-96 (2009)

2008

F. Quinlan, C. Williams, S. Ozharar, P. J. Delfyett, "Measurement of the comb dynamics for feedback control of an etalon-based coupled optoelectronic oscillator," Opt. Lett., vol. 33, 1422-1424 (2008)

F. Quinlan, C. Williams, S. Ozharar, S. Gee, P. J. Delfyett, "Self-stabilization of the optical frequencies and the pulse repetition rate in a coupled optoelectronic oscillator," J. Lightw. Technol., vol. 26, 2571-2577 (2008)

I. Ozdur, S. Ozharar, **F. Quinlan**, D. Mandridis, P. J. Delfyett, "An Interferometric Method for High Extinction Ratio Measurements with 60 dB Dynamic Range," IEEE Photon. Technol. Lett., vol. 20, 2075-2077 (2008)

I. Ozdur, S. Ozharar, **F. Quinlan**, S. Gee, P. J. Delfyett, "Modified Pound-Drever-Hall Scheme for High Precision Free Spectral Range Measurement of a Fabry-Perot Etalon, IEEE Electron. Lett., vol. 44, 927-928 (2008)

S. Ozharar, **F. Quinlan**, I. Ozdur, S. Gee, P. J. Delfyett, "Ultraflat Optical Comb Generation by Phase-Only Modulation of Continuous-Wave Light," IEEE Photon. Technol. Lett., vol. 20, 36-38 (2008)

2007

F. Quinlan, S. Gee, S. Ozharar, P. J. Delfyett, "Greater than 20 dB supermode suppression and timing jitter reduction via CW injection of a harmonically mode-locked laser," IEEE Photon. Technol. Lett., vol. 19, 1221-1223 (2007)

S. Gee, S. Ozharar, **F. Quinlan**, J. J. Plant, P. W. Juodawlkis, and P.J. Delfyett, "Self Stabilization of an actively mode-locked semiconductor based fiber ring laser for ultra-low jitter," IEEE Photon. Technol. Lett., vol. 19, 498-500 (2007)

S. Gee, **F. Quinlan**, S. Ozharar, and P. J. Delfyett, "Correlation of supermode noise of harmonically modelocked lasers," J. Opt. Soc. Am. B, vol. 24, 1490-1497 (2007)

S. Ozharar, S. Gee, **F. Quinlan**, I. Ozdur, P. J. Delfyett, "Ultra-high spur-free dynamic range RF synthesis using optical homodyne serrodyne technique," IEEE Electron. Lett., vol. 43, 65-66 (2007)

2006

F. Quinlan, S. Gee, S. Ozharar, P. J. Delfyett, "The effects of filtering RF source phase noise by a low noise, high quality factor actively modelocked laser on the laser's absolute and relative phase noise," Optics Express, vol. 14, 5346-5355 (2006)

F. Quinlan, S. Gee, S. Ozharar, P. J. Delfyett, "Ultralow jitter- and amplitude-noise semiconductor based actively modelocked laser," Opt. Lett., vol. 31, 2870-2872 (2006)

S. Ozharar, S. Gee, **F. Quinlan**, P. J. Delfyett, "Pulse-amplitude-equalization by negative impulse modulation for rational harmonic modelocking," Opt. Lett., vol. 31, 2924-2926 (2006)

S. Ozharar, S. Gee, **F. Quinlan**, P. J. Delfyett, "Time division multiplexing based modulation scheme for RF chirp extension," IEEE Electron. Lett., vol. 42, 714-715 (2006)

S. Gee, S. Ozharar, **F. Quinlan**, P. J. Delfyett, "High-precision measurement of free spectral range of etalon," IEEE Electron. Lett., vol. 42, 715-716 (2006)

P. J. Delfyett, S. Gee, M. Choi, H. Izadpanah, W. Lee, S. Ozharar, **F. Quinlan**, T. Yilmaz, "Optical Frequency Combs from Semiconductor Lasers and Applications in Ultra-wideband Signal Processing and Communications," (INVITED) IEEE J. of Lightw. Technol., vol. 24, 2701-2719 (2006)

2005

S. Gee, **F. Quinlan**, S. Ozharar, and P. J. Delfyett, J. J. Plant, and P. W. Juodawlkis, "Ultralow noise modelocked optical pulse trains from a slab coupled optical waveguide amplifier (SCOWA) based external cavity laser," Opt. Lett., vol. 30, 2742-2744 (2005)

S. Ozharar, **F. Quinlan**, S. Gee, P. J. Delfyett, "Demonstration of Endless Phase Modulation for Arbitrary Waveform Generation," IEEE Photon. Technol. Lett., vol. 17, 2739-2741 (2005)

S. Gee, **F. Quinlan**, S. Ozharar, and P. J. Delfyett, "Two-mode beat phase noise of actively modelocked lasers," Optics Express, vol. 13, 3977-3982 (2005)

S. Gee, **F. Quinlan**, S. Ozharar, and P. J. Delfyett, "Simultaneous optical comb frequency stabilization and super mode noise suppression of harmonically modelocked semiconductor ring laser using an intracavity etalon," IEEE Photon. Technol. Lett., vol. 17, 199-201 (2005)

Selected Conference Proceedings

2023

F. Quinlan, "Photonic Interconnects to Superconducting Circuit Platforms," (INVITED,) IEEE Summer Topicals Meeting, July 2023

F. Quinlan, M. L. Kelleher, C. McLemore, N. Jin, P. Rakich, S. A. Diddams, "Compact and Manufacturable Ultrastable Optical Reference Cavities: 10-14 Stability in Less Than 10 mL Volume," (INVITED), 9th Symposium on Frequency Standards and Metrology, October 2023

F. Quinlan, "Ultra-stable Lasers Based on Compact and Portable Fabry-Perot Resonators," (INVITED), Optical Fiber Communication Conference (OFC), March 2023

2022

D. Lee, T. Nakamura, A.J. Metcalf, **F. Quinlan**, "High-Resolution Line-by-Line Pulse Shaper for Optically Driving Cryogenic Josephson Junctions," IEEE Photonics Conference, Nov. 2022

C. A. McLemore, J. Guo, N. Jin, C. Xiang, D. Lee, L. Wu, W. Jin, M. L. Kelleher, D. Mason, L. Chang, A. Feshali, M. Paniccia, P. T. Rakich, K. J. Vahala, S. A. Diddams, J. E. Bowers, **F. Quinlan**, "Stabilization of an integrated laser with an 8 mL Fabry-Pérot optical reference cavity," IEEE Photonics Society Summer Topicals Meeting, July 2022

M. L. Kelleher, C. A. McLemore, D. Lee, S. A. Diddams, **F. Quinlan**, "Portable Centimeter-Scale Rigidly Held Optical Cavity with $<3 \times 10^{-14}$ Fractional Frequency Stability," CLEO conference, May 2022

D. Lee, T. Nakamura, A. J. Metcalf, **F. Quinlan**, "Sub-GHz Resolution Dynamic Line-by-Line Pulse Shaper at 1 μm ," CLEO conference, May 2022

C. A. McLemore, N. Jin, J. P. Hendrie, D. Mason, M. L. Kelleher, Y. Luo, D. Lee, P. Rakich, S. A. Diddams,

F. Quinlan, “Compact, Low-Noise Optical Reference Cavity with Lithographically Fabricated Mirrors,” CLEO conference, May 2022

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