

Paul A. Morton, PhD

Published Writings, Presentations and Patents

Paul A. Morton, Jacob B Khurgin, Zemer Mizrahi, Steven J. Morton, 'High SFDR 'Super-Ring' Microresonator Based True-Time-Delay (TTD)', 2014 IEEE Avionics, Fiber Optics and Photonics Technology (AVFOP) Conference, Atlanta, GA, Nov. (2014).

Jaime Cardenas, Carl B. Poitras, Kevin Luke, Lian Wee Luo, **Paul A. Morton**, and Michal Lipson, 'High Coupling Efficiency Etched Facet Tapers in Silicon Waveguides', IEEE Phot. Tech. Lett., **26**, (2014).

Paul A. Morton, Jacob B Khurgin, Zemer Mizrahi, Steven J. Morton, 'Commercially Packaged Optical True-Time-Delay Devices With Record Delays of Wide Bandwidth Signals', Conference on Lasers and Electro-Optics (CLEO), AW3P.6, (2014).

P. A. Morton, J. B. Khurgin US patent, # 8,718,421 B2, 'Super-Ring Resonator Based Devices', May (2014).

Paul A. Morton, 'Photonic Integrated Circuit Use Case: Optical Time Delay Device', Si2 Photonic Integrated Circuit workshop at Optical Fiber Communications (OFC) Conference, San Francisco, CA, March (2014).

Paul A. Morton, 'Advancements in Photonic Components', invited talk at 'The Photonics Toolbox for Defense Applications' Workshop, the Georgia Tech Research Institute (GTRI), Atlanta, GA, January (2014).

Paul A. Morton, Jaime Cardenas, Jacob B. Khurgin, Michal Lipson, 'Miniature, Linearized Silicon Photonics Modulators For Phased Array Systems' presentation at the 2013 IEEE International Topical Meeting on Microwave Photonics, Th1-4, Virginia, (2013).

J. Cardenas, **P. A. Morton**, J. B. Khurgin, A. Griffith, C. Poitras, Kyle Preston, M. Lipson, 'Linearized Silicon Modulator based on a ring assisted Mach Zehnder interferometer', Optics Express, **21**, p22549 (2013).

Paul A. Morton, 'High SFDR Optical True-Time-Delay and Photonic Integration Opportunities' invited presentation at the 2013 IEEE Avionics, Fiber Optics and Photonics Technology (AVFOP) Conference, TuB4, San Diego, CA, (2013).

J. Cardenas, **P. A. Morton**, J. B. Khurgin, A. Griffith, C. Poitras, M. Lipson, 'Linearized Silicon Modulator', Conference on Lasers and Electro-Optics (CLEO), CTh1C.1, (2013).

Paul A. Morton, 'Optical True-Time-Delay (TTD) Devices for Phased Array Systems', Invited presentation at the National Innovation Summit, Defense and Energy Session (2013).

P. A. Morton and J. B. Khurgin, US patent 8,406,586 B2, 'Tunable Optical Group Delay' March (2013).

P. A. Morton, Z. Mizrahi, 'Low-Cost, Low-Noise Hybrid Lasers for High SFDR RF Photonic Links', IEEE Avionics, Fiber Optics and Photonics Technology Conference (AVFOP), **WD2**, Sept. (2012).

P. A. Morton, ‘Silicon Photonics for High SFDR Systems’, Advanced Microelectronics & Photonics for Space (AMAPS) Conference, Albuquerque NM, June (2012).

J. Cardenas, K. Luke, L. W. Luo, C. Poitras, **P. A. Morton**, M. Lipson, ‘High Coupling Efficiency Etched Facet Tapers in Silicon’, Conference on Lasers and Electro-Optics (CLEO) 2012, JW4A.10, May (2012).

J. Cardenas, **P. A. Morton**, J. B. Khurgin, C. Poitras, M. Lipson, ‘Super-Ring Resonators: Taking Advantage of Resonance Variability’, Conference on Lasers and Electro-Optics (CLEO) 2012, CTu3I.4, May (2012).

J. Cardenas, C. B. Poitras, B. Zhang, J. B. Khurgin, **P. A. Morton**, M. Lipson, ‘Broadband Tunable Delay for Wireless Networks’, invited presentation at Photonics West, San Francisco, Jan (2012).

P. A. Morton, J. Cardenas, J. B. Khurgin, M. Lipson, ‘Fast Thermal Switching Of Wideband Optical Delay Line With No Long Term Transient’ IEEE Phot. Tech. Lett., **24**, p512 (2012).

P. A. Morton, J. Cardenas, C. B. Poitras, J. B. Khurgin, M. Lipson, ‘Practical Silicon Photonics True-Time-Delay Devices for Phased Array Systems’, IEEE Avionics, Fiber Optics and Photonics Technology Conference (AVFOP), **THD2**, Oct (2011).

P. A. Morton, ‘Low-Cost Ultra-Low-Noise Hybrid-Integrated Laser’, presentation at the Navy Opportunity Forum 2011, Crystal City, (2011).

P. A. Morton and J. B. Khurgin, published patent US 2011/0164299 A1, ‘Super-Ring Resonator Based Devices’ July (2011).

P. A. Morton, ‘Silicon Photonics Devices for True-Time-Delay in Phased Array Systems’, Advanced Microelectronics & Photonics for Space (AMAPS) Conference, San Diego, June (2011).

P. A. Morton, US patent #7,970,280 ‘Thermally-Floating Transmitter Wavelength Grid of Signal Channels in a WDM Transmission System’ (2011).

J. Cardenas, M. Foster, N. Sherwood-Droz, C. B. Poitras, H. L. R. Lira, B. Zhang, A. L. Gaeta, J. B. Khurgin, **P. A. Morton**, M. Lipson, ‘Wide-bandwidth continuously tunable optical delay using silicon microring resonators’, Optics Express, **18**, p26525-26534 (2010).

J. B. Khurgin, **P. A. Morton**, US patent #7,831,119 B2, ‘Tunable Optical Group Delay Based on Microresonator Structures’ (2010).

J. Cardenas, S. Manipatruni, N. Sherwood-Droz, C. B. Poitras, B. Zhang, J. B. Khurgin, **P. A. Morton**, M. Lipson, ‘Large Tunable Delay of an RF Photonic Signal with 130 GHz Bandwidth Using Silicon Microresonators’, The Conference on Lasers and Electro-Optics (CLEO), CWG3 (2010).

P. A. Morton and J. B. Khurgin, ‘Microwave Photonic Delay Line With Separate Tuning of the Optical Carrier’, IEEE Phot. Tech. Lett., **21**, p1686 (2009).

B. Zhang, J. Khurgin, **P. A. Morton**, ‘Linearized Ring Assisted Electro-Optical Modulator for Coherent Optical OFDM Links’, IEEE Phot. Tech. Lett., **21**, p1621 (2009).

J. B. Khurgin and **P. A. Morton**, ‘Tunable wideband optical delay line based on balanced coupled resonator structures,’ *Opt. Lett.* 34(17), 2655-2657 (2009).

J. Cardenas, N. Sherwood-Droz, M. Foster, C. B. Poitras, A. L. Gaeta, M. Lipson, J. B. Khurgin, **P. A. Morton**, ‘Large-bandwidth continuously tunable delay using silicon microring resonators’, 6th International Conference on Group IV Photonics, paper WC4, (2009).

P. A. Morton, J. B. Khurgin, US patent # 7,558,450 B2, ‘Microwave Photonic Delay Line With Separate Tuning Of Optical Carrier’, (2009).

P. A. Morton, ‘GENI Optical Introduction’, invited Talk, GENI Optical Workshop, Washington DC, September (2007).

P. A. Morton, ‘Optical Networks in GENI’ Invited Talk, **FON2**, International workshop on the Future of Optical Networking, Optical Fiber Communications Conference (OFC), Anaheim, March (2007).

P. A. Morton, ‘Optical Technologies for the Future Internet’, invited Seminar, Johns Hopkins University, December (2006).

P. A. Morton, ‘Semiconductor Lasers for Optical Communication Systems’, invited Lecture, Johns Hopkins University, April (2006).

P. A. Morton, ‘High-Speed Photonic Components for High-Capacity Optical Communication Systems’, Distinguished Lecturer invited tutorial, University of California at San Diego, March (2006).

P. A. Morton, ‘Directly-Modulated 10Gbps External Cavity Laser TOSA for Long Reach (80km) and DWDM Applications’, product tutorial at the Optical Fiber Communications Conference (OFC), Anaheim, March (2006).

L. Luo, D. Ross, S. Tarnavski, D. Harvey, P. Glowacki, C. Ward, S. Varlamov, S. Popescu, S. Li, M. Puchert, C. Lei, **P. A. Morton** ‘80 km Transmission at 10 Gbps using a Directly-Modulated Miniature Planar-External-Cavity (PLANEX) Laser’, IEEE Lasers and Electro-Optics Annual Meeting 2005, Paper TuT3, Sydney, Australia, October (2005).

P. A. Morton, ‘Active Photonic Components for Optical Networking’, Invited Seminar, ECE Distinguished Lecture Series, Georgia Institute of Technology, October (2002).

P. A. Morton, ‘Shifts Occurring in Telecom Industry Structure’ Panel moderator, Liquid Europe Executive Forum, in conjunction with the European Conference on Optical Communications, ECOC, and RHK, Copenhagen, September (2002).

P. A. Morton, ‘Active Photonic Components for Optical Networks’ Invited Tutorial, **WY**, Optical Fiber Communications Conference (OFC), Anaheim, March (2002).

P. A. Morton, moderator for Panel Session on Tunable Lasers, **TuA4**, Advanced Semiconductor Lasers and Applications, IEEE-LEOS Summer Topical Meeting, Copper Mountain Resort, July (2001).

T. Brenner, **P. A. Morton**, D. X. Zhu, U.S. Patent # 6,233,080, ‘Crosstalk-Free Signal Source for Dense Wavelength Division Multiplexed Systems’, May (2001).

P. A. Morton, ‘Semiconductor Lasers for DWDM Systems’ Invited Tutorial, **CTuV1**, Conference on Lasers and Electro-Optics, CLEO, Baltimore, May (2001).

P. A. Morton, ‘Optical Add/Drop Multiplexer’, US Patent # 6,205,269, March (2001)

P. A. Morton, ‘Components for WDM Systems’, session organizer for IEEE Semiconductor Laser Workshop, San Francisco, May (2000).

P. A. Morton, ‘Optoelectronic Components for the Telecom Revolution’, Invited Talk, OIDA Broadband Communications and Switching Components Technology Workshop, Palo Alto, April (1999).

J. Yu, T. Y. Chang, G. C. Wilson, T. H. Wood, N. J. Sauer, J. E. Johnson, T. Tanbun-Ek, and **P. A. Morton**, ‘Linearization of 1.55 μ m Electroabsorption Modulated Laser by Distortion Emulation and Reversal for 77-Channel CATV Transmission’, IEEE Phot. Tech. Lett., **10**, p433, (1998).

P. A. Morton, ‘High Speed 1.55 μ m Lasers for Fiber Optic Transmission’, Invited paper, International Journal of High Speed Electronics and Systems (IJHSE&S), **8**, p457, (1997).

D. A. Ackerman, G. E. Shtengel, **P. A. Morton**, L. M. Zhang, J. E. Johnson, C. G. Bethea, L. J. P Ketelsen, ‘Identifying Sources of Residual Reflections within Integrated Electroabsorption Modulated Laser Cavities’, Optical Fiber Communications Conference (OFC), Dallas, **WG7**, (1997).

P. A. Morton, G. E. Shtengel, L. D. Tzeng, R. D. Yadvish, T. Tanbun-Ek, R. A. Logan, ‘38.5km Error Free Transmission at 10 Gb/s in Standard Fiber using a Low Chirp, Spectrally Filtered, Directly Modulated 1.55 μ m DFB Laser’, Electron. Lett. **33**, p310 (1997).

Gordon C. Wilson, Thomas H. Wood, M. Gans, J. L. Zyskind, J. W. Sulhoff, J. E. Johnson, T. Tanbun-Ek, and **Paul A. Morton**, ‘Predistortion of Electroabsorption Modulators For Analog CATV Systems at 1.55 μ m’, IEEE J. Lightwave Tech, **15**, p1654 (1997).

G. E. Shtengel, **P. A. Morton**, R. F. Kazarinov, D. A. Ackerman, M. S. Hybertsen, G. L. Belenky, C. L. Reynolds, ‘Experimental Study of Physical Parameters of Semiconductor Lasers’, Invited paper, SPIE **2994**, p678 (1997).

J. E. Johnson, **P. A. Morton**, Y. K. Park, L. J. P Ketelsen, J. A. Grenko, T. J. Miller, S. K. Sputz, T. Tanbun-Ek, J. Vandenberg, R. D. Yadvish, T. R. Fullowan, P. F. Sciortino Jr., A. M. Sergent, W. T. Tsang, ‘High-Speed Integrated Electroabsorption Modulators’, Invited paper, symposium on ‘High Speed Semiconductor Laser Sources’, SPIE Conference on Lasers and Integrated Optoelectronics, p30, February (1997).

Y. K. Park, T. V. Nguyen, **P. A. Morton**, J. E. Johnson, O. Mizuhara, J. Jeong, L. D. Tzeng, P. D. Yeates, T. Fullowan, P. F. Sciortino Jr., A. M. Sergent, W. T. Tsang, R. D. Yadvish,, ‘Dispersion Penalty Free Transmission Over 130 km Standard Fiber Using a 1.55 μ m 10 Gb/s Integrated EA/DFB Laser with Low Extinction Ratio and Negative Chirp’, IEEE Phot. Tech. Lett., **8**, p1255 (1996).

G. E. Shtengel, D. A. Ackerman, **P. A. Morton**, J. A. Sheridan-Eng, R. F. Kazarinov, ‘Device characterization for optimization of high performance semiconductor lasers’, IEEE LEOS

Annual Meeting, **ThP2** (1996).

G. C. Wilson, T. H. Wood, J. L. Zyskind, J. W. Sulhoff, J. E. Johnson, T. Tanbun-Ek, **P. A. Morton**, 'SBS and MPI suppression in analogue systems with integrated electroabsorption modulator/DFB laser transmitters', *Electron Lett.*, **32**, p1502 (1996).

P. A. Morton, J. E. Johnson, Y. K. Park, R. D. Yadvish, T. Fullowan, A. M. Sergent, P. F. Sciortino, W. T. Tsang, 'High-Speed Integrated DFB/Electroabsorption Modulated lasers', Invited talk, Conference on Lasers and Electro-Optics, CLEO, Anaheim, **CWL1** (1996).

Y. K. Park, T. V. Nguyen, O. Mizuhara, J. Jeong, L. D. Tzeng, P. D. Yeates, **P. A. Morton**, J. E. Johnson, T. Fullowan, P. F. Sciortino Jr., A. M. Sergent, W. T. Tsang, R. D. Yadvish, 'Dispersion Penalty Free Transmission Over 130 km Standard Fiber Using a 1.55 μ m 10 Gb/s Integrated EA/DFB Laser with Low Extinction Ratio and Negative Chirp', European Conference on Optical Communications (ECOC), **TuP.11** (1996).

G. C. Wilson, T. H. Wood, J. L. Zyskind, J. W. Sulhoff, J. E. Johnson, T. Tanbun-Ek, **P. A. Morton**, 'Integrated Electroabsorption Modulator/DFB Laser Analog Transmitter with Distortion Correction to 5th Order', Conference on Lasers and Electro-Optics, CLEO, Anaheim, **CTuW5** (1996).

P. A. Morton, T. Tanbun-Ek, R. A. Logan, D. A. Ackerman, G. Shtengel, N. Chand, J. E. Johnson, R. D. Yadvish, A. M. Sergent, P. F. Sciortino Jr., 'High-Speed, Low-Chirp, Directly Modulated 1.55 μ m DFB Laser Sources for 10 GBit/s Local Distribution', Optical Fiber Communications Conference (OFC), San Jose, February 1996.

G. C. Wilson, T. H. Wood, J. L. Zyskind, J. W. Sulhoff, S. B. Krasulick, J. E. Johnson, T. Tanbun-Ek, **P. A. Morton**, 'Suppression of Stimulated Brillouin Scattering (SBS) and Multipath Interference (MPI) in analog systems with integrated electroabsorption modulator/DFB laser transmitters' Optical Fiber Communications Conference (OFC), San Jose, February 1996.

P. A. Morton, T. Tanbun-Ek, R. A. Logan, D. A. Ackerman, G. E. Shtengel, R. D. Yadvish, A. M. Sergent, P. F. Sciortino Jr., 'Ultra-Wide Bandwidth 1.55 μ m Lasers', invited talk, symposium on 'High Speed Semiconductor Laser Sources', SPIE Conference on Lasers and Integrated Optoelectronics, January (1996).

J. E. Bowers, P. Blixt, A. Petersen, **P. A. Morton**, R-C. Yu, S. M. Beccue, K. R. Runge, K. C. Wang, '30 Gbit/s Transmission Experiment Using Directly Modulated Semiconductor Lasers', Invited Talk, SPIE OE/LASE '96, San Jose, January (1996).

G. E. Shtengel, D. A. Ackerman, **P. A. Morton**, E. J. Flynn and M. S. Hybertsen, 'Correction of Carrier Lifetime Measurements of Semiconductor Lasers', IEEE LEOS Annual Meeting, **SCL6.3** (1995).

J. E. Johnson, **P. A. Morton**, T. Tanbun-Ek, W. T. Tsang, 'Integrated Electroabsorption Modulators for WDM Systems', invited talk at the IEEE LEOS Annual Meeting, **IO5.2** (1995).

G. E. Shtengel, D. A. Ackerman, **P. A. Morton**, 'True Carrier Lifetime Measurements of Semiconductor Lasers', *Electron. Lett.*, **31**, p1747 (1995).

G. C. Wilson, T. H. Wood, J. L. Zyskind, J. W. Sulhoff, S. B. Krasulick, J. Johnson, T. Tanbun-Ek, **P. A. Morton**, 'Analogue Transmission at 1.55 μ m using Linearized Electroabsorption

Modulator/DFB laser and Fibre Amplifier', Electron. Lett. **31**, p1934 (1995).

G. E. Shtengel, D. A. Ackerman, **P. A. Morton**, E. J. Flynn, M. S. Hybertsen 'Impedance-corrected carrier lifetime measurements in semiconductor lasers', Applied Physics Letters, **67**, p1506, (1995).

G. E. Shtengel, D. A. Ackerman, **P. A. Morton**, 'True Carrier Lifetime Measurements of Semiconductor Lasers', Device Research Conference Postdeadline Paper, Session IIIB, Charlottesville, Virginia, June (1995).

P. A. Morton, 'Semiconductor Laser Sources for 100 GBit/s Systems', Invited Talk, Rump Session, Device Research Conference, Charlottesville, Virginia, June (1995).

W. T. Tsang, J. E. Johnson, **P. A. Morton**, T. Tanbun-Ek, S. N. G. Chu, W. D. Johnston, 'Integrated laser/modulators for high capacity WDM transmission systems', IEEE MTT-S International, **TU4C-1** (1995).

P. A. Morton, 'High Speed Optoelectronic Sources', Invited talk at the OSA Annual Meeting, **THYY1**, Portland, Oregon, September (1995).

M. S. Ozyazici, **P. A. Morton**, L. M. Zhang, V. Mizrahi, 'Theoretical Model of Hybrid Soliton Pulse Source', IEEE Phot. Tech. Lett., **7**, p1142 (1995).

G. C. Wilson, T. H. Wood, S. B. Krasulick, J. Johnson, T. Tanbun-Ek, **P. A. Morton**, 'Linearization of an integrated electroabsorption modulator / DFB laser using electronic predistortion', **CPD12**, Postdeadline Paper, Conference on Lasers and Electro-Optics (CLEO), Baltimore (1995).

P. A. Morton, 'High Performance Sources for Ultra-High Bit Rate Networks', Invited talk at the workshop on 'Ultra-High Bit Rate Networks', Optical Fiber Communications Conference (OFC), (1995).

J. E. Johnson, **P. A. Morton**, T. Nguyen, O. Mizuhara, S. N. G. Chu, G. Nykolak, T. Tanbun-Ek, W. T. Tsang, T. R. Fullowan, P. F. Sciortino Jr., A. M. Sergent, K. W. Wecht, R. D. Yadavish, '10 GBit/s Transmission Using an Integrated Electroabsorption Modulator/DFB Laser Grown by Selective-Area Epitaxy', Optical Fiber Communications Conference (OFC), **TuF2** (1995).

P. A. Morton, V. Mizrahi, G. Harvey, L. Mollenauer, T. Tanbun-Ek, R. A. Logan, H. M. Presby, T. Erdogan, A. M. Sergent, K. W. Wecht, 'Packaged Hybrid Soliton Pulse Source Results and 270 Terabit.km/sec Soliton Transmission', IEEE Phot. Tech. Lett., **7**, p111, (1995).

P. A. Morton, D. A. Ackerman, G. E. Shtengel, R. F Kazarinov, M. S. Hybertsen, T. Tanbun-Ek, R. A. Logan, A. M. Sergent, 'Gain Characteristics of 1.55 μ m High Speed MQW Lasers', IEEE Phot. Tech. Lett., **7**, p833 (1995).

D. A. Ackerman, **P. A. Morton**, G. E. Shtengel, M. S. Hybertsen, R. F Kazarinov, T. Tanbun-Ek, R. A. Logan, 'Analysis of T_0 in 1.3 μ m Multi-Quantum Well and Bulk Active Lasers', Appl. Phys. Lett., **66**, p2613 (1995).

D. A. Ackerman, G. E. Shtengel, M. S. Hybertsen, **P. A. Morton**, R. F Kazarinov, T. Tanbun-Ek, R. A. Logan, 'Analysis of Gain in Determining T_0 in 1.3 μ m Semiconductor Lasers', IEEE Selected Topics in Quantum Electron., **1**, p250 (1995).

P. A. Morton, T. Tanbun-Ek, R. A. Logan, N. Chand, K. W. Wecht, A. M. Sergent, P. F. Sciortino Jr., 'Packaged 1.55 μ m DFB Laser with 25 GHz Modulation Bandwidth', *Electron. Lett.*, **30**, p2044 (1994).

P. A. Morton, T. Tanbun-Ek, R. A. Logan, V. Mizrahi, 'High Speed Optoelectronic Sources for Multi-Gigabit Communication Links', Invited Talk, IEEE LEOS Annual Meeting, **OC1.2**, November 1994.

P. A. Morton, T. Tanbun-Ek, R. A. Logan, N. Chand, K. W. Wecht, A. M. Sergent, P. F. Sciortino Jr., '25 GHz Bandwidth Fully Packaged 1.55 μ m DFB Laser', Postdeadline paper, IEEE 14th International Semiconductor Laser Conference, Hawaii, **PD13**, (1994).

P. A. Morton, V. Mizrahi, G. Harvey, L. Mollenauer, T. Tanbun-Ek, R. A. Logan, H. M. Presby, T. Erdogan, A. M. Sergent, K. W. Wecht, 'Packaged Hybrid Soliton Pulse Source Results and 270 Terabit.km/sec Soliton Transmission using Sliding-Frequency Guiding Filters', IEEE 14th International Semiconductor Laser Conference, Hawaii, **TH2.5**, (1994).

D. A. Ackerman, **P. A. Morton**, R. F. Kazarinov, M. S. Hybertsen, G. E. Shtengel, T. Tanbun-Ek, R. A. Logan, 'Study of Gain in Determining T_0 of 1.3 μ m Semiconductor Lasers', IEEE 14th International Semiconductor Laser Conference, **TH3.3**, Hawaii, (1994).

J. E. Johnson, T. Tanbun-Ek, Y. K. Chen, D. A. Fishman, R. A. Logan, **P. A. Morton**, S. N. G. Chu, A. Tate, A. M. Sergent, P. F. Sciortino Jr., K. W. Wecht, 'Low-Chirp Integrated EA-Modulator/DFB Laser Grown by Selective-Area MOVPE', IEEE 14th International Semiconductor Laser Conference, Hawaii, **M4.7**, (1994).

P. A. Morton, 'The Hybrid Soliton Pulse Source', Book Chapter in 'Compact Sources of Ultrashort Pulses', Editor Irl Duling, Cambridge University Press, ISBN 0 521 46192 8, (1995).

P. A. Morton, D. A. Ackerman, R. F. Kazarinov, M. S. Hybertsen, T. Tanbun-Ek, R. A. Logan, 'Material Characteristics of 1.55 μ m High Speed P-Doped Compressively Strained MQW Lasers', Conference on Lasers and Electro-Optics (CLEO), **CW04**, (1994).

P. A. Morton, V. Mizrahi, T. Tanbun-Ek, R. A. Logan, P. Lemaire, T. Erdogan, P. F. Sciortino Jr., A. M. Sergent, K. W. Wecht, 'High Power Mode-Locked Hybrid Pulse Source Using Two-Section Laser Diodes', *Optics Letters*, **19**, p725 (1994).

P. A. Morton, V. Mizrahi, T. Tanbun-Ek, R. A. Logan, P. Lemaire, H. M. Presby, T. Erdogan, S. L. Woodward, J. E. Sipe, M. R. Phillips, A. M. Sergent, K. W. Wecht, 'Stable Single Mode Hybrid Laser with High Power and Narrow Linewidth', *Applied Physics Letters*, **64**, p2634, (1994).

D. A. Ackerman, **P. A. Morton**, R. F. Kazarinov, T. Tanbun-Ek, R. A. Logan, 'Analysis of T_0 in 1.3 μ m Bulk and Multi-Quantum-Well Lasers', Poster and Proceedings paper at the Indium Phosphide and Related Materials Conference, **WP19**, Santa Barbara, California (1994).

P. A. Morton, V. Mizrahi, T. Tanbun-Ek, R. A. Logan, P. Lemaire, T. Erdogan, P. F. Sciortino Jr., A. M. Sergent, K. W. Wecht, 'High Power Hybrid Pulse Source', Talk and Proceedings paper at the Indium Phosphide and Related Materials Conference, **MC5**, Santa Barbara, California (1994).

P. A. Morton, V. Mizrahi, R. Adar, L. F. Mollenauer, U.S. Patent # 5,305,336, ‘Compact Optical Pulse Source’, April (1994).

P. A. Morton, V. Mizrahi, P. Lemaire, T. Tanbun-Ek, R. A. Logan, H. M. Presby, T. Erdogan, S. L. Woodward, M. R. Phillips, A. M. Sergent, K. W. Wecht, ‘High Power, Narrow Linewidth, Stable Single-Mode Hybrid Laser’, Talk at the Optical Fiber Communication Conference, San Jose, California, **WG4** (1994).

M. S. Hybertsen, R. F. Kazarinov, L. Zhang, G. A. Baraff, D. A. Ackerman, G. E. Shtengel, **P. A. Morton**, T. Tanbun-Ek, R. A. Logan, ‘Modeling of InGaAsP Based Laser Performance’, SPIE OE/LASE Symposium: Physics of Optoelectronic Devices III, San Jose, CA, 1994.

Press Release and publicity articles on Ultra-High Speed Lasers (1993)

Video Program describing the design and measurement of Ultra-High Speed Laser Diodes, ‘High Tech Shower International, Bell Laboratories Specials, #504’, (1993).

P. A. Morton, T. Tanbun-Ek, R. A. Logan, P. F. Sciortino Jr., A. M. Sergent, K. W. Wecht, ‘Superfast 1.55 μ m DFB Lasers’, Electron. Lett., **29**, p1429 (1993).

P. A. Morton, T. Tanbun-Ek, R. A. Logan, P. F. Sciortino Jr., A. M. Sergent, ‘Ultra-High Speed Long Wavelength MQW Lasers’, Invited Talk, Conference on Lasers and Electro-Optics (CLEO), May (1993).

P. A. Morton, V. Mizrahi, P. A. Andrekson, T. Tanbun-Ek, R. A. Logan, P. Lemaire, A. M. Sergent, K. W. Wecht, P. F. Sciortino Jr., ‘Mode-Locked Soliton Pulse Source with Fiber Cavity and Integrated Chirped Bragg Reflector’, Talk at Optical Fiber Communication Conference/International Conference on Integrated Optics and Optical Fiber Communication, San Jose, California, **TuM1** (1993).

P. A. Morton, V. Mizrahi, P. A. Andrekson, T. Tanbun-Ek, R. A. Logan, P. Lemaire, D. L. Coblentz, A. M. Sergent, K. W. Wecht, P. F. Sciortino Jr., ‘Mode-Locked Hybrid Soliton Pulse Source with Extremely Wide Operating Frequency Range’, IEEE Phot. Tech. Lett. **5**, January (1993).

P. A. Morton, R. A. Logan, T. Tanbun-Ek, P. F. Sciortino Jr., A. M. Sergent, R. K. Montgomery, B. T. Lee, ‘25 GHz Bandwidth 1.55 μ m GaInAsP P-Doped Strained Multiple-Quantum-Well Lasers’, Electron. Lett., **28**, p2156 (1992).

Invited speaker and panelist on ‘Compact Ultrashort Pulse Laser Sources’, Optical Society of America (OSA) Annual Meeting, Albuquerque, New Mexico, September (1992).

H. Lipsanen, D. L. Coblentz, R. A. Logan, R. D. Yadvish, **P. A. Morton**, H. Temkin, ‘High Speed InGaAsP/InP Multiple-Quantum-Well Laser’, IEEE Phot. Tech. Lett. **4**, p673 (1992).

P. A. Andrekson, N. A. Olsson, J. R. Simpson, D. J. Digiovanni, **P. A. Morton**, T. Tanbun-Ek, R. A. Logan, K. W. Wecht, ‘64 GB/s All Optical Demultiplexing with the Nonlinear Optical-Loop Mirror’, IEEE Phot. Tech. Lett. **4**, p644 (1992).

P. A. Morton, V. Mizrahi, S. G. Kosinski, L. F. Mollenauer, T. Tanbun-Ek, R. A. Logan, D. L. Coblentz, A. M. Sergent, K. W. Wecht, ‘Hybrid Soliton Pulse Source with Fiber Bragg Reflector’, Postdeadline paper, Conference on Lasers and Electro-Optics (CLEO) **CPD25**

(1992).

P. A. Morton, H. Temkin, D. L. Coblenz, R. A. Logan, T. Tanbun-Ek, 'Enhanced Modulation Bandwidth of Strained Multiple Quantum Well Lasers', *Appl. Phys. Lett.*, **60**, p1812 (1992).

P. A. Morton, H. Temkin, D. L. Coblenz, T. Tanbun-Ek, R. A. Logan, P. F. Sciortino Jr., A. M. Sergent, 'Enhanced Modulation Bandwidth of Long Wavelength Strained MQW Lasers', Talk and Proceedings paper at InP and Related Materials Conf., Newport, Rhode Island **FA2**, p614 (1992).

P. A. Morton, V. Mizrahi, S. G. Kosinski, L. F. Mollenauer, T. Tanbun-Ek, R. A. Logan, D. L. Coblenz, A. M. Sergent, K. W. Wecht, 'Hybrid Soliton Pulse Source with Fibre External Cavity and Bragg Reflector', *Electron. Lett.*, **28**, p561 (1992).

P. A. Morton, T. Tanbun-Ek, R. A. Logan, A. M. Sergent, P. F. Sciortino Jr., D. L. Coblenz, 'Frequency Response Subtraction for Simple Measurement of Intrinsic Laser Dynamic Properties', *IEEE Phot. Tech. Lett.* **4**, p133 (1992).

P. A. Morton, R. Adar, R. C. Kistler, C. H. Henry, T. Tanbun-Ek, R. A. Logan, D. L. Coblenz, A. M. Sergent, K. W. Wecht, 'Hybrid Soliton Pulse Source using a Silica Waveguide External Cavity and Bragg Reflector', Talk at Optical Fiber Communication Conference, San Jose, California, **ThB2** (1992).

P. A. Andrekson, N. A. Olsson, J. R. Simpson, D. J. Digiovanni, **P. A. Morton**, T. Tanbun-Ek, R. A. Logan, K. W. Wecht, 'Ultra-High Speed Demultiplexing with the Nonlinear Optical-Loop Mirror', Postdeadline paper, Optical Fiber Communication Conference, San Jose, California, **PD8** (1992).

P. A. Morton, 'Hybrid Soliton Pulse Source using a Silica Waveguide External Cavity and Bragg Reflector', Seminar given at the Jet Propulsion Labs, Los Angeles, and at the University of California at Santa Barbara, February (1992).

P. A. Morton, R. Adar, R. C. Kistler, C. H. Henry, T. Tanbun-Ek, R. A. Logan, D. L. Coblenz, A. M. Sergent, K. W. Wecht, 'Hybrid Soliton Pulse Source using a Silica Waveguide External Cavity and Bragg Reflector', *Appl. Phys. Lett.*, **59**, p2944 (1991).

D. J. Derickson, **P. A. Morton**, J. E. Bowers, R. L. Thornton, 'Comparison of Timing Jitter in External and Monolithic Cavity Mode-Locked Semiconductor Lasers', *Appl. Phys. Lett.*, **59**, p3372 (1991).

J. R. Karin, L. G. Melcer, R. Nagarajan, J. E. Bowers, S. W. Corzine, **P. A. Morton**, R. S. Geels, L. A. Coldren, 'Generation of Picosecond Pulses with a Gain-Switched GaAs Surface Emitting Laser', *Appl. Phys. Lett.*, **57**, p963 (1990).

P. A. Morton, D. L. Crawford, J. E. Bowers, 'Design of 1.3 μ m GaInAsP Surface Emitting Lasers for High Bandwidth Operation', *Optics Letters*, **15**, p679 (1990).

A. Mar, **P. A. Morton**, J. E. Bowers, 'Optimum Facet Reflectivity for High Speed Lasers', *Electron. Lett.*, **26**, p1382 (1990).

P. A. Morton, D. L. Crawford, J. E. Bowers, 'High Bandwidth Operation of 1.3 μ m GaInAsP Surface Emitting Lasers', Talk at the Conference on Lasers and Electro-Optics, Anaheim (1990).

- P. A. Morton**, 'Monolithic Mode Locked GaInAsP Lasers' Invited talk and proceedings paper, InP and Related Compounds Conference, **WA.1**, Denver (1990).
- P. A. Morton**, D. J. Derickson, R. J. Helkey, A. Mar, J. E. Bowers, 'Mode Locked Semiconductor lasers', Chapter in Volume 2 of The Physics of Optical Phenomena and Their Use as Probes of Matter, 'Laser Optics and Condensed Matter', Plenum Press, vol. 2, p401 (1990).
- P. A. Morton**, R. J. Helkey, A. Mar, D. J. Derickson, J. E. Bowers, 'Monolithic Mode Locked Laser Arrays in Optical Computing', SPIE Vol. 1215, Digital Optical Computing II, p94 (1990).
- P. A. Morton**, J. E. Bowers, 'Monolithic Mode Locked Laser Arrays in Optical Computing', Invited talk, Digital Optical Computing II, SPIE O/E LASE, Los Angeles (1990).
- P. A. Morton**, J. E. Bowers 'Monolithic Hybrid Mode Locked 1.3 μ m Semiconductor Lasers', Appl. Phys. Lett., **56**, p111 (1990).
- R. J. Helkey, **P. A. Morton**, J. E. Bowers, 'Partial Integration Method for Analysis of Mode Locked Semiconductor Lasers', Optics Letters, **15**, 112 (1990).
- D. Derickson, R. Helkey, A. Mar, **P. Morton**, J. Bowers, 'Self Mode Locking of a Semiconductor Laser Using Positive Feedback', Appl. Phys. Lett., **56**, 7 (1990).
- P. A. Morton**, R. J. Helkey, S. W. Corzine, J. E. Bowers, 'Subpicosecond Multiple Pulse Formation in Actively Mode Locked Semiconductor Lasers', book section in Springer Verlag, 'Picosecond Electronics and Optoelectronics' p87 (1990).
- P. A. Morton**, R. J. Helkey and J. E. Bowers, 'Dynamic Detuning in Actively Mode Locked Semiconductor Lasers', IEEE J. Quantum Electron., **QE-25**, p2621 (1989).
- P. A. Morton**, J. E. Bowers, L. A. Koszi, M. Soler, J. Lopata, D. P. Wilt; Monolithic hybrid mode locked 1.3 μ m semiconductor laser arrays, IEDM Tech. Dig., p865 - 868 (1989).
- P. A. Morton**, J. E. Bowers, R. Helkey, D. Derickson, A. Mar, 'High Speed Semiconductor Lasers and Applications in Subpicosecond Mode Locking', Invited talk, Lasers and Electro-Optics Society Conference, **OE7.1**, 65 (1989).
- D. Derickson, R. Helkey, A. Mar, **P. Morton**, J. Bowers, 'Self Mode Locking of a Semiconductor Laser Using Positive Feedback', Talk at the Lasers and Electro-Optics Society Conference, Florida (1989).
- J. E. Bowers, D. Derickson, A. Mar, **P. A. Morton**, and M. Rodwell, 'Phase Noise in Actively Mode Locked Semiconductor Lasers', Talk at the Seventh International Conference on Integrated Optics and Optical Fiber Communication, Kobe, Japan (1989).
- P. A. Morton**, R. F. Ormondroyd, J. E. Bowers, M. S. Demokan, 'Large-Signal Harmonic and Intermodulation Distortions in Wide-Bandwidth GaInAsP Semiconductor Lasers', IEEE J. Quantum Electron. **QE-25**, p1559 (1989).
- J. E. Bowers, **P. A. Morton**, A. Mar, S. W. Corzine, 'Actively Mode Locked Semiconductor Lasers', IEEE J. Quantum Electron. **QE-25**, p1426 (1989).
- Paul A. Morton**, J. E. Bowers, L. A. Koszi, M. Soler, J. Lopata, Daniel P. Wilt, 'Monolithic mode locked 1.3- μ m laser with active waveguide and saturable absorber', IEEE Trans. Electron

Devices, Vol. 36, p2607 - 2608, November 1989.

P. A. Morton, A. Mar, D. J. Derickson, S. W. Corzine, J. E. Bowers, 'Subpicosecond Multiple Pulse Formation in Actively Mode Locked Semiconductor Lasers', Talk at the Picosecond Electronics and Optoelectronics Conference, Salt Lake City, **ThB3** (1989).

P. A. Morton 'Use of High Speed Diode Lasers and Photodetectors', Invited talk, Picosecond Electronics Symposium, University of California at Los Angeles, March (1989).

J. E. Bowers, Y. G. Wey, A. Mar, **P. A. Morton**, and S. W. Corzine, "Modulation frequency dependency of active mode locking of semiconductor lasers," Talk at the 11th IEEE Intl. Semiconductor Laser Conference, paper **G-1**, Boston, MA, (1988).

J. E. Bowers, **P. A. Morton**, A. Mar, S. W. Corzine, 'Subpicosecond Pulses from Mode Locked Semiconductor Lasers', Invited talk, Lasers and Electro-Optics Society Conference, **OE9.1**, Santa Clara (1988).

P. A. Morton, "The Dynamics of Directly Modulated Semiconductor Lasers", Ph.D. Thesis, University of Bath, England, (1988).

P. A. Morton, R. F. Ormondroyd, 'Large Signal Analysis of Harmonic and Intermodulation Distortion in Ultra Wide Bandwidth Laser Diodes', Paper at the Conference on Lasers and Electro-Optics, Anaheim, USA, **WM11** (1988).

J. E. Bowers, **P. A. Morton**, 'Subpicosecond Stable Infrared Pulses from Mode-Locked Semiconductor Lasers', Talk at the Conference on Lasers and Electro-Optics, Anaheim, USA, **THX1** (1988).

P. A. Morton, 'Fiber Optic Incoherent Pulse Stretcher', M.Eng. Thesis, University of Bath, England, (1985).

R. F. Ormondroyd, T. E. Rozzi, **P. A. Morton**, J. Singh, 'Effect of Current Rise Time on Beam Stability in Twin Stripe Lasers', Electron. Lett., **20**, (1984).