

## Charles P. Baylis II, Ph.D.

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### Position

Professor, Department of Electrical and Computer Engineering, Baylor University, Waco, Texas  
Director, SMART Hub (Hub for Spectrum Management with Adaptive and Reconfigurable Technology)

### Education

*Doctor of Philosophy in Electrical Engineering, University of South Florida, Tampa, Florida, May 2007.*  
Dissertation Title: "Improved Techniques for Nonlinear Electrothermal FET Modeling and Measurement Validation." Ph.D. Advisors: L. Dunleavy and A.D. Snider.

*Master of Science in Electrical Engineering, University of South Florida, Tampa, Florida, May 2004.*

*Bachelor of Science in Electrical Engineering with Minor in Mathematics, University of South Florida, Tampa, FL, December 2002.*

### Research Interests

Real-time, reconfigurable microwave circuitry and waveform optimization for spectral coexistence, efficiency and linearity in power amplifier design, spectrum engineering and policy, nonlinear microwave measurements, and related system applications.

### Academic Employment History

*Professor, Department of Electrical and Computer Engineering, Baylor University, 2020 - .*

*Associate Professor, Department of Electrical and Computer Engineering, Baylor University, 2014-2020.*

*Assistant Professor, Department of Electrical and Computer Engineering, Baylor University, 2008-2014.*

*Visiting Assistant Professor, Department of Electrical Engineering, University of South Florida, May 2007-August 2008.*

*Adjunct Instructor, Department of Electrical Engineering, University of South Florida, May 2004 – May 2007.*

### Professional Society Memberships

Senior Member (2016 - ), Member (2008-2016), and Student Member (2003-2007), Institute of Electrical and Electronics Engineers (IEEE)

Senior Member (2016 - ), Member (2008-2016) and Student Member (2005-2007), IEEE Microwave Theory and Techniques Society.

Senior Member (2022 - ), IEEE Aerospace and Electronic Systems Society

Member (2015 - ), Commission E, International Radio Science Union (URSI) (2015-present)

## Research Funding

### Externally Funded Projects (With Sponsor)

- C. Baylis (PI), D. Sicker (Co-PI), "SMART Hub: Hub for Spectrum Management with Adaptive and Reconfigurable Technology," Army Research Laboratory/Huntington Ingalls Industries, October 2023 – February 2024, \$397,000 from letter subcontract (Contract fully executed and Task Order 1 \$992,964.58 offered by sponsor December 2023).
- C. Baylis (PI), R.J. Marks (Co-PI), "Intelligent Automated Amplifier Design and Measurement Optimization," Keysight Technologies, August 2023 – July 2024, \$120,000.
- C. Baylis (PI), R.J. Marks (Co-PI), "Cognitive RF Filtering for UWB SAR Radar," Army Research Laboratory, June 2023 – September 2024, \$155,000.
- C. Baylis (PI), R.J. Marks (Co-PI), "Conference: Undergraduate Spectrum Workshop," National Science Foundation, August 2022 – July 2024, \$99,000.
- C. Baylis (PI), R.J. Marks (Co-PI), "Collaborative Research: SWIFT: LARGE: Broker-Controlled Coexistence of 5G Wireless Artificially Intelligent Power Amplifier Array (AIPAA) with Passive Weather Radiometers," National Science Foundation, January 2021 – December 2024, \$479,202 (including \$57,536 NSF SII Graduate Research Supplement awarded in August 2022).
- C. Baylis (PI) and R.J. Marks (Co-PI), "Metacognition-Guided Real-Time Adaptable Circuit, Waveform, and Array Optimizations for Radar and Electronic Warfare," Army Research Office, September 2020 – September 2024, \$350,000.
- C. Baylis (PI), D. Sicker (Co-PI), S. Blunt (Co-PI), D. Peroulis (Co-PI), D. Jackson (Co-PI), R.J. Marks II (Co-PI), M. Abu Khater (Co-PI), "SII Planning: Developing a National Spectrum Innovation Initiative (SII) Center for Adaptive and Reconfigurable Wireless Technology," National Science Foundation, August 2020 – July 2024 \$299,996.
- C. Baylis, R.J. Marks II, NRL Radar Research, KeyWCorp/Naval Research Laboratory, April 2020 - March 2021, \$40,000.
- D. Peroulis (Purdue PI, Project Lead), A. Alexeenko (Purdue Co-PI), S. Macheret (Purdue Co-PI), A. Semnani (Purdue Co-PI), C. Baylis (Baylor PI), R.J. Marks II (Baylor Co-PI), J.G. Eden (Illinois PI), C. Baylis (Baylor PI), R.J. Marks II (Baylor Co-PI), "Wideband and High-Power Reconfigurable Plasma Matching Network for Compact and Efficient Phased Array Emitters," Office of Naval Research, July 2019 - September 2023, \$274,000 total Baylor funding.
- C. Baylis (PI), R.J. Marks II (Co-PI), "Reconfigurable Power Amplifier and Filter Technology for Real-time Adaptive Next Generation Radar," Additional Option Funding: Software Defined Radar, July 2018 – December 2022, \$265,000.
- C. Baylis (Entire Project PI), R.J. Marks II (Co-PI), Dimitrios Peroulis (Purdue PI), and Abbas Semnani (Toledo PI), "Real-Time Optimization of Fundamental and Harmonic Load Impedances, Source Impedance, Input Power, and Bias," July 2019-December 2019 (6 month base period), \$40,000 (The entire \$40,000 was awarded to Baylor: \$10,000 was subcontracted to Purdue, \$10,000 was subcontracted to Toledo, and \$20,000 was used for the Baylor part of the project (including F&A costs on the subcontracts. The total amount used for Baylor (including overhead but excluding subcontracts and related overhead is \$12,300. I serve as lead PI for the entire effort).
- C. Baylis (Entire Project PI), R.J. Marks II (Co-PI), Dimitrios Peroulis (Purdue PI), and Abbas Semnani (Purdue Co-PI), Army Research Laboratory, "Reconfigurable Power Amplifier and Filter Technology for Real-Time Adaptive Next Generation Radar," April 2016 – December 2018, \$873,455 (The entire \$873,455 was awarded to Baylor; \$510,631 was the amount of the subcontract to Purdue from Baylor and overhead, and \$362,824 was used for the Baylor part of the project. I served as lead PI for the entire effort.).
- C. Baylis (PI), and R.J. Marks II (Co-PI), National Science Foundation, "EARS: Joint Circuit and Waveform Optimization for Cognitive, Spectrally Confined Radar Transmission," October 2013 – September 2018, \$432,000.
- C. Baylis (PI) and R.J. Marks II (Co-PI), Raytheon, Topic Confidential, October 2016-August 2017, \$10,000.
- C. Baylis (PI), and R.J. Marks II (Co-PI), TEM Consulting, "Evaluation of Airport Wireless Interference Assessment and Comparison with University Campus Wireless Coexistence Challenges," October 2013 – September 2014, \$3,000.

- C. Baylis (PI), and R.J. Marks II (Co-PI), “Joint Optimization of Radar Power Amplifier and Waveform for Reduced Spectral Spreading,” Naval Research Laboratory, December 2011 – December 2012, \$60,000.
- C. Baylis (PI), TEM Consulting, Confidential Project Topic, November 2008 – December 2008, \$1,300.
- L. Dunleavy (PI) and C. Baylis (Co-PI), “Predicting Residual Phase Noise in Amplifiers and Frequency Multipliers”, TRAK Microwave, August 2007 – July 2008, \$12,000 + \$6,000 State of Florida I-4 High Tech Corridor Match = \$18,000.
- J. Wang (PI) and C. Baylis (Co-PI), “Characterization and Modeling for Improved Amplifier Design,” Modelithics, Inc., December 2007 – May 2009 (ended Co-PI status July 2008 upon moving to Baylor), \$25,000 + \$12,500 State of Florida I-4 High Tech Corridor Match = \$37,500.

#### Internally Funded Research Projects:

- C. Baylis (PI), “Enabling Cognitive Radar Through Waveform Diversity and Power Amplifier Circuit Optimization,” Baylor University Undergraduate Research and Scholarly Achievement Program (Office of the Vice Provost for Research), June 1, 2011 – May 31, 2012, \$5,000.
- C. Baylis (PI), “Characterization and Measurement of Nonlinear Power Amplifiers,” Baylor University Undergraduate Research and Scholarly Achievement Program (Office of the Vice Provost for Research), June 2010 – May 2011, \$5,000.
- C. Baylis (PI), “Combiner Design for Reducing Sidelobes in Radar Power Amplifiers,” Baylor University Young Investigator Development Program Grant (Office of the Vice Provost for Research), June 2009 – May 2010, \$25,000.

## Refereed Publications

### A. Book Chapter

#### Published (1):

1. C. Baylis, Chapter 12: “Adaptively Reconfigurable Radar: Joint Real-Time Optimization of the Transmitter Amplifier and Waveforms,” in *Radar and Communications Spectrum Sharing*, ed. S.D. Blunt and E.S. Perrins, IET Press, December 2018.

### B. Peer-Reviewed Journal Papers

#### Published or Accepted for Publication (32):

1. S. Haug, A. Goad, A. Egbert, C. Baylis, A. Martone, and R.J. Marks II, “Real-Time Circuit Optimizations for Dual-Function Radar-Communications,” *IEEE Transactions on Radar Systems*, accepted December 2023 for publication in *IEEE Transactions on Radar Systems*, published in early access December 2023 (submitted July 2023).
2. A.C. Goad, C. Baylis, T. Van Hoosier, A. Egbert, and R.J. Marks II, “In-Situ RF Current Assessment for Array Transmission and Optimization,” *IEEE Transactions on Microwave Theory and Techniques*, Vol. 71, No. 12, December 2023, pp. 5095-5103 (early access August 2023).
3. A.R. Yu, R.J. Marks II, K.E. Schubert, C. Baylis, A. Egbert, A. Goad, and S. Haug, “Dilated POCS: Minimax Convex Optimization,” *IEEE Access*, March 2023.
4. J. Roessler, A. Fisher, A. Egbert, Z. Vander Missen, T. Van Hoosier, C. Baylis, M. Abu Khater, D. Peroulis, and R.J. Marks II, “A Plasma-Switch Impedance Tuner with Microsecond Reconfiguration,” *IEEE Transactions on Microwave Theory and Techniques*, Vol. 71, No. 1, January 2023, pp. 296-308 (early access December 2022).
5. A. Egbert, C. Baylis, and R.J. Marks II, “Extrapolation of Load-Pull Data: A Novel Use of GAN Artificial Intelligence Image Completion,” *IEEE Transactions on Microwave Theory and Techniques*, Vol. 70, No. 11, November 2022, pp. 4849-4856.

6. G. Amigo, J.M. Bui, C. Baylis, and R.J. Marks, "Cascade Watchdog: A Multi-Tiered Adversarial Guard for Outlier Detection," *Signal, Image and Video Processing*, Springer, September 2022.
7. P. Rodriguez-Garcia, J. Sifri, C. Calabrese, A. Goad, C. Baylis, and R.J. Marks II, "Spurious Beam Suppression in Dual-Beam Phased Array Transmission by Impedance Tuning," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 58, No. 5, October 2022, pp. 3932-3945.
8. A. Egbert, A. Goad, C. Baylis, A.F. Martone, B.H. Kirk, and R.J. Marks II, "Continuous Real-Time Circuit Reconfiguration to Maximize Average Output Power in Cognitive Radar Transmitters," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 58, No. 3, June 2022, pp. 1514-1527.
9. A.F. Martone, B. Kirk, J. Kovarskiy, C. Thornton, B. Ravenscroft, M. Buehrer, S.D. Blunt, R. Narayanan, C. Baylis, and R.J. Marks II, "Closing the Loop on Cognitive Radar for Spectrum Sharing," *IEEE Aerospace and Electronic Systems Magazine*, Vol. 36, No. 9, September 2021, pp. 44-55.
10. A. Dockendorf, A. Egbert, E. Langley, C. Calabrese, J. Alcala-Medel, S. Rezayat, Z. Hays, C. Baylis, A. Martone, E. Viveiros, K. Gallagher, A. Semnani, and D. Peroulis, "Fast Optimization Algorithm for Evanescent-Mode Cavity Tuner Optimization and Timing Reduction in Software-Defined Radar Implementation," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 56, No. 4, August 2020, pp. 2762-2778.
11. C. Latham, A. Egbert, C. Baylis, L. Cohen, and R.J. Marks II, "Joint Radar Amplifier Circuit and Waveform Optimization for Ambiguity Function, Power-Added Efficiency, and Spectral Compliance," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 55, No. 3, June 2019, pp. 1190-1199.
12. S. Rezayat, C. Kappelmann, Z. Hays, L. Lamers, M. Fellows, C. Baylis, E. Viveiros, A. Hedden, J. Penn, and R.J. Marks II, "Real-Time Amplifier Load-Impedance Optimization for Adaptive Radar Transmitters Using a Nonlinear Tunable Varactor Matching Network," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 55, No. 1, February 2019, pp. 160-169.
13. M. Fellows, L. Lamers, C. Baylis, L. Cohen, and R.J. Marks II, "Bias Smith Tube Optimization of Drain Voltage and Load Reflection Coefficient to Maximize Power-Added Efficiency under ACPR Constraints for Radar Power Amplifiers," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 55, No. 1, February 2019, pp. 182-191.
14. M. Fellows, S. Rezayat, A. Magee, C. Baylis, and R.J. Marks II, "Reconfigurable Power Amplifier Optimization Algorithm to Maximize Power-Added Efficiency under Delivered Power and ACPR Constraints Using the Drain Voltage Smith Tube," accepted December 2017 for publication in *IEEE Transactions on Microwave Theory and Techniques*.
15. D. Eustice, C. Latham, C. Baylis, L. Cohen, and R.J. Marks II, "Amplifier-in-the-Loop Adaptive Radar Waveform Synthesis in a Dynamic Environment," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 53, No. 2, April 2017, pp. 826-836.
16. C. Baylis, L. Cohen, D. Eustice, and R.J. Marks II, "Myths Concerning Woodward's Ambiguity Function: Analysis and Resolution," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 52, No. 6, December 2016, pp. 2886-2895.
17. M. Fellows, L. Lamers, C. Baylis, L. Cohen, and R.J. Marks II, "A Fast Load-Pull Optimization for Power-Added Efficiency under Output Power and ACPR Constraints," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 52, No. 6, December 2016, pp. 2906-2916.

18. J. Barkate, M. Flachsbar, Z. Hays, M. Fellows, J. Barlow, C. Baylis, L. Cohen, and R.J. Marks II, "Fast, Simultaneous Optimization of Power Amplifier Input Power and Load Impedance for Power-Added Efficiency and Adjacent-Channel Power Ratio Using the Power Smith Tube," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 52, No. 2, April 2016, pp. 928-937.
19. C. Baylis, R.J. Marks II, and L. Cohen, "Pareto Optimization of Amplifier Source Impedance for Low Noise and High Gain," *International Journal of Microwave and Wireless Technologies*, October 2015.
20. M. Fellows, M. Flachsbar, J. Barlow, J. Barkate, C. Baylis, L. Cohen, and R.J. Marks II, "Optimization of Power Amplifier Load Impedance and Chirp Waveform Bandwidth for Real-Time Reconfigurable Radar," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 51, No. 3, July 2015, pp. 1961-1971.
21. M. Fellows, C. Baylis, L. Cohen, and R.J. Marks II, "Real-Time Load Impedance Optimization for Radar Spectral Mask Compliance and Power Efficiency," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 51, No. 1, January 2015, pp. 591-599.
22. M. Fellows, C. Baylis, J. Martin, L. Cohen, and R.J. Marks II, "Direct Algorithm for the Pareto Load-Pull Optimization of Power-Added Efficiency and Adjacent-Channel Power Ratio," *IET Radar, Sonar & Navigation*, Vol. 8, No. 9, December 2014, pp. 1280-1287.
23. J. Martin, C. Baylis, L. Cohen, J. de Graaf, and R.J. Marks II, "A Peak-Search Algorithm for Load-Pull Optimization of Power-Added Efficiency and Adjacent-Channel Power Ratio," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 62, No. 8, August 2014, pp. 1772-1783.
24. C. Baylis, M. Fellows, L. Cohen, and R.J. Marks II, "Solving the Spectrum Crisis: Intelligent, Reconfigurable Microwave Transmitter Amplifiers for Cognitive Radar," *IEEE Microwave Magazine*, Vol. 15, No. 5, July 2014, pp. 94-107.
25. C. Baylis, J. Martin, M. Moldovan, R.J. Marks II, L. Cohen, J. de Graaf, R. Johnk, and F. Sanders, "Spectrum Analysis Considerations for Radar Chirp Waveform Spectral Compliance Measurements," *IEEE Transactions on Electromagnetic Compatibility*, Vol. 56, No. 3, June 2014, pp. 520-529.
26. C. Baylis and R.J. Marks II, "Small Perturbation Harmonic Coupling in Nonlinear Periodicity Preservation Systems," *IEEE Transactions on Circuits and Systems I*, Vol. 59, No. 12, pp. 3034-3045, December 2012.
27. C. Baylis and R.J. Marks II, "Evaluation of Harmonic Coupling Weights in Nonlinear Periodicity Preservation Systems," *IEEE Transactions on Circuits and Systems I*, Vol. 59, No. 12, pp. 3024-3033, December 2012.
28. C. Baylis, L. Wang, M. Moldovan, J. Martin, H. Miller, L. Cohen, and J. de Graaf, "Designing Transmitters for Spectral Conformity: Power Amplifier Design Issues and Strategies," *IET Radar, Sonar & Navigation*, Vol. 5, No. 6, pp. 681-685, June 2011.
29. C. Baylis, J. Martin, M. Moldovan, and R.J. Marks II, "Going Nonlinear: Unlocking the Black-Box of Large-Signal Network Analysis," *IEEE Microwave Magazine*, Vol. 12, No. 2, April 2011, pp. 55-64.
30. C. Baylis, L. Dunleavy, S. Lardizabal, R.J. Marks II, and A. Rodriguez, "Efficient Optimization Using Experimental Queries: A Peak-Search Algorithm for Efficient Load-Pull Measurements," *Journal of Advanced Computational Intelligence and Intelligent Informatics*, Vol. 15, No. 1, January 2011, pp. 13-20.

31. L. Dunleavy, C. Baylis, W. Curtice, and R. Connick, "Modeling GaN: Challenging But Powerful," *IEEE Microwave Magazine*, October 2010.
32. S. Akamatsu, C. Baylis, and L. Dunleavy (invited), "Accurate Simulation Models Yield High Efficiency Power Amplifier Design," *IEEE Microwave Magazine*, December 2005.

Under Review/In Correspondence (3):

1. A.C. Goad, S.A. Seguin, C. Baylis, T. Van Hoosier, E. Lever, A.J. Gasiewski, A. Venkitasubramony, and R.J. Marks II, "Brokering Spectrum Sharing using Dynamic Spatial-Spectral Masks," submitted December 2023 to *IEEE Transactions on Electromagnetic Compatibility*, under review.
2. T. Van Hoosier, J. Alexander, M. Montgomery, A. Egbert, J. Roessler, C. Baylis, and R.J. Marks II, "A Hybrid Data Storage Method for Pulse-to-Pulse Optimizations," submitted December 2023 to *IEEE Transactions on Radar Systems*, under review.
3. S. Haug, R.J. Marks II, K. Schubert, A. Goad, A. Egbert, C. Baylis, and A. Martone, "Dilated POCS: A Versatile Generalization of Convex Optimization," submitted July 2023 to *ACM Transactions on Algorithms*, under review.

#### C. Peer-Reviewed Conference Papers

Published or Accepted for Publication (93):

1. A. Egbert, A. Goad, S. Haug, C. Baylis, B. Kirk, A. Martone, and R.J. Marks II, "In-Situ Measurement of Transmitter Antenna Input Current Using a Software-Defined Radio," Automatic RF Techniques Group Conference, San Diego, California, June 2023.
2. S. Haug, A. Egbert, R.J. Marks II, C. Baylis, A. Martone, and B. Kirk, "Directional Modulation for Multi-Node Interaction from an Artificially Intelligent Power Amplifier Array: Simultaneous Radar and Communication while Optimizing Circuit Performance," 2023 IEEE Radar Conference, San Antonio, Texas, May 2023.
3. T. Van Hoosier, J. Alexander, A. Egbert, J. Roessler, C. Baylis, and R.J. Marks, "Pulse-to-Pulse Circuit Reconfiguration in Spectrum Sensing Radar," 2023 IEEE Radar Conference, San Antonio, Texas, May 2023.
4. S. Haug, R.J. Marks II, C. Baylis, and A. Martone, "Changepoint Detection for Real-Time Spectrum Sharing Radar," 2023 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2023.
5. S. Hussey, A. Clegg, C. Baylis, A. Egbert, A. Goad, T. Van Hoosier, and R.J. Marks II, "Spectrum Sharing Policy for a Cooperative Broker System," 2023 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2023.
6. J. Roessler, A. Fisher, A. Egbert, T. Van Hoosier, C. Baylis, D. Peroulis, and R.J. Marks, "Steady-State Thermal Analysis on a Real-Time Plasma Impedance Tuner for High-Power RF Matching Applications," 2023 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2023.
7. C. Baylis, D. Roberson, S. Hussey, A. Egbert, A. Clegg, and R.J. Marks II, "Adaptive and Reconfigurable Collaboration between Aircraft Wireless Systems and Wireless Communications," 2023 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2023.

8. C. Baylis, A. Goad, T. Van Hoosier, A. Egbert, and R.J. Marks II, "In-Situ Assessment of Array Antenna Currents for Real-Time Impedance Tuning," 2022 IEEE Symposium on Phased Array Systems and Technology, Waltham, Massachusetts, October 2022.
9. A. Clegg, S.A. Seguin, C. Baylis, and R.J. Marks II, "Improving Spectrum Sharing Interference Criteria: A Survey of a Critical Need for Measurements," 2022 IEEE Electromagnetic Compatibility Symposium, Spokane, Washington, August 2022.
10. S.A. Seguin, T. Van Hoosier, A. Goad, C. Baylis, A. Gasiewski, and A. Venkitasubramony, "Spectrum Sharing Brokers for Active and Passive Devices," 2022 IEEE Electromagnetic Compatibility Symposium, Spokane, Washington, August 2022.
11. J. Roessler, A. Egbert, T. Van Hoosier, A. Goad, S. Seguin, A. Martone, C. Baylis, and R.J. Marks II, "A Fast Impedance Tuner Implementation in a Cognitive Radar for Synchronous Real Time Optimization in a Congested Environment," 2022 IEEE MTT-S International Microwave Symposium, Denver, Colorado, June 2022.
12. J. Roessler, A. Fisher, A. Egbert, Z. Vander Missen, T. Van Hoosier, C. Baylis, M. Abu Khater, D. Peroulis, and R.J. Marks II, "A Low-Loss Reconfigurable Plasma Impedance Tuner for Real-Time, Frequency-Agile, High-Power RF Applications," 2022 IEEE MTT-S International Microwave Symposium, Denver, Colorado, June 2022.
13. S. Haug, A. Goad, C. Baylis, A. Egbert, R.J. Marks II, S.A. Seguin, A. Martone, and B. Kirk, "The Effect of Amplifier Nonlinearities on Directionally Modulated Signals in Phased-Array Transmitters," 2022 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2022.
14. C. Baylis and R.J. Marks II, "Solving the 5G Crisis: Enabling Coexistence with Crucial Safety Systems through Adaptivity and Reconfigurability," 2022 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2022.
15. C. Baylis, A. Goad, R.J. Marks II, J. Alonzo, S.A. Seguin, A. Egbert, A. Martone, and B. Kirk, "Amplifier Impedance Reconfiguration and Directional Transmission Techniques for Multifunction Arrays," 2022 IEEE Radar Conference, New York, New York, March 2022.
16. A. Clegg, S. Seguin, C. Baylis, and R.J. Marks II, "Radar Sharing in the U.S. 3 GHz Band," 2022 IEEE Radar Conference, New York, New York, March 2022.
17. C. Calabrese, J. Roessler, A. Fisher, Z. Vander Missen, C. Baylis, M. Abu Khater, D. Peroulis, and R.J. Marks, "A Plasma-Switch Impedance Tuner for Real-Time, Frequency-Agile, High-Power Radar Transmitter Reconfiguration," 2021 IEEE MTT-S International Microwave Symposium, Atlanta, Georgia, June 2021.
18. P. Rodriguez-Garcia, J. Sifri, C. Calabrese, C. Baylis, and R.J. Marks II, "Range Improvement in Single-Beam Phased Array Radars by Amplifier Impedance Tuning," 2021 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, May 2021.
19. C. Baylis, D. Sicker, S. Blunt, E. Fernandez, A. Clegg, S. Hutton, Z. Han, D. Jackson, R. Henderson, R. Narayanan, A. Semnani, and T. Tuinstra, "SMART Hub: Solving the Spectrum Crisis through Parallel Research in Policy, Technology, Security, and Economics for Future Adaptive and Reconfigurable Wireless Systems," 2021 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, May 2021.
20. A. Egbert, A. Goad, C. Baylis, R.J. Marks II, and A. Martone, "Detecting Potential Performance Improvements in Cognitive Radar Systems," 2021 IEEE Radar Conference, Atlanta, Georgia, May 2021.

21. J. Roessler, A. Goad, A. Egbert, C. Baylis, A. Martone, R.J. Marks II, and B. Kirk, "Enhancing Frequency-Agile Radar Range over a Broad Operating Bandwidth with Reconfigurable Transmitter Amplifier Matching Networks," 2021 IEEE Radar Conference, Atlanta, Georgia, May 2021.
22. C. Baylis, R.J. Marks II, A. Egbert, and C. Latham, "Artificially Intelligent Power Amplifier Array (AIPAA): A New Paradigm in Reconfigurable Radar Transmission," 2021 IEEE Radar Conference, Atlanta, Georgia, May 2021.
23. A.F. Martone, K.D. Sherbondy, J.A. Kovarskiy, B.H. Kirk, J.W. Owen, B. Ravenscroft, A. Egbert, A. Goad, A. Dockendorf, C.E. Thornton, R.M. Buehrer, R.M. Narayanan, S. Blunt, and C. Baylis, "Practical Aspects of Cognitive Radar," 2020 IEEE Radar Conference, Rome, Italy, September 2020.
24. A. Egbert, B.H. Kirk, C. Baylis, A. Martone, and R.J. Marks II, "Fast Software-Defined Radio-Based System Performance Evaluation for Real-Time Adaptive RF Systems," Automatic RF Techniques Group Conference, June 2020.
25. C. Calabrese, A. Egbert, A. Dockendorf, C. Baylis, and R.J. Marks II, "Dynamic Online Learning Applied to Fast Switched-Stub Impedance Tuner for Frequency and Load Impedance Agility in Radar Applications," 2020 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, May 2020.
26. A. Egbert, A. Martone, C. Baylis, and R.J. Marks II, "Partial Load-Pull Extrapolation Using Deep Image Completion," 2020 IEEE Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, May 2020.
27. A.F. Martone, K.D. Sherbondy, J.A. Kovarskiy, B.H. Kirk, C.E. Thornton, J.W. Owen, B. Ravenscroft, A. Egbert, A. Goad, A. Dockendorf, R.M. Buehrer, R.M. Narayanan, S.D. Blunt, and C. Baylis, "Metacognition for Radar Coexistence," 2020 IEEE International Radar Conference, Bethesda, Maryland, April 2020.
28. A. Goad, A. Egbert, A. Dockendorf, C. Baylis, A. Martone, and R.J. Marks II, "Optimizing Transmitter Amplifier Load Impedance for Tuning Performance in a Metacognition-Guided, Spectrum Sharing Radar," 2020 IEEE International Radar Conference, Bethesda, Maryland, April 2020.
29. A. Dockendorf, A. Egbert, A. Goad, B. Ravenscroft, J. Owen, C. Baylis, S. Blunt, and A. Martone, "Impedance Tuning with Notched Waveforms for Spectrum Sharing in Cognitive Radar," 2020 IEEE International Radar Conference, Bethesda, Maryland, April 2020.
30. C. Calabrese, A. Dockendorf, A. Egbert, B. Herrera, C. Baylis, and R.J. Marks II, "Fast Switched-Stub Impedance Tuner Reconfiguration for Frequency and Beam Agile Radar," 2020 IEEE International Radar Conference, Bethesda, Maryland, April 2020.
31. A. Goad, C. Baylis, P. Flaten, B. Olson, and R.J. Marks II, "Algorithm for Fast Simultaneous Harmonic and Fundamental Impedance Tuning in Reconfigurable Radar Transmitter Power Amplifiers," 2020 IEEE International Radar Conference, Bethesda, Maryland, April 2020.
32. A. Dockendorf, A. Goad, C. Calabrese, B. Adkins, A. Egbert, J. Owen, B. Ravenscroft, C. Baylis, R.J. Marks II, S. Blunt, A. Martone, K. Sherbondy, E. Viveiros, "The Impact of Nonlinear Power Amplifier Load Impedance on Notched Waveforms for Cognitive Radar Spectrum Sharing," IEEE Radio and Wireless Symposium, San Antonio, Texas, January 2020.
33. C. Baylis, A. Egbert, J. Alcala-Medel, A. Dockendorf, A. Martone, and R.J. Marks II (invited), "Real-Time Circuit Reconfiguration for a Cognitive Software-Defined Radar Transmission: A New



Paradigm in Spectrum Sharing”, 2019 IEEE Electromagnetic Compatibility Symposium, New Orleans, Louisiana, July 2019.

34. J. Alcala-Medel, A. Egbert, C. Calabrese, A. Dockendorf, C. Baylis, G. Shaffer, A. Semnani, D. Peroulis, A. Martone, E. Viveiros, and R.J. Marks II, “Fast Frequency-Agile Real-Time Optimization of High-Power Tuning Network for Cognitive Radar Applications,” 2019 IEEE MTT-S International Microwave Symposium, Boston, Massachusetts, June 2019.
35. C. Baylis, A. Egbert, J. Alcala-Medel, A. Dockendorf, C. Calabrese, E. Langley, A. Martone, K. Gallagher, E. Viveiros, D. Peroulis, A. Semnani, and R.J. Marks II (invited), “Reconfigurable and Adaptive Radar Amplifiers for Spectrum Sharing in Cognitive Radar,” 2019 IEEE Radar Conference, Boston, Massachusetts, April 2019.
36. A. Egbert, K. Gallagher, B. Kirk, M. Kozy, A. Martone, C. Baylis, E. Viveiros, and R.J. Marks II, “The Effect of Real-Time Radar Transmitter Amplifier Impedance Tuning on Range and Doppler Detection Accuracy,” 2019 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, March 2019.
37. P. Rodriguez-Garcia, A. Egbert, C. Baylis, and R.J. Marks II, “Spatial-Spectral Coexistence: Search Radar Transmission Synthesis Using a Spatial Mask,” 2019 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, March 2019.
38. A. Dockendorf, E. Langley, C. Baylis, A. Martone, K. Gallagher, and E. Viveiros, “Faster Frequency-Agile Reconfiguration of a High-Power Cavity Tuner for Cognitive Radar Using Previous Search Results,” 2019 IEEE Radio and Wireless Symposium, Orlando, Florida, January 2019.
39. P. Rodriguez-Garcia, G. Ledford, C. Baylis, and R.J. Marks II, “Real-Time Synthesis of Simultaneous Radar and Spatially Secure Communications from a Common Phased Array,” 2019 IEEE Radio and Wireless Symposium, Orlando, Florida, January 2019.
40. S. Rezayat, C. Kappelmann, Z. Hays, L. Hays, C. Baylis, E. Viveiros, A. Semnani, and D. Peroulis, “Real-Time Frequency-Agile Circuit Reconfiguration for S-Band Radar Using a High-Power Tunable Resonant Cavity Matching Network,” 2018 IEEE MTT-S International Microwave Symposium, Philadelphia, Pennsylvania, June 2018.
41. C. Baylis, R.J. Marks II, L. Hays, Z. Hays, S. Rezayat, C. Kappelmann, M. Abu Khater, A. Semnani, and D. Peroulis, “Frequency-Agile and Spectrally Sensitive Radar Transmitter Amplifier Optimizations,” 2018 IEEE Radar Conference, Oklahoma City, Oklahoma, April 2018.
42. L. Hays, A. Egbert, Z. Hays, C. Baylis, R.J. Marks II, C. Kappelmann, and E. Viveiros, “Real-Time Instability Detection for a Reconfigurable Power Amplifier,” 2018 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2018.
43. A. Egbert, C. Latham, C. Baylis, and R.J. Marks II, “Multi-Dimensional Coexistence: Using a Spatial-Spectral Mask for Spectrum Sharing in Directional Radar and Communication,” 2018 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2018.
44. Z. Hays, C. Kappelmann, L. Lamers, C. Baylis, M. Abu Khater, A. Semnani, D. Peroulis, E. Viveiros, and J. Penn, “Fast Impedance Matching Using Interval Halving of Resonator Position Numbers for a High-Power Evanescent-Mode Cavity Tuner,” 2018 IEEE Radio and Wireless Symposium, Anaheim, California, January 2018.
45. L. Lamers, Z. Hays, C. Kappelmann, S. Rezayat, M. Fellows, E. Walden, A. Egbert, C. Baylis, R.J. Marks II, E. Viveiros, J. Penn, A. Hedden, and A. Darwish, “Comparison of Bias-Voltage and Reflection-Coefficient Based Reconfiguration of a Tunable-Varactor Matching Network for

Adaptive Amplifiers," 2017 IEEE Wireless and Microwave Technology Conference (WAMICON 2017), Cocoa Beach, Florida, April 2017.

46. L. Lamers, E. Walden, C. Baylis, E. Viveiros, and R.J. Marks II, "Fast Design of Unconditionally Stable Power Amplifier Using the Center Frequency Smith Tube," 2017 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, March 2017.
47. S. Rezayat, C. Baylis, R.J. Marks II, and E. Viveiros, "Measurement of Load-Pull Performance in the Power Smith Tube Using a Tunable Varactor Matching Network," 2017 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, March 2017.
48. Z. Hays, C. Baylis, R.J. Marks II, M. Abu Khater, A. Semnani, D. Peroulis, and E. Viveiros, "Fast Amplifier PAE Optimization Using Resonant Cavity Interval Halving with an Evanescent-Mode Cavity Tuner," 2017 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, March 2017.
49. C. Latham, M. Fellows, C. Baylis, L. Cohen, and R.J. Marks II, "Radar Waveform Optimization for Ambiguity Function Properties and Dynamic Spectral Mask Requirements Based on Communication Receiver Locations," 2017 IEEE Radio and Wireless Symposium, Phoenix, Arizona, January 2017.
50. Z. Hays, C. Kappelmann, S. Rezayat, M. Fellows, L. Lamers, M. Flachsbar, J. Barlow, C. Baylis, E. Viveiros, A. Darwish, A. Hedden, J. Penn, and R.J. Marks II, "Real-Time Amplifier Optimization Algorithm for Adaptive Radio Using a Tunable-Varactor Matching Network," 2017 IEEE Radio and Wireless Symposium, Phoenix, Arizona, January 2017.
51. A. Tsatsoulas, J. Barkate, C. Baylis, R.J. Marks II, and L. Cohen, "A Simplex Optimization Technique for Real-Time, Reconfigurable Transmitter Power Amplifiers," IEEE MTT-S International Microwave Symposium, San Francisco, California, May 2016.
52. C. Baylis, M. Fellows, J. Barkate, A. Tsatsoulas, S. Rezayat, L. Lamers, L. Cohen, and R.J. Marks II, "Circuit Optimization Algorithms for Real-Time Spectrum Sharing Between Radar and Communications," IEEE Radar Conference, Philadelphia, Pennsylvania, May 2016.
53. J. Barkate, A.P. Tsatsoulas, C. Baylis, L. Cohen, and R.J. Marks II, "Comparison of Multidimensional Circuit Optimization Techniques for Real-Time Transmitter Use," 2016 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, March 2016.
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55. J. Barkate, A. Tsatsoulas, M. Fellows, M. Flachsbar, C. Baylis, L. Cohen, and R.J. Marks II, "Fast, Momentum-Aided Optimization of Transmitter Amplifier Load Impedance and Input Power for Cognitive Radio Using the Power Smith Tube," 2016 IEEE Radio and Wireless Symposium, Austin, Texas, January 2016.
56. M. Fellows, S. Rezayat, J. Barlow, J. Barkate, A. Tsatsoulas, C. Baylis, L. Cohen, and R.J. Marks II, "The Bias Smith Tube: Simultaneous Optimization of Bias Voltage and Load Impedance in Power Amplifier Design," 2016 IEEE Radio and Wireless Symposium, Austin, Texas, January 2016.
57. D. Eustice, C. Baylis, L. Cohen, and R.J. Marks II, "Waveform Synthesis via Alternating Projections with Ambiguity Function, Peak-to-Average Power Ratio, and Spectrum Requirements," 2016 IEEE Radio and Wireless Symposium, Austin, Texas, January 2016.

58. M. Fellows, J. Barlow, M. Flachsbart, J. Barkate, C. Baylis, L. Cohen, and R.J. Marks II, "Fast Radar Power Amplifier Optimization for Bandwidth, Efficiency, and Spectral Confinement Using the Smith Tube," 2015 IEEE Radar Conference, Arlington, Virginia, May 2015.
59. D. Eustice, C. Baylis, L. Cohen, and R.J. Marks II, "Effects of Power Amplifier Nonlinearities on the Radar Ambiguity Function," 2015 IEEE Radar Conference, Arlington, Virginia, May 2015.
60. R.J. Marks II, D. Eustice, and C. Baylis, "Woodward's Ambiguity Function: From Foundations to Applications," 2015 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2015.
61. D. Eustice, C. Baylis, C. Latham, R.J. Marks II, L. Cohen, "Optimizing Radar Waveforms Using Generalized Alternating Projections," 2015 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2015.
62. J. Barkate, J. Barlow, M. Fellows, C. Baylis, L. Cohen, and R.J. Marks II, "The Power Smith Tube: Joint Optimization of Power Amplifier Input Power and Load Impedance for Power-Added Efficiency and Adjacent-Channel Power Ratio," 2015 IEEE Wireless and Microwave Technology Conference (WAMICON 2015), Cocoa Beach, Florida, April 2015.
63. M. Fellows, J. Barlow, C. Baylis, J. Barkate, R.J. Marks II, "Designing Power Amplifiers for Spectral Compliance Using Spectral Mask Load-Pull Measurements," 2015 IEEE Conference on Power Amplifiers for Wireless and Radio Applications (PAWR), San Diego, California, January 2015.
64. C. Baylis, M. Fellows, M. Flachsbart, J. Barlow, J. Barkate, and R.J. Marks II, "Enabling the Internet of Things: Reconfigurable Power Amplifier Techniques Using Intelligent Algorithms and the Smith Tube," Dallas Circuits and Systems Conference, Richardson, Texas, October 2014.
65. M. Fellows, M. Flachsbart, J. Barlow, C. Baylis, and R.J. Marks II, "The Smith Tube: Selection of Radar Chirp Waveform Bandwidth and Power Amplifier Load Impedance Using Multiple Bandwidth Load-Pull Measurements," 2014 IEEE Wireless and Microwave Technology Conference (WAMICON 2014), Tampa, Florida, June 2014.
66. Z. Hays, G. Richter, S. Berger, C. Baylis, and R.J. Marks II, "Alleviating Airport Wi-Fi Congestion: A Comparison of 2.4 GHz and 5 GHz WiFi Usage and Capabilities," 2014 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2014.
67. M. Fellows, J. Barlow, J. Barkate, M. Mosley, M. Flachsbart, C. Baylis, L. Cohen, and R.J. Marks II, "Measurement-Based Radar Waveform Optimization Using the Ambiguity Function and Spectral Mask," 2014 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2014.
68. M. Fellows, C. Baylis, L. Cohen, and R.J. Marks II, "Calculation of the Radar Ambiguity Function from Time-Domain Measurement Data for Real-Time, Amplifier-in-the-Loop Waveform Optimization," Automatic RF Techniques Group (ARFTG) Conference, Columbus, Ohio, December 2013.
69. C. Baylis, J. Martin, M. Fellows, D. Moon, M. Moldovan, L. Cohen, and R.J. Marks II, "Radar Power Amplifier Circuit and Waveform Optimization for Spectrally Confined, Reconfigurable Radar Systems," IEEE Radar Conference, Ottawa, Ontario, Canada, May 2013.
70. M. Fellows, C. Baylis, L. Cohen, and R.J. Marks II, "Radar Waveform Optimization to Minimize Spectral Spreading and Achieve Target Detection," 2013 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, April 2013.

71. J. Martin, M. Moldovan, C. Baylis, R.J. Marks II, L. Cohen, and J. de Graaf, "Radar Chirp Waveform Selection and Circuit Optimization Using ACPR Load-Pull Measurements," IEEE Wireless and Microwave Technology Conference, Cocoa Beach, Florida, April 2012.
72. C. Baylis, J. Martin, M. Moldovan, O. Akinbule, and R.J. Marks II, "A Test Platform for Real-Time Waveform and Impedance Optimization in Microwave Radar Systems," International Waveform Diversity and Design Conference, Kauai, Hawaii, January 2012.
73. M. Moldovan, C. Baylis, R.J. Marks II, M. Wicks, and J. Martin, "Chirp Optimization Using Piecewise Linear Approach," International Waveform Diversity and Design Conference, Kauai, Hawaii, January 2012.
74. J. Martin, C. Baylis, R.J. Marks II, and M. Moldovan, "Perturbation Size and Harmonic Limitations in Affine Approximation for Time Invariant Periodicity Preservation Systems," International Waveform Diversity and Design Conference, Kauai, Hawaii, January 2012.
75. C. Baylis and R.J. Marks II, "Frequency Multiplexing Tickle Tones to Determine Harmonic Coupling Weights in Nonlinear Systems," Automatic RF Techniques Group (ARFTG) Conference, Tempe, Arizona, December 2011.
76. C. Baylis, B.R. Jean, J. Martin, L. Wang, M. Moldovan, and H. Miller, "Load-Impedance Dependence of Self-Heating Effects in Nonlinear Transistor Measurement and Operation," Automatic RF Techniques Group (ARFTG Conference), December 2010, Clearwater, Florida.
77. C. Baylis, L. Wang, M. Moldovan, J. Martin, H. Miller, L. Cohen, and J. de Graaf, "Designing for Spectral Conformity: Achieving Linearity and Efficiency in Power Amplifiers," IEEE Conference on Waveform Diversity, Niagara Falls, Ontario, Canada, August 2010.
78. C. Baylis, M. Moldovan, L. Wang, J. Martin, L. Cohen, and J. de Graaf, "LINC Power Amplifiers for Reducing Out-of-Band Spectral Re-growth: A Comparative Study," IEEE Wireless and Microwave Technology Conference, Melbourne, Florida, April 2010.
79. C. Baylis, J. Perry, M. Moldovan, R. Marks II, and L. Dunleavy, "Use of a Step-Response Approximation for Thermal Transient Modeling in Power MOSFETs," Automatic RF Techniques Group (ARFTG) Conference, Broomfield, Colorado, December 2009.
80. S. Meena, C. Baylis, L. Dunleavy, and M. Marbell, "Duty Cycle Dependent Pulsed IV Simulation and Thermal Time Constant Extraction for LDMOS Transistors," Automatic RF Techniques Group (ARFTG) Conference, Broomfield, Colorado, December 2009.
81. C. Baylis and L. Dunleavy (invited), "Electrothermal Nonlinear FET Modeling for Spectral Prediction," 2009 IEEE Electromagnetic Compatibility Symposium, Austin, Texas, August 2009.
82. C. Baylis, L. Dunleavy, and R. Connick (invited), "Modeling Considerations for GaN HEMT Devices," 2009 IEEE Wireless and Microwave Technology Conference (WAMICON), Clearwater, Florida, April 2009.
83. C. Baylis and R. Jean, "A Course Sequence in High Frequency Electronics with Hands-On Laboratory Experiments," American Society of Engineering Education (ASEE) Gulf Southwest Conference, Waco, Texas, March 2009.
84. S. Meena, C. Baylis, and L. Dunleavy, "Benchmarking Comparison of Thermal and Diode Sensors for Pulsed Power Measurement," 72<sup>nd</sup> Automatic RF Techniques Group Conference, Portland, Oregon, December 2008.

85. C. Baylis and L. Dunleavy, "Voltage Transient Measurement and Extraction of Power RF MOSFET Thermal Time Constants," 70<sup>th</sup> Automatic RF Techniques Group Conference, Tempe, Arizona, November 2007.
86. C. Baylis, S. Lardizabal, and L. Dunleavy, "A Fast Sequential Load-Pull Algorithm Implemented to Find Maximum Power," IEEE Wireless and Microwave Technology Conference (WAMICON 2006), Clearwater, Florida, December 2006.
87. C. Baylis, L. Dunleavy, and J. Martens, "Constructing and Benchmarking a Pulsed S-Parameter System," 66<sup>th</sup> Automatic RF Techniques Group Conference, December 2005, Washington, D.C.
88. R. Varanasi, C. Baylis, L. Dunleavy, and W. Clausen, "Prediction of Harmonic Tuning Performance in pHEMTs," 2005 IEEE Wireless and Microwave Technology Conference, Clearwater, Florida, April 2005.
89. C. Baylis, L. Dunleavy, and A. Snider, "The Normalized Difference Unit as a Metric for Comparing IV Curves," 64<sup>th</sup> Automatic RF Techniques Group Conference, Orlando, Florida, December 2004.
90. C. Baylis, L. Dunleavy, P. Ladbroke, and J. Bridge, "The Influence of Pulse Separation and Instrument Input Impedance on Pulsed IV Measurement Results," 63<sup>rd</sup> Automatic RF Techniques Group Conference, Fort Worth, Texas, June 2004.
91. C. Baylis, L. Dunleavy, and J. Daniel, "Direct Measurement of Thermal Circuit Parameters Using Pulsed IV and the Normalized Difference Unit," IEEE Microwave Theory and Techniques Society International Microwave Symposium, Fort Worth, Texas, June 2004.
92. C. Baylis, L. Dunleavy, and J. Daniel, "Thermal Correction of IV Curves for Nonlinear Transistor Modeling," IEEE 2004 Wireless and Microwave Technology Conference, Clearwater, Florida, April 2004.
93. C. Baylis and L. Dunleavy, "Understanding Pulsed IV Measurement Waveforms," *Eleventh IEEE International Symposium on Electron Devices for Microwave and Optoelectronic Applications* (EDMO 2003).

Under Review/In Correspondence (4):

1. J. Roessler, E. Lever, A. Egbert, C. Baylis, R.J. Marks II, B. Kirk, and A. Bouvy, "An Overview of Tunable Notch Filters for Radar Systems," submitted December 2023 to 2024 IEEE Radar Conference, Denver, Colorado, May 2024.
2. S. Haug, A.C. Goad, A. Egbert, C. Baylis, A. Marone, B. Kirk, and R.J. Marks II, "Fully Reconfigurable Power Amplifier Array Design," submitted December 2023 to 2024 IEEE Radar Conference, Denver, Colorado, May 2024.
3. S. Haug, J. Swindell, A. Goad, C. Baylis, J. Boh, M. Ozalas, A. Howard, D. McLearnon, C. Latham, and R.J. Marks II, "Dynamic Faceting in RF Amplifier Design," submitted December 2023 to 2024 IEEE MTT-S International Microwave Symposium, Washington, D.C., June 2024.
4. S. Hussey, J. Swindell, A.C. Goad, A. Egbert, A. Clegg, C. Baylis, and R.J. Marks II, "Assessing Aggregate Interference with Mamdani Fuzzy Interference Systems," submitted December 2023 to 2024 IEEE International Symposium on Dynamic Spectrum Access Networks, Washington, D.C., May 2024.

## Additional Publications

A. Trade Magazine Articles (2):

1. C. Baylis, L. Dunleavy, and W. Clausen, "Design of Bias Tees for Pulsed-Bias S-Parameter Measurements Using Accurate Component Models," *Microwave Journal*, October 2006.
2. C. Baylis, L. Dunleavy, and W. Clausen, "Not So Fast: The Importance of a Slow Sweep Rate in DC-IV Measurements," *Microwave Journal*, March 2005.

**B. Master's Thesis and Ph.D. Dissertation (2):**

1. C. Baylis, Improved Techniques for Nonlinear Electrothermal FET Modeling and Measurement Validation, Doctoral Dissertation, University of South Florida, 2007.
2. C. Baylis, Improved Current-Voltage Methods for RF Transistor Characterization, Master's Thesis, April 2004, University of South Florida, Tampa, Florida.

## **Presentations and Seminars**

**A. Abstracts/Other Conference and Meeting Presentations:**

Other Conference Presentations:

1. T. Van Hoosier, J. Alexander, A. Egbert, J. Roessler, C. Baylis, and R.J. Marks, "Implementing a Hybrid Data Storage Technique within a Cognitive Radar to Allow for Pulse-to-Pulse Optimizations," USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2023.
2. S. Hussey, A. Clegg, T. Van Hoosier, A. Goad, A. Egbert, C. Baylis, and R.J. Marks, "Development of a Regulatory Solution for Extending Real-Time Spectral Brokering to Novel Frequency Bands," USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2023.
3. J. Roessler, A. Egbert, T. Van Hoosier, C. Baylis, and R.J. Marks, "Improving High-Power Handling on a Real-Time Switched-Network Impedance Tuner," USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2023.
4. S. Haug, A. Egbert, A. Goad, C. Baylis, and R.J. Marks, "Optimizing Directionally Modulated Power-Amplifier Array Transmissions with Impedance Tuning and Signal Equalization," USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2023.
5. A. Goad, T. Van Hoosier, A. Egbert, C. Baylis, and R.J. Marks, "Implementation and Validation of an In-Situ Measurement Technique for Antenna Input Current in a Reconfigurable-Circuit Array," USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2023.
6. C. Baylis (invited), "Adaptive and Reconfigurable Circuit Technology for Wireless Coexistence," WInnComm 2022, Virtual, December 2022.
7. C. Baylis, "A New Radar Spectrum-Use Paradigm," presented as part of Young Professionals Radar Panel Session, 2022 IEEE MTT-S International Microwave Symposium, Denver, Colorado, June 2022.
8. C. Baylis and S.A. Seguin, "Spatial-Spectral Broker and Array Impedance Tuning for Real-Time Active/Passive System Spectral Coexistence," in workshop WMJ: "Microwave Techniques for Coexistence between 5G and Passive Scientific Systems," 2022 IEEE MTT-S International Microwave Symposium, Denver, Colorado, June 2022.
9. C. Baylis, "Adaptive and Reconfigurable Circuits and Systems for Real-Time Spectrum Sharing," presented as part of Panel Session: "Advanced Wireless Research in the State of Texas," 2022 IEEE Wireless Communications and Networking Conference, Austin, Texas, April 2022.

10. T. Van Hoosier, K. Sanders, C. Baylis, S. Seguin, A Goad, and R.J. Marks II, "Creation of a Spatial-Spectral Mask in a Spectrally Brokered System," 2022 USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2022.
11. C. Baylis, S. Seguin, A. Clegg, and R.J. Marks II, "Enabling Crucial Scientific and Military Systems for Coexistence with 5G," 2022 USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2022.
12. S. Seguin, K. Sanders, T. Van Hoosier, A. Goad, C. Baylis, and R.J. Marks II, "Spectrum Sharing Broker for Active and Passive Devices Considering In-Band and Out-of-Band Emissions," 2022 USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2022.
13. S. Haug, A. Egbert, C. Baylis, and R.J. Marks II, "Changepoint Detection for Real-Time Spectrum Sharing Radar," 2022 USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2022.
14. A. Goad, J. Alonzo, A. Egbert, S. Seguin, C. Baylis, and R.J. Marks II, "Directional Modulation and Array Impedance Tuning for Secure Radar and Communications," 2022 USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2022.
15. A. Egbert, C. Baylis, and R.J. Marks II, "Circuit Optimization of Non-Linear Transmit Amplifiers using Partial Load-Pull Image Completion," 2022 USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2022.
16. A. Goad, C. Baylis, S. Seguin, and R.J. Marks II, "Optimization Approach for a High Power array Based System with Elementwise Power Amplifier Impedance Tuning using a Combination of Digital and Continuous Search Algorithms for 5G Systems," 2022 USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2022.
17. J. Roessler, A. Egbert, C. Baylis, R.J. Marks II, C. Laktasic, Z. Vander Missen, A. Fisher, M. Abu Khater, and D. Peroulis, "High-Power, Plasma-Switched, Lumped-Element Reconfigurable Impedance Tuner for Radar Transmitter Applications," 2022 USNC-URSI National Radio Science Meeting, Boulder, Colorado, January 2022.
18. S.A. Seguin, C. Baylis, and R.J. Marks, "The Radar, Communication, and Passive Device Spectrum Environment: Issues and Solutions," 2021 IEEE International Symposium on Electromagnetic Compatibility, Signal, and Power Integrity, Military EMC Workshop, Virtual, August 2021.
19. C. Baylis, R.J. Marks II, and S. Seguin, "Reconfigurable Impedance Tuning for Radar Transmitter Spectrum Sharing," 2021 IEEE International Symposium on Electromagnetic Compatibility, Signal, and Power Integrity, Military EMC Workshop, Virtual, August 2021.
20. C. Baylis, D. Sicker, S. Blunt, Z. Han, D.R. Jackson, R. Narayanan, A. El Gamal, E. Perrins, and R.J. Marks II, "Multi-Level Adaptive and Reconfigurable Wireless Systems for Spectrum Sharing," 2021 URSI National Radio Science Meeting, Boulder, Colorado, January 2021.
21. J. Roessler, A. Goad, A. Egbert, C. Baylis, A Martone, R.J. Marks II, and B. Kirk, "A Comparison of Fixed Broadband and Tunable Narrowband Output Matching Networks in a Power Amplifier for Improvements in Radar Range," 2021 URSI National Radio Science Meeting, Boulder, Colorado, January 2021.
22. A. Egbert, A. Goad, B. Kirk, C. Baylis, A. Martone, and R.J. Marks II, "Continuous Real-Time Circuit Reconfiguration to Optimize Average Performance for Spectrum-Sharing Radar Transmitters," 2021 URSI National Radio Science Meeting, Boulder, Colorado, January 2021.

23. C. Calabrese, A. Egbert, J. Roessler, A. Fisher, C. Baylis, M. Abu Khater, D. Peroulis, and R.J. Marks II, "Toward a High Power, High Speed Plasma-Switch Impedance Tuner Under Software-Defined Radio Control," 2021 URSI National Radio Science Meeting, Boulder, Colorado, January 2021.
24. A. Goad, C. Baylis, L. Cohen, R.J. Marks II, and S. Seguin, "An Algorithm for the Optimization of a Dual-Beam Steerable Phased Array System with Real-Time Reconfigurable Element-Wise Power Amplifier Load Impedance Tuners," 2021 URSI National Radio Science Meeting, Boulder, Colorado, January 2021.
25. P. Rodriguez-Garcia, J. Sifri, C. Calabrese, C. Baylis, and R.J. Marks II, "Element-Wise Impedance Tuning for Improved Capabilities in Single-Beam and Dual-Beam Phased Array Transmitters," 2020 URSI North American Radio Science Meeting, Montreal, Canada, July 2020.
26. A. Egbert, C. Baylis, A. Martone, and R.J. Marks II, "Recursive Interval-Halving Method for Generating Model Independent Impedance Tuner Characterizations," 2020 URSI North American Radio Science Meeting, Montreal, Canada, July 2020.
27. C. Baylis and R.J. Marks II, "Artificially Intelligent Power Amplifiers in Radar Arrays: Unlocking High-Range Detection while Sharing Spectrum," 2020 URSI North American Radio Science Meeting, Montreal, Canada, July 2020.
28. C. Calabrese, A. Egbert, A. Dockendorf, B. Herrera, C. Baylis, and R.J. Marks II, "Microsecond Reconfiguration of Switched-Stub Impedance Tuner for Software-Defined Radar Transmitter Amplifiers for Varying Frequency and Antenna Impedance," 2020 URSI North American Radio Science Meeting, Montreal, Canada, July 2020.
29. A. Goad, A. Egbert, A. Dockendorf, C. Baylis, A. Martone, B. Kirk, and R.J. Marks II, "Real-Time Circuit Reconfiguration to Maximize Average Output Power using a Weighted Average Gradient Search in a Metacognition-Guided Spectrum Sharing Radar with Quickly Changing Operating Frequencies," 2020 URSI North American Radio Science Meeting, Montreal, Canada, July 2020.
30. C. Baylis, "Radar Transmitter Design Issues for Spectral Coexistence with Other Wireless Users," Invited Tutorial, 2019 Texas Symposium on Wireless and Microwave Circuits and Systems, Waco, Texas, March 2019.
31. A. Dockendorf, E. Langley, A. Egbert, C. Baylis, A. Semnani, D. Peroulis, A. Martone, E. Viveiros, and R.J. Marks III, "Frequency-Agile Reconfiguration for a High-Power Resonant Cavity Tuner Using Previous Search Results," URSI National Radio Science Meeting, Boulder, Colorado, January 2019.
32. J. Alcala-Medel, C. Calabrese, C. Baylis, A. Martone, K. Gallagher, E. Viveiros, A. Semnani, and D. Peroulis, "Fast Reconfiguration of Second-Generation Tunable Evanescent-Mode Cavity Matching Network for Frequency Agility in S-Band Cognitive Radar Applications," URSI National Radio Science Meeting, Boulder, Colorado, January 2019.
33. C. Baylis, A. Martone, K. Gallagher, E. Viveiros, D. Peroulis, and R.J. Marks II (invited), "Software Defined, Spectrally Sensitive Radar Transmission," URSI National Radio Science Meeting, Boulder, Colorado, January 2019.
34. P. Rodriguez-Garcia, A. Egbert, G. Ledford, C. Baylis, L. Cohen, and R.J. Marks II, "Real-Time Synthesis Approach for Coexistence of Radar and Communications in the Spatial-Spectral Domain," URSI National Radio Science Meeting, Boulder, Colorado, January 2019.
35. G. Ledford, P. Rodriguez-Garcia, C. Baylis, and R.J. Marks II, "Approach for Real-Time Synthesis of Simultaneous Radar and Spatially Secure Communications from a Common Phased Array," URSI National Radio Science Meeting, Boulder, Colorado, January 2019.



36. A. Egbert, K. Gallagher, C. Baylis, A. Martone, E. Viveiros, and R.J. Marks II, "Effects of Time-Varying Transmit Amplifier Matching Networks in Cognitive Radar Applications," URSI National Radio Science Meeting, Boulder, Colorado, January 2019.
37. C. Baylis, D. Peroulis, A. Semnani, E. Viveiros, L. Cohen, and R.J. Marks II, "High-Power Reconfigurable Tuners for Adaptive Radar Transmitters," Department of Defense E3 Program Review, Huntsville, Alabama, May 2018.
38. C. Baylis and D. Peroulis, "Adaptive and Reconfigurable Radar for Optimum Sharing," URSI National Radio Science Meeting, Boulder, Colorado, January 2018.
39. A. Egbert, C. Latham, P. Rodriguez-Garcia, C. Baylis, L. Cohen, and R.J. Marks II, "Multi-Dimensional Coexistence: Extending the Concept of the Spectral Mask to Include Transmitter Transmission Pattern for Spectrum Sharing," URSI National Radio Science Meeting, Boulder, Colorado, January 2018.
40. C.D. Kappelmann, L. Lamers, Z. Hays, S. Rezayat, C. Baylis, R.J. Marks II, E. Viveiros, M. Abu Khater, A. Semnani, and D. Peroulis, "Frequency-Agile Power Amplifier Matching Network Reconfiguration Using a Hybrid Real-Time Search," URSI National Radio Science Meeting, Boulder, Colorado, January 2018.
41. L.R. Hays, C. Baylis, R.J. Marks II, E. Viveiros, "Real-Time Transistor Stability Measurements Using the Acceleration of the Gain for the Next Generation Radar," URSI National Radio Science Meeting, Boulder, Colorado, January 2018.
42. L.R. Hays, S. Rezayat, Z. Hays, A. Egbert, C. Kappelmann, C. Baylis, R.J. Marks II, E. Viveiros, D. Peroulis, M. Abu Khater, A. Semnani, "Direct Tuning of Cavity Position Numbers for Circuit Optimization Using an Evanescent-Mode Cavity Tuner Designed for Reconfigurable Radar Transmission," URSI National Radio Science Meeting, Boulder, Colorado, January 2018.
43. Z. Hays, C. Baylis, M. Abu Khater, and E. Viveiros, "3D Fast PAE Optimization Using an Evanescent-Mode Cavity Tuner," URSI National Radio Science Meeting, Boulder, Colorado, January 2018.
44. S. Rezayat, C. Baylis, E. Viveiros, J. Penn, and R.J. Marks II, "Real-Time Multi-Variable Amplifier Optimization Using a Nonlinear Tunable Varactor Matching Network in the Power Smith Tube," URSI National Radio Science Meeting, Boulder, Colorado, January 2018.
45. A. Semnani, M. Abu Khater, D. Peroulis, C. Baylis, L. Hays, C. Kappelmann, and Z. Hays, "An Evanescent-Mode Cavity-Based High-Power Impedance Tuner for Adaptive Radar Applications," URSI National Radio Science Meeting, Boulder, Colorado, January 2018.
46. C. Baylis, R.J. Marks II, A. Semnani, D. Peroulis, E. Viveiros, and L. Cohen, "Reconfigurable Transmitter Amplifiers for Next-Generation Spectrally Sensitive Adaptive Radar," URSI General Assembly, Montreal, Canada, August 2017.
47. C. Baylis and R.J. Marks II, "Adaptive Amplifier Design for Dynamic Spectrum Allocation in the Next-Generation Radar," in Workshop "Microwave Circuit Design for the Next-Generation Radar: 5G and Beyond," IEEE MTT-S International Microwave Symposium, Honolulu, Hawaii, June 2017.
48. L. Lamers, Z. Hays, R.J. Marks II, E. Viveiros, J. Penn, A. Hedden, and A. Darwish, "Syndicated Test Bench Set-Up for Testing of Real-Time Reconfigurable Power Amplifiers for the Next Generation Radar," URSI National Radio Science Meeting, Boulder, Colorado, January 2017.

49. S. Rezayat, Z. Hays, C. Kappelmann, M. Fellows, L. Lamers, C. Baylis, E. Viveiros, A. Hedden, J. Penn, A. Darwish, and R.J. Marks II, "Real-Time Amplifier Impedance Optimization Using a Nonlinear Tunable Varactor Matching Network with Power-Dependent Characterization," URSI National Radio Science Meeting, Boulder, Colorado, January 2017.
50. C. Latham, A. Magee, J. Boline, A. Tsatsoulas, M. Fellows, L. Cohen, and R.J. Marks II, "Dual-Loop Joint Circuit and Waveform Optimization Technique for Ambiguity Function, Spectral Performance, and Power Efficiency," URSI National Radio Science Meeting, Boulder, Colorado, January 2017.
51. C. Baylis, R.J. Marks II, L. Dong, A. Clegg, and L. Cohen, "Dynamic Spectrum Collaboration Between Radar and Wireless Communication: A Proposed Framework for the Simultaneous Optimization of Policy, Network, and Circuits," URSI National Radio Science Meeting, Boulder, Colorado, January 2017.
52. Z. Hays, L. Lamers, C. Baylis, R.J. Marks II, E. Viveiros, J. Penn, A. Hedden, and A. Darwish, "Comparison of Gain Optimization Techniques on Reconfigurable Power Amplifiers with a Real-Time Varactor Tuning Network," URSI National Radio Science Meeting, Boulder, Colorado, January 2017.
53. M. Fellows, S. Rezayat, A. Magee, C. Baylis, L. Cohen, and R.J. Marks II, "Optimization of Load Impedance and Bias Voltage for Power-Added Efficiency, Delivered Power, and Adjacent-Channel Power Ratio Using the Bias Smith Tube," URSI National Radio Science Meeting, Boulder, Colorado, January 2017.
54. J. Barkate, C. Baylis, A. Tsatsoulas, Z. Hays, L. Cohen, and R.J. Marks II, "Search Algorithm Comparison for Fast Optimization of Power Amplifier Load Impedance and Input Power," URSI National Radio Science Meeting, Boulder, Colorado, January 2016.
55. M. Fellows, S. Rezayat, L. Lamers, J. Barkate, C. Baylis, L. Cohen, and R.J. Marks II, "Joint Optimization of Load Impedance and Bias Voltage for Power-Added Efficiency and Adjacent-Channel Power Ratio Using the Bias Smith Tube," URSI National Radio Science Meeting, Boulder, Colorado, January 2016.
56. D. Eustice, C. Baylis, L. Cohen, M. Fellows, J. Barkate, and R.J. Marks II, "A Simultaneous Circuit and Waveform Optimization for Radar Systems," URSI National Radio Science Meeting, Boulder, Colorado, January 2016.
57. M. Fellows, S. Rezayat, J. Barlow, J. Barkate, A. Tsatsoulas, C. Baylis, L. Cohen, and R.J. Marks II, "The Bias Smith Tube for Simultaneous Optimization of Power Amplifier Bias Voltage and Load Impedance," 2015 IEEE Topical Symposium on Power Amplifiers for Wireless Communication, La Jolla, California, September 2015.
58. A. Tsatsoulas, M. Fellows, J. Barkate, C. Baylis, L. Cohen, and R.J. Marks II, "Multidimensional Smith Tubes for Multi-Objective, Multi-Parameter Power Amplifier Design Optimization," 2015 IEEE Topical Symposium on Power Amplifiers for Wireless Communication, La Jolla, California, September 2015.
59. J. Barkate, A. Tsatsoulas, M. Fellows, M. Flachsbart, C. Baylis, L. Cohen, and R.J. Marks II, "Momentum-Aided Search in the Power Smith Tube for Simultaneous Optimization of Power Amplifier Input Power and Load Impedance," 2015 IEEE Topical Symposium on Power Amplifiers for Wireless Communication, La Jolla, California, September 2015.
60. C. Baylis, M. Fellows, J. Barkate, J. Barlow, M. Flachsbart, R.J. Marks II, and E. Mokole, "The Smith Tube: Providing the Foundation for Real-Time, Spectrally Sensitive Circuit Optimizations," 2015 URSI North American Radio Science Meeting, Vancouver, Canada, July 2015.

61. M. Fellows, C. Baylis, M. Flachsbarth, J. Barkate, J. Barlow, L. Cohen, and R.J. Marks II, "Joint Circuit and Waveform Optimization for Spectrally Sensitive Power Amplifiers Using the Smith Tube," 2014 Power Amplifier Symposium, La Jolla, California, September 2014.
62. M. Fellows, C. Baylis, L. Cohen, and R.J. Marks II, "A Vector-Based Algorithm for Real-Time, Spectrally Sensitive Load Impedance Reconfiguration in Radar Transmitters," URSI National Radio Science Meeting, Boulder, Colorado, January 2014.
63. C. Baylis, M. Fellows, L. Cohen, and R.J. Marks II, "A Research Path for the Design of Future Spectrally Compliant, Flexible Radar Transmitters," URSI National Radio Science Meeting, Boulder, Colorado, January 2014.
64. C. Baylis, "Direct Fast Load-Pull Algorithm for PAE and ACPR Optimization," Power Amplifier Symposium, La Jolla, California, September 2013.
65. C. Baylis (invited), "Implementing High-Efficiency Power Amplifier Design for Radar and Communication Systems," IDGA Military Radar Summit, Washington, D.C., February 2013.
66. C. Baylis, M. Moldovan, D. Moon, M. Fellows, R.J. Marks II, and L. Cohen, "Waveform Optimization for Spectrally Confined Radar Transmission," URSI National Radio Science Meeting, Boulder, Colorado, January 2013.
67. J. Martin, C. Baylis, R.J. Marks II, L. Cohen, and J. de Graaf, "Load Impedance Optimization for Power Added Efficiency and Adjacent-Channel Power Ratio," URSI National Radio Science Meeting, Boulder, Colorado, January 2013.
68. J. Martin, C. Baylis, R.J. Marks II, L. Cohen, and J. de Graaf, "A Peak-Search Algorithm for Combined PAE and ACPR Load-Pull," Power Amplifier Symposium, La Jolla, California, September 2012.
69. J. Martin, M. Moldovan, C. Baylis, and R.J. Marks II, "Radar Power Amplifier Spectrum optimization for Chirp Waveforms Using ACPR Load-Pull Measurements," URSI National Radio Science Meeting, Boulder, Colorado, January 2012.
70. C. Baylis, "Joint Optimization of Amplifier and Circuit for Next-Generation Cognitive Radar Systems," NATO SET-182 Research Task Group Meeting, Washington, D.C., November 2011.
71. C. Baylis, "Solid-State Amplifier Configurations for Efficiency and Linearity," NATO SET-182 Research Task Group Meeting, Washington, D.C., December 2011.
72. C. Baylis, "Simultaneously Reconfigurable RF Circuitry and Optimizable Waveforms to Meet Spectral Mask Requirements and Maximize Power Efficiency," Radar R&D Panel, International Symposium on Advanced Radio Technologies (ISART), National Telecommunications and Information Administration (NTIA), Boulder, Colorado, July 2011.
73. L. Cohen and C. Baylis, "Solid-State Power Amplifiers for Next-Generation Radar Transmitters," International Symposium on Advanced Radio Technologies (ISART), National Telecommunications and Information Administration (NTIA), Boulder, Colorado, July 2011.
74. R. Jost, L. Cohen, and C. Baylis, Tutorial: "Introduction to Radar Transmitters," IEEE Radar Conference, Kansas City, Missouri, May 2011.
75. C. Baylis, R. J. Marks II, J. Martin, L. Wang, M. Moldovan, and H. Miller, "Wirtinger Calculus as a Means to Assess and Improve Linearity and Efficiency in Radar Power Amplifiers," URSI National Radio Science Meeting, Boulder, Colorado, January 2011.

76. C. Baylis and R.J. Marks II, "Simultaneous Circuit and Waveform Optimization for Cognitive Radar," Poster Presentation, Office of Naval Research Science and Technology Partnership Conference, Arlington, Virginia, November 2010.
77. C. Baylis, R. J. Marks II, L. Wang, M. Moldovan, J. Martin, H. Miller (invited), "Spectrum Issues in Radar Transmitter Amplifier Design," Defense Spectrum Organization Conference, Annapolis, Maryland, September 2010.
78. C. Baylis, H. Miller, L. Wang, and M. Moldovan (invited presentation), "Spectrum Issues in Power Amplifier Design," 2009 Tri-Service Radar Symposium, Boulder, Colorado, June 2009.
79. L. Dunleavy and C. Baylis (Invited Workshop Presentation), "Meeting the Challenges in High-Power Device Modeling," in IEEE MTT-S International Microwave Symposium Workshop: "Challenges of High Power Device Characterization and Modeling," Honolulu, Hawaii, June 2007.
80. C. Baylis, L. Dunleavy, and S. Lardizabal, "Efficient Load-Pull Measurement Using a Sequential Search Algorithm," IEEE Topical Symposium on Power Amplifiers for Wireless Communications, Long Beach, California, January 2007.

B. Seminars and Guest Lectures:

1. C. Baylis, "Intelligent Adaptive and Reconfigurable Circuits and Systems for Wireless Coexistence between Radar, Communications, and Passive Sensing," Wireless Institute Seminar Series, University of Notre Dame, South Bend, Indiana, December 2022.
2. C. Baylis, "Spectrum-Broker Controlled Reconfiguration for 5G Transmitter Coexistence with Weather Radiometers at 24 GHz," National Institute of Standards and Technology, Virtual, October 2022.
3. D. Peroulis, A. Fisher, C. Baylis, J. Eklund, and B. Olson, "Wideband and High-Power Reconfigurable Plasma Matching Network for Compact and Efficient Phased Array Emitters," ONR 312 EW D&I Program Review, Virtual, July 2022.
4. A. Egbert, A. Goad, J. Roessler, C. Kappelmann, A. Dockendorf, C. Baylis, and R.J. Marks II, "Reconfigurable Front-End Hardware," Department of Defense Rapid Response Technology Office (RRTO) SDRadar Demonstration, Virtual, December 2020.
5. D. Peroulis, C. Baylis, A. Semnani, C. Runnion, M. Abu Khater, R.J. Marks II, and B. Olson, "Wideband and High-Power Reconfigurable Plasma Matching Network for Compact and Efficient Phased Array Emitters," ONR 312 EW D&I Program Review, Virtual, October 2020.
6. D. Peroulis, B. Olson, C. Baylis, J.G. Eden, A. Semnani, and C. Runnion, "Wideband and High-Power Reconfigurable Plasma Matching Network for Compact and Efficient Phased Array Emitters," ONR 312 EW D&I Program Review, Arlington, Virginia, December 2019.
7. C. Baylis, "Enabling Software-Defined Radar: Automated Impedance Tuning for Real-Time Radar Spectrum Sharing," IEEE Microwave Theory and Techniques Society Dallas Chapter Meeting, Plano, Texas, July 2019.
8. C. Baylis and R.J. Marks II, "Reconfigurable Power Amplifier Circuitry in Software Defined Radar," Army Research Laboratory, Adelphi, Maryland, March 2019.
9. C. Baylis, "Graduate Research Opportunities in Electrical and Computer Engineering at Baylor University: Reconfigurable Microwave Circuitry for Next-Generation Radar Transmitters," Valparaiso University, Valparaiso, Indiana, October 2018.

10. C. Baylis, "Graduate Research Opportunities in Electrical and Computer Engineering at Baylor University: Reconfigurable Microwave Circuitry for Next-Generation Radar Transmitters," Cedarville University, Cedarville, Ohio, October 2018.
11. C. Baylis, "Reconfigurable Microwave Circuitry for Next-Generation Radar Transmitters," Rose-Hulman Institute of Technology, Terre Haute, Indiana, October 2018.
12. C. Baylis, "Reconfigurable Power Amplifier Optimization for Next-Generation Radar Transmitters," Texas A&M University, College Station, Texas, October 2016.
13. C. Baylis, "Reconfigurable Power Amplifier Optimization for Next-Generation Transmitters," IEEE Microwave Theory and Techniques Society, Dallas Chapter Meeting, Plano, Texas, July 2016.
14. C. Baylis, "Reconfigurable Circuit and Waveform Design for Next-Generation Cognitive Radar Systems," Physics Colloquium, Baylor University, Waco, Texas, September 2013.
15. C. Baylis, "Joint Waveform and Circuit Optimization for Spectrally Confined Radar Transmission," IEEE Microwave Theory and Techniques Society, Dallas Chapter Meeting, Plano, Texas, June 2012.
16. C. Baylis, "High-Efficiency, Linear, Power Amplifier Design and Related Characterization Techniques," Texas Analog Center for Excellence (TxACE) Seminar, University of Texas at Dallas, Richardson, Texas, May 2010.
17. C. Baylis, "X-Parameters: The Power to Create a New Paradigm for Nonlinear Design?," Baylor Engineering and Research Seminar (B.E.A.R.S.), Baylor University, Waco, Texas, February 2010 (won award for best Spring 2010 B.E.A.R.S. Seminar by a faculty member as voted by the students).
18. C. Baylis, L. Dunleavy, S. Lardizabal, H. Miller, J. Perry, R. Marks II, "A Peak-Search Algorithm for More Efficient Load-Pull Measurements," IEEE Microwave Theory and Techniques Society, Dallas Chapter Meeting, Dallas, Texas, June 2009.
19. C. Baylis, "Research in Wireless and Microwave Active Circuits at Baylor University," CASPER Seminar, Baylor University, May 2009.
20. C. Baylis, "An Overview of Transistor Modeling for RF and Microwave Applications," Baylor Engineering and Research Seminar (B.E.A.R.S.), March 2009.
21. C. Baylis, "Improving the RF Active Circuit Design Cycle Through Innovations in Electrothermal Modeling, Characterization, and Design Techniques," Baylor Engineering and Research Seminar (B.E.A.R.S.), Baylor University, April 2008.
22. C. Baylis, "PDFs and MGFs for Sums of Random Variables," Guest Lecture in Probability and Random Processes Course, Cedarville University, Cedarville, Ohio, March 2008.
23. C. Baylis, "RF/Microwave Transistor Modeling Research at the University of South Florida," Wireless Seminar, University of South Florida, Tampa, Florida, February 2008.
24. C. Baylis, "Development of New Time-Dependent Modeling and Characterization Techniques for Thermal and Trapping Effects in GaN FETs and HEMTs," Army Research Laboratory, Adelphi, Maryland, January 2008.
25. C. Baylis, "Active Circuit Research at the USF WAMI Center," Freescale Semiconductor, Tempe, Arizona, November 2007.

26. C. Baylis, "Improved Microwave Transistor Modeling Techniques Using Pulsed Measurements," Wireless Seminar, University of South Florida, Tampa, Florida, January 2007.

## Courses Taught

Courses Taught at Baylor University:

- ELC 4383: RF/Microwave Circuits I (High Frequency Electronics I), Fall 2008, Fall 2009, Fall 2010, Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020, Fall 2021, Fall 2022 – Transmission line theory, microwave network analysis, matching network design, microwave filter design, diodes and mixers for microwave applications, network analyzer measurements, and an introduction to RF and microwave computer-aided design
- ELC 4384: RF/Microwave Circuits II (High Frequency Electronics II), Spring 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2013, Spring 2014, Spring 2015, Spring 2016, Spring 2017, Spring 2018, Spring 2019, Spring 2020, Spring 2021, Spring 2022, Spring 2023 – Microwave amplifier and oscillator design, with CAD exercises and a student low-noise amplifier design project.
- ELC 3335: Signals and Systems, Fall 2009, Spring 2010, Fall 2010, Spring 2011, Fall 2011, Fall 2014, Fall 2016, Spring 2017, Fall 2018, Spring 2019, Spring 2021, Spring 2022, Spring 2023 – Time and frequency domain analysis of continuous-time signals and systems; finding system response, Fourier analysis, Laplace transform, sampling theorem, discrete-time systems
- ELC 3314: Electronic Design, Fall 2012, Fall 2013, Fall 2015, Fall 2017, Spring 2018, Fall 2019, Spring 2020, Fall 2020, Fall 2021, Fall 2022 – Amplifiers, Op-amps, diodes, BJTs, FETs, differential amplifiers, Bode plots, and feedback.
- ELC 3337: Applied Electromagnetic Fields, Spring 2009 - Distributed circuit design, traveling waves, static and dynamic electric and magnetic fields.
- ELC 4350: Principles of Communication, Spring 2015 – Taught basic analog and digital communication system techniques, including amplitude modulation, frequency modulation, and line coding. This is a senior elective/graduate course.
- EGR 1302: Introduction to Engineering Analysis, Spring 2013, Spring 2014, Spring 2016 – Introduced MATLAB, Mathcad, complex numbers, and other basic engineering analysis skills to freshman engineering majors.

Courses Taught at University of South Florida:

- EEL 3100: Network Analysis and Design, Fall 2005, Summer 2006, Spring 2007, Summer 2007 - Second course in linear circuit design, introduces Laplace and Fourier methods for circuit analysis as well as graph theory.
- ELR 4316L: Wireless and Microwave Instructional (WAMI) Laboratory Course, Spring 2008 – Required laboratory-based course in RF/Microwave circuits, systems, and measurements. Students characterize and build a 915 MHz receiver over the course of the semester.
- EEL 4421/5935: RF and Microwave Circuits I, Fall 2007 – Introductory course in RF circuit theory, covers transmission line theory, Smith Charts, S-parameters, matching networks, RF filter design, couplers, RF diodes, and mixers. The course also introduces students to microwave CAD techniques through a series of software laboratory exercises.
- EEL 4471: Electromagnetics – Summer 2004, Fall 2004, Spring 2005, Summer 2005 – Distributed circuit design, traveling waves, static and dynamic electric and magnetic fields.
- EEL 4512: Introduction to Communication Systems – Fall 2006 – Senior-level course in communication system theory and analog and digital modulation techniques.

## Dissertations, Theses, and Projects Supervised

### A. Ph.D. Dissertation

Completed:

1. A. Egbert, Ph.D. Dissertation, *Enabling and Directing Real-Time Cognitive Radar Transmitter Optimization*, Baylor University, 2021.
  2. P. Rodriguez-Garcia, Ph.D. Dissertation, *Phased Array Impedance Tuning, Secure Transmission, and Nonlinear Spatial Intermodulation Suppression for Next-Generation Radar and Communications Systems*, Baylor University, 2020.
  3. M. Fellows, Ph.D. Dissertation, Baylor University, *Multidimensional Power Amplifier Circuit Optimizations for Adaptive Radar*, 2017.
- B. In Progress:
1. A. Goad, Ph.D. Dissertation, expected completion Fall 2023.
  2. J. Roessler, Ph.D. Dissertation, expected completion Fall 2023.
  3. T. Van Hoosier, Ph.D. Dissertation, expected completion Spring 2025.
- C. Master of Science in Electrical and Computer Engineering/Master of Science in Electrical Engineering Theses
- Completed (10 as advisor, 1 as co-advisor):
1. C. Calabrese, M.S.E.C.E. Thesis, Baylor University, *Design, Simulation, Construction, and Measurement Testing of Fast-Reconfigurable Radio Frequency Switched-Stub Matching Networks*, 2021.
  2. A. Dockendorf, M.S.E.C.E. Thesis, Baylor University, *Faster Circuit Optimization Techniques for Full-Band and Notched Waveforms to Enable Next-Generation Radar*, 2020.
  3. C. Latham, M.S.E.C.E. Thesis, Baylor University, *Joint Circuit and Waveform Optimization for Next-Generation Radar*, 2018.
  4. L.R. Hays, M.S.E.C.E. Thesis, Baylor University, *Power-Amplifier Optimization Using Tunable Circuitry and Stability Analysis Methods for the Next Generation Radar*, 2018.
  5. Z. Hays, M.S.E.C.E. Thesis, Baylor University, *Circuit Modeling and Optimization Techniques for Next-Generation Radar*, 2018.
  6. S. Rezayat, M.S.E.C.E. Thesis, Baylor University, *Circuit Optimization and Frequency Agility for Cognitive Radar*, 2018.
  7. J. Barkate, M.S.E.C.E. Thesis, Baylor University, *Real-Time Power Amplifier Circuit Optimization Using the Power Smith Tube*, 2016.
  8. D. Eustice, M.S.E.C.E. Thesis, Baylor University, *Adaptive Radar Waveform Synthesis via Alternating Projections*, 2015.
  9. M. Fellows, M.S.E.C.E. Thesis, Baylor University, *Waveform and Circuit Optimizations to Provide Spectral Compliance for Cognitive Radar*, 2014.
  10. J. Martin, M.S.E.C.E. Thesis, Baylor University, *Adaptive Load Impedance Optimization for Power Amplifiers in Reconfigurable Radar Transmitters*, 2012.

11. L. Wang, M.S.E.C.E. Thesis, Baylor University, *Side Lobe Modulation of Radar Antenna Pattern Utilizing an Auxiliary Array*, 2012.

12. S.S. Meena (co-advisor with Dr. Lawrence Dunleavy, University of South Florida), M.S.E.E. Thesis, University of South Florida, *Pulsed Power and Load-Pull Measurements for Microwave Transistors*, 2009.

D. Master of Engineering Project

Completed:

1. M. Moldovan, M.E. Project, Baylor University, "Piecewise Linear Approach for Optimizing Radar Chirps," 2012.

## External Service

Founding Chair, Chair of Executive Committee (2008-present), and General Chair (2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016) Texas Symposium on Wireless and Microwave Circuits and Systems.

Chair, Commission E, U.S. National Committee of International Radio Science Union (USNC-URSI), 2015-2017.

Region 5 Coordinator, IEEE Microwave Theory and Techniques Society, Membership and Geographic Activities Coordinator, 2014-2022.

Member, North Atlantic Treaty Organization (NATO) SET-182 Research Task Group on Spectrum Engineering, 2011 – 2014.

Student Design Competition Co-Chair (Technical Program Committee), 2014 IEEE Microwave Theory and Techniques Society International Microwave Symposium, Tampa, Florida, June 2014.

Workshop Organizer, "Microwave Techniques for Coexistence between 5G and Passive Scientific Systems," 2022 IEEE MTT-S International Microwave Symposium, Denver, Colorado, June 2022.

Workshop Organizer, "Microwave-Circuit Design for the Next-Generation Radar: 5G and Beyond," 2017 IEEE MTT-S International Microwave Symposium, Honolulu, Hawaii, June 2017.

Special Session Organizer, "Spectrum-Aware and Frequency-Agile Circuits," 2016 IEEE MTT-S International Microwave Symposium, San Francisco, California, May 2016.

Workshop Organizer, "Radar in a Communications-Driven Spectrum: Innovative System, Component, and Circuit Design for the Evolving Spectrum Environment," 2015 IEEE MTT-S International Microwave Symposium, Phoenix, Arizona, May 2015.

Special Session Organizer and Co-Chair: "Spectrum Issues, Challenges, and Solutions," 2013, 2014, 2016, 2017 URSI National Radio Science Meetings, Boulder, Colorado, January 2013.

Journal Reviewer, *IEEE Transactions on Microwave Theory and Techniques*.

Technical Program Committee Member, Session Co-Chair, and Paper Awards Competition Coordinator, 2010 IEEE Wireless and Microwave Technology Conference, April 2010, Melbourne, Florida.

Executive Committee Member and Student Activities Chair, IEEE Microwave Theory and Techniques Society, Dallas Chapter, 2009-2011.



Evaluator, IEEE Microwave Theory and Techniques Society Undergraduate Scholarship Competition, 2009-2010.

Steering Committee Member and Website Chair, 2009 IEEE Wireless and Microwave Technology Conference, Clearwater, Florida, April 2009

Session Co-Chair: Special Session on Transistor Modeling, 2009 IEEE Wireless and Microwave Technology Conference, Clearwater, Florida, April 2009.

Local Arrangements Chair, 2008 IEEE Power Amplifier Symposium, Orlando, Florida, January 2008.

## **University Service**

*Faculty Advisor, IEEE Microwave Theory and Techniques Society Baylor Student Chapter, 2017 – present.*

*Development Coordinator, Department of Electrical and Computer Engineering, Baylor University, 2015-2019. Organized the formation of the ECE Department Advisory Board, and integrated board activities into the department.*

*Baylor University Illuminate (Academic Strategic Plan) Data Sciences Subcommittee, December 2018 – present.*

*Baylor University Grievance Committee, August 2014-July 2018.*

*Faculty Search Committee, Baylor University Department of Electrical and Computer Engineering, August 2014-May 2015 and August 2019-May 2020.*

*Baylor Electrical and Computer Engineering Graduate Committee, August 2017 – present.*

*Baylor School of Engineering and Computer Science Development Task Force, 2010 – 2012.*

*Baylor School of Engineering Strategic Thinking – Phase 1 Committee, Baylor University, 2008 – 2009.*

*Baylor Engineering Graduate Recruiting Committee, 2008-2009.*