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## Education

B.S. Electrical Engineering, The Pennsylvania State University, 1980.

M.S., Electrical Engineering, The Pennsylvania State University, 1984.

Ph.D. Electrical Engineering, The Pennsylvania State University, 1987.

## Employment

The Pennsylvania State University 1980–1985.

Auburn University 1985–Present.

## Academic Rank

Associate Professor of Electrical Engineering

## Publications

### *Journal Articles*

#### 1 Journal Publications

1. T. Killian, S. M. Rao, and M. E. Baginski, "Electromagnetic Scattering from Electrically Large Arbitrarily-Shaped Conductors using the Method of Moments and a New Null-Field Generation Technique", *IEEE Transactions on Antennas and Propagation*, Submitted, March 2010.
2. A. I. Mackenzie, S. M. Rao, and M. E. Baginski, "Method of Moments Solution of Electromagnetic Scattering Problems Involving Arbitrarily-Shaped Conducting/Dielectric Bodies Using Triangular Patches and Pulse Basis Functions," *IEEE Transactions on Antennas and Propagation*, vol. 58, no. 2, pp. 488–493, February 2010.
3. A. I. Mackenzie, S. M. Rao, and M. E. Baginski, "Electromagnetic Scattering From Arbitrarily Shaped Dielectric Bodies Using Paired Pulse Vector Basis Functions and Method of Moments," *IEEE Transactions on Antennas and Propagation*, vol. 57, no. 7, pp. 2076–2083, July 2009.
4. T. N. Killian, S. M. Rao, and M. E. Baginski, "A New Method of Moments Solution Procedure to Solve Electrically Large Problems," *Computer Modeling in Engineering and Science*, vol. 46, no. 3, pp. 255–229, March, 2009.

5. A. I. Mackenzie, M. E. Baginski, S. M. Rao "New Basis functions for the Electromagnetic Solution of Arbitrarily-shaped, Three Dimensional Conducting bodies using Method of Moments," *Microwave and Optical Technology Letters* Vol. 50, No. 4, pp. 1121-1124, May 2008.
6. A. I. Mackenzie, M. E. Baginski, S. M. Rao "An Alternate Set of Basis Functions for the Electromagnetic Solution of Arbitrarily-Shaped, Three-Dimensional, Closed, Conducting Bodies Using Method of Moments," *Microwave and Optical Technology Letters* vol. 50, no. 9, pp. 2354-2357, September 2008.
7. D. L. Faircloth, M. E. Baginski, S. M. Rao, S. M. Wentworth and M.D. Deshpande, "Modified Genetic Algorithm to Design Arbitrary Response Filters for Waveguides of Arbitrary Cross-Sectional Dimensions", *International Journal of RF and Microwave Computer-Aided Engineering*, Vol. 17, No. 3, pp. 367 - 375, May 2007.
8. D. L. Faircloth, M.E. Baginski, and S. M. Wentworth, "Complex Permittivity and Permeability Extraction for Multilayered Samples Using S -Parameter Waveguide Measurement," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 54, No.3, pp 1201 – 1209, March 2006
9. D. L. Faircloth and M. E. Baginski and S. M. Rao and M. D. Deshpande, "Investigation of reflection and transmission properties of dielectric slabs randomly doped with conducting objects," *Microwave and Optical Technology Letters* Vol. 48, No. 1, pp. 83-86, sion Properties of Dielectric Slabs Randomly Doped with Conducting Objects", *Microwave and Optical Technology Letters*, Vol. 48, No 1, January 2006.
10. D. L. Faircloth and M. E. Baginski and S. M. Rao and M. D. Deshpande, "Comparison of two optimization techniques for the estimation of complex permittivities of multilayered structures using waveguide measurements," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 53, No. 10, pp. 1121-1124, October 2006.
11. M. E Baginski and D. L Faircloth and M. D Deshpande, "Comparison of two optimization techniques for the estimation of complex permittivities of multilayered structures using waveguide measurements," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 53, No. 10, pp. 1121-1124, October 2005.
12. Michael E. Baginski ,Edward C. Shaffer, Keith A. Thomas, and Jeffrey S. McGuirk "A comparison of the electrodynamics of metals under the action of large electric currents (II)," *International Journal of Applied Electromagnetics and Mechanics*, No. 1, Vol 11, 2000.
13. Michael E. Baginski, R. Wayne Johnson, and Stuart M. Wentworth, Finite Element Characterization of Microstrip Systems and Approximate Formulas for Capacitance, *IEEE Journal of Hybrid Electronics* , November 1997.
14. Marcus A. Lankford, Kyle L. Davis, R. Wayne Johnson, Michael E. Baginski, Hayden C. Hontgas, Kevin Slattery, Robert Newberry, and John Evans, "Design and Performance of Multichip Modules including Electromagnetic Compatibility," *International Journal of Microcircuits and Electronic Packaging*, September 1997.
15. George W. Jarriel, Lloyd S. Riggs, and Michael E. Baginski, A Simple Method for Optimizing Radar Absorbent Material Coatings on HF Rope Antennas for the Increased Attenuation of Unwanted Reflections, *IEEE Transactions on Electromagnetic Compatibility*, November, 1997.
16. J. E. Mooney, L. S. Riggs, and M. E. Baginski, The electrostatic characterization of an N-element planar array using the singularity expansion method *Radio Science* Vol. 31, No. 5 , p. 1011 (96RS01929).
17. M. E. Baginski, K.A. Thomas, E. Shaffer T. A. Baginski A Characterization of the Electrodynamics of Metals under the Action of Large Electric Currents, *International Journal of Applied Electromagnetics in Materials*. 7(1996) 192-211.

18. M.E. Baginski, A.S. Hodel, and M. Lankford, On the Subject of Simulated Thunderstorm Related Vertical and Horizontal Electric Fields in the Middle Atmosphere: Similarities and Differences, *Journal of Electrostatics*, 36 (96) 331-347
19. M.E. Baginski, Finite Element Solution to the Atmosphere's Electromagnetic Response to Charge Perturbations Associated with Lightning, *Progress in Electromagnetics Research, PIER* 8, pp. 315 - 364, 1994.
20. M. E. Baginski and George W. Jarriel, Characterization of Thunderstorm Induced Maxwell Current Densities in the Middle Atmosphere, *Journal of Electrostatics*, 33 1994, pp. 87 - 102.
21. B. L. Slaten, L. A. Shanley, R. Broughton, and M. E. Baginski, Thermal Properties of Novel Carbon Fiber Battings, *Journal of Fire Science's*, Vol. 12, No. 3, pp. 239 - 245, May/June 1994.
22. M.E. Baginski, L.S. Riggs, H.D. Williams, and F.J. German, Finite Element Analysis of Microstrip Systems in the Vicinity of a Substrate Edge and Approximate Formulas for Capacitance, *IEEE Transactions on Electromagnetic Compatibility*, Vol. 36, No. 4, pp. 404 - 408, November, 1994.
23. M. E. Baginski and A. S. Hodel, A Case Study Comparing the Lossy Wave Equation to the Continuity Equation in Modeling Late Time Fields Associated With Lightning, *Applied Computational Electromagnetics Society Journal*, Vol. 9, No. 2., pp. 98 - 110, 1994.
24. K. Driscoll, R. Blakeslee, and M. Baginski, A Modeling Study of Time Averaged Electric Currents in the Vicinity of an Isolated Thunderstorm, *Journal of Geophysical Research*, Vol. 97, No. D11, pp. 11535-11551, July 20, 1992.
25. T. Roppel, M.E. Baginski, and D. Jaworske, Sensor Application for Synthetic Polycrystalline Thin Film Diamond, *Sensors and Materials*, 2, 6 (1991), pp. 329-346.
26. M.E. Baginski, T.A. Baginski, and J.L. Davidson, Experimental Characterization of the Ion Implantation and Thermally Driven Diffusion of Boron in <100> Diamond, *Journal of the Electrochemical Society*, Vol 137, No 9, pp. 2984-2987, September 1990.
27. T.A. Baginski and M.E. Baginski, A Novel RF Insensitive EED Utilizing an Integrated Metal-Oxide-Semiconductor Structure, *IEEE Transactions on Electromagnetic Compatibility*, Vol 32, No 2, pp. 163-167, May 1990.
28. T.A. Baginski and M.E. Baginski, Characterization of a Novel Passive RF Filter that Provides 125 dB of Attenuation for Frequencies of 4 - 125 MHz, *IEEE Transactions on Electromagnetic Compatibility*, Vol 32, No 2, pp. 106-112, May, 1990.
29. M. Baginski, R. Broughton, D. Hall, and L. Christman, Experimental and Numerical Characterization of the Radio Frequency Drying of Textile Materials II, *Journal of Microwave Power and Electromagnetic Energy*, Vol 25, No 2, pp. 104-113, 1990.
30. M. Green, D. Wheelock, and M.E. Baginski, On the Electrodynamics of the Get-Away Tether Experiment, *Journal of Spacecraft and Rockets*, Vol 26, No 6, pp. 452-459, December 1989.
31. R.C. Jaeger, J.S. Goodling, M.E. Baginski, C.D. Ellis, N.V. Williamson, and R.M. O'Barr, High Heat Flux Cooling for Silicon Hybrid Multichip Packaging, *IEEE Transactions on Components, Hybrids, and Manufacturing Technology*, Vol 4, No. 12, pp. 772-779, December 1989.
32. M.E. Baginski, L.S. Riggs, F.J. German, and M. Reed, Experimental and Numerical Characterization of the Radio Frequency Drying of Textile Materials, *Journal of Microwave Power and Electromagnetic Energy*, Vol. 24 No. 1, pp. 14-20, 1989.

33. M.E. Baginski, L.C. Hale, and J.J. Olivero, On the Subject of Lightning Induced Electric Fields in the Ionosphere, *Geophysical Research Letters*, Vol. 15, No. 8 pp 764-767, August 1988.
34. M.E. Baginski, L.S. Riggs, and F.J. German, Electrical Breakdown of Soil About Earthed Conductors Resulting from Late Time EMP Effects, *IEEE Transactions on Electromagnetic Compatibility*, Vol. EMC-30, No. 3, pp. 380-385, August 1988.
35. L.S. Riggs, M.E. Baginski and F.J. German, Singularity Expansion Method (SEM) Natural Modes as an Efficient Entire Domain Expansion Functions in the Analysis of Frequency Selective Surfaces (FSS), *The Fourth Annual Review of Progress in Applied Computational Electromagnetics*, 1988.
36. L.C. Hale and M.E. Baginski, Current to the Ionosphere Following a Lightning Stroke , *Nature*, Vol 329, pp. 814-816, 29, October 1987.

## 2 Refereed conference publications and proceedings

1. T. N. Killian, S. M. Rao , and M. E. Baginski, "Fast Solution of Large-Body Problems Using Domain Decomposition and Null-Field Generation in the Method of Moments," , Accepted for presentation in *2009 IEEE AP-S International Symposium on Antennas and Propagation and 2009 USNC/URSI National Radio Science Meeting* to be held in Charleston, South Carolina, USA, on June 01-05, 2009.
2. S. M. Rao , T. N. Killian, and M. E. Baginski "A Novel Method to Analyze Conducting Structures with Extremely Thin Dielectric Layers," *IEEE AP-S/URSI International Symposium*, San Diego, CA July, 5-11, 2008.
3. A. I. Mackenzie, S. M. Rao , and M. E. Baginski, "Paired Pulse Basis Functions for arbitrary shaped material body MoM scattering Solutions: EFIE and HFIE," *IEEE AP-S/URSI International Symposium*, San Diego, CA July, 5-11, 2008.
4. S. M. Rao, A. I. Mackenzie, and M. E. Baginski, " New Basis Functions for the Electromagnetic Solution of Arbitrarily-shaped, Three Dimensional Material Bodies Using Method of Moments," presented at the 2008 IEEE/URSI General Assembly of the International Union of Radio Science (Union Radio Scientifique Internationale-URSI), August 7-16, 2008; Chicago, IL; United States.
5. M. E. Baginski, S. M. Rao, A. I. Mackenzie "Finite Element Analysis of the Transient Ionospheric Energy Dissipation Associated with Lightning Induced Sprites," presented at the 2008 IEEE/URSI General Assembly of the International Union of Radio Science (Union Radio Scientifique Internationale-URSI), August 7-16, 2008; Chicago, IL; United States.
6. A. I. Mackenzie, M. E. Baginski , and S. M. Rao , "New Basis Functions for the Electromagnetic Solution of Arbitrarily-shaped, Three Dimensional Conducting Bodies Using Method of Moments," *23rd International Review of Progress in Applied Computational Electromagnetics (ACES 2007)*, March 19 - 23, 2007, Verona, ITALY.
7. A. I. Mackenzie, S. M. Rao, and M. E. Baginski , "Paired Pulse Basis Functions for the Method of Moments EFIE Solution of Electromagnetic Problems Involving Arbitrarily-shaped, Three-dimensional Dielectric Scatterers", *Electromagnetic Code Consortium (EMCC) Annual Meeting*, May 8-10, 2007; San Diego, CA; United States.
8. S. M. Wentworth, M. E. Baginski, D. L. Faircloth, S. M. Rao, and L. S. Riggs, "Calculating Effective Skin Depth for Thin Conductive Sheets", *IEEE AP-S International Symposium on Antennas and Propagation 2006*, Albuquerque, NM.

9. S. M. Rao, M. E. Baginski, S. M. Wentworth and D. L. Faircloth, "Analysis of Arbitrarily-Shaped Microstrip Patch Antenna with Thin-Dielectric Substrate on a Finite Ground Plane," submitted January 2006, accepted March 2006, to be presented at URSI 2006 International Symposium on Antennas and Propagation 2006, Albuquerque, NM.
10. D. L. Faircloth, S. M. Wentworth, M. E. Baginski and S. M. Rao, "A Novel Constitutive Parameter Extraction Technique Using a Single Short Circuit Waveguide Measurement", IEEE AP-S International Symposium on Antennas and Propagation 2006, Albuquerque, NM.
11. D. L. Faircloth, M. E. Baginski, S. M. Rao, S. M. Wentworth and M. D. Deshpande, "A Novel Procedure for Design and Synthesis of Waveguide Filters Using the Genetic Algorithm", IEEE AP-S International Symposium on Antennas and Propagation 2006, Albuquerque, NM.
12. D. L. Faircloth, M. E. Baginski, S. M. Wentworth and S. M. Rao, "Complex Constitutive Parameter Extraction for Multilayered Samples Using S-Parameter Waveguide Measurements", IEEE AP-S International Symposium on Antennas and Propagation, 2006, Albuquerque, NM.
13. M. E. Baginski, D. L. Faircloth, S. M. Rao, and S. M. Wentworth, "Finite Element Characterization of the Power Density, Energy Deposition, and Transient Electron Density Profiles Associated with Lightning Induced Sprites", IEEE AP-S International Symposium on Antennas and Propagation, 2006, Albuquerque, NM.
14. L. G. Horta, M. C. Reaves, W. K. Belvin, M. M. Mikulas and M. E. Baginski, "Independent Studies of a 300 Meters Truss for a Large Space-Based Antenna", Proceedings of the 24th International Modal Analysis Conference (IMAC XXIV), St. Louis, MO, January 30 - February 2, 2006.
15. Daniel L. Faircloth and Michael E. Baginski, "Synthetic Thinned Aperture Radiometer for Mars Exploration", Proceedings from 2005 IEEE AP-S International Symposium and URSI National radio science meeting, July 3-8, 2005, Washington, DC. Columbus, Ohio.
16. D. L. Faircloth, S. Chilaka, L. S. Riggs, M. E. Baginski, "A Finite Element Method for the Electromagnetic Characterization of Quasi-Magnetostatic Problems Found in UXO Detection and Discrimination," Proceedings of 2004 Applied Computational Electromagnetics Society Conference, Syracuse, NY, April 19-23, 2004.
17. Michael. E. Baginski, Manohar D. Deshpande, Daniel L. Faircloth, "A Novel Method for the Determination of the Complex Constitutive Parameters of Multilayer Dielectric Structures Based on S-parameter Measurements", Proceedings from 2003 IEEE AP-S International symposium and USNC/CNC/URSI National radio science meeting, June 22-27, 2003, The Ohio State Univ., Columbus, Ohio.
18. Daniel L. Faircloth, Michael E. Baginski, and Manohar D. Deshpande, "Time Domain Finite Element Analysis of the Transient Electric Field penetration Through Thin Slit Apertures on Rectangular Enclosures", Proceedings from 2003 IEEE AP-S International symposium and USNC / CNC /URSI National radio science meeting, June 22-27, 2003, The Ohio State Univ., Columbus, Ohio.
19. Michael. E. Baginski, Manohar D. Deshpande, Daniel L. Faircloth, "Finite element modeling of the vertical and horizontal electric field signatures in the presence of a sprite", Proceedings from 2003 IEEE AP-S International symposium and USNC/CNC/URSI National radio science meeting, June 22-27, 2003, The Ohio State Univ., Columbus, Ohio.
20. Michael E. Baginski and Daniel Faircloth, "Peculiarities in the vertical and horizontal electric field signatures in the presence of a sprite ", *Proceedings from XXVIIth Triennial General Assembly of the International Union of Radio Science* , August 2002

21. J. S. McGurik, K. A. Thomas, E. Shaffer, A. L. Malone, T. Baginski, M. Baginski, Plasma Properties of Exploding Semiconductor Igniter, "Bulletin of the American Physical Society, Vol. 42., page 1811-1900, November 1997.
22. Marcus A. Lankford, Kyle L. Davis, R. Wayne Johnson, Michael E. Baginski, Hayden Hontgas, Kevin Slattery, Robert Newberry, and John Evans, "Investigation of Design and Performance of Multichip Modules including Electromagnetic Compatibility, Presented at Internation Conference on Multichip modules in Denver, CO., April 2-4,1997.
23. Michael E. Baginski, Zhi Ding, and George W. Jarriel, "Simulation of the Temporal Development of the SPRITE event using Nonlinear Equations in a 3D Environment, PIERS, 1997 Vol. 1.
24. Michael E. Baginski, George W. Jarriel, Keith Thomas, and Edward C. Shaffer, "Contrast and Comparison of the Electrodynamics of Various Metals under the Action of Large Electric Currents, PIERS, 1997 Vol. 2.
25. Michael E. Baginski, R. Wayne Johnson, Stuart M. Wentworth, and Kyle L. Davis, "Finite Element Analysis of Microstrip Systems and Approximate Formulas for Capacitance, Proceedings of the Technical Program, NEPCON West, 1995.
26. Edward C. Shaffer, Charles A. Gross, and Michael E. Baginski, "Magnetostatic Analysis Using a General Finite Element Program, 1995 Southeast Symposium on Systems Theory.27th meeting Presented Mar 14th at Mississippi State University, Starkville, Miss..
27. M.E. Baginski, A.S. Hodel, M Lankford "A Finite Element Simulation of Lightning Induced Field Changes that Possibly Cause Sprites and Blue Jets, IAMAS, No. 7, July 1995 G. W..
28. Jarriel, L. S. Riggs, and M. E. Baginski, "A Characterization of EM Scattering from RAM Coated Wires, The Fifth Annual Review of Progress in Applied Computational Electromagnetics, March 1995. .
29. M. E. Baginski and George W. Jarriel, "Characterization of Thunderstorm Induced Maxwell Current Densities in the Middle Atmosphere, Journal of Electrostatics, 33 1994, pp. 87 - 102.
30. B. L. Slaten, L. A. Shanley, R. Broughton, and M. E. Baginski, "Thermal Properties of Novel Carbon Fiber Battings, Journal of Fire Science's, Vol. 12, No. 3, pp. 239 - 245, May/June 1994.
31. M.E. Baginski, L.S. Riggs, H.D. Williams, and F.J. German, "Finite Element Analysis of Microstrip Systems in the Vicinity of a Substrate Edge and Approximate Formulas for Capacitance, IEEE Transactions on Electromagnetic Compatibility, Vol. 36, No. 4, pp. 404 - 408, November, 1994.
32. R.C. Jaeger, J.S. Goodling, M.E. Baginski, C.D. Ellis, N.V. Williamson, and M. O'Barr, "High Heat Flux Cooling for Silicon-on Silicon Packaging, IEEE SEMITHERM V Proceedings, February, 1989.
33. F. German, H. Williams, L. Riggs and M.E. Baginski, "Three Dimensional Full Wave Analysis of Passive Microstrip Components Using the TLM Method, The Fifth Annual Review of Progress in Applied Computational Electromagnetics, March, 1989.
34. M.E. Baginski, L.S. Riggs, H. Williams and F. German, "Finite Element Analysis of Microstrip Systems in the Vicinity of an Edge, The Fifth Annual Review of Progress in Applied Computational Electromagnetics, March, 1989.
35. F. German, L.S. Riggs, G. Gothard and M.E. Baginski, "Analysis of Microstrip Antennas Using the TLM Method, The Fifth Annual Review of Progress in Applied Computational Electromagnetics, March, 1989.

36. L.S. Riggs, M.E. Baginski and F.J. German, "Singularity Expansion Method (SEM) Natural Modes as an Efficient Entire Domain Expansion Functions in the Analysis of Frequency Selective Surfaces (FSS), The Fourth Annual Review of Progress in Applied Computational Electromagnetics, 1988.
37. M.E. Baginski, F.J. German and L.S. Riggs, "A Finite Element Analysis of Lightning Induced Maxwell Current Densities, The Fourth Annual Review of Progress in Applied Computational Electromagnetics, 1988.
38. F.J. German, L.S. Riggs and M.E. Baginski, "Electromagnetic Analysis by the Transmission Line Modeling (TLM) Method, The Fourth Annual Review of Progress Applied Computational Electromagnetics, 1988.
39. L.C. Hale, C. Croskey, J. Mitchell, L. Tyahla, R. Divany, and M.E. Baginski, "Lightning Related Maxwell Currents to the Ionosphere, Transactions American Geophysical Union Vol.67, November 6, 1987.
40. M.E. Baginski and L.C. Hale, "Lightning Related Maxwell Currents to the Ionosphere, Transactions American Geophysical Union, Vol. 67, November 6, 1986.
41. M.E. Baginski and L.C. Hale, "Computer Simulation of the Atmosphere's Response to Lightning Related Transients, Transactions American Geophysical Union, Vol. 65, No. 45, November 6, 1984.

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