

LIFETIME PUBLICATIONS

(names of trainees in bold; citations per Google Scholar: 3048, h-index: 29, i10-index: 75)

Journal papers

(accepted)

1. **D. Tajik, A.D. Pitcher**, and N.K. Nikolova, “Comparative study of the Rytov and Born approximations in quantitative microwave holography,” *Progress in Electromagnetic Research (PIER)*. (accepted Oct. 6, 2017)
2. **L.S. Kalantari**, M.H. Bakr, and N.K. Nikolova, “Sensitivity analysis of ferrites with TLM,” *IEEE Microw. Wireless Comp. Lett.* (accepted Aug. 24, 2017).
3. **D.S. Shumakov** and N.K. Nikolova, “Fast quantitative microwave imaging with scattered-power maps,” *IEEE Trans. Microwave Theory Tech.* (accepted Apr. 13, 2017)

(published)

4. **L.S. Kalantari, O.S. Ahmed**, M.H. Bakr, and N.K. Nikolova, “A TLM-based wideband adjoint variable method for sensitivity analysis of nondispersive anisotropic structures,” *IEEE Trans. Antennas Propag.*, vol. 65, no. 10, pp. 5267–5278, Oct. 10, 2017.
5. **D.S. Shumakov, A.S. Beaverstone**, and N.K. Nikolova, “De-noising algorithm for enhancing microwave imaging,” *The IET J. Eng.*, DOI: 10.1049/joe.2016.0207, Mar. 2017.
6. **A.S. Beaverstone, D.S. Shumakov**, and N.K. Nikolova, “Integral equations of scattering for scalar frequency-domain responses,” *IEEE Trans. Microwave Theory Tech.*, vol. 64, no. 4, pp. 1120–1132, Apr. 2017.
7. **D.S. Shumakov, A.S. Beaverstone**, and N.K. Nikolova, “Optimal illumination schemes for near-field microwave imaging,” *Progress in Electromagnetic Research (PIER)*, vol. 157, pp. 93–110, 2016.
8. **S. Tu, J.J. McCombe**, and N.K. Nikolova, “Fast quantitative microwave imaging with resolvent kernel extracted from measurements,” *Inverse Problems*, vol. 31 no. 4, **045007**, (33 pp), Apr. 2015.
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12. N.K. Nikolova, “Microwave biomedical imaging,” *Wiley Encyclopedia of Electrical and Electronics Engineering*, pp. 1–22. (published on-line Apr. 25, 2014)
13. **M.H. Negm**, M.H. Bakr, N.K. Nikolova, and J.W. Bandler, “Wideband second-order adjoint sensitivity analysis exploiting TLM,” *IEEE Trans. Microwave Theory Tech.*, vol. 62, no. 3, pp. 389–398, March 2014.
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Conference proceedings (refereed)

(accepted/published)

1. **D. Tajik, D.S. Shumakov**, and N.K. Nikolova, "Study of the impact of noise on two real-time microwave inversion methods," *XXXII Int. Union of Radio Science General Assembly & Scientific Symp. (URSI GASS 2017)*, Montreal, Aug. 2017, accepted.
2. **D.S. Shumakov, D. Tajik, A.S. Beaverstone**, and N.K. Nikolova, "Study of practical limitations of real-time microwave imaging of tissue," *IEEE AP-S/URSI Int. Symp. on Antennas and Propagation*, July 2017, San Diego, CA, accepted.
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133. N.K. Georgieva, “Construction of solutions to electromagnetic problems in terms of two collinear vector potentials,” *IEEE MTT-S Int. Microwave Symp. Digest 2001*, May 2001, vol. 3, pp. 2011–2014.
134. N.K. Georgieva, “Study on the completeness of a pair of two collinear vector potentials in electrodynamics,” *URSI Int. Symposium on Electromagnetic Theory Digest 2001*, May 2001, pp. 267–269.
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140. **M.H. Bakr**, J.W. Bandler, and N.K. Georgieva, “Modeling of microwave circuits exploiting space derivative mapping,” *IEEE MTT-S Int. Microwave Symp. Digest*, June 1999, vol. 2, pp. 715–718.
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146. N.K. Georgieva and E. Yamashita, “Analysis method for transient fields in planar structures by marching-on-in-time integral equation technique”, *IEEE MTT-S Int. Microwave Symp. Digest*, June 1996, pp. 1051–1054.
147. N.K. Georgieva, “Analysis of the characteristic parameters of microstrip lines by the boundary element method,” *Annual Symposium in Electronics* (Gabrovo, Bulgaria), June 1992.

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Invited Lectures

Lectures under the IEEE Distinguished Microwave Lecturer Series

Lecture title: *Microwave near-field imaging of human tissue: hopes, challenges, outlook*

Presented at:

1. *McGill University*, Montreal, Aug. 2017.
2. *Villanova University*, Pennsylvania, Apr. 2017.
3. *Graduate Seminar Series*, Ryerson University, Toronto, Canada, Mar. 2016.
4. *IEEE Canadian Atlantic Section MTT-S Chapter, DalTech*, Halifax, NS, Canada, Nov. 2013.
5. *European Doctoral School*, Nuremberg, Germany, Oct. 2013.
6. *IEEE Winnipeg Waves Chapter (AP/MTT/VT), University of Manitoba*, Winnipeg, MB, Canada, Sep. 2013.
7. *IEEE New Hampshire Section's MTT-S Chapter*, Manchester, NH, Sep. 2013.
8. *IEEE Wireless and Microwave Technology Conference (WAMICON) 2013*, Tutorial, Orlando FL, Apr. 2013.
9. *The North Jersey MTT 25th Annual Symposium and Mini-Show*, East Hanover NJ, Oct. 2012.
10. *IEEE MTT Chapter of the NJ Coast Section*, Red Bank NJ, Oct. 2012.
11. *ElectroScience Laboratory*, Columbus OH, Aug. 2012.
12. *The Hamilton IEEE Section*, Hamilton ON, June 2012.
13. *Washington University at St. Louis*, Missouri, May 2012.
14. *Advanced Electromagnetics Symposium*, Paris, France, Apr. 2012.
15. *University of Arizona*, Tucson AZ, Apr. 2012.
16. *Radio Wireless Week (RWW) 2012*, Santa Clara CA, Jan. 2012.
17. *2011 IEEE International RF and Microwave Conference (RFM2011)*, Seremban, Malaysia, Dec. 2011.
18. *University of Adelaide*, Adelaide, Australia, Dec. 2011.
19. *Asia-Pacific Microwave Conference (APMC) 2011*, Melbourne, Australia, Dec. 2011.
20. *National Chung Cheng University (NCCU)*, Chiayi, Taiwan, Dec. 2011.
21. *National Taiwan University (NTU)*, Taipei, Taiwan, Nov. 2011.
22. *National Chiao Tung University (NCTU)*, Hsinchu, Taiwan, Nov. 2011.
23. *University of Minnesota*, Minneapolis, Oct. 2011.
24. *Purdue University*, Indianapolis, Sep. 2011.
25. *70th URSI CNC Meeting Symp.*, École Polytechnique de Montréal, May 2011.
26. *University of Ottawa*, May 2011.
27. *National University of Singapore*, Singapore, March 2011.
28. *University of Waterloo*, March 2011.
29. *Winter TCC meeting of the IEEE MTT-S*, Phoenix AZ, Jan. 2011.

Other invited lectures:

30. N.K. Nikolova, “Challenges in the microwave imaging of human tissue,” *Microwave Imaging*, IEEE Women in Engineering Montreal Section, McGill University, Aug. 2017.
31. N.K. Nikolova, “Challenges faced by female academics in male-dominated disciplines – a personal perspective,” *Mentor of the Month*, McMaster WISE (Women in Science and Engineering) Society, Feb. 2016.
32. N.K. Nikolova, **J.J. McCombe**, **D. Shumakov**, and **A.S. Beaverstone**, ““Smart” radar for stand-off security screening in the making at Mac,” *CAFÉ E-Xpress Morning Lecture Series*, McMaster University, Dec. 2015.
33. N. K. Nikolova, “Solving design problems through electromagnetic simulation,” *Institute of High-Performance Computing (IHPC)*, Singapore, March 2011.
34. N.K. Nikolova, “Recent advances in the methodologies of near-field microwave imaging,” *University of Toronto*, Dec. 2009.
35. N.K. Nikolova, **R.K. Amineh**, **L. Liu**, and **A. Trehan**, “Microwave imaging of the human body: beyond simulation,” *Pennsylvania State University, University Park*, Oct. 2009.
36. N.K. Nikolova, “Solving design and inverse-imaging problems through electromagnetic simulation,” *Defence R&D Canada – Ottawa*, Sep. 2008.
37. N.K. Nikolova, “Solving design and inverse-imaging problems through electromagnetic simulation,” *Warsaw University of Technology*, May 2008.

Books

1. N.K. Nikolova, *Introduction to Microwave Imaging*. Cambridge University Press, July 2017.

Book Chapters

1. **D.S. Shumakov**, **D. Tajik**, **A.S. Beaverstone**, and N.K. Nikolova, “Real-time quantitative reconstruction methods in microwave imaging,” Chapter 17, in A. Lakhtakia and C.M. Furse, Eds., *The World of Applied Electromagnetics - In Appreciation of Magdy Fahmy Iskander*. Springer, 2017 <http://www.springer.com/gp/book/9783319584027> (ISBN 978-3-319-58402-7).
2. G. Kouzaev, M.J. Deen, and N. Nikolova, “Transmission lines and passive components,” Chapter II in M.J. Deen, Guest Ed., *Advances in Imaging and Electron Physics, vol. 174: Silicon-Based Millimeter-Wave Technology, Measurement, Modeling and Applications*. Academic Press, 2012 (ISBN 978-0-12-394298-2).
3. N.K. Nikolova, **M. Ravan**, and **R.K. Amineh**, “Substrate integrated antennas on silicon,” Chapter VI in M.J. Deen, Guest Ed., *Advances in Imaging and Electron Physics, vol. 174: Silicon-Based Millimeter-Wave Technology, Measurement, Modeling and Applications*. Academic Press, 2012 (ISBN 978-0-12-394298-2).
4. N. Georgieva, “Time-domain theory and applications of electromagnetic potentials,” in *Recent Research Development in Microwave Theory & Techniques (vol. 2)*, Transworld Research Network, 2002. (ISBN 81-7736-099-X)
5. N. Georgieva, Chapter IV, “Electromagnetic induction, time-varying electromagnetic fields, electromagnetic energy,” in M. Ivanova, S.V. Savov, E. Panov, N. Georgieva and R. Vassilev, *Solved Problems in Electromagnetics*, Technical University of Varna Press Center, 1997 (in Bulgarian)

Patents

- *On-body Concealed Weapon Detection System*, United States Provisional Application: No. 62/017,410 (priority date, June 26, 2014), now expired.
- *On-body Concealed Weapon Detection System*, United States Utility Patent Application: No. 14/751,796 (filed June 26, 2015).

- *On-body Concealed Weapon Detection System*, Canadian Patent Application: No. CA 2,895,795 (filed June 26, 2015).
- *On-body Concealed Weapon Detection System*, Ukrainian Patent Application: No. a 2015 06349 (filed June 26, 2015).
- *Cognitive Microwave Radar for the Stand-Off Detection of On-Body Concealed Weapons*, European Patent Application: No. EP15174116.2 (filed June 26, 2015).
- *On-body Concealed Weapon Detection System*, Hong Kong Patent Application: No. 16106764.3 (filed June 13, 2016).
- *On-body Concealed Weapon Detection System*, to be filed in Australia 2016.
- *Electromagnetic Wave-Potential Communication System*, Patent No 12/184,700 (US Patent)

Non-refereed Publications (Workshop, Invited Conference Presentations, Editorials)

1. **D.S. Shumakov, D. Tajik, A.S. Beaverstone**, and N.K. Nikolova, “Experimental study of quantitative quasi-real time methods for microwave imaging,” Special Session in honor of Prof. M. Iskander, *IEEE MTT-S Int. Microwave Symp.* (Honolulu, Hawai’i), June 2017.
2. N.K. Nikolova, “The basics of microwave imaging,” Workshop on Principles of RF and Microwave Imaging Technology: From Radar to MRI, *IEEE MTT-S Int. Microwave Symp.* (San Francisco, CA), May 2016.
3. N.K. Nikolova, **J.J. McCombe, D. Shumakov**, and **A.S. Beaverstone**, ““Smart” radar for stand-off security screening in the making at Mac,” *CAFÉ E-Xpress Morning Lecture Series*, McMaster University, Dec. 2015.
4. **J.J. McCombe**, N.K. Nikolova, and **D. Shumakov**, “Long-range stand-off microwave radar for personnel protection,” *NATO SPS Project Meeting*, McMaster University, Dec. 2015.
5. N.K. Nikolova and Z. Chen, “Welcome message from the Technical Program Chairs,” *IEEE MTT-S Int. Conf. on Numerical Electromagnetic and Multiphysics Modeling and Optimization (NEMO 2015) Conference Proceedings*, Aug. 11–14, 2015, Ottawa, Canada.
6. N.K. Nikolova, **M.S. Dadash**, and J.W. Bandler, “Field-based analytical sensitivities of scattering parameters,” Workshop on Statistical Modeling of Microwave Circuits and Systems, *IEEE MTT-S Int. Microwave Symp.* (Tampa, FL), June 2014.
7. N.K. Nikolova, **Y. Zhang**, and **R.K. Amineh**, “Model-based real-time reconstruction methods for microwave imaging of tissue,” Workshop on Biomedical Applications of Microwaves, *European Microwave Week (EuMW) 2012* (Amsterdam, the Netherlands), Oct. 2012.
8. N.K. Nikolova and M.H. Bakr, “Overview of focus and special sessions at IMS 2012,” *IEEE Microwave Mag.*, June 2012.
9. M.H. Bakr and N.K. Nikolova, “IMS 2012: Panel and rump sessions,” *IEEE Microwave Mag.*, June 2012.
10. N.K. Nikolova, “Challenges in the solution of inverse problems in microwave imaging,” *Int. Conf. Industrial and Applied Mathematics (ICIAM 2011)* (Vancouver, Canada), July 2011.
11. N.K. Nikolova, “Microwave near-field imaging of human tissue: hopes, challenges, outlook,” Workshop on Recent Developments in Microwave Imaging and Detection, *IEEE MTT-S Int. Microwave Symp.* (Baltimore, MD), June 2011.
12. N.K. Nikolova, **R.K. Amineh**, and **Li Liu**, “Exploiting electromagnetic simulations in real-time imaging and detection algorithms,” Workshop on Simulation- and Surrogate-Driven Microwave Design Technology, *IEEE MTT-S Int. Microwave Symp.* (Baltimore, MD), June 2011.
13. N.K. Nikolova, **R.K. Amineh**, and **Li Liu**, “Microwave raster scanning apparatus and real-time reconstruction methods,” *CRC 10 Year Anniversary Event* (Toronto), Nov. 2010.
14. N.K. Nikolova, **R.K. Amineh**, and **Li Liu**, “Microwave raster scanning apparatus and real-time

- reconstruction methods,” *2010 Advances in Breast Cancer Research Workshop* (Fayetteville, AR), Oct. 2010.
15. **K. Moussakhani, S. Dadash**, and N.K. Nikolova, “Using self adjoint sensitivity analysis for design of metamaterial unit cell,” *The 10th International Workshop on Finite Elements for Microwave Engineering* (Meredith, New Hampshire), Oct. 2010.
 16. N.K. Nikolova and **Li Liu**, “Microwave real-time detection of scatterers using self-adjoint sensitivity analysis,” *International Workshop on Advances in Modeling and Optimization of High Frequency Structures* (Reykjavik, Iceland), Aug. 2010.
 17. N.K. Nikolova, **R.K. Amineh, A. Trehan**, and **Li Liu**, “Direct methods for detection and imaging with microwave measurements in the ultra-wide band,” Workshop on Ultra Wide Band Technology – State-of-the-Art and Applications, *IEEE MTT-S Int. Symposium* (Anaheim, CA), May 2010.
 18. N.K. Nikolova, **L. Liu, R.K. Amineh**, and **A. Trehan**, “Electromagnetic simulations aiding imaging and detection with microwaves,” Workshop on New Theories, Applications and Practice of Electromagnetic Field Simulators, *IEEE MTT-S Int. Symposium* (Anaheim, CA), May 2010.
 19. N.K. Nikolova, **L. Liu**, and **A. Trehan**, “Adjoint sensitivities in microwave imaging and design tuning,” Workshop on EM-Based Microwave Optimization Technology: State of the Art and Applications, *IEEE MTT-S Int. Symposium* (Boston, MA), June 2009.
 20. N.K. Nikolova, “From the Guest Editor’s desk: Electromagnetic software in microwave engineering,” *IEEE Microwave Magazine*, Guest Editorial, vol. 9, No. 6, Dec. 2008.
 21. N.K. Nikolova, “Solving design and inverse-imaging problems through electromagnetic simulation,” invited, *17th Int. Conference on Microwaves, Radar and Wireless Communications MIKON 2008*, May 2008.
 22. **R.K. Amineh**, N.K. Nikolova, J.P. Reilly, and J.R. Hare, “Characterization of surface breaking cracks,” *20th Int. Pipeline Pigging and Integrity Management Conference*, Houston, TX, Feb. 2008.
 23. **A. Hasib, X. Zhu**, and N.K. Nikolova, “Frequency-domain sensitivity analysis for optimization with HFSS,” *First-Pass System Success*, Ansoft Application Workshop for High-Performance Electronic Design, Toronto, Oct. 2007.
 24. **D. Li** and N.K. Nikolova, “S-parameter sensitivity analysis of waveguide structures with FEMLAB,” *COMSOL Multiphysics Conference*, Oct. 2005, Cambridge, MA, pp. 267–271.
 25. N.K. Nikolova, “Sensitivity analysis and optimization with frequency-domain electromagnetic solvers,” Workshop on *Electromagnetics-based Computer-aided Design of High-frequency Structures and Antennas*, McMaster University, Sep. 2005.
 26. N.K. Nikolova, “Sensitivity analysis in the time domain: applications with the FDTD method,” Workshop on *Electromagnetics-based Computer-aided Design of High-frequency Structures and Antennas*, McMaster University, Sep. 2005.
 27. N.K. Nikolova, “The origin of nonuniqueness in inverse electromagnetic problems: a review,” Workshop on *Field-based Synthesis and Computer Aided Design of Electromagnetic Structures*, *16th Int. Zurich Symp. on Electromagnetic Compatibility*, Feb. 2005.
 28. N.K. Nikolova, “Teaching waves and electrodynamics: concepts and tools,” Workshop on *Electromagnetics Education*, *IEEE MTT-S Int. Symposium* (Fort Worth, Texas), June 2004.
 29. N.K. Georgieva and **Y. Rickard**, “Problem-independent enhancement of PML ABC for finite difference time domain techniques in electrodynamics,” *Southern Ontario Numerical Analysis Day* (The FIELDS Institute for Research in Mathematical Sciences), Apr. 2002.
 30. N.K. Georgieva, **S. Glavic**, M.H. Bakr, and J.W. Bandler, “Adjoint sensitivities for EM simulations,” Workshop on *Optimization Engines for Wireless and Microwave Computer Aided Engineering*, Carleton University, Ottawa, June 2002.

31. N.K. Georgieva, **S. Glavic**, M.H. Bakr, and J.W. Bandler, “Adjoint variable methods for design sensitivity analysis with the method of moments,” *CITO Annual Workshop*, Ottawa, May 2002.
32. **S. Glavic** and N.K. Georgieva, “Adjoint-based optimization of antennas with the Method of Moments,” poster presentation at the *Micronet Annual Workshop* (Hull, Québec), Apr. 2002.
33. **R. Tam, H. Tam**, and N.K. Georgieva, “Optimization oriented transient EM simulator for the design of high-frequency structures,” *Micronet Annual Workshop* (Aylmer, Québec), Apr. 2001.
34. N.K. Georgieva, “Visualization and involvement: a key to the intuitive understanding of electromagnetics and antenna theory,” Workshop on *Web-Based RF and Microwave Education, IEEE MTT-S Int. Symposium* (Phoenix, Arizona), May 2001.
35. N.K. Georgieva, “Commercial EM simulators and optimization,” Workshop on *Next Generation Optimization Methodologies for Wireless and Microwave Circuit Design*, McMaster University, June 1999.