

# JOHN BRAND SCHNEIDER

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## Address:

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## Education:

B.S. *Summa Cum Laude*, Tulane University, Electrical Engineering, 1983  
M.S., University of Washington, Electrical Engineering, 1985  
Ph.D., University of Washington, Electrical Engineering, 1991

## Professional Experience:

Student Engineer, North Anna Nuclear Power Plant, Jun. 1980 – Aug. 1980  
Graduate Teaching Assistant, University of Washington, Sep. 1983 – Jun. 1985,  
Sep. 1986 – Dec. 1986  
Graduate Research Assistant, University of Washington, Sep. 1985 – Jun. 1986  
Participant, San Diego Supercomputer Center Summer Institute, Aug. 1986  
System Manager (DEC VAX/VMS), University of Washington, May 1986 – Feb. 1989  
Predoctoral Research Assoc., University of Washington, Aug. 1987 – May 1989  
Project Associate, Washington State University, May 1989 – Aug. 1991  
Visiting Assistant Professor, Washington State University, Aug. 1991 – Aug. 1992  
Participant, NSF workshop *Revitalizing the Engineering, Mathematics, and Science Curricula via Symbolic Algebra*, Jul. 1992  
Assistant Professor, Washington State University, Aug. 1992 – Aug. 1998  
Associate Director, School of Electrical Engineering and Computer Science, Washington State University,  
May 2001 – Aug. 2002  
Associate Professor, Washington State University, Aug. 1998 – present  
Participant, ABET Institute for the Development of Excellence in Assessment Leadership (IDEAL), Aug.  
2010.  
Director of Educational Initiatives, Digilent Inc., Aug. 2012 – Oct. 2013.  
Associate Dean for Undergraduate Programs and Student Services, Voiland College of Engineering and  
Architecture, Washington State University, Jan. 2014 – Aug. 2018.

## Research Interests:

Acoustics, optics, and electromagnetics  
Wave propagation and scattering  
Computer solutions to electromagnetic and acoustic problems  
Remote sensing

**Awards:**

IEEE New Orleans Chapter Best Student Paper Award, 1983  
Eldec Corporation Graduate Teaching Fellowship, 1983–86  
GTE Graduate Fellowship, 1986–87  
Physio-Control Graduate Fellowship, 1987–89  
Best Paper Award, Pacific Northwest Am. Soc. for Engineering Education Meeting, 1992  
Office of Naval Research Young Investigator, 1996–1999  
Washington State University School of Electrical Engineering and Computer Science Outstanding Research Faculty Member, 2000–2001  
Washington State University School of Electrical Engineering and Computer Science Outstanding Teacher, 2011–2012  
Washington State University Voiland College of Engineering and Architecture Reid Miller Teaching Excellence Award, 2013–2014  
IEEE Fellow, 2013  
Washington State University Voiland College of Engineering and Architecture Reid Miller Teaching Excellence Award, 2022–2023

**Professional Memberships:**

Eta Kappa Nu  
Tau Beta Pi (Life Member)  
Institute of Electrical and Electronics Engineers: Antennas and Propagation Society, Electromagnetic Compatibility Society, Geoscience and Remote Sensing Society, Microwave Theory and Techniques Society, Oceanic Engineering Society  
Applied Computational Electromagnetics Society  
American Society for Engineering Education  
Acoustical Society of America  
International Union of Radio Science (URSI) Commission B

**Professional Service:**

Reviewer for NIH Special Study Section on Electromagnetic Devices; PWS-Kent Publishing Co.; NSF Instrumentation and Laboratory Improvement Program (ILI); NSF Small Business Innovation Research Program (SBIR); and other NSF programs; Engineering and Physical Sciences Research Council (Europe); *IEEE Transactions on Acoustics, Speech, and Signal Processing*; *IEEE Transactions on Antennas and Propagation*; *IEEE Transactions on Electromagnetic Compatibility*; *IEEE Transactions on Geoscience and Remote Sensing*; *IEEE Transactions on Microwave Theory and Techniques*; *Journal of the Optical Society of America*; *Radio Science*; *Journal of Electromagnetic Waves and Applications*; *IEEE Microwave and Guided Wave Letters*; *Journal of the Acoustical Society of America*; *Journal of Computational Physics*; *Acustica United with Acta Acustica*; *Applied Computational Electromagnetics Society*; *Physics of Fluids*  
Session Chair, 55th Annual PNW ASEE Section Conference, Pullman, WA, 1993  
Technical Reviewer and Session Chair for the IEEE Antennas and Propagation Society and URSI Radio Science Meeting, Seattle, WA, 1994  
Session Chair, Progress in Electromagnetics Research Symposium (PIERS), Seattle, WA, 1995; Session

Chair for the IEEE Antennas and Propagation Society and URSI Radio Science Meeting, Salt Lake City, UT 2000

Former maintainer of `fdtd.org` which provided, among other services, a listing of FDTD-related publications

Associate Editor, *Journal of the Acoustical Society of America*, 2003–2005

Member of the Technical Program Committee, reviewer, and session chair for the IEEE International Symposium on Antennas and USNC/URSI National Radio Science Meeting, Charleston, SC, 2009

Member of the Technical Program Committee, reviewer, and session chair for the IEEE International Symposium on Antennas and CNC-USNC/URSI National Radio Science Meeting, Toronto, Canada, 2010

Co-Chair of the Technical Program Committee, member of the Special Session Committee, reviewer, and session chair for the IEEE International Symposium on Antennas and USNC/URSI National Radio Science Meeting, Spokane, WA, 2011

Member of the Technical Program Committee, Special Session Committee, and reviewer for the IEEE International Symposium on Antennas and USNC/URSI National Radio Science Meeting, Chicago, IL, 2012

Member of the Special Session Committee, Judge for the Student Paper Competition, and reviewer for the IEEE International Symposium on Antennas and USNC/URSI National Radio Science Meeting, Orlando, FL, 2013

Chair of the Washington Council for Engineering and Related Technical Education (WCERTE), Fall 2016–2018

### **Grants:**

Co-P.I., Boeing Defense and Space Group, “Electromagnetic Scattering from Curved Conducting Surfaces Coated with Isotropic and Anisotropic Dielectrics,” 1993, \$75,000.

Co-P.I., Office of Naval Research, “Monte Carlo Simulations of Acoustic Propagation through Shallow Water,” 1994, \$54,706.

Co-P.I., Office of Naval Research, “Monte Carlo Simulations of Acoustic Propagation through Shallow Water,” 1995–97, \$50,406.

P.I., Office of Naval Research, “Numerical Studies of Acoustic Propagation in Shallow Water,” 1996-99, \$300,000.

Co-P.I., Office of Naval Research, “Visualization and Animation of Acoustic Propagation,” 1996, \$3,447.

P.I., National Science Foundation, “An Open Database of the Finite-Difference Time-Domain Literature,” 1999–2000, \$41,737.

P.I., Office of Naval Research, “Application of the Finite-Difference Time-Domain Method to Problems in Shallow-Water Acoustics,” 1999–2001, \$161,339.

P.I., Office of Naval Research, “Application of Finite-Difference Time-Domain Methods to Problems in Ocean Acoustics,” 2001–2004, \$295,861.

P.I., Office of Naval Research, “Time-Domain Simulations of Acoustic Scattering from Discrete Objects in an Ocean Sediment,” 2005, \$62,013.

P.I., Electric Power Research Institute (EPRI), “FDTD Modeling of RF Burns,” 2008, \$46,170.

P.I., Electric Power Research Institute (EPRI), “Finite-Difference Time-Domain Modeling of Human Exposure to Advanced Metering Infrastructure Equipment,” 2010, \$40,882.

Co-P.I., National Science Foundation, (Louis Stokes Alliance for Minority Participation [LSAMP]), “Pa-

cific Northwest LSAMP Alliance,” 2014, \$523,654.

Co-P.I., National Science Foundation (STEP), “Collaborative Research: The Washington State Academic RedShirt in Engineering Program,” 2014, \$849,949. (Grant started in 2013. I took over in 2014.)

Co-P.I., National Science Foundation (S-STEM), “Collaborative Research: The Redshirt Engineering Consortium,” 2016, \$761,228.

P.I., Donation from the Raintrain Foundation, “Creation of the Frank Innovation Zone,” 2014, \$1,500,000.

P.I., Donation from Boeing Cybergrants program, “An Open Innovation Zone for Engineering Student Engagement,” 2014, \$42,000.

P.I., Donation from Stubblefield Trust, “Support for the Washington State Academic RedShirt (STARS) Program,” 2015, \$5,000.

Over the course of my time as associated dean also participated in providing input to various proposals either to government agencies (where I was not a named PI) or to donors (where the Development Team had lead responsibility).

Co-P.I., National Science Foundation (HRD-ADVANCE), “Values-based Academic Leadership Trajectories for women in STEM (VAuLTS),” 2019–2023, \$1,218,058.

P.I., WSU Provost’s Office, “Redesign of Fall 2021 Large Course,” 2021, \$3,262.

### **Courses Taught:**

Innovation in Design (ENGR 120)

Introduction to Algorithmic Problem Solving (CptS 111)

Data Structures (CptS 122)

Computer Programming for Engineers (CptS 203)

Design of Digital Circuits (EE 214)

The C Programming Language (CptS 251)

Introduction to Electric Circuits (EE 304)

Electrical Circuits I (EE 261)

Electrical Circuits II (EE 321)

Numerical Computing (CptS 330)

Electromagnetic Fields and Waves (EE 331)

Distributed Parameter Systems (EE 351)

Numerical Solutions to Electromagnetics Problems (EE 417)

Introduction to Modern Optics (EE 504)

Advanced Electromagnetic Theory (EE 518)

Special Topics in Electromagnetics (EE 528)

Numerical Solutions to EM Problems I (EE 535)

Introduction to the FDTD Method (EE 595)

### **Graduate Students:**

Mark Steeds, M.S., Thesis: *A Comparison of Two Conformal Methods for FDTD Modeling*, May 1995 (co-chair with Shira Broschat).

Frank Hastings, Ph.D., Thesis: *A Study of Rough Surface Scattering in Electromagnetics, Acoustics, and Elastodynamics Applications Using Finite-Difference Time-Domain Simulations*, Aug. 1997.

- Christopher L. Wagner, M.S., Thesis: *Sources and Field Divergence in Electromagnetic Finite-Difference Time-Domain Simulations*, May 1998.
- Julius G. Tolan, M.S., Thesis: *Finite-Difference Time-Domain Acoustic Simulations Using a Locally Conformal Representation of Neumann Boundaries*, May 2001.
- Christopher L. Wagner, Ph.D., Thesis: *Theoretical Basis for Numerically-Exact Three-Dimensional Time-Domain Algorithms*, May 2004.
- Abulikemu Tuerxunjiang, M.S., Thesis: *FDTD Measurement of the Reflection Coefficient Associated with Total Internal Reflection from Gainy Media*, Dec. 2008.
- Lanchuan Zhou, Ph.D., Thesis: *The Study of RF Burns and AMI Exposure Using the FDTD Method*, May 2012.
- Timothy Minter, Ph.D., Thesis: *Electromagnetic Modeling Based on Directional Time-Distance Energy Transfer Analogies*, May 2013.
- Zhen Chen, Ph.D., Thesis: *Applications of, and Enhancements to, Finite-Difference-Based Solutions to Problems in Electromagnetics*, Dec. 2013.

**Graduate Student Committees:**

- Mark Derbyshire, M.S., Electrical Engineering, June 1993.
- Samuel Backus, M.S., Electrical Engineering, Dec. 1993.
- Frank Hastings, M.S., Electrical Engineering, May 1993.
- Agus Daniel, M.S., Electrical Engineering, Aug. 1993.
- Trevor Snyder, M.S., Mechanical Engineering, Dec. 1993.
- Christopher Lyon, M.S., Electrical Engineering, Sep. 1994.
- Ashraf Osman, M.S., Electrical Engineering, Dec. 1994.
- Yan Chen, M.S., Electrical Engineering, Aug. 1995.
- Aaron Andrews, Ph.D., Electrical Engineering, May 1994.
- S. Gökhan Tanyer, Ph.D., Electrical Engineering, Jul. 1994.
- Trevor Snyder, Ph.D., Mechanical Engineering, Dec. 1995.
- Sterling Backus, Ph.D., Engineering Science, May 1996.
- Russel Bruhn, Ph.D., Electrical Engineering, Dec. 1998.
- Scot Morse, Ph.D., Physics, Aug. 1998.
- John St. George, M.S., Electrical Engineering, Dec. 1999.
- Brian Hefner, Ph.D., Physics, Jul. 2000.
- Ronggang Zhang, M.S., Electrical Engineering, Dec. 2000.
- Florian Blonigan, Ph.D., Physics, Aug. 2001.
- Bhavana Katyal, M.S., Electrical Engineering, Aug. 2004.
- Curtis Ousterhoudt, Ph.D., Physics, May 2007.
- Erik Wemlinger, M.S., Physics, May 2007.
- Tim Minter, M.S., Electrical Engineering, May 2008.
- Kyungmin Baik, Ph.D., Physics, May 2008.
- Aubrey España, Ph.D., Physics, Jul. 2009.
- Yanqiu Wang, Ph.D., Electrical Engineering, May 2010.
- Tengmeng Tan, Ph.D., Electrical Engineering, University of Calgary, Mar. 2010.
- Jon LaFollett, Ph.D., Physics, Jun. 2010.

Erik Wemlinger, Ph.D., Electrical Engineering, May 2012.  
 Rokib Islam, Ph.D., Electrical Engineering, May 2016.  
 Shuzheng Xie, Ph.D., Electrical Engineering, May 2019.  
 Matthias Engels, Ph.D., Electrical Engineering, Dec. 2019.  
 Jon Leman, Ph.D., Electrical Engineering, May 2021.

### Refereed Journal Publications:

[NN:G:II; NN=citations primarily as of Feb. 2022 (although some date to Feb. 2021); G=indicates the citation-count source is Google Scholar; II=journal impact factor for 2024 as report by Google.]

1. J. B. Schneider and I. C. Peden, "Differential Cross Section of a Dielectric Ellipsoid by the  $T$ -Matrix Extended Boundary Condition Method," *IEEE Trans. Antennas Propagat.*, vol. 36, no. 9, pp. 1317–1321, 1988. [**45:G:5.7**]
2. J. Schneider, J. Brew, and I. C. Peden, "Electromagnetic Detection of Buried Dielectric Targets," *IEEE Trans. Geosci. Remote Sensing*, vol. 29, no. 4, pp. 555–562, 1991. [**26:G:8.125**]
3. S. L. Broschat, J. B. Schneider, F. D. Hastings, and M. W. Steeds, "Interactive Software for Undergraduate Electromagnetics," *IEEE Trans. Educ.*, vol. 36, no. 1, pp. 123–126, 1993. [**21:G:3.57**]
4. J. Schneider and I. C. Peden, "Detection of Tunnels in Low Loss Media Illuminated by a Transient Pulse," *IEEE Trans. Geosci. Remote Sensing*, vol. 31, no. 2, pp. 503–506, 1993. [**12:G:8.125**]
5. G. L. Hower, R. G. Olsen, J. D. Earls, and J. B. Schneider, "Inaccuracies in Numerical Calculations of Scattering Near Natural Frequencies of Penetrable Objects," *IEEE Trans. Antennas Propagat.*, vol. 41, no. 7, pp. 982–986, 1993. [**84:G:5.7**]
6. J. Schneider and S. Hudson, "The Finite-Difference Time-Domain Method Applied to Anisotropic Material," *IEEE Trans. Antennas Propagat.*, vol. 41, no. 7, pp. 994–999, 1993. [**205:G:5.7**]
7. J. B. Schneider and S. L. Broschat, "The Measured Equation of Invariance Method Applied to Randomly Rough Surfaces," *Applied Computational Electromagnetics Soc. J.*, vol. 10, no. 1, pp. 19–30, 1995. [**3:G:1.41**]
8. C. W. Manry, S. L. Broschat, and J. B. Schneider, "Higher-Order FDTD Methods for Large Problems," *Applied Computational Electromagnetics Soc. J.*, vol. 10, no. 2, pp. 17–29, 1995. [**74:G:1.41**]
9. C. J. Railton, I. J. Craddock, and J. B. Schneider, "Improved Locally Distorted CPFDTD Algorithm with Provable Stability," *Electronics Lett.*, vol. 31, no. 18, pp. 1585–1586, 1995. [**42:G:1.316**]
10. S. Kapoor and J. B. Schneider, "Characterization of Microstrip Discontinuities Using Conformal Mapping and the Finite-Difference Time-Domain Method," *IEEE Trans. Microwave Theory Tech.*, vol. 43, no. 11, pp. 2636–2639, 1995. [**10:G:4.3**]
11. K. L. Shlager and J. B. Schneider, "A Selective Survey of the Finite-Difference Time-Domain Literature," *IEEE Antennas Propag. Mag.*, vol. 37, no. 4, pp. 39–56, 1995. [**371:G:3.5**]

12. F. D. Hastings, J. B. Schneider, and S. L. Broschat, "A Monte-Carlo FDTD Technique for Rough Surface Scattering," *IEEE Trans. Antennas Propagat.*, vol. 43, no. 11, pp. 1183–1191, 1995. [**21:G:5.7**]
13. M. W. Steeds, S. L. Broschat, and J. B. Schneider, "A Comparison of Two Conformal Methods for FDTD Modeling," *IEEE Trans. Electromagn. Compat.*, vol. 38, no. 2, pp. 181–187, 1996. [**17:G:2.1**]
14. T. J. Snyder, J. B. Schneider, and J. N. Chung, "A Second Look at Electrokinetic Phenomena in Boiling," *J. Appl. Phys.*, vol. p79, no. 9, pp. 6755–6760, 1996. [**12:G:2.286**]
15. F. D. Hastings, J. B. Schneider, and S. L. Broschat, "Application of the Perfectly Matched Layer (PML) Absorbing Boundary Condition to Elastic Wave Propagation," *J. Acoust. Soc. Am.*, vol. 100, no. 5, pp. 3061–3069, 1996. [**45:G:2.4**]
16. C. J. Railton, I. J. Craddock, and J. B. Schneider, "The Analysis of General 2D PEC Structures Using a Modified CPFDTD Algorithm," *IEEE Trans. Microwave Theory Tech.*, vol. 44, no. 10, pp. 1728–1733, 1996. [**23:G:4.3**]
17. J. B. Schneider, P. J. Flynn, and K. L. Shlager, "Animating the Evolution of a Field," *IEEE Antennas Propag. Mag.*, vol. 38, no. 6, pp. 7–17, 1996. [**5:G:3.5**]
18. J. B. Schneider and K. L. Shlager, "FDTD Simulations of TEM Horns and the Implications for Staircased Representations," *IEEE Trans. Antennas Propagat.*, vol. 45, no. 12, pp. 1830–1838, 1997. [**50:G:5.7**]
19. F. D. Hastings, J. B. Schneider, and S. L. Broschat, "A Finite-Difference Time-Domain Solution to Scattering from a Rough Pressure-Release Surface," *J. Acoust. Soc. Am.*, vol. 102, no. 6, pp. 3394–3400, 1997. [**45:G:2.4**]
20. J. B. Schneider, C. L. Wagner, and S. L. Broschat, "Implementation of Transparent Sources Embedded in Acoustic Finite-Difference Time-Domain Grids," *J. Acoust. Soc. Am.*, vol. 103, no. 1, pp. 136–142, 1998. [**75:G:2.4**]
21. T. J. Snyder, J. N. Chung, and J. B. Schneider, "Competing Effects of Dielectrophoresis and Buoyancy on Nucleate Boiling and an Analogy with Variable Gravity Boiling Results," *J. Heat Transf.–Trans. ASME*, vol. 129, pp. 371–379, May 1998. [**24:G:2.1**]
22. O. M. Ramahi and J. B. Schneider, "Comparative Study of the PML and C-COM Mesh-Truncation Techniques," *IEEE Microwave and Guided Wave Lett.*, vol. 8, no. 2, pp. 55–57, 1998. [**15:G:3.0, now published as IEEE MWCL**]
23. J. B. Schneider and O. M. Ramahi, "The Complementary Operators Method Applied to Acoustic Finite-Difference Time-Domain Simulations," *J. Acoust. Soc. Am.*, vol. 104, no. 2, pt. 1, pp. 686–693, 1998. [**23:G:2.4**]
24. J. B. Schneider, C. L. Wagner, and O. M. Ramahi, "Implementation of Transparent Sources in FDTD Simulations," *IEEE Trans. Antennas Propagat.*, vol. 46, no. 8, pp. 1159–1168, 1998. [**57:G:5.7**]

25. J. B. Schneider, C. L. Wagner, and R. J. Kruhlak, "Simple Conformal Methods for FDTD Modeling of Pressure-Release Surfaces," *J. Acoust. Soc. Am.*, vol. 104, no. 6, pp. 3219–3226, 1998. **[39:G:2.4]**
26. C. L. Wagner and J. B. Schneider, "Divergent Fields, Charge, and Capacitance in FDTD Simulations," *IEEE Trans. Microwave Theory and Techniques*, vol. 46, no. 12, pp. 2131–2136, 1998. **[52:G:4.3]**
27. C. J. Railton and J. B. Schneider, "An Analytical and Numerical Analysis of Several Locally-Conformal FDTD Schemes," *IEEE Trans. Microwave Theory and Techniques*, vol. 47, no. 1, pp. 56–66, 1999. **[97:G:4.3]**
28. J. B. Schneider and C. L. Wagner, "FDTD Dispersion Revisited: Faster-than-Light Propagation," *IEEE Microwave and Guided Wave Lett.*, vol. 9, no. 2, pp. 54–56, 1999. **[115:G:3.0, now published as IEEE MWCL]**
29. T. J. Snyder, J. B. Schneider, and J. N. Chung, "Dielectrophoresis with Application to Boiling Heat Transfer in Microgravity. I. Numerical Analysis," *J. Appl. Phys.*, vol. 89, no. 7, pp. 4076–4083, 2001. **[14:G:2.286]**
30. T. J. Snyder, J. N. Chung, and J. B. Schneider, "Dielectrophoresis with Application to Boiling Heat Transfer in Microgravity. II. Experimental Investigation," *J. Appl. Phys.*, vol. 89, no. 7, pp. 4084–4090, 2001. **[15:G:2.286]**
31. J. B. Schneider and R. J. Kruhlak, "Dispersion of Homogeneous and Inhomogeneous Waves in the Yee Finite-Difference Time-Domain Grid," *IEEE Trans. Microwave Theory and Techniques*, vol. 49, no. 2, pp. 280–287, 2001. **[45:G:4.3]**
32. F. D. Hastings, J. B. Schneider, S. L. Broschat, and E. I. Thorsos, "An FDTD Method for Analysis of Scattering from Rough Fluid-Fluid Interfaces," *IEEE J. Oceanic Eng.*, vol. 26, no. 1, pp. 94–101, 2001. **[16:G:4.2]**
33. M. W. Feise, P. J. Bevelacqua, and J. B. Schneider, "Effects of Surface Waves on the Behavior of Perfect Lenses," *Physical Review B*, vol. 66, no. 3, 035113 (five pages), 2002. **[87:G:4.904]**
34. K. L. Shlager and J. B. Schneider, "Comparison of the Dispersion Properties of Several Low-Dispersion Finite-Difference Time-Domain Algorithms," *IEEE Trans. Antennas Propagat.*, vol. 51, no. 3, pp. 642–653, 2003. **[133:G:5.7]**
35. C. L. Wagner and J. B. Schneider, "On the Analysis of Resonators Using Finite-Difference Time-Domain Techniques," *IEEE Trans. Antennas Propagat.*, vol. 51, no. 10, pp. 2885–2890, 2003. **[14:G:5.7]**
36. J. G. Tolan and J. B. Schneider, "Locally Conformal Method for Acoustic Finite-Difference Time-Domain Modeling of Rigid Surfaces," *J. Acoust. Soc. Am.*, vol. 114, no. 5, pp. 2575–2581, 2003. **[40:G:2.4]**
37. K. L. Shlager and J. B. Schneider, "Comparison of the Dispersion Properties of Higher-Order FDTD Schemes and Equivalent-Sized MRTD Schemes," *IEEE Trans. Antennas Propagat.*, vol. 52, no. 4, pp. 1095–1104, 2004. **[49:G:5.7]**

38. M. W. Feise, J. B. Schneider, and P. J. Bevelacqua, "Finite-Difference and Pseudospectral Time-Domain Methods Applied to Backwards-Wave Metamaterials," *IEEE Trans. Antennas Propagat.*, vol. 52, no. 11, pp. 2955–2962, 2004. [**63:G:5.7**]
39. J. B. Schneider, "Plane Waves in FDTD Simulations and a Nearly Perfect Total-Field/Scattered-Field Boundary," *IEEE Trans. Antennas Propagat.*, vol. 52, no. 12, pp. 3280–3287, 2004. [**130:G:5.7**]
40. C. L. Wagner and J. B. Schneider, "An Acoustic Finite-Difference Time-Domain Algorithm with Isotropic Dispersion," *J. Computational Acoust.*, vol. 13, no. 2, pp. 365–384, 2005. [**14:G:1.471**]
41. J. B. Schneider and K. Abdijalilov, "Analytic Field Propagation TFSF Boundary for FDTD Problems Involving Planar Interfaces: PECs, TE, and TM," *IEEE Trans. Antennas Propagat.*, vol. 54, no. 9, pp. 2531–2542, 2006. [**54:G:5.7**]
42. K. Abdijalilov and J. B. Schneider, "Analytic Field Propagation TFSF Boundary for FDTD Problems Involving Planar Interfaces: Lossy Material and Evanescent Fields," *IEEE Antennas Wirel. Propag. Lett.*, vol. 5, pp. 454–458, 2006. [**32:G:4.2**]
43. D. J. Robinson and J. B. Schneider, "On the Use of the Geometric Mean in FDTD Near-to-Far-Field Transformations," *IEEE Trans. Antennas Propagat.*, vol. 55, no. 11, pp. 3204–3211, 2007. [**35:G:5.7**]
44. K. J. Willis, J. B. Schneider, and S. C. Hagness, "Amplified Total Internal Reflection: Theory, Analysis, and Demonstration of Existence via FDTD," *Optics Express*, vol. 16, no. 3, pp. 1903–1914, 2008. [**39:G:3.833**]
45. R. G. Olsen, J. B. Schneider, and R. A. Tell, "Radio Frequency Burns in the Power System Workplace," *IEEE Trans. Power Delivery*, vol. 26, no. 1, pp. 352–359, 2011. [**6:G:4.4**]
46. J. B. Schneider and Z. Chen, "Incorporating the G-TFSF Concept into the Analytic Field Propagation TFSF Method," *IEEE Trans. Antennas Propagat.*, vol. 59, no. 9, pp. 3296–3304 2011. [**7:G:5.7**]
47. L. Zhou and J. B. Schneider, "A Study of RF Dosimetry from Exposure to an AMI Smart Meter," *IEEE Antennas Propag. Mag.*, vol. 54, no. 6, pp. 69–80, 2012. [**14:G:3.5**]
48. Z. Chen, J. B. Schneider, K. J. Willis, and S. C. Hagness, "A Time-Domain Analysis of Enhanced Total Internal Reflection Using the FDTD Method," *IEEE Microwave and Guided Wave Lett.*, vol. 13, pp. 261–264, 2014. [**4:G:3.0, now published as IEEE MWCL**]
49. J. B. Schneider and R. G. Olsen, "Observations About Propagation, Attenuation, and Radiation of EMI from HVDC Converter Stations," *Appl. Sci.*, 14, no. 15: 6740, 2024.
50. R. G. Olsen and J. B. Schneider, "Why Faraday Shields Are Easily Compromised by Conductor Penetrations with a Practical Example," *IEEE Electromag. Compat. Mag.*, vol. 15, no. 1, pp. 69–75, 2026.

**Books, Book Chapters, or Book Sections:**

1. K. L. Shlager and J. B. Schneider, "A Survey of the Finite-Difference Time-Domain Literature," in *Advances in Computational Electromagnetics: The Finite-Difference Time-Domain Method*, A. Taflove editor, Artech House, Boston, MA, chap. 1, pp. 1–62, 1998.
2. C. L. Wagner and J. B. Schneider, §5.4, " $\vec{J}$  and  $\vec{H}$  Current Sources in Three Dimensions," in *Computational Electrodynamics: The Finite-Difference Time-Domain Method*, 2 ed., Allen Taflove and Susan Hagness, Artech House, Boston, MA, 2000 (also appears in 3 ed., 2005).
3. J. B. Schneider, §5.9, "Advanced Dispersion Compensation in the TF/SF Technique," in *Computational Electrodynamics: The Finite-Difference Time-Domain Method*, 3 ed., Allen Taflove and Susan Hagness, Artech House, Boston, MA, 2005.
4. J. B. Schneider, "Understanding the Finite-Difference Time-Domain Method," available via [eeecs.wsu.edu/~schneidj/ufdtd](http://eeecs.wsu.edu/~schneidj/ufdtd), 2010. [315:G]
5. J. B. Schneider, S. L. Broschat, J. Dahmen, "Algorithmic Problem Solving with Python," available via [eeecs.wsu.edu/~schneidj/swan](http://eeecs.wsu.edu/~schneidj/swan), 2013.

#### Technical Report:

1. T. J. Snyder, J. B. Schneider, Y.-C. Su, and J. N. Chung, "High-Gradient Bubble Dielectrophoresis at the Edge of Two Diverging-Plate Electrodes with Application to Thermal Management in Terrestrial Gravity and Microgravity," report no. WSU-MME-95-4, prepared under NASA grant no. NAG3-1387, Sep. 1995.
2. R. G. Olsen, J. B. Schneider, and R. A. Tell, "Radiofrequency Burns in the Workplace," EPRI Technical Report, Oct., 2008.
3. R. A. Tell, R. G. Olsen, and J. B. Schneider, "Radio Frequency Burn Mechanisms," EPRI Technical Report 1017991, Dec., 2009.

#### Invited Talks:

1. J. B. Schneider, F. D. Hastings, and C. J. Railton, "Application of Recent Advances in FDTD Modeling to the Problem of Acoustic Propagation in Shallow Water," *12th Annual Review of Progress in Applied Computational Electromagnetics*, vol. 2, pp. 1057–1064, Monterey, CA, Mar. 1996.
2. J. B. Schneider, P. J. Flynn, S. L. Broschat, and F. D. Hastings, "Understanding Acoustic Propagation in Shallow Water via Animations," *J. Acoust. Soc. Am.*, vol. 99, no. 4, pt. 2, pp. 2552, Indianapolis, IN, May 1996.
3. K. L. Shlager and J. B. Schneider, "Using Non-Uniform FDTD Techniques to Model Narrow-Angled TEM Horn Antennas," Progress in Electromagnetics Research Symposium, Hong Kong, Jan. 1997.
4. S. L. Broschat, J. B. Schneider, F. D. Hastings, and P. J. Flynn, "Computational and Theoretical Models for Rough Surface and Bottom Scattering," Proceedings of the 1997 International Conference on Shallow-Water Acoustics, Beijing, pp. 89–94, Apr. 1997.

5. C. L. Wagner and J. B. Schneider, "Using the Dispersion Relation to Understand Finite-Difference Time-Domain Worlds," International Conference on Electromagnetics in Advanced Applications (ICEAA 01), Torino, Italy, pp. 375–378, Sep. 2001.
6. M. W. Feise, P. J. Bevelacqua, and J. B. Schneider, "Backward-Wave Meta-Materials for Perfect Lenses," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, San Antonio, TX, Jun. 2002.
7. C. L. Wagner and J. B. Schneider, "Toward the Creation of a Magic Time Step in Three-Dimensional FDTD Algorithms," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Columbus, OH, Jun. 2003. [2:G]
8. J. B. Schneider, "Total Internal Reflection and Gainy Material: Can the Reflection Coefficient Be Greater Than Unity?" Physics and Astronomy Colloquium, Washington State University, Mar. 2009.

#### **Conference Presentations:**

1. J. B. Schneider and I. C. Peden, "The T-Matrix, Extended Boundary Condition Method Applied to a Dielectric Ellipsoid," URSI-B, 1987 National Radio Science Meeting, Boulder, Colorado, Jan. 1987.
2. J. B. Schneider and I. C. Peden, "Identification of Deeply Buried Targets from Backscatter," URSI-B, IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Syracuse, New York, Jun. 1988.
3. I. C. Peden, J. B. Schneider, and J. Brew, "Electromagnetic Detection of Buried Dielectric Targets," URSI General Assembly, Prague, Czechoslovakia, Apr. 1990. [5:G]
4. J. B. Schneider, I. C. Peden, and J. Brew, "Electromagnetic Detection of Buried Dielectric Targets," URSI-F, International Geoscience and Remote Sensing Symposium, College Park, Maryland, May 1990.
5. J. B. Schneider and S. L. Broschat, "A Workstation Laboratory for Undergraduate Education in Electromagnetics," 1992 Pacific Northwest American Society for Engineering Education Meeting, Bozeman, Montana, Apr. 1992.
6. J. B. Schneider and S. L. Broschat, "Wave Scattering from Perfectly Conducting Rough Surfaces using the FDTD Method," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Chicago, Illinois, Jul. 1992.
7. I. C. Peden, J. B. Schneider, and J. Brew, "Electromagnetic Detection of Buried Dielectric Targets in Low Loss Media," Proceedings of the Fourth Tunnel Detection Symposium on Subsurface Exploration Technology, Golden, CO, Apr. 1993.
8. F. D. Hastings, S. L. Broschat, and J. B. Schneider, "An Application of the Contour Path Finite Difference Time Domain Method to Rough Surface Scattering," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Ann Arbor, Michigan, Jun. 1993.

9. C. W. Manry, S. L. Broschat, and J. B. Schneider, "A Higher Order FDTD Algorithm for Solving Large Scattering Problems," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Ann Arbor, Michigan, Jun. 1993.
10. J. L. Young, J. B. Schneider, and R. G. Olsen, "Theoretical Aspects on the Measured Equation of Invariance," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Ann Arbor, Michigan, Jun. 1993.
11. J. L. Young, J. B. Schneider, and R. G. Olsen, "Laplace's Equation and the Measured Equation of Invariance," COMPUMAG Conference on the Computation of Electromagnetic Fields, Miami, Florida, Nov. 1993.
12. F. D. Hastings, S. L. Broschat, and J. B. Schneider, "The FDTD Method for Scattering from Rough Surfaces: Oblique Incidence," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Seattle, WA, Jun. 1994.
13. J. B. Schneider and S. L. Broschat, "The MEI Method Applied to Random Rough Surfaces," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Seattle, WA, Jun. 1994.
14. J. B. Schneider, S. L. Broschat, and P. J. Flynn, "Finite Difference Simulations of Propagation in a Shallow Water Environment," *J. Acoust. Soc. Am.*, vol. 96, no. 5, pt. 2, pp. 3265, Austin, TX, Nov. 1994.
15. M. W. Steeds, S. L. Broschat, and J. B. Schneider, "A Comparison of Two Conformal Methods for FDTD Modeling," Progress in Electromagnetics Research Symposium, Seattle, WA, Jul. 1995.
16. K. L. Shlager, J. G. Maloney, and J. B. Schneider, "Limitations on Using the Staircased FDTD Method When Modeling Narrow-Angled TEM Horn Antennas," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Baltimore, MD, Jul. 1996.
17. T. J. Snyder, J. N. Chung, and J. B. Schneider, "A Study on the Competing Effects of the Dielectrophoretic Force and Buoyancy on Nucleate Boiling Heat Transfer Rates and an Analogy with Variable Gravity," ASME International Mechanical Engineering Congress and Exposition (IMECE), HTD-Vol. 332, vol. 1, pp. 21–32, Atlanta, GA, Nov. 1996.
18. F. D. Hastings, J. B. Schneider, and S. L. Broschat, "Scattering from Rough Pressure-Release Surfaces Using the Finite-Difference Time-Domain Method," *J. Acoust. Soc. Am.*, vol. 100, no. 4, pt. 2, pp. 2798, Honolulu, HI, Dec. 1996.
19. F. D. Hastings, J. B. Schneider, and S. L. Broschat, "A Monte Carlo Finite-Difference Time-Domain Technique for Scattering from Rough Elastic Bottoms," *J. Acoust. Soc. Am.*, vol. 100, no. 4, pt. 2, pp. 2798, Honolulu, HI, Dec. 1996.
20. F. D. Hastings, J. B. Schneider, S. L. Broschat, and E. I. Thorsos, "Scattering from Rough Fluid-Fluid Interfaces Using the Finite-Difference Time-Domain Method," *J. Acoust. Soc. Am.*, vol. 101, no. 5, pt. 2, pp. 3065, State College, PA, Jun. 1997.

21. F. D. Hastings, S. L. Broschat, and J. B. Schneider, "A Monte Carlo Contour Path FDTD Method for Scattering from Randomly Rough Dielectric Surfaces," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Montréal, Canada, Jul. 1997.
22. J. B. Schneider and O. M. Ramahi, "A Comparison and Evaluation of PML and COM in FDTD Simulations," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, vol. 3, pp. 1904–1907, Montréal, Canada, Jul. 1997. [11:G]
23. K. L. Shlager and J. B. Schneider, "Analysis of the Dispersion Properties of the Multiresolution Time-Domain (MRTD) Scheme," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, vol. 4, pp. 2144–2147, Montréal, Canada, Jul. 1997. [10:G]
24. F. D. Hastings, J. B. Schneider, S. L. Broschat, and E. I. Thorsos, "A Comparison of the Finite-Difference Time-Domain and Integral Equation Methods for Scattering from Shallow Water Sediments," abstract: *J. Acoust. Soc. Am.*, vol. 103, no. 5, pt. 2, pp. 3095; proc. paper: *Proc. 135th Meeting Acoust. Soc. Am.*, vol. 4, pp. 3025–3026, Seattle, WA, Jun. 1998.
25. J. B. Schneider and C. L. Wagner, "Analytic Analysis of the CP-FDTD and C-FDTD Methods for Offset Planar Boundaries," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, vol. 4, pp. 1816–1819, Atlanta, GA, Jun. 1998. [4:G]
26. K. L. Shlager and J. B. Schneider, "Relative Accuracy of Several Low-Dispersion Finite-Difference Time-Domain Schemes," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, vol. 1, pp. 168–171, Orlando, FL, Jul. 1999. [10:G]
27. J. B. Schneider and R. J. Kruhlak, "Inhomogeneous Waves and Faster-than-Light Propagation in the Yee FDTD Grid," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, vol. 1, pp. 184–187, Orlando, FL, Jul. 1999. [1:G]
28. J. B. Schneider and R. J. Kruhlak, "Plane Waves and Planar Boundaries in FDTD Simulations," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, Salt Lake City, UT, Jul. 2000. [11:G]
29. J. B. Schneider and J. G. Tolan, "A Locally Conformal Method for Modeling Rigid Boundaries in the FDTD Method," *J. Acoust. Soc. Am.*, vol. 108, no. 5, pt. 2, pp. 2563, Newport Beach, CA, Dec. 2000.
30. K. L. Shlager and J. B. Schneider, "A Comparison of the Dispersion Error of Higher-Order Finite-Difference Time-Domain Schemes with Daubechies' Multi-Resolution Time-Domain Schemes," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, vol. 1, pp. 72–75, Boston, MA, Jul. 2001.
31. K. J. Shlager and J. B. Schneider, "A 2-D Dispersion Analysis of the W-MRTD Method Using CDF Biorthogonal Wavelets," IEEE Antennas and Propagation Society International Symposium and URSI Radio Science Meeting, vol. 3, pp. 244–247, San Antonio, TX, Jun. 2002.
32. K. J. Willis, S. C. Hangness, J. B. Schneider, and A. E. Siegman, "On the Existence of Evanescent Gain: Insights from FDTD Analyses," URSI Radio Science Meeting, Ottawa, Canada, Jul. 2007.

33. J. B. Schneider, L. Zhou, S. L. Broschat, and Y. Wang, "On the Use of an Untapered Plane Wave in Numerical Studies of Scattering from Randomly Rough Surfaces," IEEE Antennas and Propagation Society International Symposium and Radio Science Meeting, Charleston, SC, Jun. 2009.
34. L. Zhou, J. B. Schneider, and R. G. Olsen, "Using Artificial Loss to Control the Instability in the Huygens Subgridding Method," IEEE Antennas and Propagation Society International Symposium and Radio Science Meeting, Toronto, Canada, Jul. 2010. [6:G]
35. J. B. Schneider, "AMI Dosimetry," Electric Power Research Institute Environment Area and Sector Council Meetings, San Antonio, TX, Sep. 2010.
36. L. Zhou, J. B. Schneider, R. Olsen, and R. Tell, "Examination of the Possibility of RF Burns Induced by Contact with a PEC," IEEE Antennas and Propagation Society International Symposium and Radio Science Meeting, Spokane, WA, Jul. 2011.
37. T. Tan and J. B. Schneider, "FDTD 1D-MAP Plane Wave TFSF Simulation for Lossy and Stratified Media," IEEE Antennas and Propagation Society International Symposium and Radio Science Meeting, Spokane, WA, Jul. 2011.
38. Z. Chen and J. B. Schneider, "Use of the G-TFSF and AFP Methods to Study Scattering from 3D Defects in Edges or Wedges," IEEE Antennas and Propagation Society International Symposium and Radio Science Meeting, Spokane, WA, Jul. 2011. [1:G]
39. Z. Chen, K. Willis, J. B. Schneider, and S. C. Hagness, "Finite Difference Time Domain Analysis of Energy Flow in Amplified Total Internal Reflection," IEEE Antennas and Propagation Society International Symposium and Radio Science Meeting, Orlando, FL, Jul. 2013.
40. J. Kingma, E. A. Riskin, J. B. Schneider, R. G. Olsen, S. Cunningham, D. Wiggin, K. A. Reinkens, and S. Winter, "The Washington State Academic RedShirt (STARS) in Engineering Program," Paper ID #9201, 7 pages, ASEE Annual Conference, Indianapolis, ID, June, 2014. [3:G]
41. E. A. Riskin, D. Wiggin, J. Kingma, J. B. Schneider, S. Cunningham, S. Winter, "The Washington State Academic RedShirt (STARS) in Engineering Program," Paper ID #11882, 9 pages, ASEE Annual Conference, Seattle, WA, June, 2015. [4:G]
42. K. C. Tetrick, E. A. Riskin, J. B. Schneider, S. Cunningham, "Implementation and Assessment of the Washington State Academic RedShirt (STARS) Program," Paper ID #16488, 10 pages, ASEE Annual Conference, New Orleans, LA, June, 2016.
43. K. C. Tetrick, J. B. Schneider, C. Pezeshki, "Measuring the Factors Associated with Student Persistence in the Washington State STARS Program," Paper ID #20079, 15 pages, ASEE Annual Conference, Columbus, OH, June, 2017.
44. E. A. Riskin, J. Milford, J. Callahan, P. Cosman, J. B. Schneider, K. Pitts, E. Knaphus-Soran, D. C. Llewellyn, A. E. Delaney, B. A. Myers, K. C. Tetrick, S. Cunningham, T. D. Ennis, K. O'Connor, M. Ferrez, T. D. Pan, J. Baldis, "The Redshirt in Engineering Consortium: Progress and Early Insights," Paper ID #21919, 12 pages, ASEE Annual Conference, Salt Lake City, UT, June, 2018.

45. B. G. Olsen, J. B. Schneider, "Electromagnetic Energy from Multiple Sources within Perfect and Imperfect Faraday Shields," 2025 IEEE International Symposium on Electromagnetic Compatibility, Signal & Power Integrity, pp. 321–324, Raleigh, North Carolina, August, 2025.

**Other Publications:**

1. J. B. Schneider, "Electromagnetic Methods in Remote Detection of Subterranean Tunnels," prepared under contract from U.S. Army LABCOM, Dec. 1987.
2. J. B. Schneider, "Electromagnetic Detection of Buried Dielectric Targets," Ph.D. Thesis, University of Washington, 1991. [28:G6]
3. J. B. Schneider and K. L. Shlager, <http://eecs.wsu.edu/~schneidj/fdtd-bib.html>, An exhaustive BIB<sub>T</sub><sub>E</sub>X database of FDTD-related publications. (No longer maintained.)