Su Yan

Center for Computational Electromagnetics
and Electromagnetics Laboratory
Department of Electrical and Computer Engineering
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Education

University of Illinois at Urbana-Champaign

Doctor of Philosophy August 2016
Electrical and Computer Engineering
Dissertation: "Computational Modeling and Simulation of Nonlinear Electromagnetic and Multi-physics Problems"
GPA: 3.97/4.00

Master of Science August 2012
Electrical and Computer Engineering
Thesis: "Accuracy Improvement of the Second-Kind Fredholm Integral Equations in Computational Electromagnetics"
GPA: 4.00/4.00

University of Electronic Science and Technology of China

Doctor of Philosophy December 2011
Electromagnetics and Microwave Technology
Dissertation: "Calderón Technique Based Integral Equation Methods in Computational Electromagnetics"
GPA: 3.86/4.00

Bachelor of Science July 2005
Electronic Information Engineering
Thesis: "Analysis of the Near Singularity and Singular Currents in the Simulation of Electromagnetic Scattering Problems"
GPA: 3.75/4.00

Experience

University of Illinois at Urbana-Champaign *Urbana, IL*

Postdoctoral Research Associate August 2016–present
Department of Electrical and Computer Engineering

Instructor August 2012–December 2012, August 2016–December 2016
Department of Electrical and Computer Engineering
UIUC List of Teachers Ranked as Excellent by Their Students, Outstanding Rating (top 10%)

Graduate Research Assistant August 2011–July 2012, January 2013–July 2016
Department of Electrical and Computer Engineering

Graduate Teaching Assistant August 2013–May 2014
Department of Electrical and Computer Engineering

Visiting Scholar September 2008–July 2011
Department of Electrical and Computer Engineering

University of Electronic Science and Technology of China *Chengdu, China*

Associate Professor July 2012–December 2016
School of Electrical Engineering

Assistant Professor January 2012–June 2012
School of Electrical Engineering

Schlumberger *Sugar Land, TX*

Modeling & Simulation Engineer Intern June 2014–August 2014
Houston Formation Evaluation Integration Center (HFE)

Teaching

University of Illinois at Urbana-Champaign

Instructor Fall 2012, Fall 2016
Electromagnetic Waves and Radiating Systems (ECE 520)
Graduate level course, which includes electromagnetic theorems and principles, plane wave in different media, waveguide theory, and antenna systems.
4 credit hours, 21 students (2012), 33 students (2016)
UIUC List of Teachers Ranked as Excellent by Their Students, Outstanding Rating (top 10%)

Graduate Teaching Assistant Spring 2014
Computational Electromagnetics (ECE 540)
Graduate level course, which covers basic computational techniques for numerical analysis of electromagnetics problems, including the finite difference, finite element, and moment methods.
4 credit hours, 17 students

Graduate Teaching Assistant Fall 2013
Digital Systems Laboratory (ECE 385)
Undergraduate level course, which is designed to build up the students' ability to design, build, and debug digital systems using standard TTL chips and FPGA with CAD tools and VHDL.
2 credit hours, 24 students

Research Interests

Current research interests include all aspects of electromagnetics and multiphysics modeling and simulation methods, with particular interests and related experiences in the following areas:

1 **Electromagnetic Modeling & Simulation Methods**

- **a** Linear and nonlinear electromagnetic modeling and simulation;
- **b** Forward and inverse problems;
- **c** Frequency- and time-domain algorithms;
- **d** Integral-equation- and partial-differential-equation-based methods;

e Fast algorithms and preconditioning techniques.

2 **Multiphysics Modeling & Simulation Methods**

a Electromagnetic–thermal coupling and co-simulation methods;
b Electromagnetic–plasma coupling and co-simulation methods;
c Spatial and temporal multiscale problems and coupling schemes.

3 **Advanced Numerical Methods Towards Accuracy, Efficiency, & Stability**

a Dynamically *h*-, *p*-, and *hp*-adaptive algorithms in time domain;
b Divergence-cleaning techniques for inhomogeneous materials;
c Domain decomposition methods and multi-solver schemes;
d Parallel computing techniques based on both CPU and GPU platforms.

4 **Engineering Applications**

a Electromagnetic radiation, propagation, and scattering: antenna and array analysis, radar cross section (RCS) evaluation;
b Microwave devices and circuits modeling: parameter extraction, breakdown analysis in high-power microwave devices;
c Nano- and electronic device modeling: electromagnetic–fluid/particle co-simulation;
d Power device and system modeling: magnetic saturation and hysteresis analysis, magnetic–thermal co-simulation;
e Bio-electromagnetic problems: specific absorption rate (SAR) modeling and evaluation, electromagnetic compatibility (EMC) analysis and electromagnetic–thermal effects;
f Electromagnetic inverse scattering problems and well-logging technologies in oil and gas exploration.

Research Experiences & Projects

Schlumberger

Manager: Doctor Gong Li Wang, Doctor Aria Abubakar, Doctor Jaideva Goswami

1. Nonlinear inversion in triaxial induction well logging

University of Illinois at Urbana-Champaign

Advisor: Professor Jian-Ming Jin

1. Nonlinear electromagnetic modeling & simulation in time domain
2. Computational methods for multiphysics & multiscale modeling & simulation
3. Advanced numerical methods towards highly accurate, efficient, & stable simulations
4. Domain-decomposition methods & multi-solver schemes
5. Efficient electromagnetic & multiphysics simulation with GPU acceleration
6. Highly accurate integral equations for electromagnetic problems
7. Advanced Calderón preconditioning techniques
8. Novel integral equation for modeling imperfectly coated objects
9. Minimizing exposure to electromagnetic radiation with multiple transmitter chains in portable devices
10. Scattering analysis of discrete body of revolution objects using the FE-BI method

University of Electronic Science and Technology of China

Advisor: Professor Zaiping Nie

1. Accurate modeling of the scattering from composite dielectric-conducting objects
2. Phase-extracted basis functions for electrically large scattering problems
3. Novel surface integral equations for electromagnetic scattering

Honors & Awards

1. Best Student Paper Award, The First Place Winner, ACES, Honolulu, HI, 2016
2. USNC/URSI Travel Fellowship Grant Award, The National Academies (NAS), 2015
3. P. D. Coleman Outstanding Research Award, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 2015
4. Yuen T. Lo Outstanding Research Award, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 2014
5. Outstanding Doctoral Dissertation, Sichuan Provincial People's Government, 2014
6. UIUC List of Teachers Ranked as Excellent by Their Students, Outstanding Rating (top 10%), University of Illinois at Urbana-Champaign, Fall 2012
7. Outstanding Graduate Student (Highest honor from the university, ten recipients annually), UESTC, 2011
8. Best Student Paper Award, The First Place Winner, ACES, Williamsburg, VA, 2011
9. Best Student Paper Award, IEEE Chengdu Section, 2010
10. Distinguished Dissertation Award, UESTC, 2005
11. China Aerospace Science and Technology Corporation (CASC) Scholarship, CASC, 2011
12. Scholarship for Graduates, UESTC, The Top Grade, 2006; The 2nd Grade, 2008 and 2009; and The 3rd Grade, 2010
13. People's Scholarship for Undergraduates, UESTC, The 3rd Grade, 2002; The 2nd Grade, 2003 and 2004; and The 1st Grade, 2005
14. National Mathematical Modeling Competition, The 3rd Award, Sichuan, China, 2003
15. Mathematical Modeling Competition, The 3rd Award, UESTC, 2002

Society Membership

Member 2012–present
Institute of Electrical and Electronics Engineers (IEEE)

Member 2012–present
IEEE Antennas and Propagation Society

Member 2011, 2016
Applied Computational Electromagnetics Society (ACES)

Student Member 2008–2011
Institute of Electrical and Electronics Engineers (IEEE)

Student Member 2008–2011
IEEE Antennas and Propagation Society

Professional Activities

Journal Editorship

Lead Guest Editor of a special issue "Advanced Modeling and Simulation Methods for Multiphysics and Multiscale Problems" for *International Journal of Antennas and Propagation*, Scheduled for 2017.

Conference Committees

Member of Scientific Committee, 13th International Workshop on Finite Elements for Microwave Engineering, Florence, Italy, May 2016.

Member of Scientific Committee, 12th International Workshop on Finite Elements for Microwave Engineering, Chengdu, China, May 2014.

Session Chair, 12th International Workshop on Finite Elements for Microwave Engineering, Chengdu, China, May 2014.

Session Chair, IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, San Diego, CA, USA, July 2017.

Invited Talks

Calderón Technique Based Integral Equation Methods in Computational Electromagnetics

Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, August 30, 2011.

CEM Challenges in Multiphysics Modeling and Simulation

IEEE International Symposium on Antennas and Propagation, June 30, 2016.

Journal Review

Proceedings of the IEEE	2011–present
IEEE Antennas and Propagation Magazine	2014–present
IEEE Transactions on Antennas and Propagation	2011–present
IEEE Transactions on Microwave Theory and Techniques	2015–present
IEEE Transactions on Magnetics	2014–present
IEEE Photonics Journal	2017–present
IEEE Antennas and Wireless Propagation Letters	2013–present
IET Microwaves, Antennas and Propagation	2014–present
Electromagnetics	2013–present
Applied Computational Electromagnetics Society (ACES) Journal	2010–present
Waves in Random and Complex Media	2015–present
Progress In Electromagnetics Research (PIER)	2009–present
Journal of Electromagnetic Waves and Applications (JEMWA)	2009–present
International Journal of Antennas and Propagation	2015–present
International Journal of Numerical Modelling: Electronic Networks, Devices and Fields	2015–present
International Journal of RF and Microwave Computer-Aided Engineering	2016–present

Elsevier, Engineering Science and Technology (JESTECH) 2014–present

Universal Journal of Electrical and Electronic Engineering 2015–present

Publications

27 journal articles, **58** conference papers, **401** citations (as of June 20, 2017, based on Google Scholar).

Journal Articles

1. J. Li, **Su Yan**, Y. Liu, B. M. Hochwald, and J.-M. Jin, "A high-order model for fast estimation of specific absorption rate induced by multiple transmitters in portable devices," *IEEE Trans. Antennas Propag.*, 2017, revised for publication.
2. **Su Yan**, C.-P. Lin, R. R. Arslanbekov, V. I. Kolobov, and J.-M. Jin, "A discontinuous Galerkin time-domain method with dynamically adaptive Cartesian meshes for computational electromagnetics," *IEEE Trans. Antennas Propag.*, vol. 65, no. 6, pp. 3122–3133, Jun. 2017.
3. **Su Yan** and J.-M. Jin, "A dynamic *p*-adaptive DGTD algorithm for electromagnetic and multiphysics simulations," *IEEE Trans. Antennas Propag.*, vol. 65, no. 5, pp. 2446–2459, May 2017.
4. **Su Yan** and J.-M. Jin, "A continuity-preserving and divergence-cleaning algorithm based on purely and damped hyperbolic Maxwell equations in inhomogeneous media," *J. Comput. Phys.*, vol. 334, pp. 392–418, Apr. 2017.
5. C.-P. Chang, G. Chen, **Su Yan**, and J.-M. Jin, "Waveport modeling for the DGTD simulation of electromagnetic devices," *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, Feb. 2017.
6. J. Guan, **Su Yan**, and J.-M. Jin, "A multi-solver scheme based on combined field integral equations for electromagnetic modeling of highly complex objects," *IEEE Trans. Antennas Propag.*, vol. 65, no. 3, pp. 1236–1247, Mar. 2017.
7. Y. Wang, **Su Yan**, and Z. Nie, "A point-adaptive grouping scheme of MLFMA for electromagnetic simulation," *IEEE Trans. Antennas Propag.*, vol. 64, no. 12, pp. 5527–5530, Dec. 2016.
8. J. Guan, **Su Yan**, and J.-M. Jin, "A multisolver scheme based on Robin transmission conditions for electromagnetic modeling of highly complex objects," *IEEE Trans. Antennas Propag.*, vol. 64, no. 12, pp. 5345–5358, Dec. 2016.
9. **Su Yan** and J.-M. Jin, "A fully coupled nonlinear scheme for time-domain modeling of high-power microwave air breakdown," *IEEE Trans. Microw. Theory Tech.*, vol. 64, no. 9, pp. 2718–2729, Sept. 2016.
10. **Su Yan**, A. D. Greenwood, and J.-M. Jin, "Modeling of plasma formation during high-power microwave breakdown in air using the discontinuous Galerkin time-domain method (Invited Paper)," *IEEE J. Multiscale and Multiphys. Comput. Techn.*, vol. 1, pp. 2–13, 2016.
11. **Su Yan** and J.-M. Jin, "Three-dimensional time-domain finite-element simulation of dielectric breakdown based on nonlinear conductivity model," *IEEE Trans. Antennas Propag.*, vol. 64, no. 7, pp. 3018–3026, Jul. 2016.
12. **Su Yan** and J.-M. Jin, "Theoretical formulation of a time-domain finite element method for nonlinear magnetic problems in three dimensions (Invited Paper)," in *the Commemorative Collection on the 150-Year Anniversary of Maxwell's Equations*, *Progress In Electromagnetics Research*, vol. 153, pp. 33–55, 2015.
13. **Su Yan**, J.-M. Jin, C.-F. Wang, and J. Kotulski, "Numerical study of a time-domain finite element method for nonlinear magnetic problems in three dimensions (Invited Paper)," *Progress In Electromagnetics Research*, vol. 153, pp. 69–91, 2015.

14. J. Guan, **Su Yan**, and J.-M. Jin, "An accurate and efficient finite element-boundary integral method with GPU acceleration for 3-D electromagnetic analysis," *IEEE Trans. Antennas Propag.*, vol. 62, no. 12, pp. 6325–6336, Dec. 2014.
15. B. M. Hochwald, D. J. Love, **Su Yan**, P. Fay, and J.-M. Jin, "Incorporating specific absorption rate (SAR) constraints into wireless signal design," *IEEE Commun. Mag.*, vol. 52, no. 9, pp. 126–133, Sept. 2014.
16. **Su Yan** and J.-M. Jin, "Self-dual surface integral equations for electromagnetic scattering from IBC objects," *IEEE Trans. Antennas Propag.*, vol. 61, no. 11, pp. 5533–5546, Nov. 2013.
17. J. Guan, **Su Yan**, and J.-M. Jin, "An openMP-CUDA implementation of multilevel fast multipole algorithm for electromagnetic simulation on multi-GPU computing systems," *IEEE Trans. Antennas Propag.*, vol. 61, no. 7, pp. 3607–3616, July 2013.
18. **Su Yan**, J.-M. Jin, and Z. Nie, "Accuracy improvement of the second-kind integral equations for generally shaped objects," *IEEE Trans. Antennas Propag.*, vol. 61, no. 2, pp. 788–797, Feb. 2013.
19. Z. Nie, S. Ren, **Su Yan**, S. He, and J. Hu, "Modified phase extracted basis functions for efficient analysis of scattering from electrically large targets," *Proc. IEEE*, vol. 101, no. 2, pp. 401–413, Feb. 2013.
20. **Su Yan**, S. Ren, Z. Nie, S. He, and J. Hu, "Efficient analysis of electromagnetic scattering from electrically large complex objects by using phase extracted basis functions," *IEEE Antennas Propag. Mag.*, vol. 54, no. 5, pp. 88–108, Oct. 2012.
21. **Su Yan**, J.-M. Jin, and Z. Nie, "Analysis of electrically large problems using the augmented EFIE with a Calderón preconditioner," *IEEE Trans. Antennas Propag.*, vol. 59, no. 6, pp. 2303–2314, June 2011.
22. **Su Yan**, J.-M. Jin, and Z. Nie, "Improving the accuracy of the second-kind Fredholm integral equations by using the Buffa-Christiansen functions," *IEEE Trans. Antennas Propag.*, vol. 59, no. 4, pp. 1299–1310, Apr. 2011.
23. **Su Yan**, J.-M. Jin, and Z. Nie, "Calderón preconditioner: From EFIE and MFIE to N-Müller equations," *IEEE Trans. Antennas Propag.*, vol. 58, no. 12, pp. 4105–4110, Dec. 2010.
24. **Su Yan**, J.-M. Jin, and Z. Nie, "A comparative study of Calderón preconditioners for PMCHWT equations," *IEEE Trans. Antennas Propag.*, vol. 58, no. 7, pp. 2375–2383, July 2010.
25. **Su Yan**, J.-M. Jin, and Z. Nie, "EFIE analysis of low-frequency problems with loop-star decomposition and Calderón multiplicative preconditioner," *IEEE Trans. Antennas Propag.*, vol. 58, no. 3, pp. 857–867, Mar. 2010. (**Best Student Paper Award, IEEE Chengdu Section, 2010**)
26. **Su Yan**, S. He, Z. Nie, and J. Hu, "Simulating wide band radar response from PEC targets using phase extracted basis functions," *Progress In Electromagnetics Research B*, vol. 13, pp. 409–431, 2009.
27. Z. Nie, **Su Yan**, S. He, and J. Hu, "On the basis functions with traveling wave phase factor for efficient analysis of scattering from electrically large targets," *Progress In Electromagnetics Research*, vol. 85, pp. 83–114, 2008.

Conference Proceedings

1. **Su Yan**, J.-M. Jin, R. R. Arslanbekov, and V. I. Kolobov, "A dynamically *h*-adaptive discontinuous Galerkin time-domain method for electromagnetic field simulation," in *Proc. ICEAA-IEEE APWC 2017*, Verona, Italy, Sept. 2017.
2. J. Guan, **Su Yan**, K. Zhang, and J.-M. Jin, "A multi-solver algorithm for electromagnetic modeling of complex objects," in *Proc. URSI General Assembly and Scientific Symposium*, Montreal, Canada, Aug. 2017.

3. **Su Yan**, A. D. Greenwood, and J.-M. Jin, "DGTD simulation of HPM air breakdown using a 5-moment fluid model and non-Maxwellian EEDF," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, CA, USA, July 2017.

4. **Su Yan**, J. Kotulski, and J.-M. Jin, "Magnetic–thermal co-simulation of nonlinear magnetic materials at high frequencies," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, CA, USA, July 2017.

5. J. Guan, **Su Yan**, and J.-M. Jin, "Electromagnetic simulation of specific absorption rate at 5G frequencies with a simplified human head model and a multi-solver method," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, CA, USA, July 2017.

6. J. Guan, **Su Yan**, K. Zhang, and J.-M. Jin, "An MPI-accelerated multi-solver algorithm for electromagnetic modeling of complex objects," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, CA, USA, July 2017.

7. J. Li, **Su Yan**, Y. Liu, J.-M. Jin, and B. M. Hochwald, "A high-order SAR model for multiple transmitters in portable devices," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, CA, USA, July 2017.

8. J. Guan, **Su Yan**, and J.-M. Jin, "A multi-solver framework for electromagnetic analysis," in *Proc. ICEAA-IEEE APWC 2016*, Cairns, Australia, Sept. 2016.

9. **Su Yan**, A. D. Greenwood, and J.-M. Jin, "Nonlinear modeling of plasma shielding effect during high-power microwave breakdown," in *Proc. IEEE Antennas Propag. Symp.*, Fajardo, Puerto Rico, June 2016.

10. **Su Yan** and J.-M. Jin, "A GPU accelerated dynamic *p*-adaptation for simulation of EM-plasma interaction," in *Proc. IEEE Antennas Propag. Symp.*, Fajardo, Puerto Rico, June 2016.

11. **Su Yan** and J.-M. Jin, "Continuity-preserving purely hyperbolic Maxwell equations in inhomogeneous media," in *Proc. IEEE Antennas Propag. Symp.*, Fajardo, Puerto Rico, June 2016.

12. J.-M. Jin and **Su Yan**, "CEM challenges in multiphysics modeling and simulation (invited paper)," in *Proc. IEEE Antennas Propag. Symp.*, Fajardo, Puerto Rico, June 2016.

13. J. Guan, **Su Yan**, and J.-M. Jin, "A multi-solver framework for electromagnetic scattering from complex objects," in *Proc. IEEE Antennas Propag. Symp.*, Fajardo, Puerto Rico, June 2016.

14. J. Guan, **Su Yan**, and J.-M. Jin, "A CFIE-based electromagnetic solver for composite objects," in *Proc. IEEE Antennas Propag. Symp.*, Fajardo, Puerto Rico, June 2016.

15. C. P. Lin, **Su Yan**, R. R. Arslanbekov, V. Kolobov, and J.-M. Jin, "A DGTD algorithm with dynamic *h*-adaptation and local time-stepping for solving Maxwell's equations," in *Proc. IEEE Antennas Propag. Symp.*, Fajardo, Puerto Rico, June 2016.

16. **Su Yan** and J.-M. Jin, "Coupled discontinuous Galerkin time-domain simulation of the nonlinear electromagnetic-plasma interaction," in *The 13th International Workshop on Finite Elements for Microwave Engineering* (FEM2016), Florence, Italy, May 2016.

17. **Su Yan** and J.-M. Jin, "Discontinuous Galerkin time-domain solution of the purely hyperbolic Maxwell equations," in *2016 IEEE International Conference on Wireless Information Technology and Systems (ICWITS) and Applied Computational Electromagnetics (ACES)*, Honolulu, HI, Mar. 2016.

18. **Su Yan** and J.-M. Jin, "A dynamic *p*-adaptation algorithm for the DGTD simulation of nonlinear EM-plasma interaction," in *2016 IEEE International Conference on Wireless Information Technology and Systems (ICWITS) and Applied Computational Electromagnetics (ACES)*, Honolulu, HI, Mar. 2016. (**Best Student Paper Award, The First Place Winner.**)

19. **Su Yan** and J.-M. Jin, "Nonlinear finite element formulation and analysis of high-power air/dielectric breakdown in time domain," in *Proc. ICEAA-IEEE APWC 2015*, Torino, Italy, Sept. 2015.

20. **Su Yan** and J.-M. Jin, "Time-domain finite element modeling of nonlinear conductivity using Newton's method," in *Proc. IEEE Antennas Propag. Symp.*, Vancouver, BC, Canada, July 2015.

21. **Su Yan** and J.-M. Jin, "Time-domain nonlinear finite element analysis of air breakdown using a simplified plasma model," in *Proc. IEEE Antennas Propag. Symp.*, Vancouver, BC, Canada, July 2015.

22. **Su Yan** and J.-M. Jin, "A hybrid finite element–discontinuous Galerkin solver for analyzing electromagnetics-plasma interaction in four dimensions," in *Proc. IEEE Antennas Propag. Symp.*, Vancouver, BC, Canada, July 2015.

23. **Su Yan**, G. L. Wang, and A. Abubakar, "Two-dimensional inversion of triaxial induction logging data in transversely isotropic formation," in *Proc. IEEE Antennas Propag. Symp.*, Vancouver, BC, Canada, July 2015.

24. K. D. Zhang, **Su Yan**, and J.-M. Jin, "Accurate and efficient simulation of scattering by large objects with anisotropic impedance surfaces," in *Proc. ICEAA-IEEE APWC 2014*, Palm Beach, Aruba, Aug. 2014.

25. **Su Yan**, C.-F. Wang, J. Kotulski, and J.-M. Jin, "Time-domain finite element analysis of ferromagnetic hysteresis in three dimensions," in *Proc. IEEE Antennas Propag. Symp.*, Memphis, TN, July 2014.

26. **Su Yan**, J. Kotulski, C.-F. Wang, and J.-M. Jin, "A nonuniform time-stepping scheme for nonlinear electromagnetic analysis using time-domain finite element method," in *Proc. IEEE Antennas Propag. Symp.*, Memphis, TN, July 2014.

27. J. Guan, **Su Yan**, and J.-M. Jin, "An FE-BI-MLFMA with GPU acceleration for electromagnetic scattering analysis," in *Proc. IEEE Antennas Propag. Symp.*, Memphis, TN, July 2014.

28. J. Guan, **Su Yan**, and J.-M. Jin, "A GPU-accelerated integral-equation solution for large-scale electromagnetic problems," in *Proc. IEEE Antennas Propag. Symp.*, Memphis, TN, July 2014.

29. **Su Yan** and J.-M. Jin, "Ferromagnetic hysteresis analysis using time-domain finite element method in three dimensions," in *The 12th International Workshop on Finite Elements for Microwave Engineering* (FEM2014), Chengdu, China, May 2014.

30. **Su Yan** and J.-M. Jin, "Nonlinear magnetic analysis using time-domain finite element method with a nonuniform time stepping," in *The 12th International Workshop on Finite Elements for Microwave Engineering* (FEM2014), Chengdu, China, May 2014.

31. J. Guan, **Su Yan**, and J.-M. Jin, "A GPU-accelerated FE-BI-MLFMA for electromagnetic scattering simulation," in *The 12th International Workshop on Finite Elements for Microwave Engineering* (FEM2014), Chengdu, China, May 2014.

32. **Su Yan** and J.-M. Jin, "Analysis of nonlinear electromagnetic problems using time-domain finite element method," in *Proc. IEEE Antennas Propag. Symp.*, Orlando, FL, July 2013.

33. **Su Yan**, J.-M. Jin, and Z. Nie, "Multilevel fast multipole algorithm for mixed combined-field integral equations," in *Proc. IEEE Antennas Propag. Symp.*, Orlando, FL, July 2013.

34. **Su Yan** and J.-M. Jin, "A self-dual integral equation for solving EM scattering from PEC, PMC, and IBC objects," in *Proc. IEEE Antennas Propag. Symp.*, Orlando, FL, July 2013.

35. J. Guan, **Su Yan**, and J.-M. Jin, "A CUDA implementation of the finite element-boundary integral method for electromagnetic scattering simulation," in *Proc. IEEE Antennas Propag. Symp.*, Orlando, FL, July 2013.

36. **Su Yan**, J.-M. Jin, and Z. Nie, "Accurate and highly convergent solution of integral equations for electromagnetic problems," in *Proc. URSI Commission B 2013 International Symposium on Electromagnetic Theory*, Hiroshima, Japan, May 2013.

37. B. M. Hochwald, D. J. Love, **Su Yan**, and J.-M. Jin, "SAR codes," in *Information Theory and Applications Workshop* (ITA), San Diego, CA, Feb. 2013.

38. **Su Yan**, J.-M. Jin, and Z. Nie, "Improve the accuracy of the second-kind integral equations for generally shaped objects," in *Proc. IEEE Antennas Propag. Symp.*, Chicago, IL, July 2012.

39. J. Guan, **Su Yan**, and J.-M. Jin, "OpenMP-CUDA implementations of the moment method and multilevel fast multipole algorithm on multi-GPU computing systems," in *Proc. IEEE Antennas Propag. Symp.*, Chicago, IL, July 2012.

40. **Su Yan**, J.-M. Jin, and Z. Nie, "On the testing of the identity operator and the accuracy improvement of the second-kind SIEs," in *Proc. IEEE Antennas Propag. Symp.*, Spokane, WA, July 2011.

41. **Su Yan**, J.-M. Jin, and Z. Nie, "A higher-order Calderón preconditioner for the electric-field integral equation using the Nyström scheme," in *Proc. IEEE Antennas Propag. Symp.*, Spokane, WA, July 2011.

42. **Su Yan**, J.-M. Jin, and Z. Nie, "Accuracy improvement of the numerical solutions to the second-kind integral equations for electromagnetic scattering analysis," in *The 27th International Review of Progress in Applied Computational Electromagnetics (ACES 2011)*, Williamsburg, VA, Mar. 2011. (**Best Student Paper Award, The First Place Winner.**)

43. **Su Yan**, J.-M. Jin, and Z. Nie, "Calderón preconditioning techniques for integral equation based methods (Invited)," in *Proc. URSI Commission B 2010 International Symposium on Electromagnetic Theory*, Berlin, Germany, Aug. 2010.

44. **Su Yan**, J.-M. Jin, and Z. Nie, "A study of the augmented EFIE with a Calderón preconditioner," in *Proc. IEEE Antennas Propag. Symp.*, Toronto, Ontario, Canada, July 2010.

45. **Su Yan**, J.-M. Jin, and Z. Nie, "A comparative study of different Calderón preconditioned PMCHWT formulations," in *Proc. IEEE Antennas Propag. Symp.*, Toronto, Ontario, Canada, July 2010.

46. **Su Yan**, J.-M. Jin, and Z. Nie, "Derivation of N-Müller equations using Calderón identities," in *Proc. IEEE Antennas Propag. Symp.*, Toronto, Ontario, Canada, July 2010.

47. **Su Yan**, J.-M. Jin, and Z. Nie, "Analysis of low-frequency electromagnetic problems using the EFIE with a Calderón multiplicative preconditioner and loop-star decomposition," in *Proc. IEEE Antennas Propag. Symp.*, North Charleston, SC, June 2009.

48. **Su Yan**, J.-M. Jin, and Z. Nie, "Implementation of the Calderón multiplicative preconditioner for the EFIE solution with curvilinear triangular patches," in *Proc. IEEE Antennas Propag. Symp.*, North Charleston, SC, June 2009.

49. **Su Yan** and Z. Nie, "A set of novel surface integral equations for electromagnetic scattering from homogeneous penetrable objects," in *Asia-Pacific Microwave Conference*, Hong Kong, China, Dec. 2008.

50. S. He, Z. Nie, **Su Yan**, and J. Hu, "Multi-layer TDS approximation used to numerical solution for dielectric objects," in *Asia-Pacific Microwave Conference*, Hong Kong, China, Dec. 2008.

51. **Su Yan** and Z. Nie, "On the Rayleigh-Ritz scheme of 3D MFIE and its normal solution," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, California, USA, July 2008.

52. **Su Yan**, S. He, Z. Nie, and J. Hu, "Calculating wide band responses from metallic objects by employing the phase extracted basis functions," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, California, USA, July 2008.

53. **Su Yan**, Z. Nie, S. He, and J. Hu, "Using matrix sparsification and impedance prediction technique with phase extracted basis functions to improve the method of moments," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, California, USA, July 2008.

54. Z. Nie, **Su Yan**, S. He, and J. Hu, "The basis functions involving propagating wave phase dependency for solving the scattering from electrically large targets," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, California, USA, July 2008.

55. W. C. Chew, C. P. Davis, K. F. Warnick, Z. P. Nie, J. Hu, **Su Yan**, and L. Gürel, "EFIE and MFIE, why the difference?" in *Proc. IEEE Antennas Propag. Symp.*, San Diego, California, USA, July 2008.

56. X. Zong, Z. Nie, **Su Yan**, and S. He, "Applications of the PE-basis function in hybrid MOM-PO methods," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, California, USA, July 2008.

57. S. He, **Su Yan**, and Z. Nie, "Scattering analysis of dielectric-coated metallic targets based on phase extracted basis functions," in *Proc. IEEE Antennas Propag. Symp.*, San Diego, California, USA, July 2008.

58. **Su Yan** and Z. Nie, "A novel mixed basis function for method of moment," in *Proceedings of Asia-Pacific Microwave Conference*, vol. 3, Suzhou, China, Dec. 2005.

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