

Asif Iqbal

Email: asifiq@umich.edu

Phone: +1 (517) 512-8223

Address: 1467 Oak Valley Dr Apt 104, Ann Arbor, MI 48108

[Google Scholar](#) | [LinkedIn](#)

Education

Michigan State University, East Lansing, MI

Ph.D. in Electrical Engineering, April 2021

Thesis: Multipactor Discharge with Two-Frequency RF Fields

Advisor: Prof. Peng Zhang

Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

B.Sc. in Electrical and Electronic Engineering, September 2015

Research Interests

- Machine learning applications in accelerator technology and plasma discharge modeling
- High-power vacuum RF breakdown and secondary electron yield modeling
- RF interactions with plasmas for bioelectrics applications

Academic Positions

University of Michigan, Ann Arbor, MI

Research Fellow, Nuclear Engineering and Radiological Sciences (Jan 2025 - Present)

Conducted research on ultrafast photoemission induced nonlinear low temperature plasma, machine learning for accelerator applications. Developed advanced analytical, computational, and machine learning models.

Michigan State University, East Lansing, MI

Research Associate, Electrical and Computer Engineering (Apr 2021 - Dec 2024)

Played key role on projects on multipactor discharge and atmospheric pressure plasma discharge modeling. Developed analytical and Monte Carlo simulation techniques.

Graduate Research Assistant, Electrical and Computer Engineering (Aug 2017 - Apr 2021)

Investigated multipactor suppression and secondary electron emission modeling techniques.

Daffodil International University, Dhaka, Bangladesh

Lecturer, Electrical and Electronic Engineering (Sep 2015 - Jul 2017)

Designed and instructed undergraduate theory and laboratory courses in electromagnetics and computational modeling.

Awards & Honors

- Outstanding Graduate Student Award, Michigan State University (2020)
- MIPSE Graduate Fellowship, Michigan Institute for Plasma Science and Engineering (2019)
- Best Presentation Award, MIPSE Graduate Student Symposium (2019, 2021)
- Dean's List Fellowship, Faculty of EEE, BUET (2010 - 2015)
- University Merit Scholarship, BUET (2010 - 2015)
- Education Board Scholarship, Bangladesh (2007 - 2015)

Professional Service

- Session Chair: International Vacuum Electronics Conference (2022, 2024), IEEE International Conference on Plasma Science (2023)
- Judge: MIPSE Graduate Student Symposium (2022)
- Secretary: IEEE NPSS Student Chapter, Michigan State University (2020)
- General Secretary: Bangladesh Students' Association, Michigan State University (2020)
- President: Students' Association of Mymensingh, BUET (2015)
- Reviewer: Physics of Plasmas, IEEE Transactions on Plasma Science, etc.

Skills & Research Tools

- Software and Codes: CST Particle Studio, COMSOL, Particle in Cell (XPDP1, XOOPIC, Warp)
- Programming Languages: Python (PyTorch, Scikit-learn, TensorFlow), C, C++, MATLAB

Publications (Selected Peer Reviewed Journal Articles)

1. **A. Iqbal**, D. Wen, J. Verboncoeur, and Peng Zhang, "Two surface multipactor with non-sinusoidal RF fields", J. Appl. Phys. 134, 153304 (2023).
2. **A. Iqbal**, B.Z. Bentz, Y. Zhou, K. Youngman, and Peng Zhang, "Pulsed photoemission induced plasma breakdown", J. Phys. D: Appl. Phys. 56, 505204 (2023).
3. **A. Iqbal**, D. Wen, J. Verboncoeur, and Peng Zhang, "Recent Advances in Multipactor Physics and Mitigation", High Voltage, vol. 8, no. 6, pp. 1095–1114, 2023.
4. **A. Iqbal**, D. Wozniak, Md Z. Rahman, S. Banerjee, J. Verboncoeur, P. Zhang, and C. Jiang, "Influence of discharge polarity on streamer breakdown criterion of ambient air in a non-uniform electric field", J. Phys. D: Appl. Phys. 56 035204 (2022).
5. M. Mirmozafari, **A. Iqbal**, P. Zhang, N. Behdad, J. H. Booske, and J. P. Verboncoeur, "Secondary Electron Yield Characterization of High Porosity Surfaces for Multipactor-Free Microwave Components", Phys. Plasmas 29, 082109 (2022).
6. **A. Iqbal**, J. Verboncoeur, and Peng Zhang, "Two surface multipactor discharge with two-frequency rf fields and space-charge effects", Phys. Plasmas 29, 012102 (2022).

7. **A. Iqbal**, P. Wong, D. Wen, J. Verboncoeur, and Peng Zhang, "A Review of Recent Studies on Two-Frequency RF Field-Induced Single-Surface Multipactor Discharge", IEEE Trans. Plasma Sci. 49, 3284 (2021). [Invited Paper]
8. **A. Iqbal**, P. Y. Wong, D. -Q. Wen, Shu Lin, J. P. Verboncoeur and P. Zhang, "Time-dependent physics of single surface multipactor discharge with two carrier frequencies", Phys. Rev. E 102, 043201 (2020).
9. **A. Iqbal**, P. Y. Wong, J. P. Verboncoeur and P. Zhang, "Frequency-Domain Analysis of Single-Surface Multipactor Discharge with Single- and Dual-Tone RF Electric Fields", IEEE Trans. Plasma Sci. 48, 1950 (2020)
10. **A. Iqbal**, J. Ludwick, S. Fairchild, M. Cahay, D. Gortat, M. Sparkes, W. O'Neill, T. C. Back, and P. Zhang, "Empirical modeling and Monte Carlo simulation of secondary electron yield suppression of laser drilled micro-porous gold surfaces", J. Vac. Sci. Technol. B 38, 013801 (2020).
11. J. Ludwick, **A. Iqbal**, D. Gortat, J. Cook, M. Cahay, P. Zhang, T. C. Back, S. Fairchild, M. Sparkes, and W. O'Neill, "Angular dependence of secondary electron yield from microporous gold surfaces", J. Vac. Sci. Technol. B 38, 054001 (2020).
12. **A. Iqbal**, J. Verboncoeur, P. Zhang, "Temporal multiparticle Monte Carlo simulation of dual frequency single surface multipactor", Phys. Plasmas 26, 024503 (2019).
13. D. -Q. Wen, **A. Iqbal**, P. Zhang, and J. Verboncoeur, "Suppression of single-surface multipactor discharges due to non-sinusoidal transverse electric field", Phys. Plasmas 26, 093503 (2019).
14. **A. Iqbal**, J. Verboncoeur, P. Zhang, "Multipactor susceptibility on a dielectric with two carrier frequencies", Phys. Plasmas 25, 043501 (2018).

Conference Presentations (Selected)

1. **A. Iqbal**, De-Qi Wen, Patrick Y. Wong, Shu Lin, Sandhiya Suresh, Md Mashrafi, J. Verboncoeur, and P. Zhang, "Multipactor in a Coaxial Geometry with Non-Sinusoidal RF Fields," *2024 International Vacuum Electronics Conference (IVEC 2024)*, April 22 - 25, 2024, Monterey, California, USA. [Oral]
2. **A. Iqbal**, B. Bentz, Y. Zhou, K. Youngman, and P. Zhang, "Characterization of Plasma Breakdown Induced by Pulsed Photoemission," *2023 IEEE International Conference on Plasma Science (ICOPS)*, May 21-25, 2023, Santa Fe, New Mexico, USA. [Oral]
3. **A. Iqbal**, M. Mirmozafari, P. Zhang, N. Behdad, J. H. Booske, and J. Verboncoeur, "Secondary Electron Yield Reduction in High Porosity Surfaces and Its Application for Multipactor Suppression," *2023 IEEE International Conference on Plasma Science (ICOPS)*, May 21-25, 2023, Santa Fe, New Mexico, USA. [Oral]
4. **A. Iqbal**, D.-Q. Wen, J. Verboncoeur, and P. Zhang, "Two-Surface Multipactor with Non-Sinusoidal RF Fields and Space Charge Effects," *2023 International Vacuum Electronics Conference (IVEC)*, April 25-29, 2023, Beijing, China. [Oral]

5. **A. Iqbal**, John Verboncoeur, and Peng Zhang, "Non-sinusoidal RF Field Induced Two-Surface Multipactor Discharge," *2022 IEEE International Conference on Plasma Science (ICOPS 2022)*, May 22-26, 2022, Seattle, Washington, USA. [Oral]
6. De-Qi Wen, **A. Iqbal**, Corey Scutt, Peng Zhang, and John P. Verboncoeur, "Multipactor Mitigation via Gaussian-Shape Transverse RF Electric Field Near a Dielectric Surface," *2022 IEEE International Conference on Plasma Science (ICOPS 2022)*, May 22-26, 2022, Seattle, Washington, USA. [Oral]
7. **A. Iqbal**, Patrick Y. Wong, De-Qi Wen, Shu Lin, J. Verboncoeur, and P. Zhang, "Investigation of Two-Surface Multipactor with Two-Frequency RF Fields and Space-Charge Effects," *2022 International Vacuum Electronics Conference (IVEC 2022)*, April 25 - 29, 2022, Monterey, California, USA. [Oral]
8. **A. Iqbal**, John Verboncoeur, and Peng Zhang, "Study of Two-Frequency RF Field Induced Two-Surface Multipactor," *2021 IEEE International Conference on Plasma Science (ICOPS 2021)*, September 12-16, 2021. [Oral]
9. Dan Wozniak, Md Ziaur Rahman, Chunqi Jiang, **A. Iqbal**, Sneha Banerjee, John Verboncoeur, and Peng Zhang, "Meeks' Criterion for Breakdown Examined in Air Using a Needle-to-Plate Configuration," *2021 IEEE International Conference on Plasma Science (ICOPS 2021)*, September 12-16, 2021. [Oral]
10. **A. Iqbal**, Patrick Y. Wong, De-Qi Wen, Shu Lin, J. Verboncoeur, and P. Zhang, "Multipactor Dynamics Near a Dielectric Due to Two-Frequency RF Fields," *2021 International Vacuum Electronics Conference (IVEC 2021)*, April 27 - 30, 2021. [Oral]
11. **A. Iqbal**, Patrick Y. Wong, J. Verboncoeur, and P. Zhang, "Analysis of Single Surface Multipactor Discharge in the Frequency Domain," *21st International Vacuum Electronics Conference (IVEC 2020)*, October 26-29, 2020, Monterey, California, USA. [Oral]
12. **A. Iqbal**, J. Ludwick, S. Fairchild, M. Cahay, D. Gortat, M. Sparkes, W. O'Neill, T. C. Back, and Peng Zhang, "A General Empirical Model of Secondary Electron Yield and Its Application in Monte Carlo Simulation of a Microporous Gold Surface," *21st International Vacuum Electronics Conference (IVEC 2020)*, October 26-29, 2020, Monterey, California, USA. [Oral]
13. Shu Lin, **A. Iqbal**, Peng Zhang, and J. Verboncoeur, "Quantitative Analysis of Single-Surface Dielectric Multipactor Susceptibility with Dual Carrier Frequencies," *21st International Vacuum Electronics Conference (IVEC 2020)*, October 26-29, 2020, Monterey, California, USA. [Contributed Oral]
14. **A. Iqbal**, J. Ludwick, S. Fairchild, M. Cahay, D. Gortat, M. Sparkes, W. O'Neill, T. C. Back, and Peng Zhang, "Empirical Modeling and Monte Carlo Simulation of Secondary Electron Yield from a Microporous Surface," *International Vacuum Nanoelectronics Conference (IVNC 2019)*, July 22-26, 2019, Cincinnati, Ohio. [Oral]
15. **A. Iqbal**, J. Verboncoeur, and P. Zhang, "Temporal Study of Dual-Frequency Multipactor on a Dielectric," *2019 IEEE Pulsed Power and Plasma Science Conference (PPPS 2019)*, June 23-28, 2019, Orlando, FL, USA. [Oral]

16. **A. Iqbal**, J. Ludwick, S. Fairchild, M. Cahay, D. Gortat, M. Sparkes, W. O'Neill, T. C. Back, and Peng Zhang, "Monte Carlo Simulation of Secondary Electron Yield from a Microporous Surface," *2019 IEEE Pulsed Power and Plasma Science Conference (PPPS 2019)*, June 23-28, 2019, Orlando, FL, USA. [Poster]
17. **A. Iqbal**, J. Verboncoeur, Patrick Wong, and P. Zhang, "Temporal Study of Dual-Frequency Single-Surface Multipactor by Multiparticle Monte Carlo Simulations," *20th International Vacuum Electronics Conference (IVEC 2019)*, April 28-May 1, 2019, Busan, South Korea. [Contributed Poster]
18. **A. Iqbal**, J. Verboncoeur, and P. Zhang, "Time Dependent Physics of Single Surface Multipactor by Multiparticle Monte Carlo Simulations," *9th Annual MIPSE Graduate Student Symposium*, November 14, 2018, Ann Arbor, MI, USA. [Poster]
19. **A. Iqbal**, J. P. Verboncoeur, and P. Zhang, "Dual-Frequency Multipactor on a Dielectric," *45th IEEE International Conference on Plasma Science (ICOPS 2018)*, June 24-28, 2018, Denver, CO, USA. [Oral]
20. **A. Iqbal**, P. Zhang, and J. Verboncoeur, "Dual-Frequency Multipactor Susceptibility on a Dielectric," *19th International Vacuum Electronics Conference (IVEC 2018)*, April 24 - 26, 2018, Monterey, California, USA. [Contributed Oral]

References

(Available upon request)